

**CPCL VLLAGE DEVELOPMENT PROGRAMME IN 5
VILLAGES OF P.PANANGUDI (2 Nos) &
GOPURAJAPURAM PANCHAYTS (3 Nos) IN
THIRUMARUGAL UNION OF NAGAPATTINAM
DISTRICT- PROJECT REPORT**

CSR Project Funded by CPCL



Executed by IIT Madras



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EXECUTIVE SUMMARY

M/s Chennai Petro Chemicals Limited (CPCL) sworn MoU with ICSR of IIT-M on the 21st of June 2018, to undertake Corporate Social Responsibility (CSR) initiatives with financial assistance of Rs 15 crores. The scope caters Village Development Programme in the selected beneficiary villages of P.Panangudi, M.Pannagudi in Panangudi Panchayat and Gopurajapuram and Vellapakkam in Gopurajapuram Panchayat of Thirumarugal Union in Nagapattinam District. The MoU will be in force till completion of the works. The Project partners and brief Scope include provision of the following Activities with the revised restricted budget of Rs 13.50 crore consequent on reappropriation of budget proposal cleared by CPCL during 2020 due to inherent budget constraints:

- **CUBE's Activies:** Infrastructure works (Household Toilets, Pond Rejuvenation, Water Supply improvements & Drinking water distribution, Solid Waste Management, Waste water Treatment School improvements/, Anganwadi renovation & Community Hall.
- **UWC's Activities:** Awareness Programmes, Medical camps, Pedagogy improvement & Providing Solar Lanterns (2 nos each Household) and Street lights-150 nos
- **CSIE/IIT M:** Skill Development Activities in Tailoring & IT Skills identified in needs assessment.

The pre-implementation status revealed the apathy of dysfunctional Toilets which are neither operational nor used and no Septic tank in the existing system. The need to eliminate open defecation and safe sanitation calls for new Toilets with piped water supply in households. The project provided engineered Septic Tank and waste water treatment system with drain Field in households.

The existing water supply from Kollidam CWSS is scanty during summer months besides the local sources turned brackish and thus water scarcity is rampant in summer months. The shallow aquifer sources either dried up or can't yield sufficiently during summer and not potable beyond 6 to 10 m. And hence there is a craving for water supply in summer for drinking. The cumulative neglect of 21 waterbodies dependent on Cauvery basin flow and rainfall called for to rejuvenation. The power shortage during summer months left them in dark and hence it is proposed to provide solar lights to households and Streets under this Project.

The neglected f Schools and Anganwadi buildings yearned for safe space and sanitation and the project catered improvements with new school building in P.Panangudi and renovation in 3 Anganwadis with safe sanitation facilities including integral Pedagogy improvements. The key factor which helps to bring in sustainable behavior change could be achieved only by coherent awareness generation which is given very high importance in this project to attain the key aims/ objectives behind this benign project. The Project also catered Skill development initiatives to enhance skills and employability by self or otherwise to sustain livelihoods.

IIT M- Civil (EWRE) completed the assigned task comprising topographic survey, Geohydrological investigations, and allied design activities for Water Supply, Solid Waste Management and Waste water Treatment Systems after appropriate onsite studies. The factual backdrops from the Geophysical Studies in the project villages revealed the need for new Deep Bore wells. Accordingly after intensive scientific study, 2 nos of 300 m depth drilled during July 2019 and one more in Pnangudi near CPCL quarters during March 2021 to ease water scarcity . Both water quality and yield satisfy our requirements. The first 2 sources commissioned during March 2020 alleviated drinking water scarcity in both the Panchayats and is perceived happily by the public. The implementation phase merited the following few milestone events in the progress trajectory of the project landscape:

- ✚ The Project Inauguration chaired by District Collector held on 10-07-2018 at CPCL-CBR, Nagapattinam in presence of CPCL Director, Prof.Ligy Philip, IIT M and Village representatives
- ✚ The District Collector, Superintendent of Police, Nagapattinam in presence of CPCL MD

Inaugurated Toilet (100 Nos), Solar Street lights (150 nos), Solar lanterns supply(2 nos each household) besides inaugurating Skill Development Centre, Vellapakkam.

- ✚ The CPCL Director's Visit to Project area on 22.08.2019 further propelled the various project activities with new vigour and inaugurated Tuition Centres for school children.
- ✚ Prof.Ligy and Prof.Murty of IIT M (Civil) made site visits with emphasis on safe source creation and conducted coordination meetings to perpetuate improvements and design upgrades.
- ✚ The Visit of Mr.Kesari SNS Sarma, Officer/MGNCRE, MoHRD, GoI Unnat Bharat Abiyan on 25.09.2019 to study the best sanitation practices in the project area motivated further.
- ✚ The following Awards and Recognition 3 nos received by CPCL based on the project catalysed immense interest to perpetuate improvements amongst our partners:
 - "Best Practice Award in CSR" on 31.01.2020 from IoPE, Hyderabad
 - Award for "**Integrated Village Development**" from M/s.Fun&, Mumbai and ET on World CSR Day 18.02.2020, besides.
 - CPCL had been declared Winner under the sector Oil Refining and received **Golden Peacock Award for Corporate Social Responsibility (GPACSR)** for the year 2019.
- ✚ Periodical visits and interventions of CPCL Directors/DGM/Sr.Managers and the discussion meetings further helped to propel the Project activities to meet the end results.

The multitude of Natural Calamities (Heavy Monsoon, Gaja storm, Corona pandemic for about 15 months) and 3 public elections (Parliament in May,2019, Panchayat in Jan 2020 and Assembly in May 2021) besides adversities after Panchayat elections hindered progress with inherent delays. Amongst all these hindrances and oddities, the project is being propelled by our enthusiastic infrastructure partner CUBE, United Way and CSIE by their sustained coordination and follow-up with all stake holders. The gist of progress of various Activities implemented is itemized below:

1.CUBE hitherto completed 432 Household Toilets, Rejuvenation of Ponds (Total 17 nos) 8 nos completed & 9 in advanced stage held up due to good seasonal rain, Water supply improvements in 5 villages with 2 nos deep borewells duly energized since March 2020 supply copious piped water in streets, Water supply distribution completing pipes procurement for Distribution and house connection, Pre-casting of 45 K OHT for Gopurajapuram completed. The laying and construction held up due to lockdowns and adversities of Panchayats.

The Community Hall, School building in P.Panangudi and /Anganwadi Centre renovation works-2 nos Completed except Toilet Block in Gopurajapuram which is in advanced stage. The Household Drain Field for waste water treatment system is 75% completed

2.UWC completed 27 Awareness Activities covering WaSH, SWM, and Water Conservation including Covid Awareness and health camps including provision of disabled friendly Scooty with assistive devices. Pedagogy improvements fully completed with perceptible improvements in 2 Schools and 3 Anganwadis. House hold lanterns 900 nos with 2 per household completed during July 2019 including 150 Solar street lights along with 250 additional lanterns during March 2021.

3. CSIE completed 3 batches of training for Tailoring and IT to benefit 76 beneficiaries besides 27 in 4th batch under way and 41 for Spoken English and 12 1st batch trainees formed SHG and earning revenue readily signify self-reliance and enhanced local employment as envisioned

The much needed synergy in place amongst CPCL, IIT M and our vibrant Project partners will ensure project completion as envisaged under the scope of the benign project.

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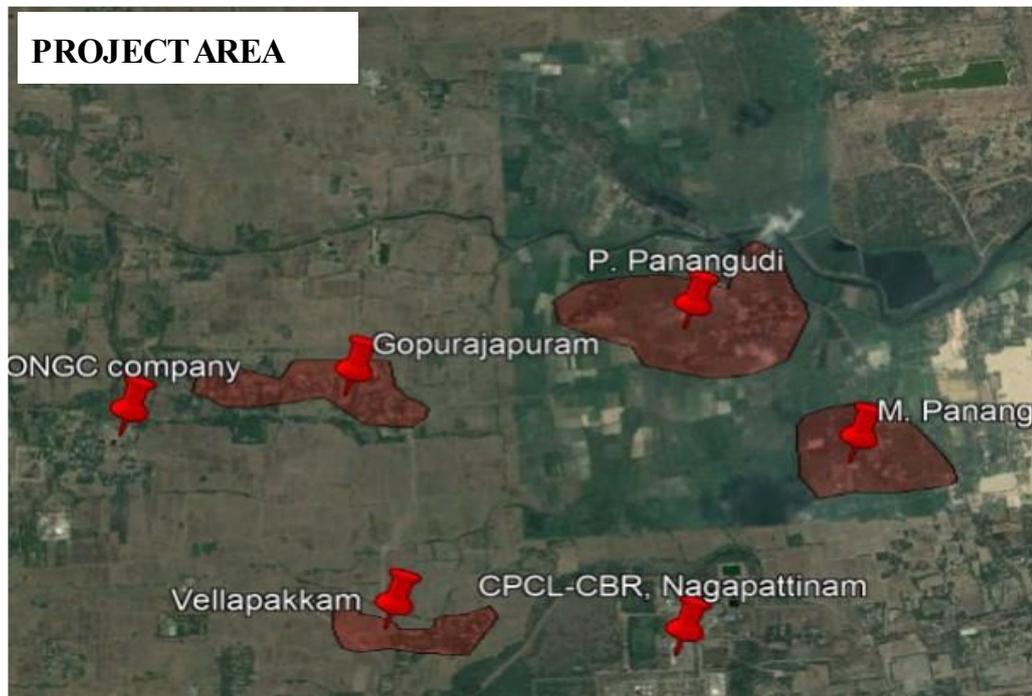
CHAPTER 1

PROJECT INTRODUCTION

1.1.Prefatory:

M/s Chennai Petro Chemicals Limited (CPCL) sworn MoU with ICSR, IIT-M on the 21st of June 2018, to undertake Corporate Social Responsibility (CSR) initiatives **Rs 15 crores in 4 selected villages** closer to their Cauvery Basin Refinery in Nagapattinam District. The beneficiaries include **P.Panangudi, M.Panagudi** in Panangudi Panchayat and **Gopurajapuram and Vellapakkam** in Gopurajapuram Panchayat of Thirumarugal Union.

Village Mapping



The project area falls in the tail end reach of Cauvery-Kollidam River basin comprising 21 Waterbodies comprising Ponds/Kuttas. The main stay of their livelihood is Agriculture. Most of them are agricultural farm labourers. The Project conceptualized by IIT M envisioned a clean and healthy Village Development Programme by adopting sustainable Water supply, water conservation, waste management, resource recovery practices and Solar energy alternatives. The MoU will be in force till completion of the work or 31.12.2020 whichever is later.

1.2 Need of the Project

The United Nation's (UN) Sustainable Development Goals (SDGs) and Swachh Bharat Mission (SBM) of Government of India (GoI) aim to confront the potent problems and the resulting challenges in the complex links between water resources and humanity. The GoI assigns lot of attention towards water supply, waste management, health and hygiene in India. The UN's SDG 6, Swachh Bharat Mission and Jal Jeevan Mission (JJM) particularly, seeks to ensure sustainable access to clean water and sanitation for all, with targets for water quality, efficiency, management, cooperation, capacity building, and ecosystem health. JJM is a time-bound, mission-mode programme launched by GoI during August 2019 to achieve drinking water security and enable Functional Household Tap Connections (**FHTC**) for all by 2024 in rural India.

As such there is renewed focus on achieving Swachh Bharat and SDGs for which water supply and Sanitation improvements is pivotal to reach the visions under SBM: **“Clean India”** and SDG6: **”Ensure clean water and Sanitation”** and JJM: **“Safe & adequate drinking water by 2024 to all Rural households”**.



The water governance landscape in the target villages is currently not poised to facilitate the visions and hence this project becomes necessary and lead to attain those goals in the project villages by provisioning Water and Sanitation with the largesse of CPCL- CSR funds.

This will surely result in positive trends toward betterment in local water governance and waste management by reaching the unreached by infrastructure improvements and appropriate social awareness catered under this benign project. This document readily captures the

contributions of this project that strive to reach readily, the nobler targets set forth under SBM, JJM and SDG6.

1.3 Aims and Objectives

The core objective of the project is to develop sustainable water/waste management, and resource recovery practices vital for clean and healthy village envisioned under **SDG6, SBM and JJM**. Such a scenario is sure to fetch improved public health outcomes.

- ✚ Drinking water for every household with FHTCs
- ✚ Household Toilets & Better sanitation conditions
- ✚ Water bodies rejuvenation, revival & Rainwater harvesting
- ✚ Awareness Generation including Environment, Water/Waste management, health and hygiene including medical camps
- ✚ Solid waste management
- ✚ School Infrastructure & pedagogy improvements
- ✚ Solar power utilization for Street lights and Household lanterns
- ✚ Skill development for youths to enhance skills and employability

1.4 Scope of the Project:

The project covers 4 target villages in 2 Panchayats in Thirumarugal Union of Nagapattinam District, Tamil Nadu as itemized below:

- 1) P.Panangudi & M.Panangudi (Panangudi Panchayat)
- 2) Gopurajapuram includes S.Panangudi & Vellapakkam (Gopurajapuram Panchayat)

The Scope entailed provision of the following components to achieve the desired objectives:

- ❖ Household Toilets with Septic Tanks and waste water treatment. This is sure to trigger safe sanitation aiming open-defecation- free conditions and clean streets eliminating waste water stagnation and contamination of soil and water.
- ❖ Water Supply improvements & Drinking water distribution upto households with FHTC as catered under SJM.
- ❖ Rejuvenation and Rehabilitation of water bodies
- ❖ Solid Waste Management

- ❖ Waste water management & Rainwater harvesting
- ❖ Community Hall
- ❖ Infrastructure for school improvements
- ❖ Awareness on Health & Hygiene and Environment including Medical camps
- ❖ Pedagogy improvements
- ❖ Solar power –Providing Household Lanterns & Solar Street Light
- ❖ Skill Development Centre for training the local youths in Tailoring, Computer training and Spoken English

The development works implemented by IIT M from the CSR funds provided by CPCL for the Village Development Programme is sure to leave lasting impressions due to significant improvements in beneficiary Villagers.

CHAPTER 2-PROJECT ACTIVITIES

The IIT M- Civil (EWRE) took up Survey and concept Design of the component activities envisaged under this Project and the project executed by concerted coordination with the following Project Partners since conception to completion:

2.1 Project Partners:

- **CUBE's Activities:** Infrastructure works (Household Toilets, Pond Rejuvenation, Water Supply & Drinking water distribution, Solid Waste Management, Waste water Treatment, Anganwadi/ school improvements & Community Hall.
- **UWC's Activities:** Awareness Programmes, Medical camps, Pedagogy improvement & Solar Lanterns (2nos per Household) and 150 Solar Street lights.
- **CSIE/IIT M:** Skill Development Activities- Tailoring & IT Skills,

2.2 PRELIMINARY FIELD VISITS

IIT Madras Team underwent field visits to pursue the following purposes very much vital for the subsequent detailed investigation, planning and design of activities:

1. Collecting preliminary data and establish rapport with Panchayat officials, which is crucial for the successful implementation of the project,
2. Identify, with the help of Panchayat officials, the target villages (within (Panangudi and Gopurajapuram Panchayat) where the focused activities would be initiated and
3. Get available information concerning the targeted activities delineated under the scope of the project for planning the various activities.
4. Water sampling to get reliable water quality data

After reconnaissance, it becomes necessary to instill environment-friendly measures and hygiene practices amongst users by appropriate social interventions integrally built in this project for creating awareness about Water and Sanitation. The field visits provide enough light to prioritise the activities planned under the scope of this project by strategic interactions with the Panchayats and public. The Social and Topographic surveys undertaken to assess the existing status of social infrastructure

and survey maps for design of the water, waste water and Solid waste management systems under the purview of this project.

2.3. Pre-implementation Scenario

2.3.1) Pre-implementation Scenario of Existing Toilets:

The field visits readily captured the cumulative neglect of the existing toilets which went beyond use implicating the need for new household toilets and there was felt need to provide household toilets with septic tank.



2.3.2. Preimplementation Scenario of Existing Waterbodies:

The Project villages have 21 ponds in 3 villages (Panangudi: 12 Nos Gopurajapuram:5 Nos & Vellapakkam:4 Nos) which are used for Agriculture besides Bathing, Washing Clothes and Vessels. The water bodies need rejuvenation for revival to enhance storage, strengthening of bund and utility, besides the much-needed recharge of groundwater to refurbish water quality/quantity besides agriculture uses. The fact that only shallow aquifers yield potable ground water implicate the need for revival of existing water bodies by appropriate interventions to rejuvenate.



2.4 Inauguration during Project Inception Stage:

The Project formally kickstarted by the inauguration held at CPCL-CBR, Nagapattinam on 10.07.2018 by the District Collector in the august presence of CPCL Director (Operations) and Prof.Ligy, Dean (Planning), IIT M-Civil.

Dr. S. Suresh Kumar, I.A.S., District Collector, Nagapattinam: Key Note address about the project



Mr. Aravindan, Director, CPCL, : Special address about CPCL project



Prof.LIGY Philip, Dean(Planning), IIT M-Civil): Briefing project details



Project Inauguration photos- Prof.Ligy Philip

Chapter 3

SURVEY, DESIGN AND PROJECT COORDINATION

The Survey and Design Activities are the tasks of IIT M-Civil(EWRE) along with SWM and project coordination activities vital for vivacious project implementation, The various activities entailed are enunciated below:

3.1.1 Social Survey:

The Social survey is undertaken from 10.08.2018 to 8. 08.2018 to peek into the existing conditions of social infrastructure and for factoring in the project comprising the following few:

- 1) Access to Toilets
- 2) Toilet coverage
- 3) Toilet Water drainage facilities
- 4) Source and access to existing drinking water supplies
- 5) Existing OHTs and public fountains etc

Details of Houses and Toilets Surveyed between 10.08.2018 to 18. 08.2018

Description	Vellapakkam (83 Houses)	Gopurajapuram (117 Houses)	Panangudi (225 Houses)
Total Number of Toilets (425Houses)	76 Nos.	104 Nos.	136 Nos.
Government Built Toilets(Under Schemes: Swachh Bharat, Amma (TN) , & IAY)	65	95	120
Toilets which are Not Functional Due to Improper build-up	34	54	92

The Social Survey outcomes are readily captured and shown pictorially in Annexure 1.1

3.1.2 Topographic Surveys & Maps:

The crux of investigation for any project starts from Topographic survey which readily capture the road map, length of roads/streets, elevation (contour lines/Ground level), names of habitations and a variety of social infrastructure, water supply utilities and allied features. Topographical survey has been carried out in all 3 villages. The detailed topographical survey is needed to collect field data for designing the water distribution system and also to obtain ponds sizes etc. The photos concerning the survey is shown in Annexure 1.2. Accordingly, intensive field survey undertaken between 10.08.2018 to 18. 08.2018 and customised village maps generated as delineated below:

The Village maps readily provide the requisite data for further investigation and design of pertinent components catered under the scope of this project.



3.1.3 Water Quality Surveys:

Water quality surveys conducted by taking water samples for analysis from various water sources used by the community. The water sampling is necessary to assess the existing water quality of various sources in proximity to the households besides the input for design of appropriate water supply system:

- 26 water samples collected from ponds, bore wells, public & private hand pumps in all 3 villages on 16.08.2018 & 18.08.2018.
- Collected samples are taken into IIT-M lab for water quality analysis and results tabulated in Annexure in Excel Sheet.
- Samples are analyzed for pH, EC, TDS, Fecal Coliforms, Total Coliforms, Alkalinity, Total Hardness, Chlorides, Sulfates, Ammonia, Nitrate, COD

3.1.4 3.1.4 Water Quality test results of existing sources:

The water sample details and allied test results analysed in IIT M Laboratory is tabulated in the PDF file link below. The data showed that only the shallow aquifer yields potable water and beyond 20' depth water is brackish. The shallow aquifer is prone to water contamination and may not yield during summer and hence not dependable, but the deeper

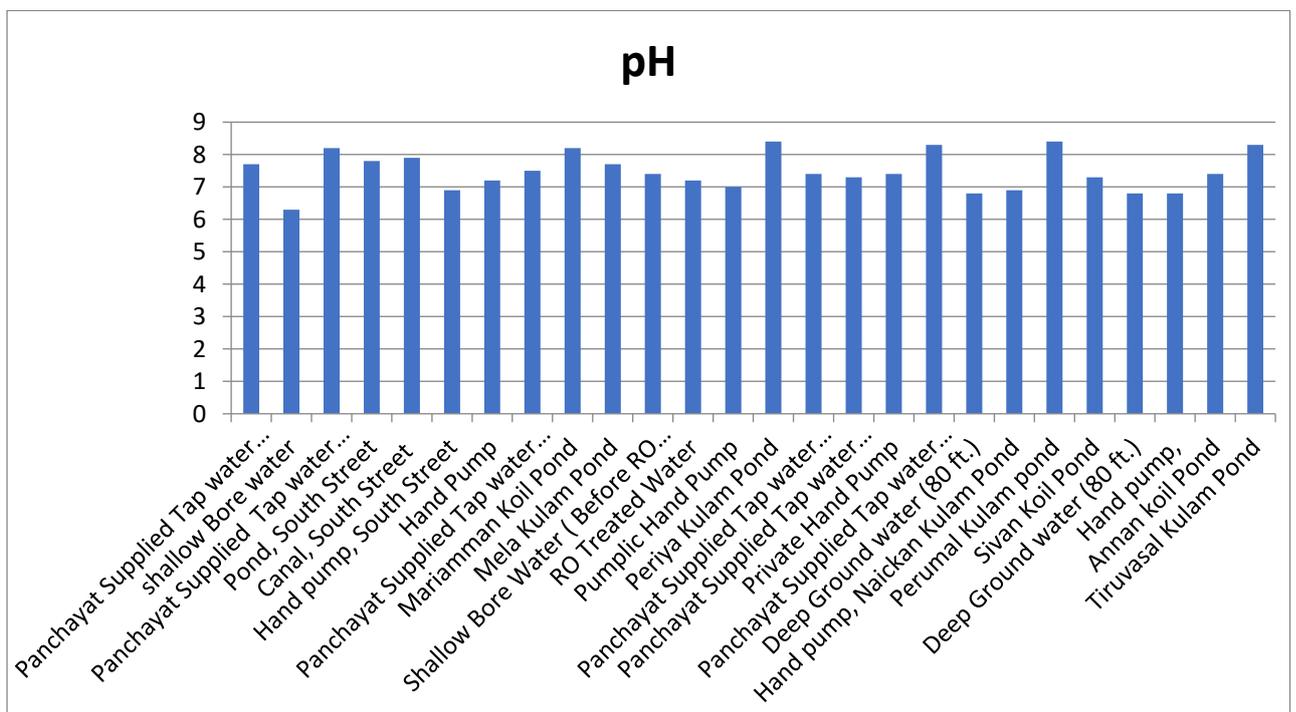
aquifer is brackish water. Hence intensive Geohydrological investigation becomes necessary to identify a viable source which is safe both on Quality and quantity parameters.



Water sample
Results Existing Sou

3.1.5. Water Quality mapping of existing sources:

The pH of the various water samples collected from different sources are readily plotted and shown in the Graph below:



3.2 Geo-Hydrogeological Investigation:

The Groundwater Perspectives Report of Nagappatinam district from Public Works Department, Tamilnadu 2013 and Well Inventory Data from Tamilnadu Water Supply and

Drainage Board (TWAD) well inventory of local sources analysed prior to the detailed investigation. The objective behind the ground water investigation is:

- ✚ To assess ground water potential of shallow and deeper Aquifers
- ✚ To meet the drinking Water Requirements of Panangudi, Rajagopuram and Vellapakkam Villages as part of CPCL CSR Activity

There is water quality problems as only shallow aquifers yield potable water and the aquifer beneath yield brackish water, in view of the comparatively high ground water table and the proximity to sea.

3.2.1 Shallow and Deep Aquifer Characteristics:

The detailed report entitled “ RESULTS OF TEST BORE DRILLED USING HAND AUGER FOR SHALLOW AQUIFER IN GOPURAJAPURAM, VELLAPAKKAM AND P PANANKUDI, NAGAPATTINAM DISTRICT, TAMIL NADU” has been prepared and well documented as shown below in PDF.



Shallow Aquifer
Detailed study repo

Ground water salinity increases beyond 12m depth. Water from Deep Well 300 m depth at Tirumarugal is of TDS 1800 mg/l and that drilled to 600 ft (200m) at Thittacherry is of 3800 mg/l.

- Shallow Aquifer -Consists of permeable sand and clayey sand
- Tube wells 10m depth and dug wells 6 m depth common
- Tube wells constructed using Hand Auger
- Ground water is potable and is used for drinking and Irrigation Purposes
- Shallow wells yield - 1000 LPH to 6000 LPH between October to March
- Yield reduces 50 % during summer. In 2016-2017 many shallow wells became dry

The shallow aquifers are prone to contamination due to anthropogenic factors and hence it is necessary to exercise caution while planning further development of available ground water resources. Ground water salinity increases beyond 12m depth. It is found that the Shallow aquifer sources are not dependable, after intensive discussions based on onsite investigations by conducting Geophysical VES Survey in 36 locations of target villages and after considering sustainability parameters.

Hence detailed investigation with VES Resistivity Surveys taken up to detect reliable deep borewell sources

3.2.2 Geophysical Resistivity Survey- Vertical Electric Sounding (VES) to identify deep borewell sources

Geophysical surveys have been carried out using a digital Resistivity meter with constant current facility so as to supplement the hydro-geological data and assess the possibilities of the occurrence of water at different depths and at different locations. The Resistivity Meter is a specialized version of IGIS resistivity meters designed for use in resistivity surveys upto about 500 m depth. The **Schlumberger method of survey** is utilized for assessing the subsurface lithology. Water from Deep Well 300 m depth at Tirumarugal is of TDS 1800 mg/l and that drilled to 600 ft (200m) at Thittacherry is of 3800 mg/l. and hence meticulous geohydrological survey is imperative for successful source identification

The resistivity methods are based on the measurement of resistance of various portions of the ground after passing electric current in to the earth. Usually the ground is constituted of various materials and the resistivity determined is the apparent resistivity. In Vertical Electric Sounding (VES) the observation point remains fixed and the current electrodes are expanded to obtain deeper penetration of current. This enables us to study the geological section of the subsurface. The following reports are reviewed and data relevant to this site assessment's objectives referred for expedient use to enhance reliability.

1. Geological maps.
2. Available report from State and Central Ground Water board, Nagapattinam
3. Existing ground water survey reports from CGWB, Nagapattinam
4. Geophysical Resistivity Survey Results

3.2.3 Detailed VES Survey Report for Deep Borewell sources:

After site walkthroughs, detailed Vertical Electrical Soundings (VES) were taken to 300 m depth. Apparent Resistivity is obtained for the different current electrode separation. At the site all these survey points are identified with GPS coordinates. The apparent Resistivity obtained is plotted against current electrode separation on a log-log scale. These curves are studied and interpreted for the different Hydro-geological units. The VES data at each of the three villages based on the field survey conducted from 15th September 2018 to 28th September 2018 and

additional survey conducted during March 2019. The general rule is to locate areas that have considerable thickness of sand and sandstone in sedimentary areas.

The detailed Study Report entitled: “ **DEEPER AQUIFER SURVEY AT PANANGUDI & NEARBY VILLAGES, NAGAPATTINAM DISTRICT, TAMIL NADU**” has been prepared based on intensive field survey and well documented in the Reports indicated below in PDF Format.

 1. Deeper Aquifer VES Draft-2.pdf	 2. Appendix - A RESISTIVITY DATA.pc	 3. Appendix - B Deep Survey IXID Gr.
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The field Survey Photos are shown in Annexure1 P1

3.2.4 Interpretation of Field Study & Recommendations for Drilling of deep Borewell in Gopurajapuram VES 11 near Sivankoil:

The only location VES 11 is selected from the surveys is recommended for drilling upto 300 m depth for Gopurajapuram near Sivan koil as per the GPS Coordinates indexed below with **Easting and Northing values in meters, UTM Zone 44 N WGS 84**)

VES ID	Easting	Northing	Village
VES 11	368862	1198737	Gopurajapuram

The Deep Bore well construction Design as executed is shown in Fig 4- Annexure 1 and photos in P2-Annexure 1.

After analysing the VES locations, only VES 11 Exhibits comparatively better resistivity values when compared to other locations and hence recommended to drill 300 m deep borewell near Sivankoil in Gopurajaouram and recommended VES location

3.2.5. Deep borewell source for P.Panangudi :

There’s popular demand for an exclusive source for P.Panangudi in Panangudi Panchayat, due to the inherent social and civic structure of the hamlets. Accordingly, additional survey conducted after harvest to detect suitable location for another deep bore-well in the nearby vicinity of the hamlets, as the site could not be accessed due to harvest in adjoining fields. Accordingly The detailed Study Report entitled: “**ADDITIONAL DEEPER AQUIFER SURVEY AT P.PANANGUDI & M.PANANGUDI VILLAGES, NAGAPATTINAM DISTRICT, TAMIL NADU**” has been prepared based on intensive field survey and details well documented in the Reports below in PDF Format.



P.Panangudi VES 40
Adl. Survey Report.p

3.2.6 Interpretation of Field Study & Recommendations for Drilling of deep Borewell in P.Panngudi VES 11 near Cattle Breeding centre: VES survey conducted to identify the locations of resistivity survey in 3 selected points, one in P.Panangudi and 2 in M.Panangudi. The geophysical survey data and the interpretation of the graphs (Figure 2-Annexure 1) and perusal of the resistivity data conclude the presence of permeable formations indicate good yield and hence tThis location is recommended for drilling a tube well to 300m depth. The resistivity graph of VES 40 is shown in Figure 2-Annexure 1.

The GPS coordinates of VES 40 is recommended for drilling with **Easting and Northing values are in meters, UTM Zone 44 N WGS 84.**

VES ID	Latitude	Longitude	Easting	Northing	Village
VES 40	10° 50' 40.17"	79° 48' 37.47"	369968	1199039	P.Panangudi

3.2.7) Additional Deep Borewell location near Panangudi- Muttam near CPCL

Quarters:

CPCL desired to help Panangudi Panchayat to create a new source near Sannamangalam play ground close to CPCL Quarters, in view of the water scarcity due to the sudden failure of the existing borewell during the pandemic period. Accordingly CPCL requested to take up the Deep Borewell works from the project funds and detailed deep borewell Surveys conducted during March 2021.

The detailed Study Report entitled: **“ADDITIONAL DEEPER AQUIFER SURVEY AT P.PANANGUDI & M.PANANGUDI VILLAGES, NAGAPATTINAM DISTRICT, TAMIL NADU”** has been prepared based on intensive field survey and details well documented in the Reports below in PDF Format.



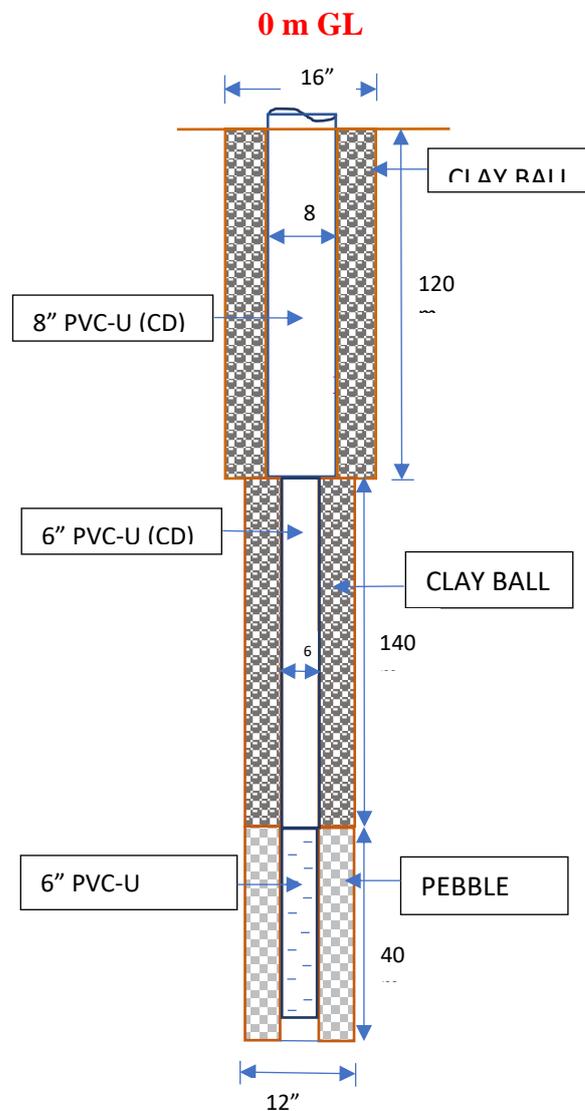
CUBE-Adl Deep
Borewell near CPCL |

3.2.9 Recommendations for Deep Borewell location P3 near CPCL Quarters in Panangudi:

Of the 3 locations surveyed, P3 near CPCL quarters in Panangudi exhibits congenial conditions and ideal resistivity readings for presence of fresh water with good yield Hence P3 location is recommended for drilling to 320m depth. The resistivity graph of the selected location P3 is shown in Figure 3-Annexure 1. Based on the results of development, decision on the type of pump and depth of installation of submersible pump could be decided.

The Detailed technical Specifications for Construction of Deep Borewell for about 300 m depth is shown in Annexure 2. The Deep Bore well construction Design is shown below.

3.2.9 Design of deep Borewells: Construction of 300 m deep Telescopic Bore well (8" x 6")



3.2.10. Water quality Test Results evaluated in IIT Laboratory:

The water samples collected during borewell flushing in P.Panangudi Borewell and Gopurajapuram Borewell on 18.07.2019. The samples tested in IIT M Environmental laboratory for evaluation and the test results are tabulated in Annexure 2.1.

Similarly the third Deep Borewell drilled during March 2021 has been sampled by CUBE and the water sample analysed in IIT M Environmental laboratory and the test results are tabulated in Annexure 2.2:

3.3 WATER SUPPLY IMPROVEMENTS :

The existing water supply from the local sources based on shallow aquifers cater only during normal seasons and go dry during summer months with inherent water scarcity. However water from Kollidam CWSS with a periodicity of once or twice a week sparsely support their drinking requirements and thus there is huge recurrent scarcity to support their entire water requirement which is vital for safe sanitation besides other domestic requirements

3.3.1 Water requirement of Project Villages (8/12 Hrs Pumping)

The population and demand of target villages based on the number of assessed houses benefitted is tabulated below:

S. No	Village	Popula- tion	Demand@ 90lpcd with 10% losses KL		Discharge in LPM @12 hr duty		Discharge in LPM @ 8hr duty	
			Present	Ultimate	Present	Ultimate	Present	Ultimate
1.1	P. Panangudi	684	67.72	88.04	94	122	141	183
1.2	M. Panangudi	240	23.76	30.89	34	43	50	65
	Sub Total	924	91.48	118.93	128	165	191	248
2.1	S. Panangudi	228	22.60	29.40	32	41	47	61
2.2	Gopurajapuram	216	21.40	27.82	30	40	45	59
	Sub Total	444	44.00	57.22	62	81	92	120
2.3	Vellapakkam	316	31.30	40.69	44	57	65	85
	Sub Total	760	75.30	97.91	106	138	157	205
	<i>Total</i>	<i>1684</i>	<i>166.78</i>	<i>216.84</i>	<i>234</i>	<i>303</i>	<i>348</i>	<i>453</i>

3.3.2 Design of Pumping Main from the 2 Deep Borewells one each in P.Panangudi and Gopurajapuram

The alignment of pumping main is prudently taken along the public roads/streets with minimal length as arrived from the topographic maps and field assessment judiciously done in consultation with respective Panchayats. The alignment plan is shown in Annexure 2.1

- 1) The hydraulic design is done for 12 hours pumping to meet the ultimate water demand of the respective villages by expedient population projections.
- 2) The per capita supply of 90 lpcd is adopted so as to facilitate house service connections and enable Functional Household Tap connections as envisioned under JJM.
- 3) The flow diagram is shown in Annexure 2.2 and Hydraulic design in Annexure 2.3

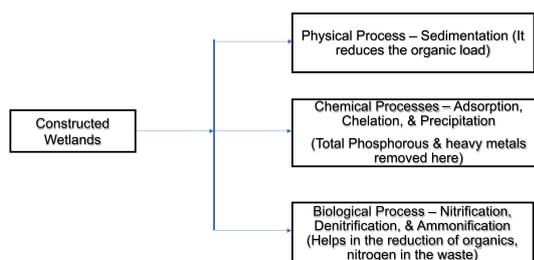
3.4. Wastewater Treatment System

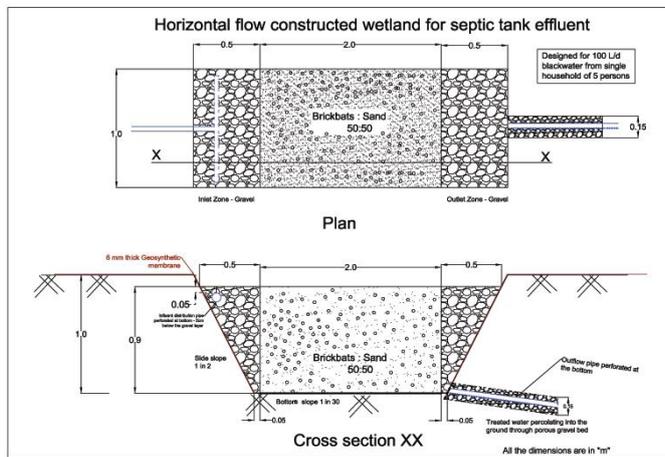
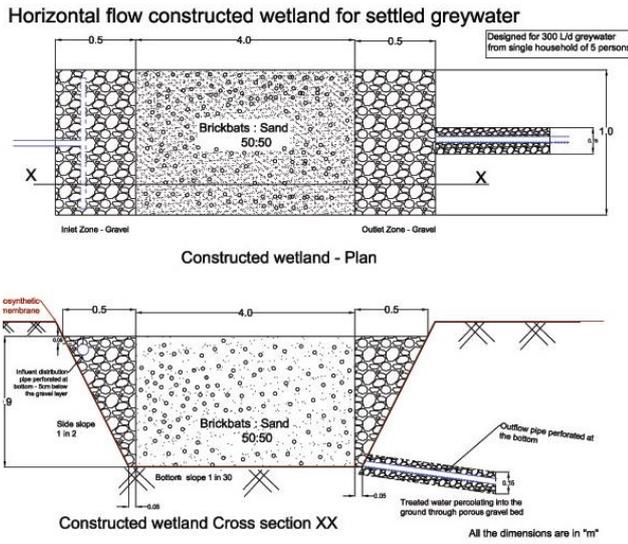
3.4.1 Septic Tank design: The design for Septic Tank as shared to CUBE for provision in each Household for onsite containment of blackwater from the Toilets is shown in Annexure 2

3.4.2 Waste water Treatment by Constructed wetland System:

While doing survey at these villages for implementation of Constructed wetland system as proposed by IITM, the following challenges/constraints have been witnessed at site. The much-needed land is not available as per the design requirements to implement the Cluster based constructed wetland system and hence cluster based Constructed wetland system is not proposed. The option narrowed down to household model for which too sufficient land is not available for Constructed Wetland system in most of the household as the public are generally poor.

Constructed Wetland-Treatment Process Mechanism

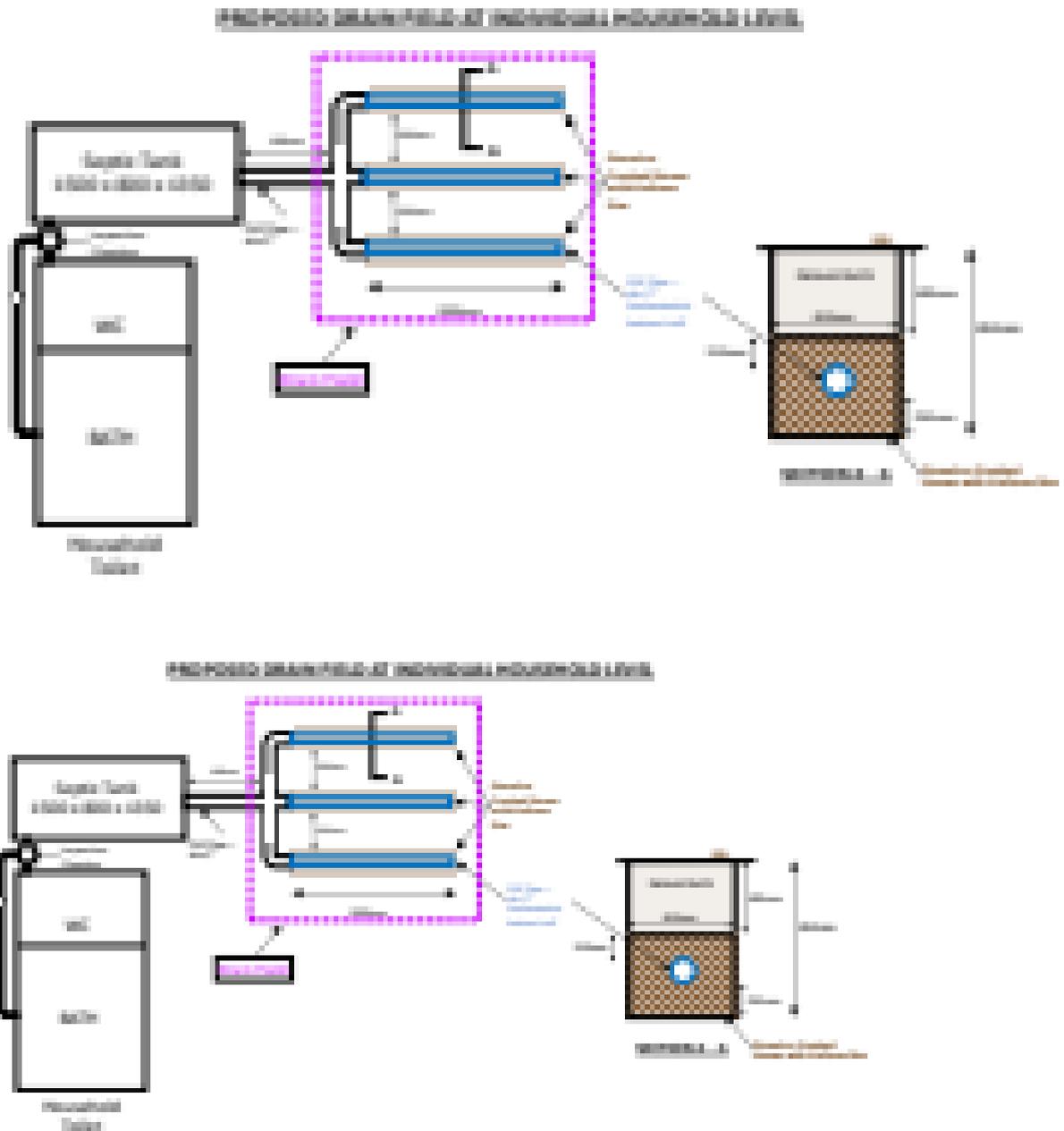




Alternative technology proposed with Drainfield system in every household the details of which are briefed below:. Add hence it is constrained to look for alternative technology options for onsite treatment within the available space.

3.4.3. Drain field Treatment System for Household Waste Water :

Accordingly Drain field system of treatment is now proposed for adoption in view of the preceding discussions



3.5.SWM Compost Yard for P.Panangudi

The initial design for P,Panangudi SWM was designed to suit the site provided near the Cattle breeding site (Details in Annexure 7) and due to public objection it is shifted to Samuthavapuram site.

There also public objected and lastly Panchayat authorities confirmed a site in M.Panangudi which is being now executed as per the design and layout shown below in the combined drawing attached:



Combined
drawings - Compost

3.5.1 SWM Procurement:

The scope included the following items to facilitate Door-to-door collection of segregated solid waste besides the utilities and allied accessories to aid processing in the Compost yard:

- 1) Already Procured 3 nos of Containerized Garbage Tri-cycles Manual along with household bins 900 nos for segregated collection in 2 colour bins (Green& Blue).
- 2) Motorized Battery Operated Containerized Garbage Tricycles- 2 nos
- 3) SWM Accessories and Utilities comprising Shredder, sieve shaker, packaging and allied tools for composting operation and allied maintenance charges including energy during start up training period

The accessories will be procured after the Compost yard under construction in M.Panangudi for the combined processing of solid waste collected from P,Panagudi and M.Panangudi

3.6 Solar Installations

The project contemplates provision for Household lanterns 2 W LED Bulb 2 nos each Family (Total: 1000 Nos) and 150 Solar Street lights with 18 W LED Bulb. The detailed specifications formulated by us within the umbrella specifications postulated by MNRE, GoI and got vetted by Prof.Krishna of Electrical Engineering Department before finalising it.. The approval for standard specifications communicated vide mail dated 19.02.2019 subject to the following prerequisites during Procurement:

- ✚ The Vendor selection should be from only OEM or Manufacturers of either Solar panel/LFP Battery / LED Lights in conformity to MNRE standards certified from NABL Accredited Laboratories/NISE etc indicated in the technical specifications
- ✚ Such Agencies registered with TEDA or any Central Government/ State Government Institutions with a clean credential shall be made eligible for Vendor selection for Solar street Light system.
- ✚ The observance of all standard procedures in place for Procurement.

3.6.1 Functional Specifications of Solar lanterns:

The supply entailed 900 nos of Household Lanterns to provide 2 nos per household and the approval granted as per Email dated 22.02.2019.

The proposal for Solar lanterns is generally cleared with the condition that **the unit Estimate Cost of Rs 2100/- per Lantern inclusive of all applicable taxes should not be exceeded.** Herein, it also deems fit to reminisce the following:

- 1) United way should ensure compatibility to the Standard Technical specifications already communicated to you and relevant documents/Test reports should be verified during procurement and copies furnished to this office for documentation .
- 2) The process of procurement shall be done with due diligence, after observance of all standard procedures.
- 3) The No. of households actually assessed and in existence in the villages, as already enumerated shall be the criteria for procurement of the requisite quantity with some marginal cushion that deems fit.
- 4) The budget will be based on actual execution only.

The United way, Chennai may proceed with the process of procurement swiftly to supply a product of best standards and fund requirements proposal shall also be sent immediately.

The detailed Specifications are shown in Annexure 7.1. The broad Performance Indicators of a W-LED light source based solar lantern system:

Model as per MNRE specification	: Model 1A
PV module Wattage under STC (Wp)	:Min: 3-4 Wp under STC with certifications
Battery Model IA (C-rated)	: Min of 1450 mAh or requisite capacity Lithium Ferro Phosphate(LFP) capacity V or
Light Source	: 2.0 Watts cool W-LED luminaire
Charge Controller	: Built-in PWM Regulated type
Lantern Body	: ABS Plastic body/ Poly Carbonate diffuser and IP 44 protection

3.6.2 Functional Specifications of Solar streetlights:

The brief performance indicators are as denoted below:

PV module Chemistry : Monocrystalline / Polycrystalline silicon Solar

PV module (Wp) power :Min 60 Wp under STC or requisite capacity

Battery Chemistry : Lithium Ferro phosphate(LFP) Battery
LFP battery capacity : Min 190 Wh Li-FePO4 Battery (12 V/16Ah @C/10 or actuals)
Charge Controller : PWM/MPPT Regulated & with PIR Motion Sensor
Operational conditions : i) Ensure IP 65 certification.
ii) Shall resist coastal weather conditions
and Wind resistance of 140 km/h.

Lighting Parameters

LED Capacity : 18 W White LED(W-LED)

The proposal for 18 W Solar Street Light System is cleared vide Email communication Dated 27.02.2019 as per detailed Technical Specifications in Annexure 7.2 with the following observations:

- 1) The maximum unit Cost of Rs 22,440/-/ estimated per Solar Street Light System is inclusive of all applicable taxes and 5 year warranty commitments compatible to the Standards & Technical specifications already communicated and appended herewith.
- 2) United Way should ensure compatibility to the Standard Technical specifications already communicated to you and relevant documents/Test reports should be verified during procurement and copies furnished to this office for documentation .
- 3) The budget for O&M cost after due fulfillment of warranty clause agreed upon as per MNRE's standard specifications including United Way's Administrative Cost will be based on actual execution only.

3.7. Project Coordination Activities:

The project started with planned schedule of activities based on the workable survey and design inputs orchestrated by Project Coordinators Prof.Ligy Philip and Prof.Murthy. The project implementation is propelled to progress the activities by conducting series of coordination meetings, field visits, public consultation & sensitization meetings and interim inauguration of completed activities and proposing adoption under Swaachh Action Plan envisaged under UBA. The CPCL CSR Village Development Programme got 3 Awards and Recognition in succession after participating in the Techno Conclave conducted in IIT M Research park during September 2019 readily portray the merits behind the CPCL CSR project.

3.7.1 Coordination Meetings of IIT M- Civil (EWRE) Professors:

The IIT M- Civil (EWRE) Professors in the capacity of Project Coordinator, conducted periodic meetings with CPCL and the Project partners. The purpose is to discuss about field progress, understand field issues better to take unified stand to redress it without impeding progress. Their suggestions, involvement and timely actions to catalyse progress, improving the design based on field realities prodded the execution of activities by sparking the quest for excellence. The details of such meeting is shown in Annexure 6.4.

3.7.2. Field Visits of IIT Professors:

IIT M Project Coordinators Prof.Ligy Philip and Prof.Murty made field visits to catalase field activities by onsite interventions duly interacting with project partners and public. Their visit made significant observations with resultant improvements in the field strategy, design and the much needed qualitative upgrades in the activity implementation. During the course of drilling of Deep Borewell, IIT M Prof.Ligy and Prof.Murty made field visits to propel the project execution as contemplated in the design and for expediting other project activities.

The visuals of their field visit is captured in Annexure 6.7

3.7.3 Public Consultation & Sensitisation of Panchayats/ Officials:

IIT M in coordination with CPCL and CUBE conducted a discussion Meeting with Panchayat President, Ward Members in Panangudi Panchayat Office on 21.02.2020 in sequel to the interactive meeting of CPCL DGM/Sr.Mananger with IIT M team and CUBE CEO. Accordingly CPCL DGM Mr.Ravikumar & Senior Manger and representatives of IIT M, CUBE, United Way & CSIE sensitised Panchayat President, Members and public so as to resolve the pending issues to move forward with execution without further delay.

- 1) Water Supply Distribution lines
- 2) HSC Deposit
- 3) SWM site identification as two previous sites met with public objection
- 4) Pond rejuvenation works- Public/Panchyat objections to enter and deawter the ponds to proceed with rejuvenation

Then apprised BDO, Thirumarugal Union also to intervene to move forward with project activities. The photos showing the discussionmeeting is shown in Annexure 6.6 and Annexure 17.1

3.7.4. Natural Calamities and Adversities during project Implementation Phase:

The factors that led to excusable delays during implementation phase could be reckoned from the 2 severe cyclonic storms (Gaja during November 2019 and Nivar in November 2020) and the much dreaded Covid pandemic elongated over 14 months. Further some delays are due to 3 public elections and the consequent issues from the heightened expectancy of Panchayat Presidents which are being resolved by parleys and persuasions through concerned authorities by our project partners. The details of potential delay factors are summarised in Annexure 6.6.1

3.8. Adoption of CPCL Project under MoHRD's Unnat Bharat Abhiyan (UBA) Swachh Ata Action Plan:

CPCL CSR Project provided a platform to provide environmental awareness, safe water, Household Toilets, waste water management including Solid waste management practices, Solar lights, and School/Anganwadi improvements catered, so as to catalyze sustainable living within easy reach of the selected villages. The Health and Hygiene is prioritized alongside sustained toilet use to ensure open defecation free status of the villages. Accordingly, the project is prioritised for adoption under UBA .

Mr. Kesari S N S Sarma along with IIT project persons comprising Project Consultant, Mr.K.Vivekanandan and Project Associate Mr.Yoganathan along project partners visited Nagapattinam on 25.10.2019 to collect baseline data by interacting with Panchayat Secretary, Community as per the UBA requirement. The requisite inputs have been furnished in the prescribed format **for evaluating** Swachh Ata in the Schools/Anganwadis and community.

The Ministry of HRD under UBA is considering to provide appreciation fund which is 10% the money matched by the MHRD of all the convergence done for the adopted village under UBA as per Email message dated 24.02.2020 from UBA. Accordingly details also sent in the prescribed format for consideration. The field visit photos shown in Annexure 6.5

3.9. Awards & recognition for CPCL Village Development Project:

CPCL has received the following 3 Awards & recognition from various organisations which readily signify the merits behind the project implemented through IIT M- Civil (EWRE).

3.9.1 Institute of Public Enterprises (IoPE) Hyderabad Award for Best Practices in CSR:

The CPCL who funded this project has received Award Certificate on **31.01.2020** from the Institute of Public Enterprises Hyderabad for "**Best Practices in CSR Awards 2020**" for the project titled "**Village Adoption/Development Project in Nagapattinam-Vellapakkam, Gopurajapuram & Panangudi**", in the segment of Award for Rural Development.

3.9.2 Award for Integrated Village Development:

M/s.Fun& Joy, Mumbai and ET Now being Telecast Partner had organised and conceptualised the 9th edition of the World CSR Day Congress & Awards, under which CPCL had been conferred with an award under the category "Integrated Village Development" for our sustainable CSR initiatives and efforts undertaken through the Village Adoption / Development project in Nagapattinam District on 18.02.2020

3.9.3 Golden Peacock Awards:

The Golden Peacock Awards Secretariat invited applications for the Golden Peacock Award for Corporate Social Responsibility (GPACSR) for the year 2019, CPCL had been declared Winner under the sector Oil Refining for the Golden Peacock Award for Corporate Social Responsibility (GPACSR).

The photos showing the Awards & recognition is shown in Annexure 6.5

3.10 Project Inauguration and other cardinal events:

The project under implementation by IIT M- Civil project team along with project partners took concerted action to propel the activities to attain the nobler objectives. Accordingly after ascertaining the field progress decided to have an inauguration to dedicate the completed facilities for community use. The mile stone events concerning the project are the following few which deserves to be documented in the project landscape:

- ✚ The inauguration conducted on 01.07.2019 in a function chaired by District Collector in presence of Managing Director CPCL and Superintendent of Police, Nagapattinam
- ✚ Shri G Aravindan, Director(Operations) and Dr P B Lohiya, Independent Director & Chairman CSR Sub Committee of Board of CPCL visited Nagapattinam on 22.08.2019 for onsite interventions with project implementation team and beneficiary public on 22.08.2019
- ✚ Technology Conclave conducted in IIT Research Park on wherein, CPCL Project is displayed as model for emulation for investing CSR funds

3.11.1 Project Inauguration on 01.07.2018:

The function arranged in Vellapakkam Community Hall to dedicate the following facilities completed as on date for:

- ✚ Inauguration of Vellapakkam Skill Development Centre
- ✚ 100 Public Toilets
- ✚ Distribution of Lanterns 2 nos each family in the 5 project villages
- ✚ Dedicating 150 Solar Street Lights constructed in the 5 project villages

The visuals of the moment is ably captured and shown in Annexure 6.7

3.11.2 Directors Visit to the Project Area on 22.08.2019:

The Chairman CPCL CSR Sub Committee along with Director(operations)CPCL made an onsite visit on 22.08.2019 for the various activities implemented under the scope of the project. The chairman being a Doctor, who took keen interest on Sanitation, Health and Hygiene measures and suggested to provide disabled friendly Toilets after seeing such children one of whom he handed over he Scooty Type disabled friendly vehicle with assistive devices. This is the trigger for providing 6 Disabled friendly Toilet with European closet as all others are of Indian Closet. The Photos showing their field visit is captured and shown in Annexure 6.8. The field visit photos lucidly convey their keen interest in the best implementation of the project, as the beneficiaries radiated happiness during their interactive sessions

3.11.3 Technology conclave conducted in IIT M Research Park:

The CPCL CSR Village development activities gained prominence during the Techno Conclave exhibition inaugurated by Hon'ble Minister for heavy Industries & Public Enterprises on 22.09.2019 at IIT M research park. The Hon'ble Minister and other participants visited the stall displaying the project activities under CPCL CSR Project. The senior Manger, CPCL ably explained the dignitaries about the project activities during visit of Ho'ble Minister and IIT M Director, to the stall. The poster created by capturing the prominent moments concerning the project display during the Conclave is shown in Annexure 6.9

This event of CPCL CSR Project proved to be beneficial to showcase the Activities of the project model implemented by IIT M in an expedient manner and activated series of 3 awards and recognition as discussed in para 3.9. The first award from The IoPE, an organ of the MoHI & PE who organised this Technology Conclave in IIT M Research Park to CPCL clearly stand testimony to this, followed by 2 more awards in a short span of 4 months since the conclave.

Chapter 4 ACTIVITIES OF CUBE- IIT M Research Park

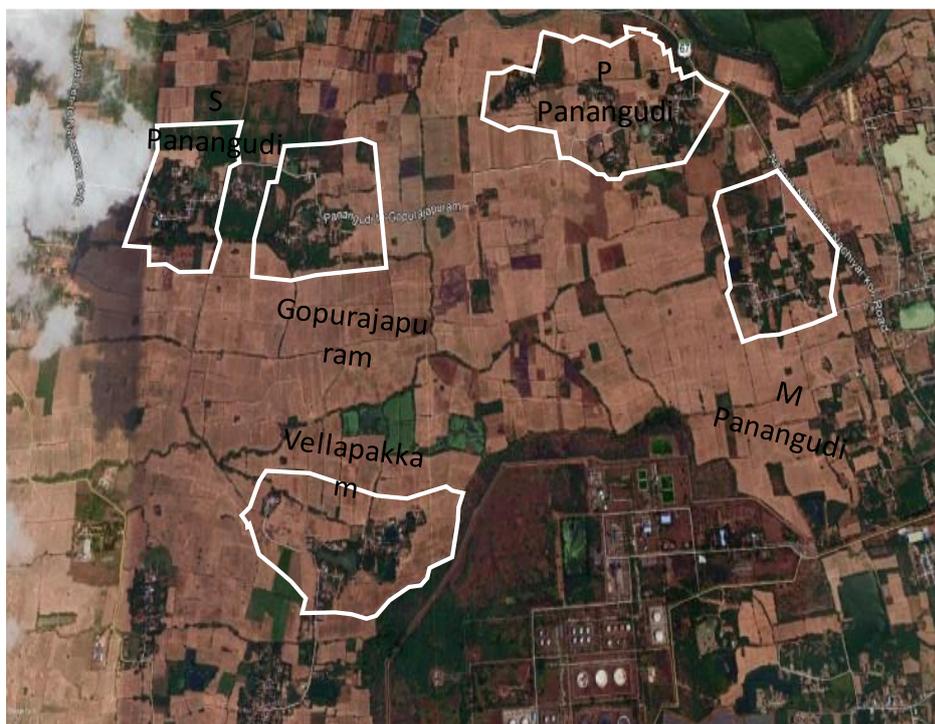
4.1 Scope of CUBE's Activities:

The scope of works entrusted to CUBE under the scope of CPCL CSR activities include the following components:

1. Household Toilets
2. Rejuvenation of Ponds
3. Drinking Water Distribution
4. Waste Water Treatment
5. Compost Yard
6. Schools & Anganwadi
7. Community Hall
8. CPCL Branding

PROJECT AREA & SCOPE

Page 5



Project Implementation Area

1. P Panangudi
2. M Panangudi
3. Gopurajapuram
4. S Panangudi
5. Vellapakkam

Project Scope

1. Household Toilets
2. Rejuvenation of Ponds
3. Drinking Water Distribution
4. Waste Water Treatment
5. Compost Yard
6. Schools & Anganwadi
7. Community Hall
8. CPCL Branding

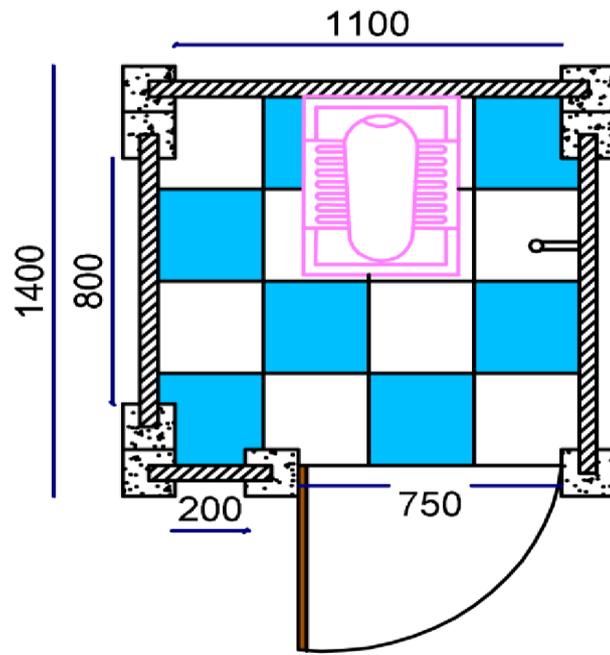


CPCL Village Adoption CSR Project

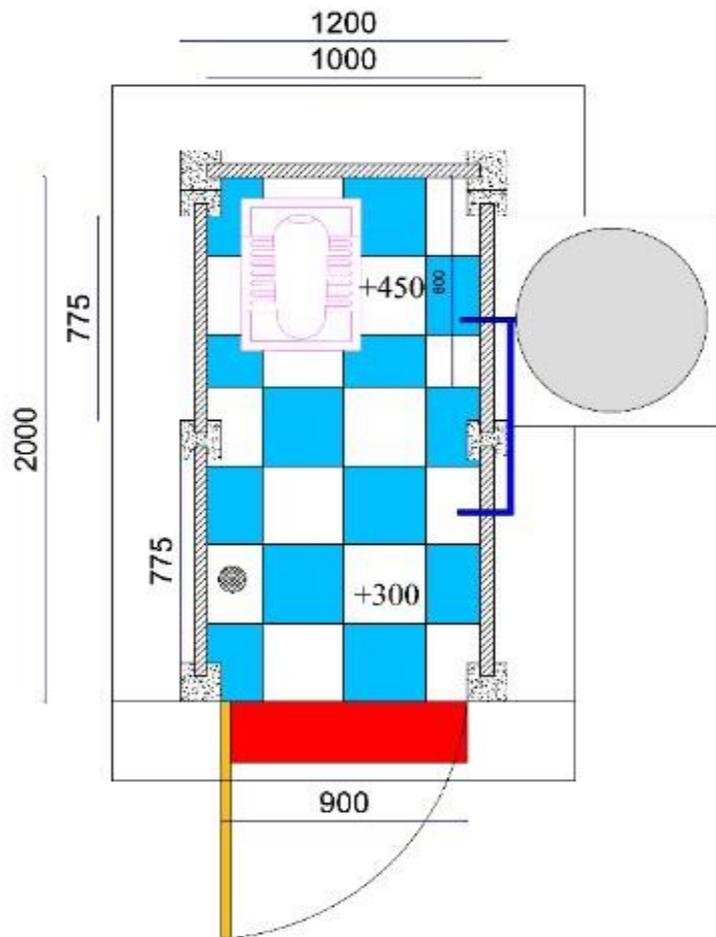


The component-wise activities are briefed below along with pertinent details pertaining to that work:

4.2 Household Toilets with Septic Tank: The household toilets initially included only toilet portion with Conventional Masonry Structure – Size 3' x 4 which is subsequently modified with bathing facility as desired by the public.



Subsequently the scope widened to attach the bathing facility with overall inner dimension of 4'*7' size using precast modular structure for walls based on popular demand in consultation with CPCL authorities also. The modified layout is shown below:



4.2.1 Household Toilets Coverage in the Project area:

The total toilet units constructed for the beneficiary households in the project area is 432 nos as tabulated below

S.No.	Village name	No. of Toilets
Panangudi Panchayat		
1	M.Panangudi	69
2	P Panangudi	146
	Sub Total	315
Gopurajapuram Panchayat		
3	S Panangudi	53
4	Gopurajapuram	75
5	Vellapakkam	89
	Sub Total	217
	Grand Total (315+217=432)	432

4.2.2.Functional Features and Components of Toilet unit:

The salient functional features of household toilets and the components thereof include the following provisions For RCC Precast Modular Structure (Size 4' x 7') for the 432 households in the project area:

1. Bath + Water Closet
2. Masonry Septic Tank- Twin chamber

The initial scope catered only the above 2 components only and subsequently scope widened based on the requirements of the community with an eye on their acceptance and the continual usage vital for the successful utility after completion

Additional facilities included the following :-

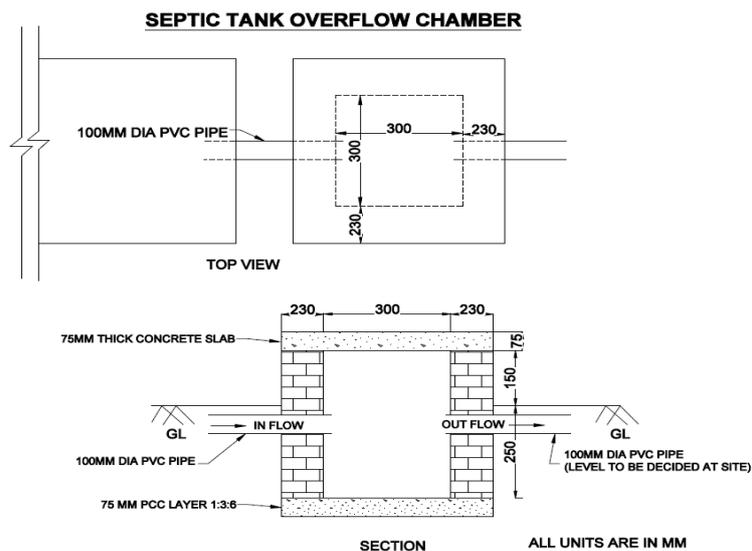
1. Water Storage Tank with Pedestal.
2. Plumbing and Taps for Bathing and W/C
3. Solid PVC Framed Door
4. Ceramic Tile Flooring and Skirting
5. All Round Plinth Protection
6. Differently Abled Friendly Provisions in Toilets - European Water Closet in place of IWC, provision of handrails and Ramp for ease of access. – 6 No



**Modular pre-cast construction – Household Toilet
[Bath, IWC and Septic Tank + Overflow Chamber]**



4.2.3 Septic Tank Construction Design: The design of Two compartment Septic Tank with overflow chamber arrangement is shown below:



4.2.4 Technical Specifications of Toilet Unit with bathing Facility as executed:

1.Toilet Block Structure:

The Size of the unit as constructed is of 2100mm (L) 1200mm (B) x 2400mm (H) and the technical specifications are itemized below:

- a) Construction of Foundation including earthwork as per tender drawing.
- b) Providing and fixing of RCC Precast walls, slabs and Precast Posts of grade M30 as per the tender drawing.
- c) Providing and laying in position cement concrete of specified grade for post grouting 1:3:6 (1 cement: 3 coarse sand: 6 20 mm nominal size).
- d) Provide a transverse slope of 1:40 at roof slab to avoid water ponding.

2.Finishes.

- a) Providing and laying Anti-skid designer Ceramic floor tiles 300x300mm, laid on 20 mm thick cement mortar of mix 1:4 (1 cement:4 coarse sand) including pointing the joints with white cement and matching pigment etc., complete.
- b) Providing and fixing ceramic glazed wall tiles up to 450mm above FFL, over 12 mm thick bed of cement mortar 1:3 (1 cement: 3 coarse sand), including pointing in white cement mixed with pigment of matching shade complete.
- c) Applying wall painting for both exterior (weather coat) and interior (emulsion paint).

3.Joineries.

- a) Providing and fixing solid PVC doors with required fixtures.
- b) Providing & Fixing Precast RCC jally for ventilation (900mm x 400mm).

4.Plumbing Items.

- a) Providing and fixing PVC Water tap.
- b) Providing and fixing IWC pan of Gujarat type
- c) Providing and fixing of 20mm dia PVC pipes for delivery.
- d) Providing and fixing PVC P-trap.
- e) Providing and fixing PVC Floor trap (75mm).
- f) Providing and fixing of 4kg pressure PVC pipes (75 mm dia).

5.External.

- a) Making plinth protection of cement concrete 1:2:4 (1 cement: 2 coarse sand: 4 graded stone aggregate 20 mm nominal size) over 50mm thick bed of dry brick ballast 40 mm nominal size including finishing the top smooth including required brick edging.

6.Water Tank Pedestal.

- a) Construction of Water Tank Pedestal (800mm Sq x 700mm depth) as per tender drawing.
- b) Filling available excavated earth in foundations etc. in consolidating each deposited layer by ramming and watering.
- c) Providing and laying in position cement concrete of specified grade: 1:3:6 (1 cement: 3 coarse sand: 6 aggregate).
- d) Half Brick wall masonry with Brick work with common burnt clay F.P.S. (non-modular) bricks of class designation 7.5 with Cement mortar 1:4 (1 cement: 4 coarse sand).
- e) 12 mm cement plaster of mix: 1:4 (1 cement: 4 sand).

Providing and placing water storage tank (200 Litre capacity) with cover and suitable locking arrangement and making necessary holes for inlet, outlet and overflow pipes.

7. Septic Tank (5 person capacity).

- a) Construction of Septic Tank (1500mm (L) x 800mm (B) x 1350mm (D) as per tender drawing.
- b) Earth work in excavation by mechanical means (Hydraulic excavator) / manual means over areas including earth to be levelled and neatly dressed.
- c) Providing and laying in position cement concrete of specified grade: 1:2:4 (1 cement: 2 coarse sand: 4 graded stone aggregate 20 mm nominal size)
- d) Brick work with common burnt clay F.P.S. (non-modular) bricks of class designation 7.5 with Cement mortar 1:4 (1 cement: 4 coarse sand):
- e) Providing and fixing precast baffle wall.
- f) 12 mm cement plaster of mix: 1:4 (1 cement: 4 sand)
- g) Providing and laying of cover slab for septic tank
- h) Providing and fixing of 4kg pressure PVC pipes (75mm dia) for inlet and outlets.
- i) Providing and fixing of Vent cowel with mosquito proof mesh.

The photos of Toilet construction as executed and completed is shown in Annexure 8.

4.2.5 Beneficiaries of Toilets in the project area:

The household Toilet beneficiaries list with name and Toilet Id has been compiled and shown below in the PDF link below for ready reference:



Household Toilet
beneficiaries.pdf

4.3 Rejuvenation of Ponds

The rejuvenation of ponds comprised activities to refurbish and revive 21 ponds in the project villages, which is subsequently restricted to 17 nos due to budget and field constraints.

4.3.1 Scope and components of works:

The scope of works catered for pond rejuvenation under the scope of the project is itemized below and the pond-wise listing of works is captured in the table above:

- ✚ Desilting of ponds for an average depth upto 60 cm as per the site assessment
- ✚ Toe wall Construction
- ✚ Stabilization of slopes and bunds
- ✚ Plain cement concrete precast slab pitching of slopes and bunds
- ✚ Recharge wells
- ✚ Cattle ramp
- ✚ Bathing ghats
- ✚ Construction of flow channels wherever necessary

4.3.2 Details of Ponds rejuvenated:

POND COMPLETION STATUS									
S.No	Village Name	Pond Name	Desilting	Slope Making	Toe Wall	PC Slab Pitching	Bathing Ghats	Cattle Ramp	Recharge Well
1	Vellapakkam	Mariamman koil kulam	✓	✓	✓	✓	✓		✓
2	Vellapakkam	Thalaiyari kulam	✓	✓	✓	✓	✓		✓
3	S.Panangudi	Sivan koil kulam	✓	✓	✓	✓	✓		
4	M.Panangudi	Kuyavan kuttai	✓	✓	✓	✓	✓		
5	P.Panangudi	Aana pulla kulam	✓	✓	✓	✓	✓		
6	P.Panangudi	Annan koil kulam	✓	✓	✓	✓	✓	✓	
7	P.Panangudi	Ponni veetu kuttai	✓	✓	✓	✓	✓		
8	P.Panangudi	Mela theru kulam	✓	✓	✓	✓	✓	✓	
9	M.Panangudi	Akrahara kulam	✓	✓	✓		✓		
10	P.Panangudi	Chinna kulam	✓	✓	✓				
11	P.Panangudi	Periya Kulam	✓	✓	✓				
12	S.Panangudi	Naicken kulam	✓	✓	✓				✓
13	P.Panangudi	Ayyanar kulam	✓	✓					
14	Gopurajapuram	Gramathuk kulam	✓	✓					
15	S.Panangudi	Alli kulam	✓	✓					

POND COMPLETION STATUS									
S.No	Village Name	Pond Name	Desilting	Slope Making	Toe Wall	PC Slab Pitching	Bathing Ghats	Cattle Ramp	Recharge Well
16	P.Panangudi	Thiruvasal kulam	✓	✓					
17	P.Panangudi	Therku Theru kulam	✓	✓					
18	Vellapakkam	Mela Kulam	✗	✗	✗	✗	✗	✗	✗
19	Vellapakkam	Perumal Kulam	✗	✗	✗	✗	✗	✗	✗
20	Vellapakkam	Madha Kullam	✗	✗	✗	✗	✗	✗	✗
21	M Panangudi	Alli Kuttai	✗	✗	✗	✗	✗	✗	✗

The photos pertaining to the rejuvenation of ponds depicting various stages of construction and after completion is shown in Annexure 10.

4.3.3 Technical Specifications for Pond Rejuvenation:

The broad technical specifications adhered in the rejuvenation work is itemized below:

- Earth work excavation in loose soil of Average thickness of 600mm, Desilting of Ponds by mechanical means and disposal of the surplus earth with in a lead of 5 KM including dewatering
- Earth work excavation in loose soil by mechanical means, dressing, and making good the sloped surface and disposal of the surplus earth
- Supply, filling with Quarry Dust/ Gravel/ Murum, compaction, watering for a thickness of 75mm beneath slab Pitching.
- Supply of pre-cast plain cement concrete blocks of dimensions 500x500x100mm for laying on plain areas and pond side slopes / verges (earthen shoulders)
- Supplying and laying of Dry Stone pitching for a thickness of 225mm with stone size of about 225x150mm on plain areas and pond side slopes / verges (earthen shoulders) and packing it properly with cut stones
- Random Rubble masonry with hard stone in foundation and plinth for Toe Wall masonry and bathing ghat
- Precast RCC Guard Rail of grade 1:2:4 with nominal Reinforcement and size 150mm x 150mm for an overall length of 1200mm, out of which 900mm shall be protruding above the ground and balance 300mm shall be buried in the earth within a PCC pocket of size 300mm x 300mm x 450mm of grade 1:4:8 at an interval of 750mm C/C.
- Construction of Recharge well with 1000mm Dia, 300mm HT, 50mm THK Precast RCC Rings for a well depth of 3000mm. The top of the well is 1500mm above pond bed level. The well filled with layers of graded aggregate fill from bottom comprising 40mm aggregate for 1200mm fill, 20mm aggregate for 600mm fill and fine river sand for 600mm fill. A 6" PVC pipe shall be bored into the pond surface up to the sandy soil layer (4.5m from the pond bed surface) and placed in the centre of the well. The PVC Pipe shall be perforated up to a depth of 6000mm from bottom.

4.3.4 Constraints and reappropriation of Budget:

The original contract made for Pond rejuvenation has to be terminated due to the inability of the contractor to cope up with the stringent specifications laid out for field execution

and the field supervision instituted therefor. Accordingly fresh tenders called for and agency fixed with inherent initial delay. Now works being executed in spite of monsoon adversities, Corona pandemic /restriction/lock downs for more than one year.

- The early monsoon and uncommon heavy rain this season have resulted in the village ponds getting flooded earlier than anticipated.
- Corona pandemic and lockdowns/restrictions
- Adversity of newly elected Panchayats since January 2020
- Few individuals have also **stalled the ongoing pond rejuvenation works closer to their fields** / houses on the pretext of encroachments.
- Issues from Panchayat and public due to multiple reasons

While efforts are on to resolve these issues, it is further delaying the progress. Further ponds 4 nos are not feasible to execute, as narrated below:

Out of the total scope of 21 ponds, **desilting with slope / bank dressing and stabilisation have been completed** for a total of **17 No. of ponds** and their holding capacity have been augmented fully. The remaining works in the ponds which are incomplete due to water in ponds will be continued during FY22 after water recede. Works at **balance 4 No. of ponds are not feasible** due to undermentioned reasons: -

1.Gopurajapuram Panchayat.

- **Mela Kulam & Perumal Kulam** – These ponds are perennial source of water for their respective villages Vellapakkam & S Panangudi, they are being continuously used by the villagers for their everyday domestic needs. They are also surrounded by individual households at their banks and thus working in these ponds may lead to several disputes regarding encroachments in to their land property.
- **Madha Kulam** – located at Vellapakkam is surrounded by agricultural fields, off-season agricultural works had commenced in this pond at the month of August 2020 and site access is not available for work execution in this season.

2.Panangudi Panchayat.

Alli Kuttai - This pond was taken over by the villagers and desilting works were carried out by them. At present it is under use by the local residents

It is proposed to complete the balance scope of six partly done ponds as & when the water level comes down. Accordingly budget reappropriation works recommended by CUBE so as to use the savings due to deletion in Water supply distribution/House Service Connections and another new OHT of 45 K in Gopurajapuram. The reappropriated budget is cleared by CPCL during December,2020 based on which works are now under progress.

4.4 Water Supply Improvements and Street Distribution System

The scope of the works included the following components

- ✚ Source creation and Drilling of Deep borewells (2 nos) including supply and delivery of Submersible pump-set
- ✚ Pumping Main using HDPE pipes from the 2 new Deep Borewells to the OHTs in the beneficiary villages
- ✚ Water Supply Distribution System
- ✚ Additional Deep Bore well 1 no in Panagudi near CPCL Quarters
- ✚ 45 K OHT in S.Panangudi (Gopurajapuram) to be constructed using Precast / Pre Engineered construction technology

4.4.1 Source creation and Drilling of Deep borewells (2 nos):

After detailed Geophysical Surveys as already explained in section 2.2, 2 deep borewells for about 300 m depth is drilled one each in P.Panangudi and Gopurajapuram in the recommended VES locations. The GPS Coordinates of VES locations recommended for Drilling of Deep Bore-Well-2 nos (Easting and Northing values are in meters, UTM Zone 44 N WGS 84) is tabulated below:

S.No	VES Id	GPS Coordinate		Village Name
		Northing	Easting	
1	VES 11	1198737	368862	Gopurajapuram
2	VES 40	369968	1199039	P.Panangudi

The well design as already provided by IIT M is ably followed by CUBE for the drilling of Borewell during July 2018. The drill log and the Electrical logging after drilling is completed guided the Casing pipe erection by providing slotted pipes in the recommended locations. The saline water zone is expediently sealed using clay balls and fresh water is abstracted suitably through the slotted pipes erected appropriately to facilitate fresh water abstraction:

4.4.2 Broad Technical Specifications

- (a). Drilling of 150mm pilot bore
- (b). Reaming from 150 mm dia pilot bore to 300 mm dia bore as directed by the Engineer-in-Charge for the entire 300 m depth.
- (c). Reaming from 300 mm dia bore to 400 mm dia bore as directed by Engineer-in-Charge.
- (d). Conducting electrical logging for the entire 300 m Depth including conveyance etc

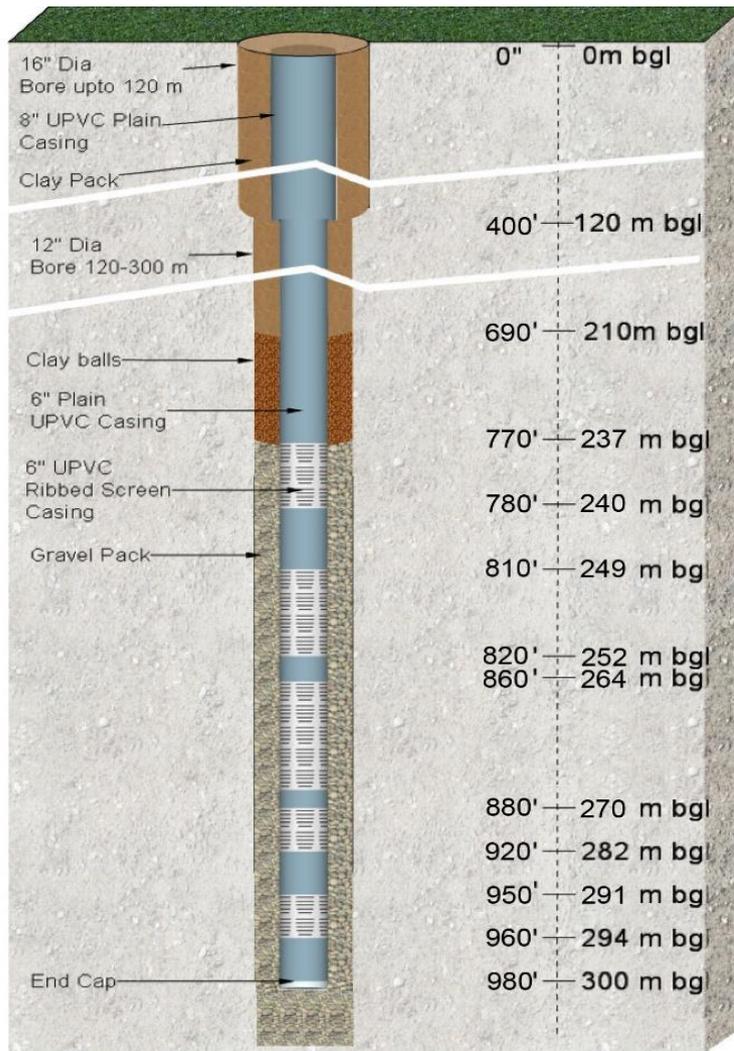
complete, as directed by Engineer-in-Charge.

- (e). Supply and delivery of PVC-U (Unplasticized) casing pipes of the following diameter in 3 metres length with screwed and socket ends and centering guides for every 15m length of pipes with BIS Standard Mark Certified under IS 12812 :1992 and DN 4925 and as amended from time to time to suit field conditions.
- (f). Supply and delivery of 200mm Nominal dia (8") Deep borewell PVC-U plain casing pipe (Casing Deep- CD) wall thickness of 13.0 mm to 14.80mm
- (g). Supply of 150mm Nominal dia (6") Deep borewell PVC plain casing pipe (Casing Deep- CD) wall thickness of 13.0 mm to 14.30mm
- (h). Supply and delivery of 150 mm Nominal dia (6") PVC-U, Casing Deep-borewell Ribbed Screen (CDRS) Casing pipe with BIS Standard Mark Certified under IS 12818:2010, with suitable 1.0mm horizontal slot with having open areas 12 % minimum with wall thickness 13mm to 14.30 mm at site of work

4.4.3.P.Panangudi Deep Borewell Construction Design as executed

The deep borewell is a telescopic bore of 300 m depth comprising 16" bore upto 120 m depth and 12" bore for the remaining 180 m. The drilling commenced on 31.05.2019 and casing pipe erected on 14.07.2019 and flushing completed on 18.07.2019. after the prolonged observations during flushing on 18.07.2019 is about 25000 lph. The cross-section of borewell as executed is shown below:

Yield: 25000 LPH & Depth: 300m

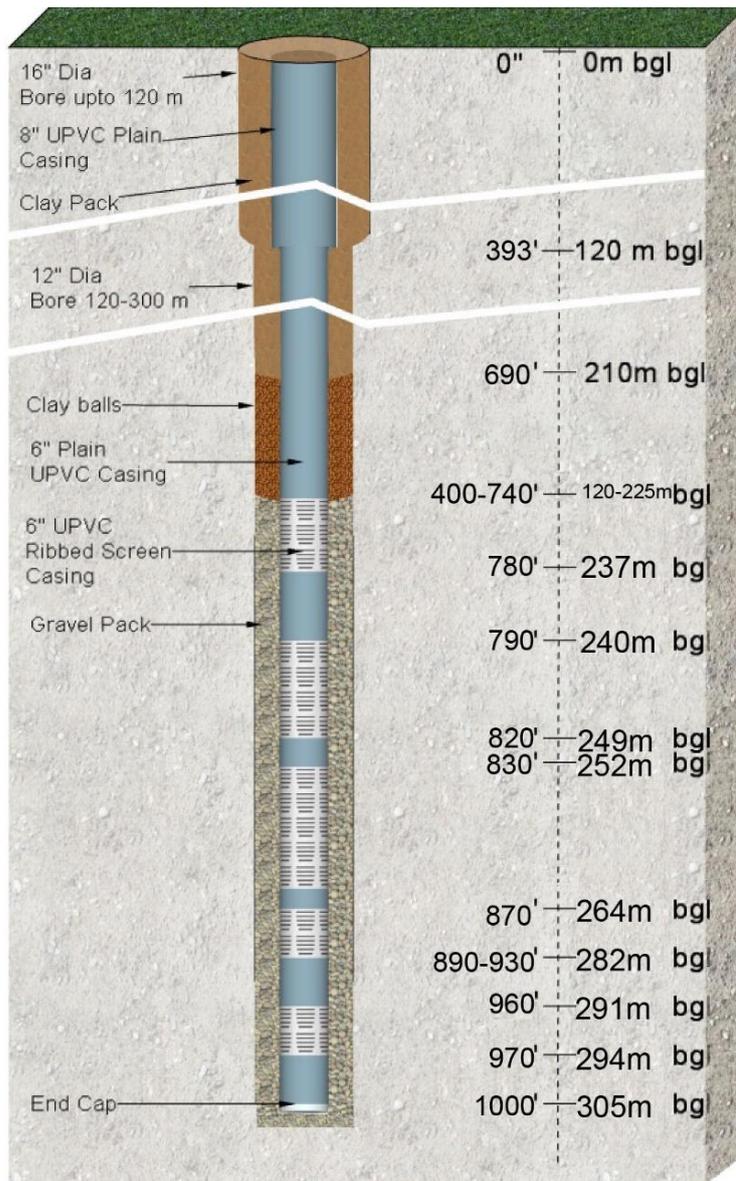


Well Construction Design - P.Panangudi

4.4.4 .Gopurajapuram Sivankoil Deep Borewell-Construction Design as executed

The deep borewell is a telescopic bore 305 m depth comprising 16” bore upto 120 m depth and 12” bore for the remaining 185 m. The drilling commenced on 11.06.2019 and casing pipe erected on 14.07.2019 and flushing completed on 18.07.2019. The assessed yield of the borewell on 18.07.2019 after the prolonged observations during flushing on 18.07.2019 is around 37000 lph. The cross-section of borewell as executed is shown below

Yield: 37000 LPH & Depth: 305 m



Well Construction Design - Gopurajapuram

4.4.5 Yield Test of P.Panangudi and Gopurajapuram deep Borewells:

The yield test report of Gopurajapuram Borewell and that of P.Panngudi is tabulated below:

Yield Test – Panangudi

18.07.19

Time	pH	EC (MICROSIEMENS/CM)	TDS (PPT)	TDS (PPM) OR MG/L	90 DEGREE V NOTCH HEIGHT IN CM	Yield in litres per hour

905 am	8.43	1470	0.73	730	6 CM	5400
932 am	8.07	1400	0.71	710	9 cm	12240
10 am	8.21	1410	0.70	700	12 CM	25560
10.30 am	7.92	1400	0.70	700	12 cm	25560
11 am	8.10	1390	0.69	690	12 CM	25560
11.30 am	8.10	1390	0.69	690	12 cm	25560
12 pm	8.11	1390	0.69	690	12 CM	25560
12.30 pm	8.10	1390	0.69	690	12 cm	25560
1 pm	8.08	1390	0.68	690	12 CM	25560
1.30 pm	8.10	1390	0.68	690	12 cm	25560
2 pm	8.11	1390	0.68	690	12 CM	25560

Yield Test – GOPURAJAPURAM

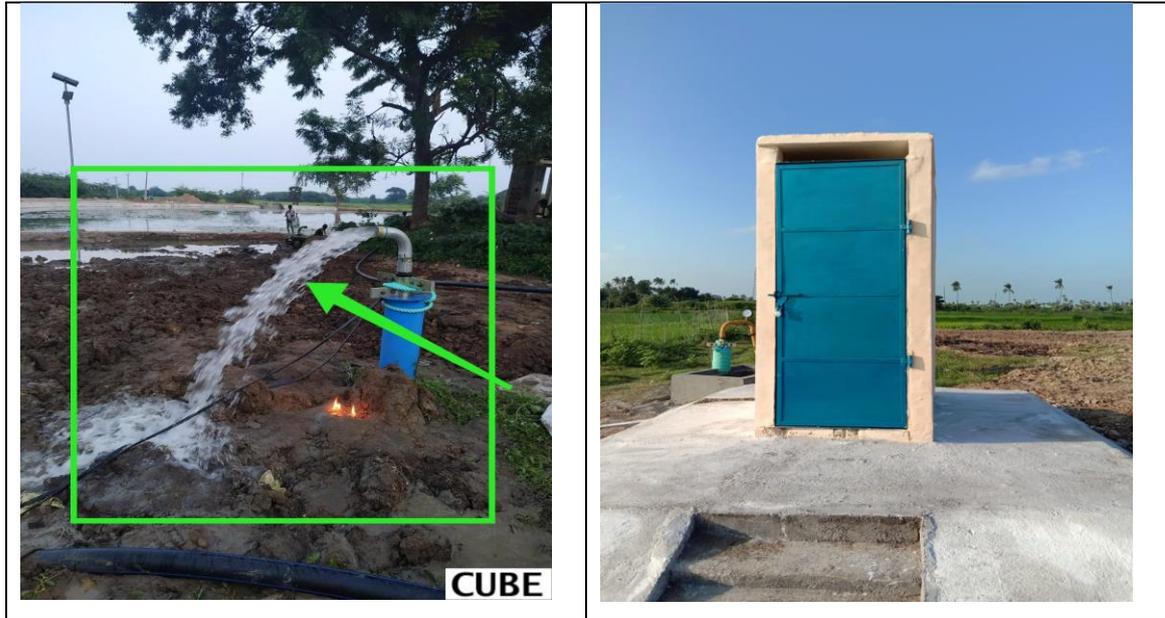
18.07.2019

Time	pH	EC (MICROSIEMENS/CM)	TDS (PPT)	TDS (MG/L)	90 DEGREE V NOTCH HEIGHT IN CM	Yield in litres per hour
3 pm	8.42	1370	0.68	680	8 cm	9000
3.30	8.38	1370	0.68	680	10 cm	16200
4 PM	8.44	1370	0.68	680	14cm	37800
4.30 pm	8.45	1360	0.68	680	14cm	37800
5 pm	8.32	1350	0.68	680	14cm	37800
5.30 pm	8.44	1350	0.68	680	14cm	37800
6 pm	8.12	1350	0.68	680	14cm	37800
6.30 pm	8.16	1350	0.68	680	14cm	37800
7 pm	8.54	1350	0.68	680	14cm	37800
7.30 pm	8.51	1350	0.68	680	14cm	37800
8 pm	8.11	1350	0.68	680	14cm	37800
8.30 pm	8.17	1350	0.68	680	14cm	37800
9 pm	8.17	1350	0.68	680	14cm	37800

4.4.6.Provision of Submersible pump-set in P.Panngudi and Gopurajapuram Bore wells:

The submersible pumpset 2 nos 15 HP, one each in Gopurajapuram and P.Panangudi is erected to meet the projected duty of 138 lpm* 106 m head for Gopurajapuram and 122 lpm* 106 m head for P.Panangudi deep borewells. The control panels are housed in the Control room of size 1.5*1.8 m constructed near the borewells.

The Broad Technical Specifications of Submergible Pump-set is shown in Annexure 10.4.1



4.4.7. Additional Deep Borewell in Panangudi near CPCL Quarters:

It is a telescopic borewell of 320 m depth comprising 16” bore upto 120 m depth and 12” bore for the remaining 200 m. The borewell drilling works commenced on 07.03.2021 and casing pipe erection completed on 18.03.2021 as denoted below:

6” dia PVC Casing pipes plain : 3.05 m*45 nos

6” dia PVC Casing pipes Slotted : 3.05 m*17 nos

8” dia PVC Casing pipes plain : 3.05 m*40 nos

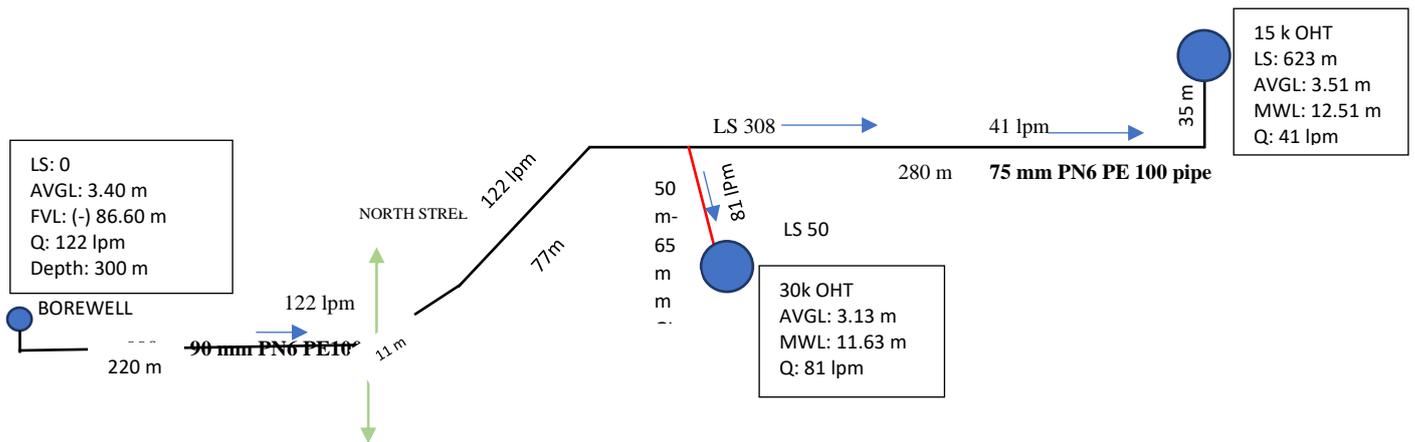
The assessed yield based on the observations during flushing on 01.04.2021 is around 30,000 lph. Water quality test results of the sampled water from the newly created borewell during the course of flushing is shown in Annexure

4.5. Pumping Main(PM) for P.Panngudi & Gopurajapuram Panchayats:

4.5.1. Pumping Main(PM) using HDPE pipes from the 2 new Deep Borewells to the OHTs in the beneficiary villages:

The pumping main has been designed as two independent system one for P.Panangudi to feed 2 existing OHTS (1 no 30 k OHT & 1 no 15K OHT) and another one for Gopurajapuram to feed three existing OHTS(30k OHT in S.Panangudi, 15 K OHT in Gopurajapuram and 30K OHT in Vellapakkam) one each for S.panangudi, Gopurajapuram and Vellapakkam. The Alignment Plan is shown in **Annexure**.

1) PM to P.Panangudi from the new Borewell:



The pipeline provided include the following array of pipes to feed the existing OHTs as shown in the flow diagram above:

LS 0 to 308 m: 90 mm PN6 PE 100 HDPE Pipe: 308 m Branch takes off to 3 k OHT

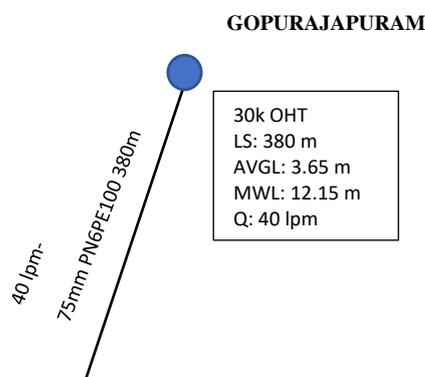
Ls 308 to Ls 623 m: 75 mm PN6 PE 100 HDPE Pipe: 315 m

Branch to 30 K OHT:

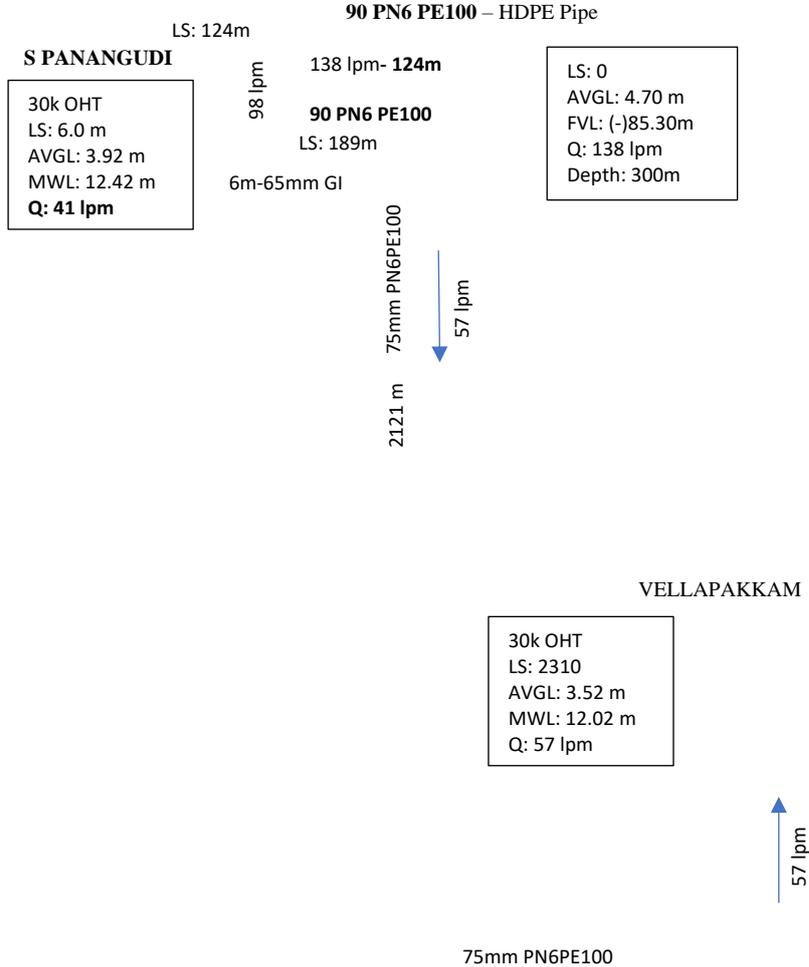
LS to 50 m 65 mm GI pipe: 50m

2) PM to P.Panangudi from the new Borewell:

The pipeline provided include the following array of pipes to feed the existing OHTs from the new deep borewell near Sivankoil of Gopurajapuram, as shown in the flow diagram below:



BOREWELL (NEAR SIVAN KOIL)



LS 0 to 18 m : 189m 90 mm PN6 PE 100 HDPE Pipe: 124 m Br to Gopurajapuram 15K OHT

LS 124 to 189m: 65m 90 mm PN6 PE 100 HDPE Pipe: 124 m Branch to 30K OHT

Ls 189 to LS 2310: 2121 m 75 mm PN6 PE 100 HDPE Pipe: 30k OHT Vellapakkam

Br to Gopurajapuram 15k OHT:380m 75 mm PN6 PE 100 HDPE Pipe

Br to S.Paangudi 30K OHT: 65 mm GI pipe: 50m

4.5.2 Broad Technical Specifications of pumping Main Works:

The broad technical specifications catered in PM works is extracted below for ready reference:

(a). PE 100 Grade PN6 HDPE Pipes in Coils as per **IS 4984:2016 with BIS Standard mark**

as per the codal provisions

- (b). PE 100 Grade 90 mm OD PN6 HDPE Pipes in Coils as per IS 4984:2016
- (c). PE 100 Grade 75 mm OD PN6 HDPE pipes in Coils as per IS 4984:2016
- d) GI pipeas as per IS 1239/PART I/2004 with BIS Standard mark
- e) 65 mm GI pipe (MEDIUM) AS PER IS 1239/PART I/2004
- f) 80 mm GI pipe in Culvert crossings (MEDIUM) AS PER IS 1239/PART I/2004
- g) 140 mm PVC 4 KSC Encasing pipes AS PER IS 4985 / 2000
- h) Supply & delivery of HDPE or other Specials AS PER IS 8360/1977/Part I, II, III
- i) 90 mm bend suitable for HDPE pipes AS PER IS 8360/1977/Part I, II, III
- j) 90 mm HDPE Tee AS PER IS 8360/1977/Part I, II, III
- k) 75 mm bend suitable for PE 100 HDPE pipes AS PER IS 8360/1977/Part I, II, III
- l) 90mm Stub end with flanged adopter for HDPE
- m) 90*75mm Reducer
- n) 75mm stub End with Flanged adopter for HDPE pipes

- o) Jointing 75 to 90 mm OD HDPE Pipes and Specials by butt fusion welding / electro fusion welding joints using fusion equipment as per ISO 21307- 2011 and as per IS 7634 (Part-2) : 2012
- p) Supply and delivery of DI D/F Gate sluice valves (soft seated) resilient seated soft sealing Gate Valves(Sluice Valves) with body Bonnet of Ductile cast iron of Grade GGG 40 or equivalent grade, Wedge fully rubber lined with EPDM replaceable spindle nut without gland packing and with 3 O- Ring protection on the shaft and seals of NBR and the valves should be of Vacuum tight and 100% leak proof with face to face dimensions as per **BS 5163-89/ISI 4846-2000/DIN 3202 F4**. All the valves should be with electrostatic powder coating both inside and out side with pocket less straight through body passage. All the valves are to be compatible for buried application with pressure rating PN 10/16 (12.9). The rate includes supply of CI Flanged Tailpieces of min 0.75 m length on either side, Flanged adopters and allied joineries complete for serviceable condition.
- q) Supply and delivery of the following C.I. D/F sluice valves of class PN 1.0 with cap / wheel non raising high tensile brass spindle valve operating in anticlockwise direction as per **IS 14846/2000** and as amended from time to time with ISI marking including cost taxes and transportation charges loading unloading charges etc. complete and as directed by the TWAD Board officers..for **Scour purpose** as per standard specification including CI flanged Tail pieces, duck foot Bend, semicircular Bend and allied Joinery complete for

serviceable condition.

- r) Supply and delivery of the following CI single Air valves as per 14845/2000 IS fig. H. 40 and H4 of section B of G & K catalogue tested to a minimum test pressure of Head of Water including cost of, loading freight unloading and stacking at site, supply of allied flanged tail pieces of min 0.75 m length on either side, Air valve Tee and other needed joinery etc complete. and as directed by the TWAD Board officers.(12.3)
- s) Supply and delivery of the following sizes of OHT flow control valve with female BSP threaded ends, (20mm length) with Stainless Steel Body as per ANSI 202 Grade, Plug, flange – Nylon 66, (with life cycle test certificate from FCRI/NABL accredited lab, Working Pressure 10 KSC, FCRI, Palgaut pressure test and flow test to be furnished) Triangular notch type flow control path with opening reference scale arrangements for flow notch and Upstream & Downstream pressure checking spring loaded mouth arrangements.

Construction of the following **Sluice valve pit** as per type design No 2 / CE / P&D madras with brick work in CM 1:5 (One cement and five sand) using country Bricks, plastering with CM 1:3 (One cement and three sand)12mm thick, providing RCC 1:1 1/2 :3 (One cement , one and half sand and three coarse aggregate) Cover slab including cost of steel, fabrication charges moulding charges including earth work excavation in all types of soils, levelling course in CC 1:4:8 (One cement , two sand and four coarse aggregate), cut stone in set CM 1:3 (One cement and three sand)and refilling with excavated earth around the pit and labour charges for fixing sluice valve, laying and jointing of all auxiliary pipes and specials, fixing surface box and including cost of jointing materials such as MS Bolts, Nuts, MS washers and rubber insertion sheets etc. complete and as directed by the TWAD Board Officers

The photo gallery showing the various activities catered under the scope of water supply pumping main at various stages of works is shown in Annexure 10

4.6. Water Supply Distribution System, House Service Connection & OHT:

The existing water supply Distribution system in the project villages are inadequate and require new distribution pipes to cater uninterrupted supply in the House Service connections

contemplated in the project villages for which additional funds earmarked in the reappropriated budget in view of the following scenario:

The **non-provision of water supply to individual households** is resulting in bulk of the owners using these as storerooms thus **defeating the CPCL's objective** to create significant positive impact on gender and promote social inclusion by improving sanitation & stop open defecation. The Director Finance, CPCL during his project review had specifically insisted for provision of water supply to the toilets to ensure its effective usage. The issues in water supply discussed with panchayat, BDO and Deputy Collector to redress the subject clearing the impasse hindering the execution.

The subject matter discussed with the Deputy Collector, Nagapattinam in Panangudi Panchayat Office on 23.09.2020 for appropriate solution along with other issues:



4.6.1 Water Supply Distribution lines:

The system redesigned accordingly, duly factoring the local interests of the public to ensure household supply regularly and contract now finalised and procurement of materials completed by CUBE and execution held up during Assembly elections and now due to lock down restrictions. The procurement of pipes and specials are completed and the field progress photos shown in Annexure 10.

4.6.2 Details of Distribution pipes for project Villages:

The requirement of pipes for the Panagudi and Gopurajapuram panchayat as per the estimated requirements are as below:

S.no	Village name	Length of pipes proposed for streets in m-Dia in mm		HSC PVC Threaded pipe 20 mm
		90PVC 4 ksc	50 PVC 6ksc	
1	P.Panangudi	2055	1000	2320
2	M.Panangudi	810	400	1190
	Sub Total m	2865	1400	3510
		685	400	
3	Gopurajapuram	650	200	990
4	S.Panangudi	1500	200	1130
		2835	800	
5	Vellapakkam			1680
	Sub Total m	5700	2200	3800

4.6.3 Technical Specifications of Water Distribution Lines and House Service connections:

The broad Technical Specifications are itemized below:

- (i). UPVC Pipe conforming to IS 4985 : 2000 & Jointing UPVC Pipes and Specials as per ISO 21307- 2011 and as per IS 7634 (Part-2): 2012
- (j). 90mm OD 6KSC Pipe with necessary fittings as per site requirements
- (k). 50mm OD 6KSC Pipe with necessary fittings as per site requirements
- (l). 20mm OD 15KSC Pipe with necessary fittings as per site requirements and connection to the existing Household Syntax Tank
- (m).
- (n). 90mm Main Gate Valve complete with bolts and nuts, rubber insertion etc - CI Valve with rotating handle with locking arrangement bearing BIS Standard Mark as specified by BIS and having the required working pressure
- (o). 50mm Fixing UPVC Ball Valve complete with bolts and fittings
- (p). Construction of PCC solid block chamber of inner size 600mm x 600mm and depth not more than 1000mm built in cement mortar 1:4 for housing sluice/ball valves and RCC top slab with mix 1:2:4, including necessary excavation, foundation concrete 1:5:10 and plastering with cement mortar 1:3, 12mm thick, finished with a floating coat of neat cement
- (q). UPVC stop cock of approved quality and colour, 20 mm nominal bore, 89 mm long, weighing not less than 88 gms.
- (r). Installation of 6KSC House connection service saddle of sizes 90mm x 20mm or 50mm x 20mm with 20mm Brass Ferrule as required, Male threaded adopter and 90 Degree Elbow on the U-PVC Main water supply line bearing the BIS standard mark.

4.7. Construction of pre-engineered modular precast OHT 45 KL Capacity:

The existing Overe Head Tanks at Gopurajapuram and S. Panangudi Village of 15KL and 30KL capacity respectively have **outlived their lifecycle**. At least one OHT is definitely

required to cater the water needs of both these villages and also **optimally exploit the borewell supply provided by CPCL**. Accordingly the Panchayat President made a request followed by District Collector subsequently and thus the new precast modular OHT is proposed for construction by demolishing the existing 30 K OHT which is structurally weak. As such, is accommodated in the reappropriated budget cleared by CPCL. Accordingly, Pre-Engineered Pre-cast RCC OHT of 45KL capacity with deep pile foundation & concrete stair cases with twelve meter staging is being constructed. This would be far superior in quality and can be completed soon, as pre-casting work is fully completed and ready for site execution.

4.7.1 Broad Technical Specifications of pre-engineered 45 K OHT:

Construction of Precast RCC Overhead tank of capacity 45,000 Litres with variations within a range of $\pm 10\%$ from proposed capacity, detailed scope of work given below: -

- a) Design and detailing of the entire Precast / Pre-engineered overhead tank including foundation and superstructure with steel staircase.
- b) Proof checking of all the design and drawings and obtain approval from IIT Madras Faculty.
- c) Obtain client approval on detail design / drawing and work methodology prior to commencement of production.
- d) Production / Fabrication and supplying of all the precast elements and transportation to the project site including storage and safekeeping.
- e) Appropriate foundation construction with Pile / Raft footings including earthwork.
- f) Erection of Precast RCC Columns & Beams up to 12m staging.
- g) Erection of Precast Tank as Rigid and Leak Proof structure.
- h) Erection of Prefabricated Steel staircase.
- i) Painting with Waterproof internal paint, Weather coat exterior paint of the entire external structure, suitable acrylic / enamel decorative painting of size 4' x 3' with artwork content provided by client. and galvanised painting of steel staircase.
- j) Associated Plumbing works for inlet and outlet connection to the exiting water supply provisions.
- k) Testing and commissioning of the structure including handing over to the local administration.

4.8. Waste water Treatment System with household Drain Field system:

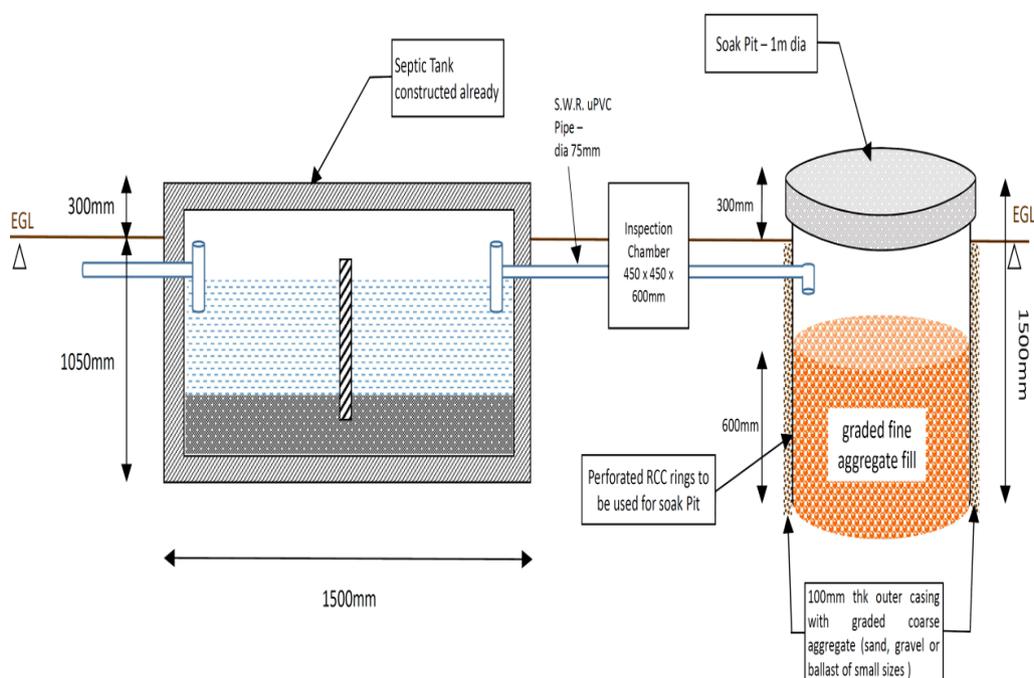
The Cluster-Based Wastewater Treatment System was planned for originally for 432 toilets with sewer lines leading to 16 No. of Constructed Wetlands distributed across five villages. However, post detailed design, due to non-availability of lands to accommodate the

constructed wetland, it was revised to individual household level Drain Fields / Soak Pits. All the efforts taken to plan, design and estimate went in vain with drain of time, energy and resources consumed there for.

After analysing the various options already discussed in 3.4, the household drain field system is executed now. The household model design followed is shown below:

4. 8.1 Working Design and Plan of household Drain Field:

The model design and specifications provided by II M Civil is expediently followed in the execution of household drain field for the onsite treatment treatment of Waste water (grey water and black water) generated from each household. The Working design is shown below pictorially:



4.8.2. Technical Specifications for Execution of Drain Field:

- a) **Masonry Chamber:** Constructing brick masonry chamber for inspection chamber and bends with bricks in cement mortar 1:4 (1 cement : 4 coarse sand) with precast concrete slab 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size), foundation concrete 1:5:10 (1 cement : 5 fine sand : 10 graded stone aggregate 40 mm nominal size), inside plastering 12 mm thick with cement mortar 1:3 (1 cement : 3 coarse sand), finished smooth with a floating coat of neat cement on walls and bed concrete etc. The top of the chamber shall be 300mm above Ground level as shown in the drawing. 450 x 450 mm and 60 cm deep for pipeline with one or two inlets: With common burnt clay F.P.S. (non-modular) bricks of class designation 7.5
- b) **Specifications of SWR uPVC pipes:** Supply and Laying of the following S.W.R. uPVC

pipes conforming to Type B as per IS:13592 and IS:14735 relevant Codes and Standards including jointing with all specials, connectors, reducers, flanges, elbows, bends, Tee, end caps etc., required for connecting different length and sizes of pipes.

- c) uPVC Pipe conforming to Type B as per IS:13592 including fittings as per IS:14735
- d) **Pipe connection:** 75mm OD as with necessary fittings for connection from Toilet Bath to Inspection Chamber and thereon from Inspection Chamber to Drain field / Soak Pit as per Notional drawing / Site requirements
- e) **Perforated drain pipes:** 75mm OD as with necessary fittings from with bottom half perforated as with necessary fittings for Drain Field as per Notional drawing / Site requirements
- f) Filter Media for the Drain Field : Supply and filling of graded crushed stone aggregates of size of 40 to 12.5mm at the Seepage trenches by well ramming, consolidating,

g) Soak Pit: Construction of Soak Pit of size 900mm Dia, 1500mm deep, made up of 50mm thk perforated Precast RCC Rings of each 300mm height with 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size) and precast concrete cover slab of 1000mm Dia, 1:2:4 mix (1 cement : 2 coarse sand : 4 graded stone aggregate 20 mm nominal size). The top of the pit shall be 300mm above Ground level as shown in the drawing. The Pit shall be filled with layers of graded fine aggregate for 600mm fill from the bottom. The sides of the Pit to be filled with graded coarse aggregate (sand, gravel or ballast of small sizes) of 100mm thickness all around.

The photos showing construction of Household Drain Field system is shown in Annexure 11.

4.9 Solid Waste Management- Compost Yard

4.9.1 Siting of Compost yard: The Compost yard initially selected in P.Panangudi prior to Panchayat election is not accepted by the new Panchayat President and their team due to public objection and based on their request alternate site provided in Samuthuvapuram. Accordingly works taken up during August 2020 after site clearance and bhoomi puja done as shown below:



Bhoomi Puja done during August 2020



Location 2: Site clearance done and stopped due to public objection

Accordingly the subject matter pursued effectively for alternative site and the same identified in M.Panangudi wherein construction of Compost yard is now under progress. The compost yard site in M.Panangudi after clearing and levelling:

4.9.2. Structural drawing for P.Panangudi site:

Compost Yard Building for P. Panangudi- Structural Drawings and allied plans (Original site) : - <https://maps.google.com/?q=10.844519,79.810450>. The scope modified to suit the site conditions, after shifting to M.Panangudi location.

4.9.3. Structural and Functional drawing for M.Panangudi Compost yard site now under construction:

The combined drawing of the compost yard under construction is shown below along with all allied detailing for meticulous execution:



Combined drawings - Compost

The construction photos are shown in **Annexure 12**. At present, the construction works are under progress, though the pandemic and the associated lockdown restrictions cripple the smooth transition of field works.

4.10. Construction of Community Hall at P.Panangudi:

The Community Hall is constructed in two storey RCC framed structure with an area of 130 sq.metre carpet area in P.Panangudi near the existing 30K OHT in the temple premises.

4.10.1 Site plan and Layout of Community hall:

The Survey map of Community Hall site plan and the Community Hall Lay out is shown below:



Community Hall - FMB Sketch.pdf



COMMUNITY HALL-Layout1 27-11-

4.10.2. Structural and architectural Drawings of Community Hall:

The Structural and architectural Drawings of Community Hall at P. Panangudi is shown in the link below and extracted below:



School Building Architectural Drawings.zip

- <https://maps.google.com/?q=10.844443,79.813217>.



The Structural and architectural Drawings of Community Hall is in Annexure 13.1 photos showing the field progress and the completion status is shown in Annexure 13.2

4.11. Construction of new School Building in P.Panagudi:

The Activity covered under the scope of Construction of New Buildings include Construction of New RCC Framed Structure School with Toilet Block Building at P Panangudi School premises.

4.11.1. Structural and Functional Plans for execution:

The building is of two storeyed RCC framed structure with brick walls as per the plans and drawings shown below in Pdf Format:



School Building
Drawings - P.Pananç

The photos showing the field progress and the completion status is shown in [Annexure 14](#)

4.12.School/Anganwadi Infrastructure Improvements/Renovation including new Toilet Block in Gopurajapuram School:

4.12.1 Scope of Works:

The Activity entail the provision of School Infrastructure Enhancements as itemized below:

- a) Renovation of Anganwadi at Panangudi, Gopurajapuram and Nariman

The Additional Works includes PVC Coated Chain link fencing, Flag Post, Extended Structural Canopy, Plinth protection and Terrace Water proofing works

- b) Construction of new Toilet blocks for School Building at Gopurajapuram is executed under the scope of this activity
 - c) The Renovation of Gopurajapuram School building is omitted since it has been taken over by Panchayat and the Angawdi is omitted since it was found beyond economical repair.
2. The photos showing the field progress concerning renovation of Anganwadis and the completion status is shown in **Annexure 15**

4.12.2 Construction of new Toilet Block in Gopurajapuram School:

There is an inherent need to provide a new Toilet Bloc to cater the requirements of Gopurajapuram Panchayat Union School which is readily implemented under the scope of this project in view of higher priority assigned for School Hygiene, sanitation and Health.

4.12.3. Technical Specifications of Toilet Block:

Toilet Block [Size – 2100mm (L) 1200mm (B) x 2400mm (H)].

Structure.

- e) Construction of Foundation including earthwork as per tender drawing.
- f) Providing and fixing of RCC Precast walls, slabs and Precast Posts of grade M30 as per the tender drawing.
- g) Providing and laying in position cement concrete of specified grade for post grouting 1:3:6 (1 cement: 3 coarse sand: 6 20 mm nominal size).
- h) Provide a transverse slope of 1:40 at roof slab to avoid water ponding.

Finishes.

- t) Providing and laying Anti-skid designer Ceramic floor tiles 300x300mm, laid on 20 mm thick cement mortar of mix 1:4 (1 cement:4 coarse sand) including pointing the joints with white cement and matching pigment etc., complete.
- u) Providing and fixing ceramic glazed wall tiles up to 450mm above FFL, over 12 mm thick bed of cement mortar 1:3 (1 cement: 3 coarse sand), including pointing in white cement mixed with pigment of matching shade complete.
- v) Applying wall painting for both exterior (weather coat) and interior (emulsion paint).

Joineries.

- c) Providing and fixing solid PVC doors with required fixtures.
- d) Providing & Fixing Precast RCC jally for ventilation (900mm x 400mm).

Plumbing Items.

- g) Providing and fixing PVC Water tap.
- h) Providing and fixing IWC pan of Gujarat type
- i) Providing and fixing of 20mm dia PVC pipes for delivery.
- j) Providing and fixing PVC P-trap.
- k) Providing and fixing PVC Floor trap (75mm).
- l) Providing and fixing of 4kg pressure PVC pipes (75 mm dia).

External.

- b) Making plinth protection of cement concrete 1:2:4 (1 cement: 2 coarse sand: 4 graded stone aggregate 20 mm nominal size) over 50mm thick bed of dry brick ballast 40 mm nominal size including finishing the top smooth including required brick edging.

Water Tank Pedestal.

- f) Construction of Water Tank Pedestal (800mm Sq x 700mm depth) as per tender drawing.
- g) Filling available excavated earth in foundations etc. in consolidating each deposited layer by ramming and watering.
- h) Providing and laying in position cement concrete of specified grade: 1:3:6 (1 cement: 3 coarse sand: 6 aggregate).
- i) Half Brick wall masonry with Brick work with common burnt clay F.P.S. (non-modular) bricks of class designation 7.5 with Cement mortar 1:4 (1 cement: 4 coarse sand).
- j) 12 mm cement plaster of mix: 1:4 (1 cement: 4 sand).
Providing and placing water storage tank (200 Litre capacity) with cover and suitable locking arrangement and making necessary holes for inlet, outlet and overflow pipes.

The photos showing the field progress of Toilet Block is shown in Annexure 15.1

4.13. CPCL Branding Initiatives in the Project Villages:

4.13.1 Scope of the Activity:

The scope entail the following activities under the CPCL branding initiative taken up as desired by CPCL Authorities during discussions

1. CPCL Logo Printed Tiles – 432 Toilets
2. Village Signage Boards - 5 No
3. Activity Display Signage Boards - 29 No
4. Overhead Tank Acrylic Display Boards - 5 No.
5. Concrete Benches – 20 No.

4.13.2. Provision of Concrete benches in prominent locations:

The Concrete benches 20 Nos. provided and placed (10 No. per each Panchayat) at public gathering places have been well received and **hugely popular** among the elderly & differently abled people as well as pregnant women.

The photos showing the field progress and the completion status is shown in Annexure 16

4.14.Details of Contract awarded for the activities of CUBE:

CUBE with IITM is making all out efforts to complete & close the ongoing CSR Project at Nagapattinam during Financial Year 2021-'22 . The works executed, both the scope & quality of execution have been very well appreciated, not only by the individual owners & village public but also by the district administration. The provision of water supply and household toilets have received immense appreciation.

The Awards and recognitions received by CPCL as in para 3.8. of this document stand testimony to the methodology followed, the way the project activities executed in the field and largely the successful implementation of the project. The details of Contracts awarded is shown in the Google Drive link shown below:
https://drive.google.com/drive/folders/12Jb9V743uvGjZOqmy6V3xqeT6_YC5ktz?usp=sharing

4.15. Field Visits of CPCL MD , Directors and Senior Managers:

The mile stone events concerning the project are the following few which deserves to be registered herein the project landscape capturing the field progress:

- ✚ The inauguration of first set of 100 Toilets dedicated in a function chaired by District Collector in presence of Managing Director CPCL and Superintendent of Police, Nagapattinam
- ✚ Shri G Aravindan, Director(Operations) and Dr P B Lohiya, Independent Director & Chairman CSR Sub Committee of Board of CPCL visited Nagapattinam on 22.08.2019 for onsite interventions with project implementation team and beneficiary public on 22.08.2019
- ✚ CPCL Senior manager's visit during the course of execution for onsite assessment and interactions with project team and public

The photo gallery of the occasions are captured and shown in Annexure 17

4.16 Public Sensitization and reconciliatory Meetings of CUBE:

Apart from the public sensitization meeting indicated in para 3.7.2, an interactive meeting conducted in P.Panangudi Panchayat by Deputy Collector, Nagapattinam on 23.09.2020 to resolve field issues by appropriate sensitisation of public representatives. The visuals thereof shown in **Annexure 18**

CHAPTER 5

ACTIVITIES OF UNITED WAY, CHENNAI

5.1) Scope of the Activities: The scope of UWC is awareness generation and improving Pedagogy in the target villages. The activities to be performed under awareness generation are detailed as below:

- a) Needs Assessments
A detailed survey report on Socio Economic conditions of the target villages and recommended interventions
- b) On-ground NGO for Awareness Generation, Community Mobilization & Sensitization
Delivering awareness programs on various proposed interventions and their benefits. Other awareness related programs.
- c) End-line study-A report on the impact of the awareness programs conducted by the grassroots NGO
- d) Solar installation activity i.e. provision of 2 nos of solar lanterns (900 nos) and solar street light (150 nos) was executed by UWC.

5.2) Needs Assessments

The objective of this study is to assess the needs in the 5 target villages of (P. Panangudi, S. Panangudi, M. Panangudi, Gopurajapuram and Vellapakkam in Nagapattinam District. The study identified the prevailing socio-economic of the target villages, to prepare a detailed consolidated report on the relevant data collected through various process of scientific Needs Assessment and to recommend appropriate developmental interventions for CPCL to address the needs and issues identified.

United Way of Chennai conducted baseline survey and participatory rural appraisal to assess the requirement of the community. A 15-member team conducted the study in 5 villages recommended by UWC between August 6th to August 18th, 2018. The villages underwent various processes of scientific Needs Assessment and the following are the methodology included during the assessment.

- Pilot visit was conducted primarily to observe the villages and collect basic details through observation and informal meetings with the villagers.
- Collaboration was made with a local NGO who assisted the further steps.
- Introductory meeting was held with Village leaders and Key informants
- Socio- Economic Survey of around 300 households across the 5 villages

- Focused Group Discussion: FGDs were conducted with groups of children, women, youth, adolescent girls, farmers from all villages
- Transit Walk through the selected villages to identify and map available resources and facilities
- Institutional Visits to Anganwadi centres, schools, hospitals etc.

The Detailed and consolidated Needs Assessments report with recommendations has been attached with this report as **Annexure 1**.

5.2.1.Toilets Survey: On behalf of CUBE, UWC conducted survey on availability and prevailing condition of toilets across the 420 households in the target villages. 5 local village level volunteers holding master degrees were engaged to conduct the survey. The survey team visited all the houses in the targeted villages and surveyed the condition and availability of toilets. Every household was also GPS mapped for further reference. Information on toilets was provided to CUBE. The results of the survey is tabulated below:

Household Toilet Survey Details					
S. No	Village Name	Total No of Households (HH)	HH Without Toilets	Fully/Partly Damaged	HH With Toilets - Poorly Maintained
1	Gopurajapuram	68	11	51	6
2	Vellapakkam	77	9	40	28
3	S Panangudi	58	3	26	29
4	M Panangudi	59	26	15	18
5	P. Panangudi	183	72	70	41
	Total	445	121	202	122

The toilets were defunct or in unusable condition in most of the households. The survey from the beneficiaries of toilets built through Swachh Bharat Mission revealed that toilets were not properly constructed or left incomplete, requested quick intervention in providing them proper toilets. Around 360 of 395 households require new toilets. During the survey, it was noted that the people requested for toilets with attached bathroom to ensure safety of the women while the take a bath.

The households with toilets are not fully used due to poorly constructed facility and resultantly it could not eliminate open defecation with inherent demand for newer Toilets with bathing Facility and water connection in place which is being addressed under the scope of this project

5.2.2. Survey for Solar lights:

On behalf of IITM, UWC conducted survey on details of electric fans available in 420 households in the target villages P. Panangudi, M. Panangudi, S. Panangudi, Gopurajapuram

and Vellapakkam covering 445 Households Surveyed. Accordingly proposals formulated to provide Solar lanterns and Solar street lights

5.3. Awareness Generation Activities:

5.3.1 Aim and Scope of Awareness Generation:

✚ **WaSH Programs:** Conducted interactive WaSH awareness programs with puppet shows in Gopurajapuram PUP School & Panangudi Primary School.

✚ **Solid Waste Management Program:** Training programs were conducted on how to manage wastes and a system has been created in schools (compost pit and recycle bins) to inculcate good habits.

5.3.2. Activities taken up under awareness generation:

S. No	Awareness Topic	Date	Villages covered	Methodology	Beneficiaries covered
1	<ul style="list-style-type: none"> CPCL Project activities Benefits of using household toilets Conservation of ponds 	24 th to 28 th September 2018	P. Panangudi, M. Panangudi, S.Panangudi, Gopurajapuram Vellapakkam	Face to face interaction and focused group discussion	370
2	<ul style="list-style-type: none"> Energy Conservation and Solar installations 	4 th – 5 th October 2018	P. Panangudi, M. Panangudi, S.Panangudi, Gopurajapuram Vellapakkam	Face to face interaction	410
3	<ul style="list-style-type: none"> Water, Sanitation and Hygiene 	14 th – 15 th November 2018	P. Panangudi, M. Panangudi, S.Panangudi, Gopurajapuram Vellapakkam	Cultural Shows	250

Subsequently, 27 Programmes conducted under Awareness programme, as shown below:

S. No.	Activity	Duration	Deliverables	Update
1	On-ground NGO support for awareness generation, community mobilization & sensitization	May 2019 - Mar 2020	Delivering awareness programs on various proposed interventions and their benefits. Other awareness related programs.	27 programs have been completed till date including Swachhta Pakhwada and Swachhta Hi Sewa. Details of the programs conducted has been attached as Annexure

5.3.3. Details of the awareness programs conducted:

The details of programmes conducted indicating location, date, details, methodology and participants benefitted etc is tabulated in **Annexure 19**.

5.3.4 Awareness Generation Programme during Swachhata Pakhwada Fortnight:

Swachhata Pakhwada started in April 2016 with the objective of bringing a fortnight of intense focus on the issues and practices of Swachhata by engaging GOI Ministries/Departments in their jurisdiction. Accordingly, CPCL requested to conduct awareness activities in target village as per advisory note received from MoPNG. Swachhata Pakhwada aims to:

- Accelerate the efforts to achieve universal sanitation coverage
- Put focus on sanitation by eliminating open defecation and ensure that the open defecation free behaviours are sustained

Create significant positive impact on gender and promote social inclusion by improving sanitation especially in marginalized communities The details of activities conducted in the field are captured below:

 Swachhta Hi Sewa-20210602T121617Z-001.zip	 Swachhata 2020-20210602T121813Z-001.zip
--	--

Swachhata Pakhwada - Swachhata Hi Seva (SHS) 2019:

The Hon'ble PM launched Swachhata Hi Seva cleanliness initiative with a call to action "No To Plastic" to " and 'Make India Single-Use-Plastic Free' . He made a clarion call to make our Environment Swachh to see a direct impact of it on our health. Accordingly, the nodal Department for Swachhata Pakhwada, has requested CPCL through their Ministry to observe Swachhata Hi Seva (SHS) 2019 from 11th September to 2nd October 2019. Hence activities taken up for sawchh awareness as desired by CPCL to observe Swachhata Hi Seva (SHS) 2019 in the project villages during the period 11th September to 2nd October 2019 as below in the link provided.

Swachhata Pakhwada week 01st July to 15th July of 2020:

The Swachhata Fortniht activities for the period from 01st July to 15th July 2020 taken up as per their Email request dated 19.06.2020. The importance of cleanliness activities and spreading the awareness of the same becomes more vital in the current scenario of COVID-19 global pandemic. Accordingly CPCL and IIT M in partnership with United Way implemented Awareness Generation Programmes to embrace Sanitation and cleanliness as a habit in the project area. The hygiene and health awareness including Hand wash awareness already inculcated proved very much beneficial in the project villages.

The snap shots of cardinal activities shown in.

5.4. Pedagogy improvements Activities:

5.4.1. Scope of various Activities in Pedagogy Improvements:

The following activities are completed under the scope of Pedagogy Improvements in the target villages

- **Getting Ready for School Program:** Basic infrastructure work has been done in 3 anganwadis to inculcate WaSH habits. Placed a local facilitator and organising community/parents meetings to increase their participation to ensure the children become school ready.
- **Play materials for Schools/ Anganwadis:** Play materials has been distributed to the schools & anganwadis. Provided playground facilities (slide and seesaw) in Gopurajapuram School and Panangudi School.
- **Providing Assistive Devices:** 1 child with CP & locomotor disability has been identified in Gopurajapuram. A disabled friendly 2 wheeler has been provided to her family to help the children attend the school and to get physiotherapy from nearby hospital which is 10 kms away.
- **Kitchen Utensils and Furniture:** Kitchen utensils, steel cupboards, exhibition tables, shoe racks, desks for 3 anganwadis. Tables, chairs, benches, fans and lights to 2 Schools, as per their requirements.
- **Green Energy for Anganwadis:** 3 Anganwadis has been provided solar lights and fans to provide a better environment to the children and promote green energy.
- **Digital Literacy Equipment:** Provided digital literacy materials to the Schools in the adopted villages.
- **Awareness Materials:** Display boards/posters has been put up in schools to sensitize children through art.
- **Play and learning Materials:** Help students in ergonomic posturing besides better learning experience
- **Tuition centres:** Conducting 4 free tuition centers in the target villages. About 120 students are getting benefitted from the centres.

5.4.2. Activities Taken up under Pedagogy:

The activities planned/conducted under Pedagogy Improvements entail the following deliverables as tabulated below:

S. No	Activities	Deliverable	Update
1	WaSH awareness program in schools	Inculcating good WASH habits among the teachers and children.	Completed. Detailed report given in the table below

2	Born Learning and school readiness program in 3 anganwadis	Improved learning outcome, increased community participation, promotion of health and hygiene and ensure the children become school ready.	<ul style="list-style-type: none"> Completed need assessment in anganwadis Vendor finalized for anganwadi improvement.
3	Play & Learning materials	Installation of play materials such as seesaw, slide, etc., will encourage children to attend school and also helps in physical wellbeing.	Provided Deskit (bag+table, made by IITK) for anganwadi and play materials (School) in Gopurajapuram. Materials were distributed by Mr. Nandhagopalan, DGM, CBR, CPCL.
4	Assistive devices for differently abled children in the targeted schools & Anganwadis	Assistive devices will be provided for differently abled children and let them avail education facilities	1 kid with locomotory disorder has been identified in Gopurajapuram. Scooty type disabled friendly vehicle provided.

The details of further activities under Pedagogy Improvements is readily shown in the Table below:

S. No	Activity	Timeline	Deliverables	Update
1	Born Learning and school readiness program covering 3 anganwadis	Aug 2019 – Mar 2020	Improved learning outcome, increased community participation, promotion of health and hygiene and ensure the children become school ready.	10 mothers meeting community/parents' engagement programs conducted by the project facilitator. Significant increase in the strength of children after the intervention.
2	Tuition centres	June 2019 – Apr 2019	Organizing 4 tuition centres in the targeted villages to provide additional educational support to underprivileged children. This will help them to cope up with their studies and reduce drop outs from schools.	4 tuition centres in the target villages are running successfully. Around 120 children are getting benefited from the centres. There is a significant improvement in their studies. Marks details have been uploaded in the below link
https://drive.google.com/drive/folders/1HYUZHLym_T1sj9HK1YLC-HV1qQ38AZSA?usp=sharing				
3	School WaSH programs	June 2019 – Apr 2019	Conducting WaSH awareness programs in schools & anganwadis 2 programs in each school	WaSH program completed

5.5. Medical Camp & other health intervention:

The details of Medical Camp & other health intervention in the project villages are shown below and photos of Medical camps and Disabled Friendly measures are shown in Annexure:22

S. No	Activity	Timeline	Key Deliverables	Update
1	Health awareness generation	Apr 2019 - Mar 2020	To provide 4 health awareness generation sessions. These sessions will precede medical camps and provide awareness on the same	<ul style="list-style-type: none"> Speciality medical camp awareness was made in all the target villages. Awareness program for disabled people to educated them on various government schemes was organised and 19 PWD benefitted from the program.
2	Conducting Medical Camps (by taking the medical team to the target areas)	Apr 2019 - Mar 2020	In total 4 Medical camps will be conducted with 1 being conducted every quarter in 4 locations (16 camps). 425 families will be covered in total	<ul style="list-style-type: none"> 1 Speciality medical camp was organized in P. Panangudi. Around 530 villagers benefitted from the camp. A camp was organised to apply for Unique Disability ID (UDID) Most of the PWDs in the target villages do not have ID cards to avail government schemes. Around 21 PWDs from our target villages took part in the camp.
3	Providing supplements at Anganwadi centers	Apr 2019 - Mar 2020	Pregnant women, lactating mother and children will get access to health supplements	<ul style="list-style-type: none"> Since the government is regularly providing the supplements, it was not distributed. Based on the suggestion from CPCL the amount will be utilised for some other purpose.

5.6. Solar Installations- Household Lanterns & Solar Street light system:

The scope of Solar light comprises procurement and distribution of 900 nos of Household lanterns and 150 Solar powered 18 W street light system. The activity entail the following readily tabulated below:

S. No	Activity	Key Deliverables	Update
1	Providing Solar Lanterns	Providing 2 Lanterns per household	<ul style="list-style-type: none"> Activity Completed. Distributed 900 Solar Lanterns to all the households and other institutions.
2	Installing 150 solar street lights	Solar street lights are installed across the streets of the targeted villages and key common areas	<ul style="list-style-type: none"> Activity completed. Installed 150 Solar SS in the target villages.
3	O & M for 5 years (Including setting up of local technical team and dedicated resource)	Setting up of local technical team (dedicated resource) to repair/maintain the SS and Lanterns	A dedicated team has been set up for the maintenance including fault attending and periodic cleaning of solar panels.

5.6.1 Solar Lanterns for Household:

1. Functional indicators: The 2W Solar Lanterns powered by Lithium Ferro Phosphate (LFP) battery(capacity: Min 1450 mAh) and PV Module Wattage(Wp) of Minimum: 3-4 Wp under STC have been procured strictly in accordance with MNRE model specifications already approved as indicated in **section 3.6.1** and as per the Detailed Technical Specifications appended in Annexure 7.1. The photos showing the Lantern distribution is shown in **Annexure .**

2.Beneficiary details and Outcome: The beneficiary details with Aadhaar number and signatures has been uploaded in the below link.

<https://drive.google.com/drive/folders/1zHF8rvFkZfGHdh-amF2ZxkId9HoEEzt3?usp=sharing>

This will help to promote the use of green energy in the community and convey the importance of renewable energy. Around 450 families are benefited because of this initiative. Now people feel safe at night and children study even during power cuts with resultant improvements in their studies as well. There is also reduction in consumption of energy from EB supply and help to conserve energy as well.

5.6.2.Solar street Lights provision in project tvillages:

The procurement and construction of 18 W LED street Light system in 5 m pole is as per MNRE model specifications already approved as indicated in **section 3.6.2** and as per the Detailed Technical Specifications appended in Annexure 7.2.

1.Functional Indicators:

The Solar street Light system 150 nos with 18 W LED Bulb motion sensor comprising is provided in the 5 project villages. The functional specifications are:

-  PV Module Chemistry : Monocrystalline / Polycrystalline silicon Solar
-  PV Module Power : Min 160 Wp under STC or requisite capacity
-  Battery Chemistry : Lithium Ferro phosphate(LFP) Battery
-  Battery Capacity : Min 190 Wh Li Fe PO4- **12 V/16Ah**
-  Charge controller :PWM/MPPT Regulated & with PIR Motion Sensor
-  Pole height : 5 m

The light will glow at full brightness for the initial 4 hours (6 to 10 pm) and reduce to 50 % brightness run mode with 100 % full bright adaptive mode on PIR detection within 10 m radius by the integral motion sensors provided therefor.

2. Mounting for Light Mast :

- Height above GL :5 m pole and light mounting at 4-4.5 m height

- Pole should be made of Galvanized Iron (GI) pipe / as per IS standards
- Dia of the Lamp post: Minimum of 76 mm dia at top fabricated with 3.4 mm thick MS plate and hot dip galvanizing
- Base plate : 16 mm thick & 200 *200 mm size
- 4) Foundation Bolt: 4 nos of Holding-down bolts of size M16 X 500 /IS 5624-1993

5.6.3. Technical Specifications for Installation in the Field:

The indicative guidelines to facilitate guidance for site installation is shown in Annexure along with Drawing 23.1 and the street light installation drawing shown in Annexure 23.2

5.6.4 Village-wise Summary of the Lanterns and Street Lights:

1.Solar lanterns Distribution details:

The beneficiary village-wise summary of Family is shown below in the PDF link below:

S.No	Village Name	No. of Households
1	P Panangudi	168
2	M Panangudi	61
	Sub Total	229
3	S Panangudi	55
4	Gopurajapuram	69
5	Vellapakkam	88
	Sub Total	212
6	Panchayats/BDO	9
	Total	450

The list of family with Aadhar number and house number is tabulated in the PDF link below:



Lanterns
distribution.pdf

2.Solar Street Lights Distribution in Villages:

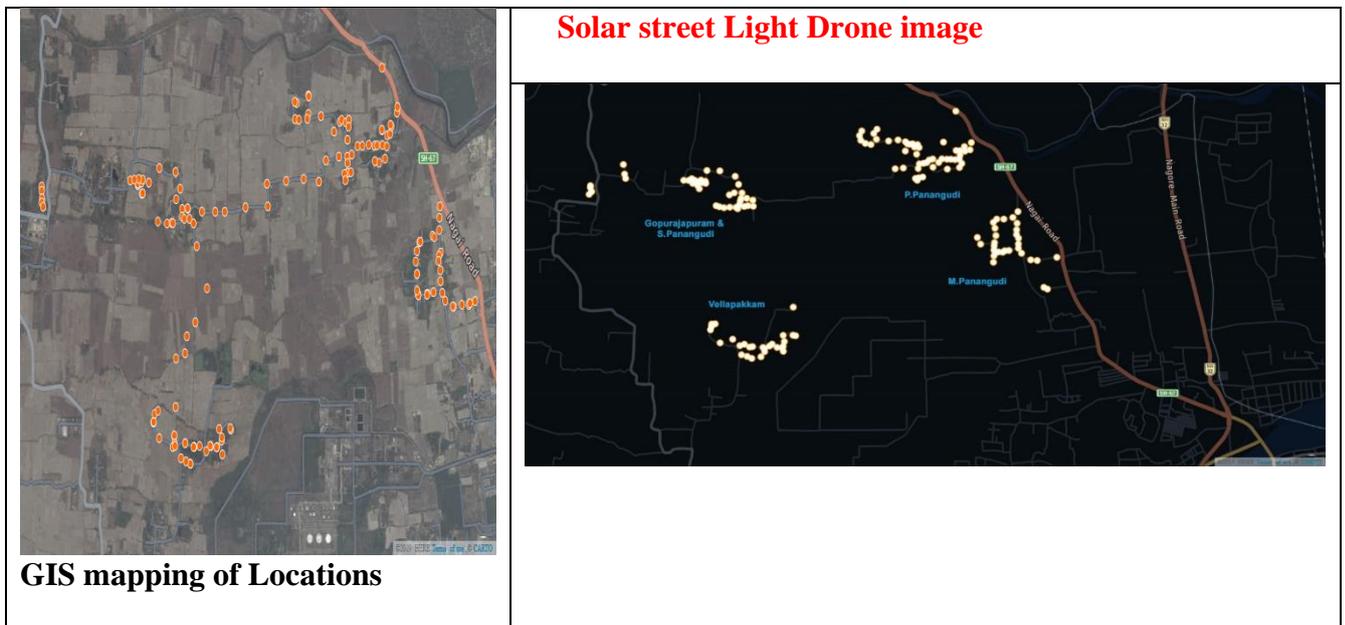
S.No	Village	No of S. Street Lights	Households
1	P Panangudi	50	168
2	M Panangudi	31	61
	Sub Total		229
3	S Panangudi	19	55
4	Gopurajapuram	22	69
5	Vellapakkam	28	88
	Sub Total		212
	Total	150	441

5.6.4 Beneficial Impact:

This will promote the use of green energy in the community. Awareness sessions were conducted among the community people on how to use/maintain the solar lanterns and importance of renewable energy. Awareness sessions were conducted among the community people on how to use/maintain the solar lanterns and importance of renewable energy. Now people feel safe at night in view of the well lit houses and streets even during power cut. More so, the consumption from EB supply is reduced with resultant savings to the local body besides contributing to energy conservation by way of using green energy.

5.6.4. GIS mapping of Solar Street light locations:

The street light locations in the various streets of 5 villages are mapped with GIS coordinates and Drone image of Street light glow during night time is captured below:



5.6.5. Photos of Progress: The pertinent details concerning inauguration of Solar lantern distribution, Solar lights comprising construction stage, beneficial front and that during Operation & maintenance period readily documented and such Photos captured in [Annexure 23](#).

CHAPTER 6

Skill Development Initiative by Centre for Social Innovation & Entrepreneurship

6.1.Scope and Objective

A skill development Centre will be established for building capacities of youths in these villages. Skills required for specific trade related job-assured opportunities will be identified through a baseline survey.

Hitherto 3 batches of training completed besides spoken English training and the final batch under training is crippled by Corona pandemic restrictions and lock down.

6.2. Planned Activities:

- ✚ Conduct a detailed needs assessment and potential job opportunities in the 3 villages on the requirements of skill development.
- ✚ Establish a Skill Development Centre. Sufficient area needs to be allocated by the local authorities. And is accommodated in Vellapakkam Community Centre
- ✚ Install infrastructure necessary for 2 trades.
- ✚ Develop curriculum for the trades.
- ✚ Recruit HR – manager for the centre, 2 trainers and assistants.
- ✚ Recruit candidates.
- ✚ Run batches of duration 3 months.
- ✚ Liaison with industries for placements.
- ✚ Conduct more batches.

6.3.Baseline Survey

The Baseline survey of all the three villages covering all the households and the youth in the respective households (defined as in the age group 15-30) have been completed.

Following tasks were carried out:

- Questionnaire was prepared. The objective is to find out number of youth, their current qualifications and their aspirations (skill requirements). Questionnaire attached in Appendix 1.
- 2 teams of 2 students each were selected and briefed about the exercise.
- Door-to-door survey was carried out and completed.
- Compilation of the data completed.

A sample of the Survey Questionnaire is shown in Annexure 24.21 and the collected data set is extracted in Annexure 24.2 and. As per analysis of the survey results, it was decided to impart

training on Tailoring and IT Skill improvements, after briefing the village elders.

The Completed Activities are collated and shown in Annexure 24.3

6.4) Establishment of Skill Development Centre(SDC):

The Vellapakkam Skill Centre is formally inaugurated by the District Collector in presence of Superintendent of Police, Nagapattinam and the Managing Director, CPCL on 01.07.2019. The centre is the fulcrum of activities for the regular training arranged under the scope of this project. The centre is having facility to conduct IT and tailoring facility with all necessary hardware and staff in place. The following trainers engaged are coordinated by a Centre Manager for the entire training activity besides some external resource persons :

- 1) Paneerselvam Kunjupillai – IT trainer Computer skills – Windows, MS-Suite, Oracle, Adobe Photoshop. Experience in e-seva centre.
- 2) R. Suganthi – Tailoring trainer 5 years experience as a tailor

A trust, APJ Abdul Kalam Arakkatai is established with the objective to manage the operations of the skill development centre by the village. CSIE is handholding the trust to manage the operations. Centre Manager is recruited from the village. Instructors are also recruited from the village. Email id is created to correspondence. Documentation of the centre activities is maintained by the Manager. Attendance records, examinations results are maintained. Accordingly various batches of training conducted as indicated below:

6.4.1.First batch Training:

The 1st batch comprising both Tailoring and IT skills started on 15 July 2019 with a total batch size of 28 participants, of which 21 are enrolled for tailoring and 7 are for IT skills and the details of trainees are summarized in Annexure 24.4 . They completed their training in Dec 2019 in IT and Tailoring skills with 280 hours of training as per the skill sector council norms. The Graduation ceremony was held on 09 Jan 2020 to issue the certificates. 21 participants received their certificates of completion. 7 participants had dropped out

6.4.2. Second batch Training:

The Second batch of skill training in IT and tailoring started from Jan 2020 with total participant strength of 23 comprising 7 for IT and 16 for tailoring and the details of trainees are summarized in Annexure 24.4 . The Second batch for Computer and tailoring was completed in Dec 2020 and . External examination was conducted by TFSC on 05 Jan 2021.

6.4.3 Third batch Training:

The third batch of skill training in IT and tailoring started with total enrolment of 38 comprising 12 for IT and 22 for tailoring. In Computer and the details of trainees are summarized in Annexure 24.5. The Third batch training completed in March 2021 and external examination was conducted by TFSC on 13 March 2021 and the details thereof are in the pdf file below:



GARMENT RESULT SHEET 13.03.2021.pc



ICT RESULT SHEET 13.03.2021.pdf

6.4.4 Fourth batch Training

The Fourth batch for Computer and tailoring started in March 2021 and held up now due to pandemic protocols during lockdown restrictions. It will be continued after normalcy restored.

6.4.5 Summary of Training Activities:

S.No	Batch	Duration	Tailoring Graduates	IT Graduates	Total
1	I	Aug 2019-Dec 2019	13	8	21
2	II	Jan 2020 – Jan 2021	14	10	24
3	III	Dec 2021 – Mar 2021	20	11	31
4	IV	Mar 2021 -	17	10	27
5	Spoken English	Jan 2020-	-	-	41
Total			64	39	144

6.4.6.SHG formed from first batch tailoring:

The Mother Theresa Women's Self-Help Group was started since January 2020 by twelve participants from the first batch of tailoring as per the details in **Annexure 24.6**. They started with face masks and a box of 700 face masks was received by Mr. Raghavan, Tahsildar, Social Welfare Department, Collectorate Office, Nagapattinam district on 07 April 2020. They are now into other tailoring related self-employment activities and the value addition by the SHG in tailoring stands at Rs. 29,000/- till the end Q2 FY 2020-21. It signifies the self-reliance of the women members trained under the Skill Development Centre and thus corroborated the objective with which the activity was taken up. This is sure to motivate other trainees as well in future for further upscaling of their revenues, if the same momentum continues.

6.4.7 Spoken English Course:

The spoken English classes for school students has been started at Skill development centre, Vellapakam from 25 January 2021, due to popular demand from the villagers. The classes are being conducted during weekends from 1000 – 1300 hr. and 40 students enrolled in the weekend course.

6.4.8 Documents Concerning CSIE Activities:

The Hard copies of the necessary documents containing the following documents **are** scanned and stored in the Google Drive in the link below:

<https://drive.google.com/drive/folders/1qusuVKJSF4ZVInjnfTsOPyuURGJ1-7bP?usp=sharing>.

Tailoring Curriculum 13 pages

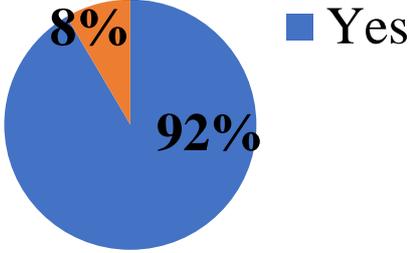
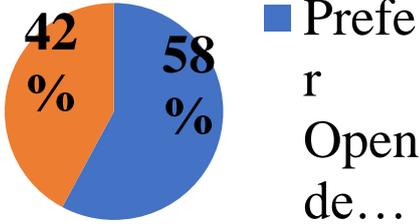
1. Computer Curriculum 33 pages
2. Application Forms First Batch 15 pages
3. Application Forms First Batch 10 pages
4. Application Forms Second Batch 32 pages
5. Application Forms Second Batch 12 pages
6. Communication materials 4 pages
7. Skill Centre Staff Details 29 pages
8. Spoken English Batch 2 pages
9. APJ Trust Order 34 pages
10. Visuals 8 pages
11. Sample Certificate of Completion 1 page

The supporting details under this activities are shown in Annexure 24.1 to 24.6 and the photos capturing the various field activities concerning Skill Development since survey to completion of training is shown in Annexure:25

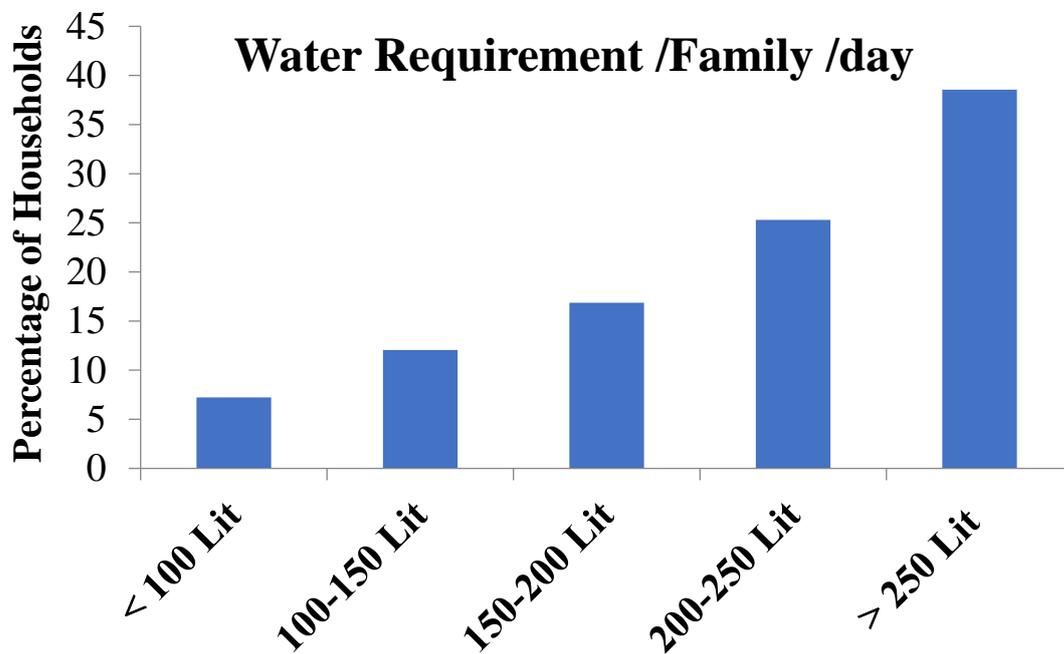
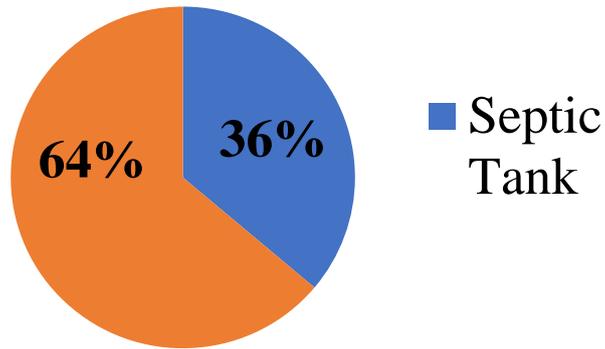
ANNEXURES

Annexure 1- Social Survey

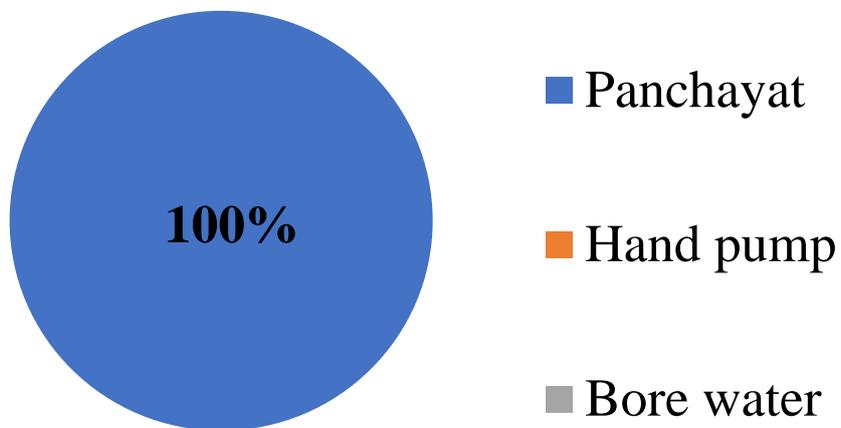
1.1 Social Survey Vellapakkam

Access to Toilets	Toilet Usage
 <p>A pie chart illustrating the results of the survey regarding access to toilets. The chart is divided into two segments: a large blue segment representing 'Yes' at 92%, and a smaller orange segment representing 'No' at 8%. A legend to the right of the chart shows a blue square next to the word 'Yes'.</p>	<p>Toilet Usage</p>  <p>A pie chart illustrating the results of the survey regarding toilet usage. The chart is divided into two segments: a blue segment representing 'Prefer' at 58%, and an orange segment representing 'Open de...' at 42%. A legend to the right of the chart shows a blue square next to the text 'Prefer' and 'Open de...'.</p>
 <p>A photograph showing a blue water tap mounted on a concrete structure. Water is flowing from the tap into a silver metal bucket placed on the ground. The surrounding area is rocky and appears to be an outdoor water collection point.</p>	 <p>A photograph of a concrete structure, possibly a toilet or a water tap, with a green horizontal stripe. Several pots and containers are placed on the ground in front of the structure, suggesting it is used for water collection or storage.</p>
 <p>A photograph of a tall, cylindrical concrete water tower with a green horizontal stripe. The tower is supported by four concrete pillars. A blue pipe runs down the side of the tower. In the background, there are trees and a cloudy sky.</p>	 <p>A photograph of a small, green-painted building with a thatched roof made of dried grass or straw. A person is sitting on the ground in front of the building, possibly engaged in a traditional activity like weaving or spinning.</p>

Toilet water drains



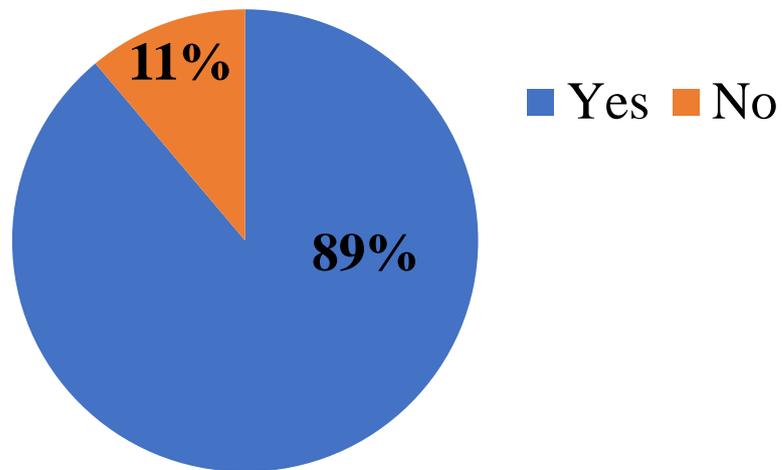
Source of Drinking Water



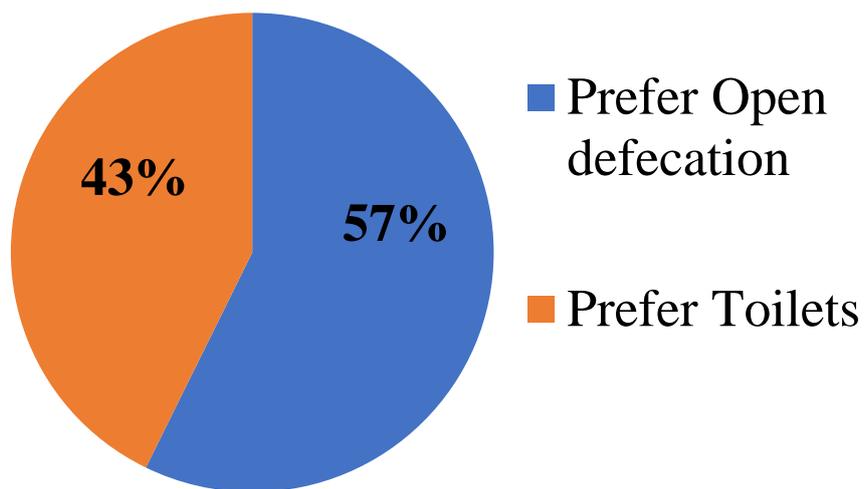
<p style="text-align: center;">Type of Family</p> <p>A pie chart titled 'Type of Family' showing two categories: 'Joint family' represented by a blue slice at 19%, and 'Nuclear Family' represented by an orange slice at 81%. A legend to the right identifies the colors: blue for 'Joint family' and orange for 'Nuclear Family'.</p> <table border="1"> <thead> <tr> <th>Family Type</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Joint family</td> <td>19%</td> </tr> <tr> <td>Nuclear Family</td> <td>81%</td> </tr> </tbody> </table>	Family Type	Percentage	Joint family	19%	Nuclear Family	81%			
Family Type	Percentage								
Joint family	19%								
Nuclear Family	81%								
<p style="text-align: center;">Type of House Roofing</p> <p>A pie chart titled 'Type of House Roofing' showing three categories: 'Coconut Leaves' (blue, 47%), 'Clay tiles' (orange, 20%), and 'Cement Concrete' (grey, 33%). A legend to the right identifies the colors: blue for 'Coconut Leaves', orange for 'Clay tiles', and grey for 'Cement Concrete'.</p> <table border="1"> <thead> <tr> <th>Roofing Type</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Coconut Leaves</td> <td>47%</td> </tr> <tr> <td>Clay tiles</td> <td>20%</td> </tr> <tr> <td>Cement Concrete</td> <td>33%</td> </tr> </tbody> </table>	Roofing Type	Percentage	Coconut Leaves	47%	Clay tiles	20%	Cement Concrete	33%	
Roofing Type	Percentage								
Coconut Leaves	47%								
Clay tiles	20%								
Cement Concrete	33%								
<p style="text-align: center;">Solid Waste Disposal</p> <p>A pie chart titled 'Solid Waste Disposal' showing two categories: 'Backyards' (grey, 62%) and 'On the roadside' (blue, 38%). A legend to the right identifies the colors: grey for 'Backyards' and blue for 'On the roadside'.</p> <table border="1"> <thead> <tr> <th>Disposal Method</th> <th>Percentage</th> </tr> </thead> <tbody> <tr> <td>Backyards</td> <td>62%</td> </tr> <tr> <td>On the roadside</td> <td>38%</td> </tr> </tbody> </table>	Disposal Method	Percentage	Backyards	62%	On the roadside	38%			
Disposal Method	Percentage								
Backyards	62%								
On the roadside	38%								

1.2.Social Survey Gopurajapuram

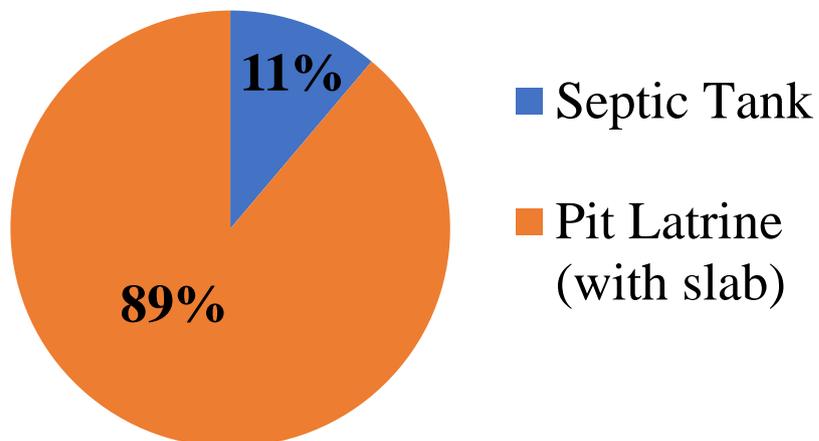
Access to Toilet Facility



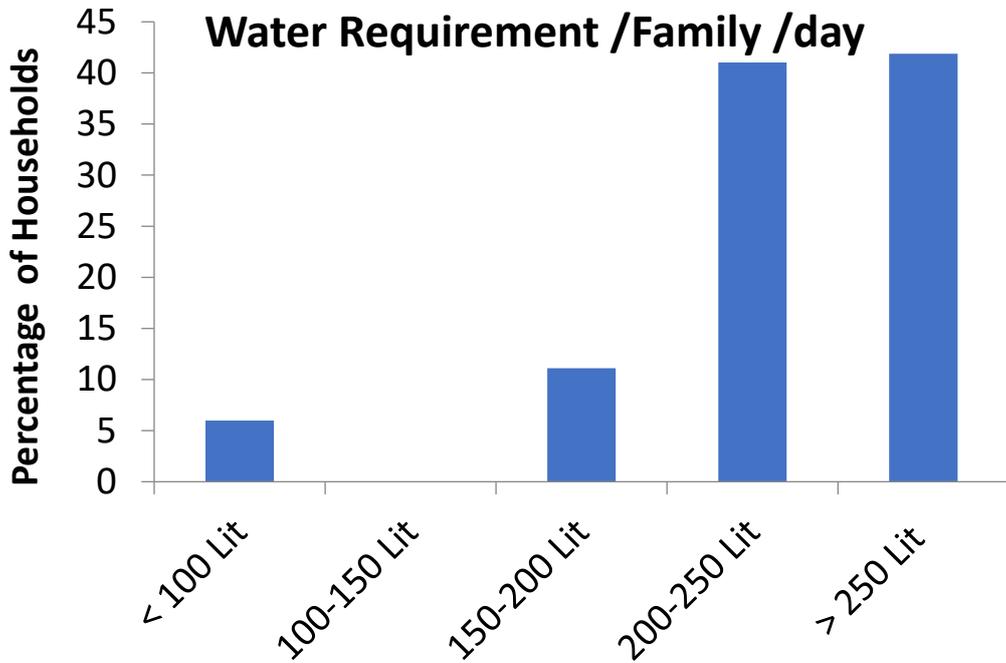
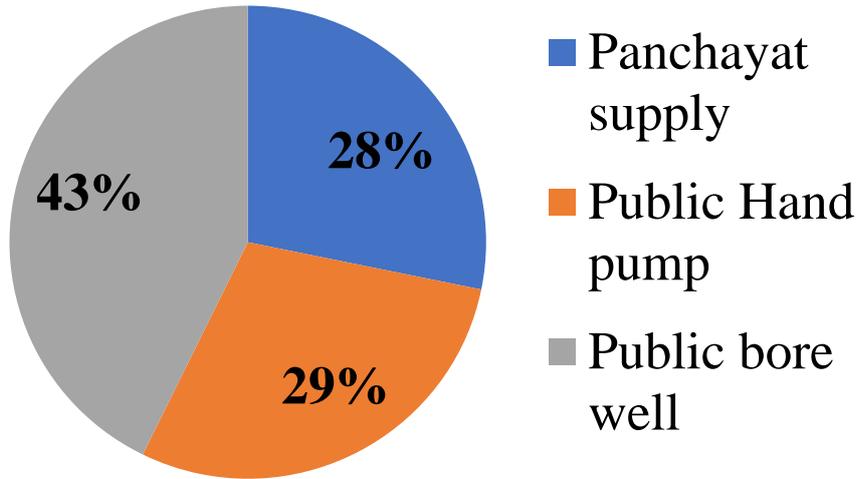
Toilet Usage



Toilet water drains

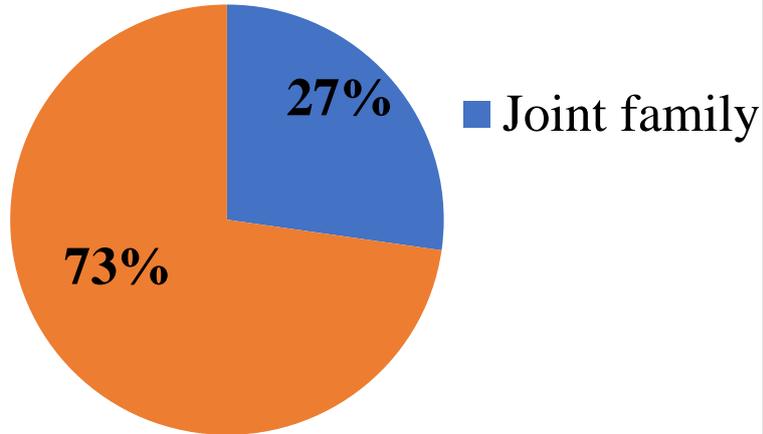


Source of Drinking Water

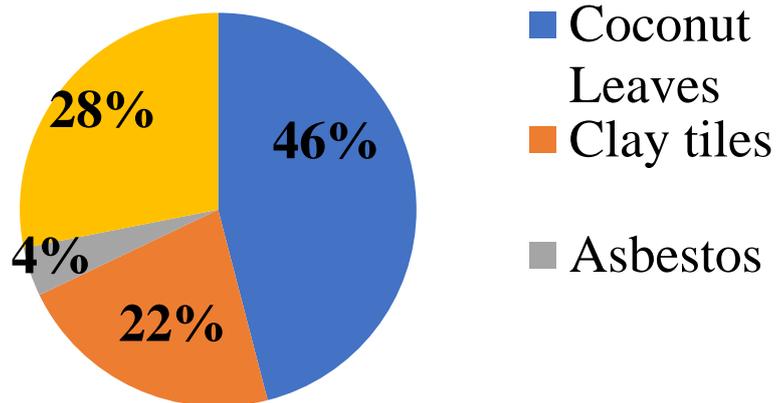


1.3. Social Survey P.Panangudi

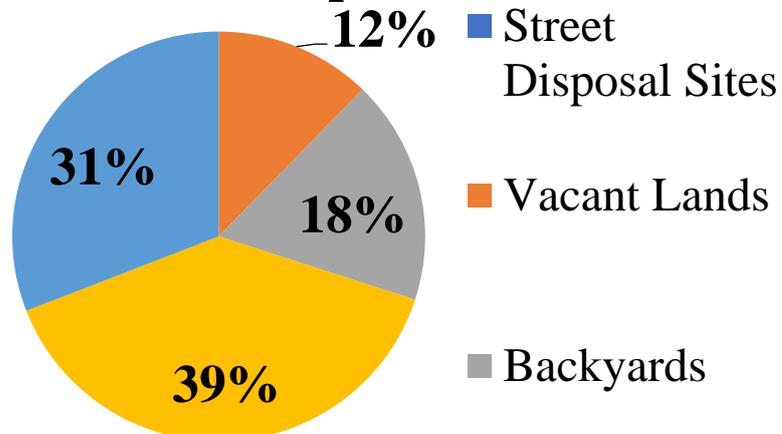
Type of Family



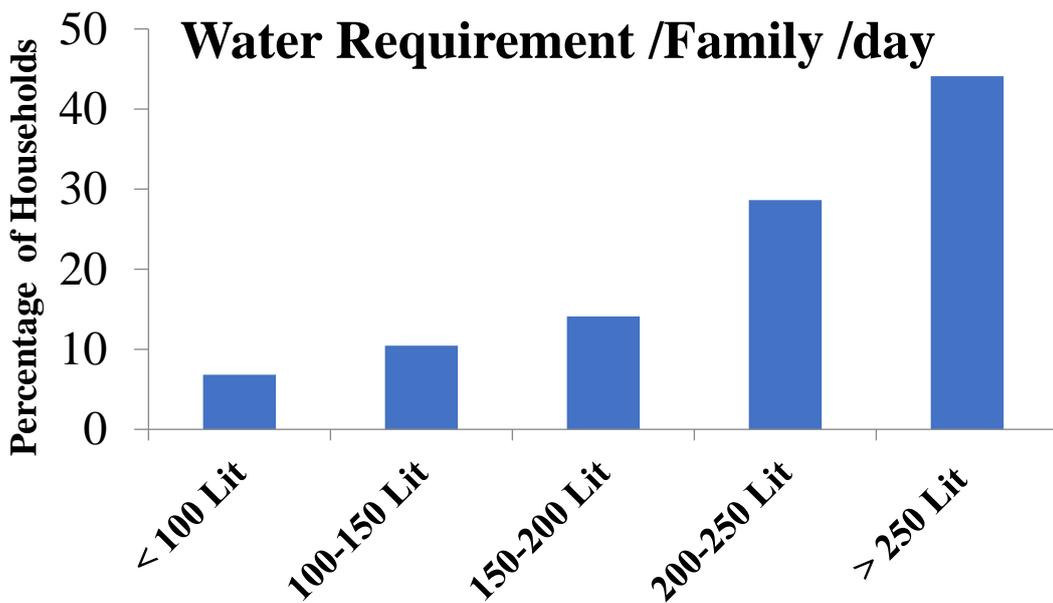
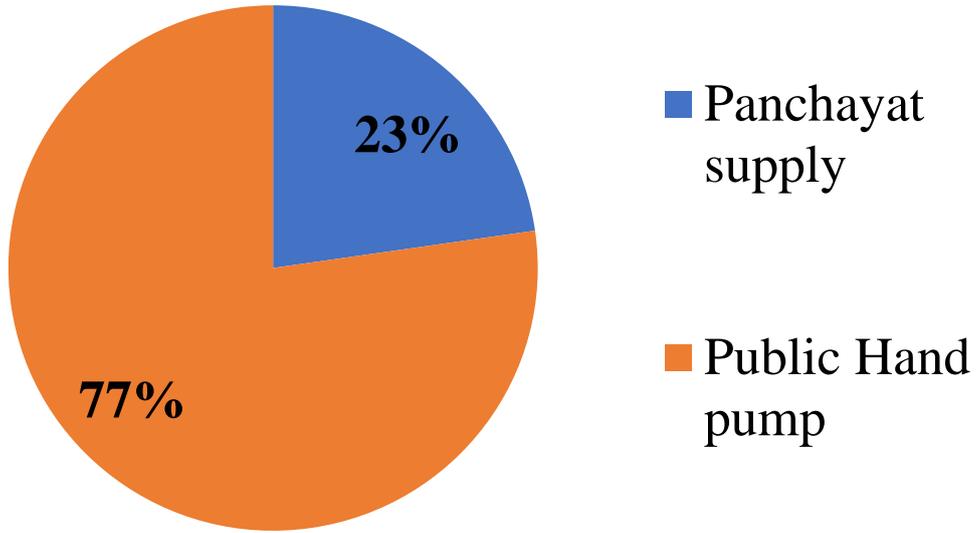
Type of House Roofing



Solid Waste Disposal



Source of Drinking Water



Annexure 1.4 Topographic Survey



Annexure: 2 Geophysical Survey for Source Creation



P1-VES Geo Physical survey to detect desirable Tube well locations



Figure1-VES 11 Sivan Koil Deep Borewell-Resistivity Data

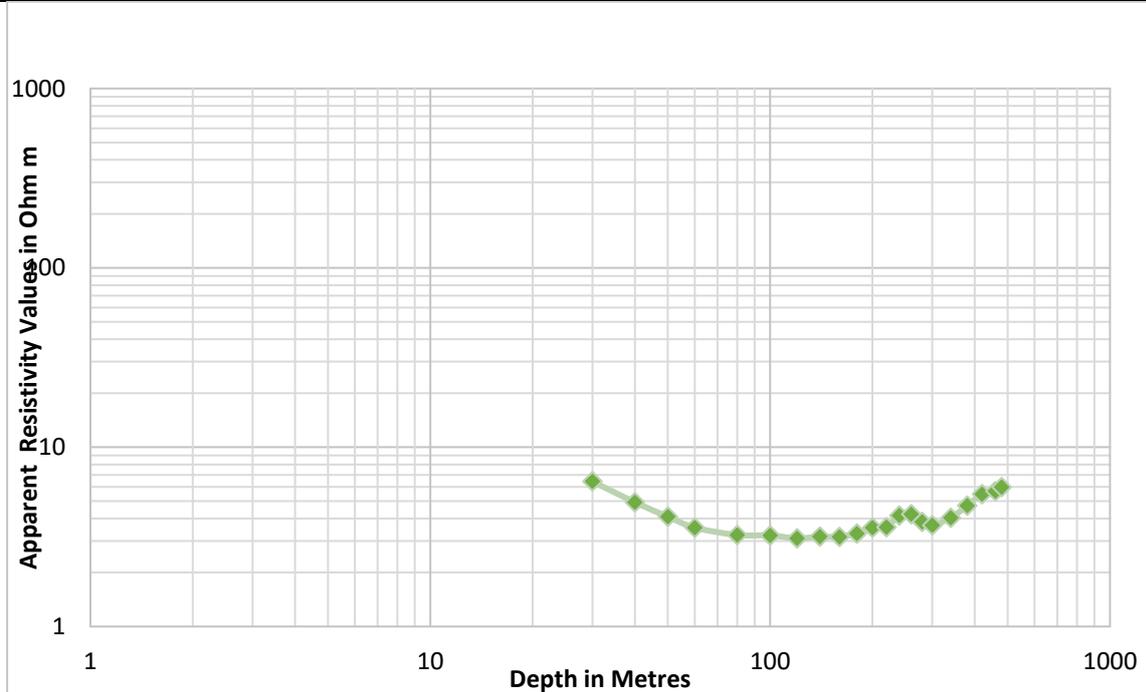


Figure 2 VES 40- P.Panangudi Resistivity Data

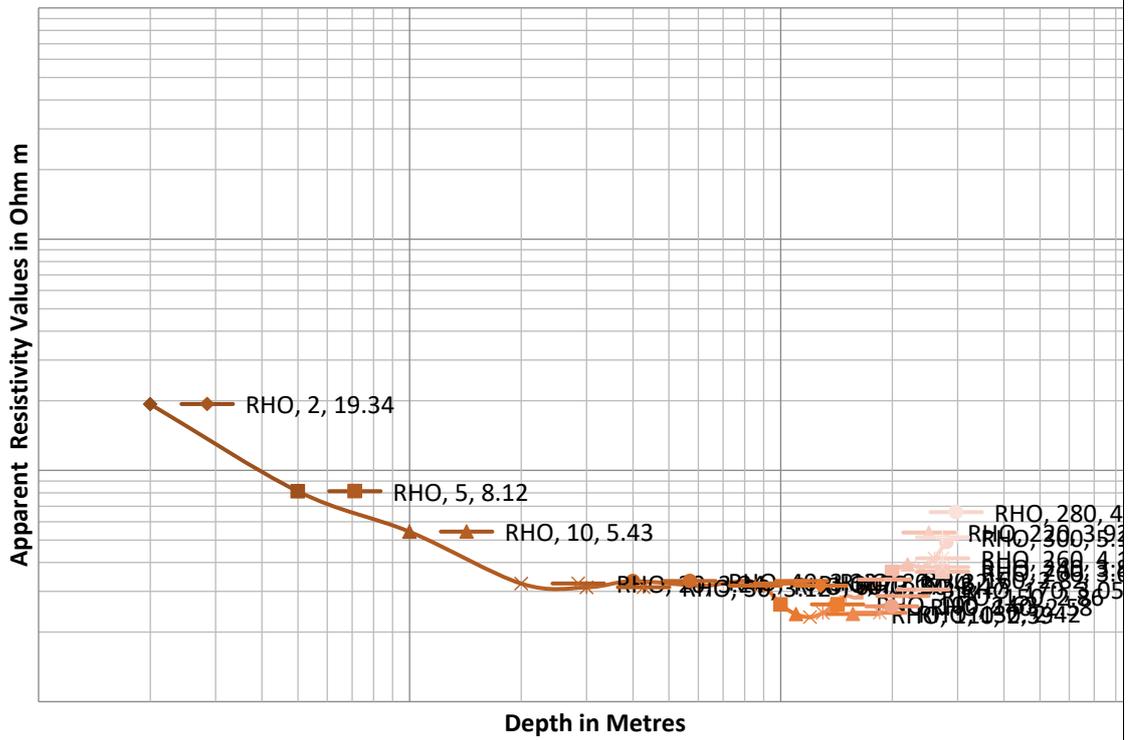
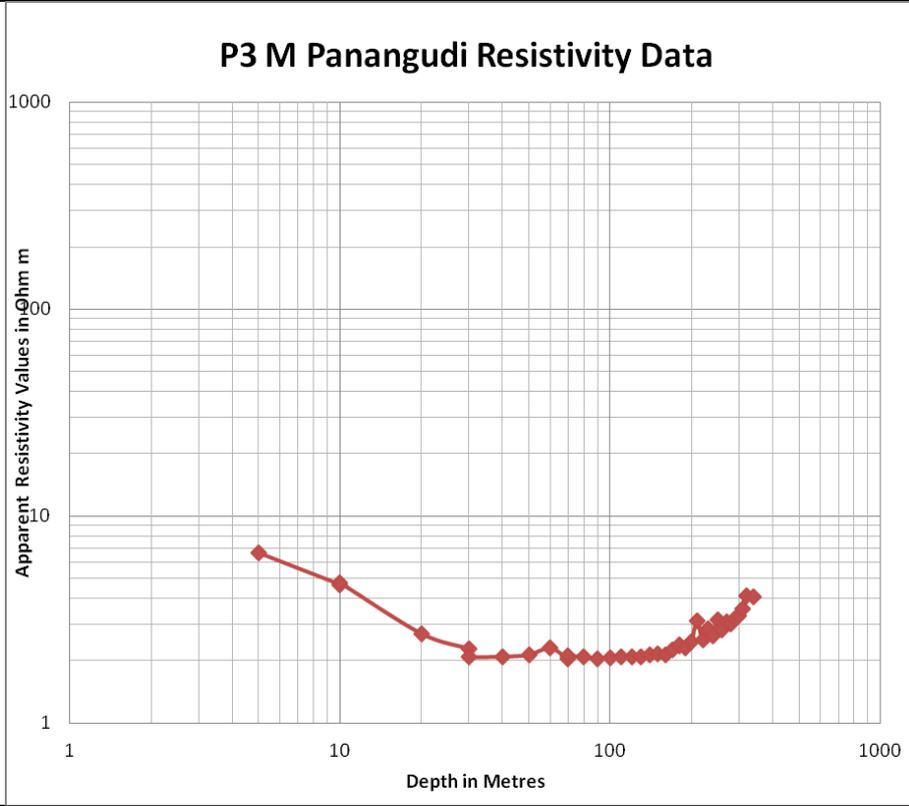


Figure 3- VES P3 Additional Deep Bore well -Panangudi near CPCL Quarters



Annexure 2.1

General Technical Specifications for Construction of Deep Borewell for 300 m depth-

Sl. No.	Description	Quantity
1	Drilling of Borewells including transportation from one place to another in alluvial soil sedimentary strata of clay and sand stone shale pebbles boulders etc by first taking a pilot bore of 150mm diameter and then enlarging to required diameter direct or reverse rotary mud circulation method using rotary rigs, fuel, labour and drilling including provision of bentonite and water required for drilling at site including construction of mud pit and all allied items required for safe drilling. - Drilling of 150mm pilot bore	300 m
2	Reaming from 150 mm dia pilot bore to 300 mm dia bore as directed by the CUBE officers for the entire 300 m depth.	300 m
3	Reaming from 300 mm dia bore to 400 mm dia bore as directed by CUBE officers.	120 m
4	Conducting electrical logging for the entire 300 m Depth including conveyance etc complete, as directed by CUBE.	Ls
5	Supply and delivery of PVC-U (Unplasticized) casing pipes of the following diameter in 3 metres length with screwed and scoket ends and centering guides for every 15m length of pipes with BIS Standard Mark Certified under IS 12812 :1992 and DN 4925 and as amended from time to time to suit field conditions.	
a	Supply and delivery of 200mm Nominal dia (8") Deep borewell PVC-U plain casing pipe (Casing Deep- CD) wall thickness of 13.0 mm to 14.80mm.	120 m
b	Supply of 150mm Nominal dia (6") Deep borewell PVC plain casing pipe (Casing Deep- CD) wall thickness of 13.0 mm to 14.30mm	140 m
c	Supply and delivery of 150 mm Nominal dia (6") PVC-U, Casing Deep-borewell Ribbed Screen (CDRS) Casing pipe with BIS Standard Mark Certified under IS 12818:2010 , with suitable 1.0mm horizontal slot with having open areas 12 % minimum with wall thickness 13mm to 14.30 mm at site of work	40 m
6	Supply and delivery of Bore cap using suitable size /Thickness M.S. Flat and M.S. sheet on top with bolting arrangements for securing the cap in position (Bore caps with M.S. Couplings need not be made) suitable for 8" Casing pipe	1 No
7	Supply and delivery of 200 mm x 150 mm dia PVC deep well Reducer at site of work and fixing it in position	1 No
8	Supply of 160 mm Nominal dia (6") dia PVC deep well bottom cap at site of work	1 No
9	Supply of the following consumables required during Bore Well Drilling/Development by sealing the annular space between the casing pipes and reamed exterior wall surfaces by proper packing with precision required for due construction of the Borewell.	
a	Bentonite and mud bags (Quantity and Rate per Tonne to be specified by the Vendor)	1 lot

b	Clay balls ((Quantity and Rate per Tonne to be specified by the Vendor)	1 lot
c	Pebbles (Quantity and Rate per Tonne to be specified by the Vendor)	1 lot
10	Inserting PVC Casing pipes assembly and PVC Reducer (with slots or without slots) in the drilled hole including jointing the pipes with PVC Couplers with Cement paste etc., complete, by packing the annular space with Clay Balls over the plain pipes and with pebbles of standard size and quality in the Slotted portion, as approved by Engineers of CUBE	
a	200 mm OD PVC casing Pipes assembly.	120 m
b	150 mm OD PVC casing Pipes assembly.	180 m
11	Developing the Borewell with air compressor of 600 CFM capacity (Minimum 8 Hours) including transportation, labour and fuel charges for compressor as directed by TWAD Officers and conducting yield test by 'V' notch method until the entire process of well development is neatly established.	10 Hrs

Annexure 2-2
Panankudi New deep Borewell Water Sample Results analysed by IIT M
Laboratory

NAGAPATTINAM WATER SAMPLE ANALYSIS OF WATER SAMPLES FROM NEW DEEP BORE WELLS				
S.NO	PARAMETERS	UNITS	Gopurajapuram	P Panangudi
1	pH		8.38	8.42
2	TDS	mg/L	995.6	1031.8
3	Conductivity	µs	1486	1540
4	Alkalinity	mg/L	350	330
5	Hardness	mg/L	10	15
6	Turbidity	NTU	21.73	35.86
7	Sulphate	mg/L	12.3	10.4
8	Nitrate	mg/L	1.95	2.14
9	Chloride	mg/L	340	435
10	Fluoride	mg/L	BDL	BDL
11	Iron	mg/L	0.018	0.022
12	COD	Mg/L	14.8	10.6
12	Fecal coliform	MPN/ 100mL	3	< 1.8
13	Total coliform	MPN/ 100mL	5	< 1.8

Annexure 2.3 Awter sample results of Panangudi additional Source

Sample details:

Total number of samples – 1

Sample name – Ground water sample, Panankudi, Nagapattinam.

Sample denotation - S1

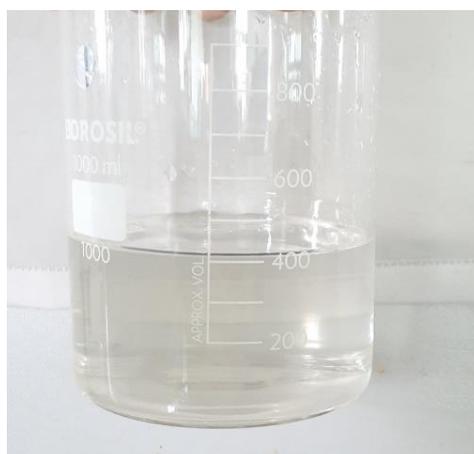


Fig 1: Ground water sample, Panangudi (S1)

Water Sample Characteristics:

S. No.	Parameters	S1	Acceptable limit (IS 10500-2012)	Permissible limit (IS 10500-2012)
1	pH	8.03±0.01	6.5 - 8.5	No relaxation
2	Apparent Colour	Slightly turbid (tiny particles)	-	-
3	Odour	Odourless	Agreeable	Agreeable
4	Electrical Conductivity (µS/cm)	1885.5±1.5	-	-
5	Turbidity (NTU)	21.4±0.19	1	5
6	Total Solids (mg/L)	1277.5±17.5	-	-
7	Total suspended Solids (mg/L)	80.0±5.0	-	-
8	Total Dissolved Solids (mg/L)	1167±13.3	500	2000
9	Total Alkalinity as CaCO ₃ (mg/L)	395±5.0	200	600
10	Total Hardness as CaCO ₃ (mg/L)	31±1.0	200	600
11	Calcium as Ca ²⁺ (mg/L)	8±0.0	75	200
12	Magnesium as Mg ²⁺ (mg/L)	2.7±0.10	30	100
13	Carbonate as CO ₃ ²⁻ (mg/L)	33±2.0	-	-
14	Bicarbonate as HCO ₃ ⁻ (mg/L)	335±1.5	-	-
15	Chloride as Cl ⁻ (mg/L)	462.4±12.5	250	1000
16	Sulphate as SO ₄ ²⁻ (mg/L)	3.05±0.26	200	400
17	Sodium as Na ⁺ (mg/L)	303.50±6.5	-	-
18	Potassium as K ⁺ (mg/L)	14.50±1.5	-	-
19	Total Phosphate as PO ₄ (mg/L)	0.02±0.0	-	-
20	Ammonical Nitrogen (NH ₃ -N) (mg/L)	BDL	0.5	No relaxation

21	Nitrate as Nitrogen (NO₃-N) (mg/L)	0.21±0.0	-	-
22	Nitrite as Nitrogen (NO₂-N) (mg/L)	0.39±0.02	-	-
23	Total Nitrogen (N) (mg/L)	0.61±0.01	-	-
24	Chemical Oxygen Demand (COD) (mg/L)	44.0±4.0	-	-
25	Total Organic Carbon (TOC) (mg/L)	13.2±0.1	-	-
26	Fluoride as Fl (mg/L)	0.59±0.1	1.0	1.5
27	Copper as Cu (µg/L)	5.28±1.06	50	1500
28	Aluminium as Al (µg/L)	BDL	30	200
29	Iron as Fe (µg/L)	BDL	300	No relaxation
30	Zinc as Zn (µg/L)	15.70±4.47	5000	15000
31	Cadmium as Cd (µg/L)	1.88±0.39	3	No relaxation
32	Chromium as Cr (µg/L)	BDL	50	No relaxation
33	Lead as Pb (µg/L)	2.05±0.46	10	No relaxation
34	Arsenic as As (µg/L)	1.43±1.38	10	50
35	Manganese as Mn (µg/L)	4.33±0.62	100	300
36	Total Coliform (MPN/100mL)	63±4.0	Nil	Nil
37	Fecal Coliform (MPN/100mL)	26±1.0	Nil	Nil

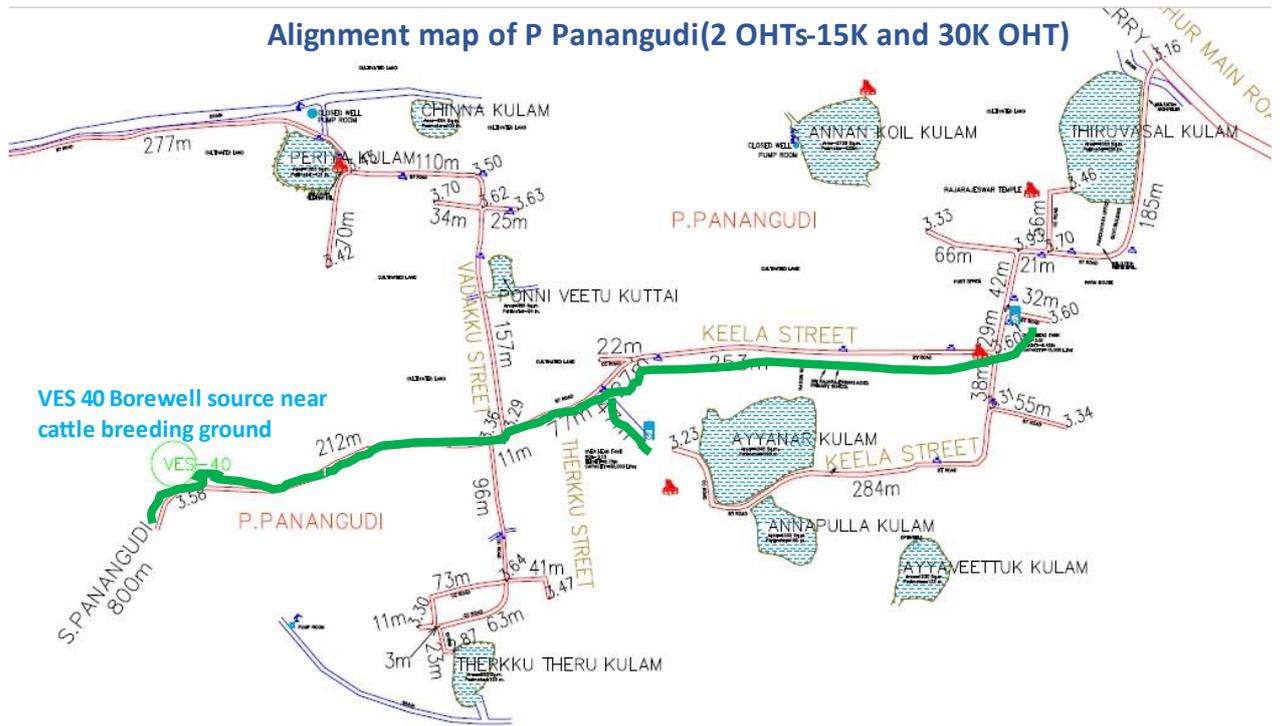
Annexure 3.1 Pumping Main Hydraulic design

2. Hydraulic Design - Gopurajapuram & 2 other Villages (12 Hrs Pumping)											
MWL= 12.02; FVL= (-) 85.90 m; Terminal Head=3 m					Static Head= 12.02+85.90+3= 100.92 m						
S. No	Size & class of pipe	LS in m			Av.GL	Q in LPM	FL m	V m/s	HGL m	Remarks	
		From	To	Distance							
	(12 Hrs Pumping)				4.1			16.63	19.52	Bore Well @ LS O	
2.1	90 PE 100 PN8	0	124	124	4.22	138	0.56	0.5	18.96	Br to G'puram-40 LPM	
	90 PE 100 PN8	124	189	65	4.65	98	0.16	0.4	18.8	Br. To S.Panangudi-41 LPM	
	75 PE 100 PN8	189	231 0	2121	3.52	57	3.78	0.3	15.02	V'Pakkam OHT; MWL=12.02, TH: 3 m	
							4.5				
			Total Head= 100.92+4.50+0.58=106 m						HGL=106-0.58-85.90=19.52		
2.2	Br.main to Gopurajapuram				4.22				18.96	Takes off from LS 124 m.	
	75 mm PN 8	0	380	380	3.65	40	0.63	0.3	18.33	MWL=12.15 GR	
2.3	Br to S.Panangudi				4.65				16.88	Takes off from LS 189 m	
	65 mm GI	0	6	6	3.92	98	0.06	0.5	16.82	MWL=12.42	
1. Hydraulic Design P Panangudi WSS (12 hrs pumping)											

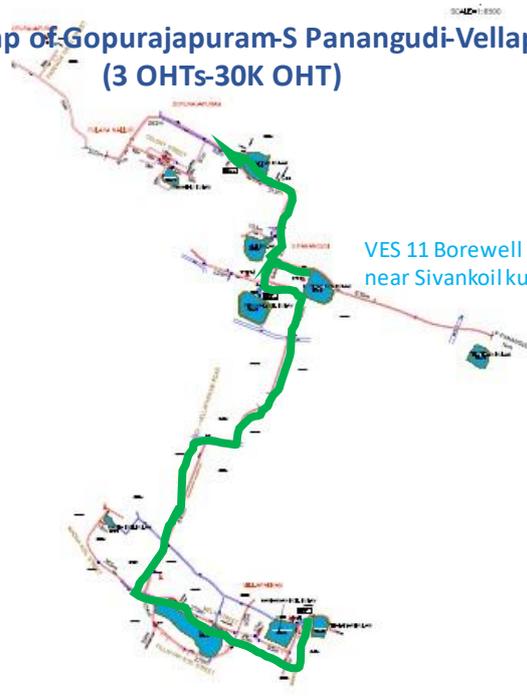
	MWL of 15K OHT = 12.51 m				FVL+ (-) 86.60		Terminal head (TH)=3 m			
	Static Head= MWL- FVL+ TH						Static Head= 12.51+86.60+3.00= 102.11 m			
S. No	Size & class of pipe	LS in m			Av.GL m	Q LPM	FL m	V m/s	HGL m	Remarks
		From	To	Distance						
1.1	90 HDPE(PE 100) PN8	0	308	308	3.4	183	2.33	0.7	16.15	Br to 30K OHT (122 lpm)
	75 HDPE(PE 100) PN8	308	623	315	3.51	61	0.64	0.3	15.51	OHT 15 K (MWL=12.51, TH=3 m)
	Total Head= 102.11+ 2.97+0.92= 106 m						2.97		<u>HGL@LS O =106-0.92-86.60= 18.48</u>	
1.2	Br. Main to 30K OHT								16.15	Takes off @ LS 308
	65 mm GI pipe	0	50	50	3.13	81	0.32	0.4	15.86	30K OHT (MWL=11.63) TH=4.23

Annexure 3.2

Alignment map of P Panangudi(2 OHTs-15K and 30K OHT)

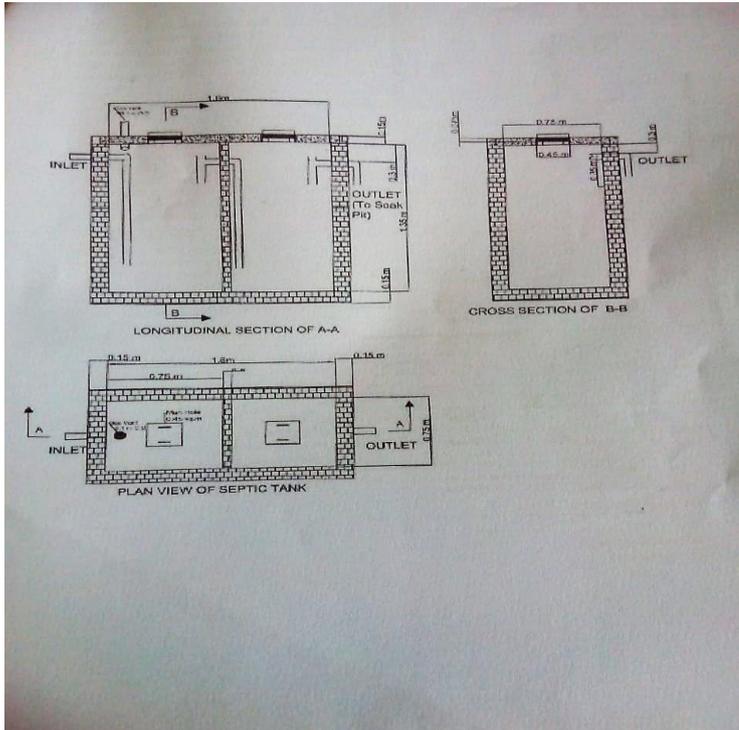


Alignment map of Gopurajapuram-S Panangudi-Vellapakkam (3 OHTs-30K OHT)

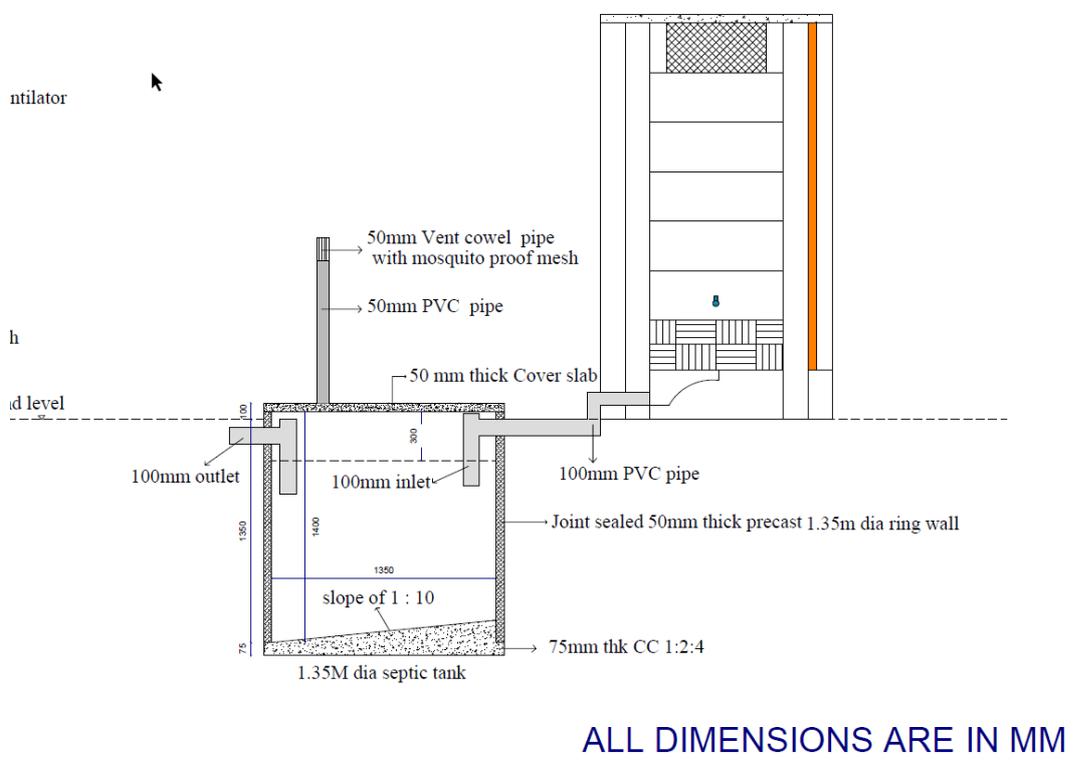


Annexure 4. Design of Septic Tanks For Households:

4.1.Design of Rectangular Septic Tank for Households



4.2. Design for Circular Septic Tank:



Annexure 5. Design considerations for constructed wetland at Nagapattinam Project Villages

Criteria	Greywater	Blackwater
Pre-treatment unit	Settler (Concrete chamber of dimensions 0.5*0.5*0.5 m) Free board 0.1m	Septic tank (already adopted)
Capacity	Designed for 300L/d of Greywater produced from a single household of 5 persons	Designed for 100L/d of blackwater produced from a single household of 5 persons
CW Flow type	Horizontal flow	Horizontal flow
CW Dimension	Length of Inlet zone - 0.5m Length of Reed bed - 4 m Length of Outlet zone - 0.5m Total length - 5m Width of bed - 1m Depth of bed – 1m Overall dimension - 5*1*1 m	Length of Inlet zone - 0.5m Length of Reed bed - 2 m Length of Outlet zone -0.5m Total length - 3m Width of bed - 1m Depth of bed – 1m Overall dimension - 3*1*1 m
Surface area	5 Sq.m	3 Sq.m
Slope	Side slope of 1 in 2 Bottom bed slope of 1 in 30	
Depth of filling	0.9 m	0.9 m
Substrate	Inlet and outlet zone filled with gravel Reed bed is filled with Brickbats and Sand 50:50	
Plants	Canna indica , Phragmites australis (Common reed), any vegetables	Canna indica , Phragmites australis (Common reed)
Treated water	A gravel bed will be provided around the outlet pipe and thus the treated water will be percolating through it into the ground	

1) Constructed wetland for settled Grey water

The detailing for the Horizontal flow constructed wetland for settled grey water is sketched below:



CW_Nagapattinam_Greywater.pdf

2) Constructed Wetland for Septic tank effluent

The detailing for the Horizontal flow constructed wetland for septic tank effluent is sketched below:



CW_Nagapattinam_Septic tank effluent.pdf

Household Level Horizontal Flow Constructed Wetland for Settled Grey Water- Proposed by IITM

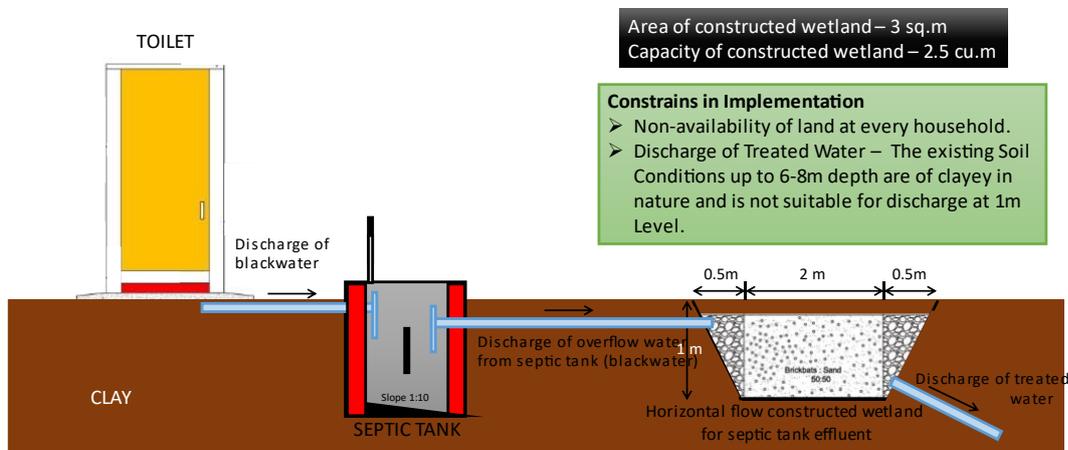
Design Considerations

Capacity	300 L/d of blackwater produced from a household of 5 persons
CW flow type	Horizontal flow
CW Dimensions	Length of inlet zone – 0.5m Length of reed zone – 4m Length of outlet zone – 0.5m Width of bed – 1m Depth of bed – 1m
Surface area	5 sq.m

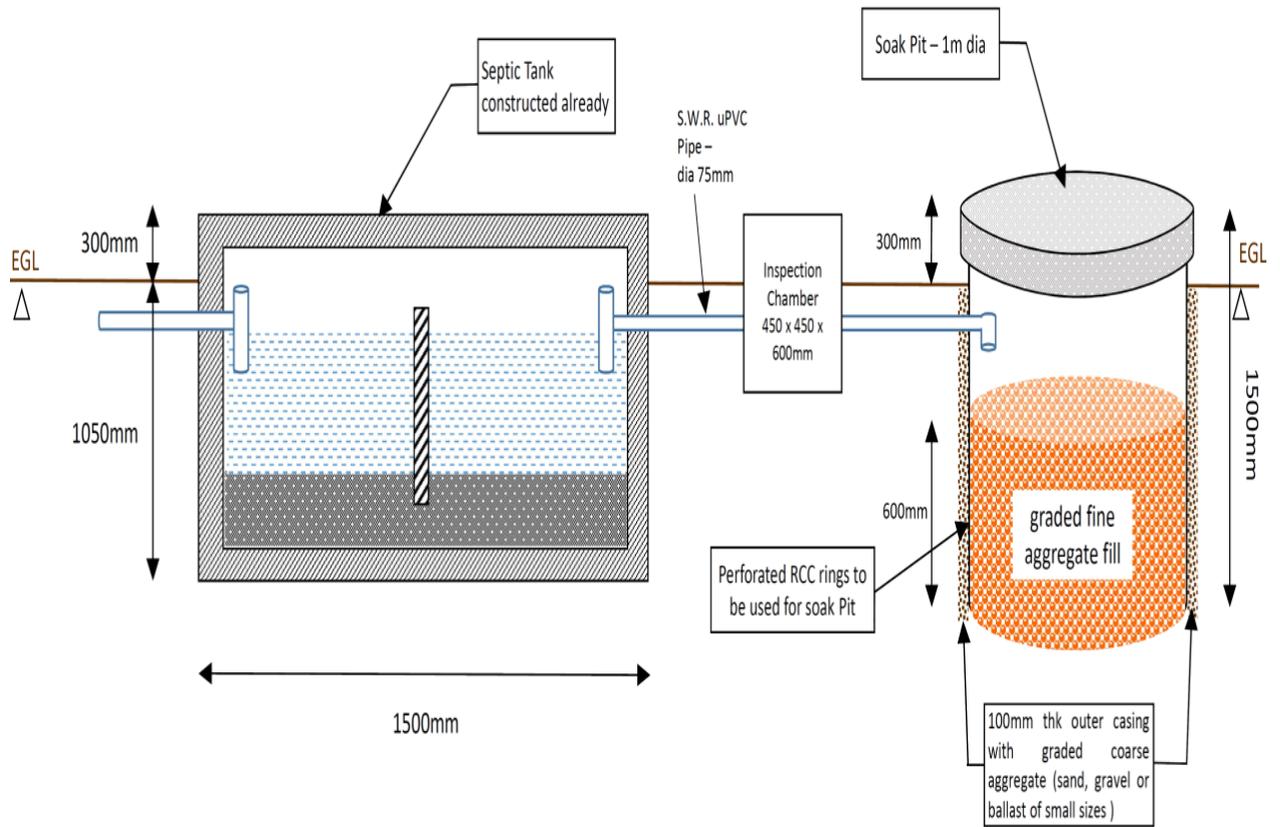
Constraints in Implementation

- Non-availability of Land at every Household.
- Due to the Water Scarcity in the region, the village people are not interested in directing the Settled Grey water as Groundwater discharge.
- Most of the households have their own Gardens/ plantations in/ adjacent to their households and are currently using the kitchen grey water for the purpose of watering.
- Hence, the proposed system of treating Grey water may not be feasible for implementation.
- Any suitable alternate method shall be suggested.

Household Level Constructed Wetland for Septic Tank Effluent – Proposed by IITM



Annexure 5.2 Household Drain Field System for treatment of waste water



Annexure 6.4 - Coordination Meetings of IIT M- Civil (EWRE) Professors

S.no	Date	Venue	Participants	Description
1	12.09.2018	IIT M-IGCS Hall 4 th Floor	1)CPCL Mr.Kaushik 2) Project Partners	Discussion about field progress and further fund release
2	16.10.208	CPCL HO Teynampet	1)CPCL Director(F) 2) Prof.Ligi Philip 3) Prof.Murty 4) Project Partners	Presented the scope of progress and discussed the additional items involved. Director Finance cleared the Change in Solar DC lights to Household Lanterns and laid more emphasis on water supply provision vital for toilets He is happy about the proposals put forth to him and suggested to make changes to make it happen even if more funds are required.
3	10.11.208	IIT M- ED Buiding- 4th Floor C'Room	CEE /Dr.Uma Sankar and Team	Apprised about the detailed Study report of Shallow aquifers and its poor dependability triggered to take up Survey for Deep Borewells in view of the intensive discussions
4	04.06.2019	IIT M-IGCS Hall 4 th Floor	1.Mr.Kaushik, CPCL 2) Project Partners	Progress of activities discussed. Pond progress delayed due to termination of contract. Fund release requested. Desired to have inauguration of Toilets and Solar lanterns, Street lights etc
5	29.10.2019	IIT M- ED Building – 4 th Floor C'Room	CPCL-DGM & Sr.Manager Pradeep	The progress of activities, issues and fund release discussed. More components requiring additional funds in Pond works discussed to move forward
6	01.01.2020	ED Building- 4 th Floor C'room	CUBE Reps: 1.Mr.John Joseph, Project Manager 2.Mr.Vishanth, Project executive	The New Year Day started with hectic discussions on Constructed Wet land and the inherent land issues. It facilitated CUBE for onsite closer interventions based on Prof.Ligy Philip's guidance. It is the trigger for CUBE to revisit the technology to adopt Household Drain field System for treatment of waste water.

6	21.02.2020	CUBE Office, IIT M Research Park	CPCL-DGM & Sr.Manager Pradeep	<p>Came to request Professors to discuss about budget scope. Suggested to recast budget factoring the additional works under CUBE's Activities. Professors suggested to discuss the same Day in CUBE office, and a meeting conducted. CUBE CEO made a presentation about the revised scope and additional details shared based on it.</p> <p>The various issues raised by the Presidents called for unified tough stand to combat the field issues from Panchyat. CEO CUBE expressed confidence to resolve the issues, after this meeting as CPCL readily extended support by apprising the District Collector, if the sensitization meeting proposed with Panchayts doesn't resolve the issues hampering the progress.</p>
7	28.09.2020	Virtual Meet	<p>1.CPCL-DGM & Sr.Manager Pradeep</p> <p>2.Project partners</p>	<p>Changes in SWM site, site constraints & issues in water supply distribution works and Drain field proposals discussed based on CUBE CEO's proposal. DGM, CPCL felt happy about the Activity progress in spite of issues from Panchayats, Pandemic period restrictions, lock downs and other field constraints retarding progress.</p>

Annexure 6.4.1 - IIT Professors field Visit to the Project Area

Inspection of Deep Borewell Works and allied field discussions	
	
Discussion with drilling team	Site identification for SWM
	
Inspection of Pedagogy interventions	Distribution of kids/learning materials
	
Existing SWM Compost yard visit	Skill development centre- Vellapakkam
	
Literacy device launching in Gopurajapuram	Supply of pedagogy- Learning materials



Existing SWM compost shed Gopurajapuram



Visit to Anganwadi Centre



Prof.Murty's visit on
Interaction in P.Pannagudi Panchayat



Interaction in Gopurajapuram Panchayat



Existing Compost yard inGopurajapuram



Deep Borewell site marked for drilling



Annexure: 6.4.3 Awareness cum Discussion Meeting in Panangudi Panchayat on 21.02.2020



Discussion Meeting arranged with Panchayat President, Ward Members in Panangudi Panchayat Office on 21.02.2020, in presence of CPCL DGM & Senior Manger and representatives of IIT M, CUBE, United Way & CSIE. Apprised BDO, Thirumarugal Union also.



Annexure 6.4.3

Natural Calamities and Adversities during the project Implementation Phase

The pivotal points impeding the progress of the planned activities deserve to be cogitated herein, though some obstacles readily resolved by parleys, sensitization and persuasion at various levels by unflinching efforts and some issues still drag progress. The events which hindered the project implementation since commencement to till date is recited below to reminisce the adverse events which consumed our valuable time hard with inherent delays:

- ✚ The Gaja Cyclone that made landfall near [Nagapattinam](#) with wind speed of 140 km/hr haunted and left trails of destruction on 10th November 2018.
- ✚ The Election protocols for Parliament Elections during May 2019, Panchayat election January 2020 and State Assembly election during April 2021 delayed the progress in view of the associated restrictions in place
- ✚ Aftermath the Panchayat elections, the interference of Panchayat Presidents ended in delays due to multifarious reasons and thus hampered the smooth transition of the benign project
- ✚ Many consultative discussions with public / Panchayats/Officers held to ease the situations. Still works could not be proceeded as per schedule causing enormous hindrance to the progress of planned activities.
- ✚ The global Corona pandemic due to Covid 19 paralysed the progress for almost 16 months since March 2020 to till date, though the relaxations are not fully enough to catalyze normalcy in work schedules and allied progress.
- ✚ The copious rainfall during South west Monsoon of 2020 and the severe Nivar Cyclone that made landfall near Puduchery struck Nagapattinam also with consequent rainfall till January 2020 paralysed works. It further delayed Compost yard and pond works as sites waterlogged. Further Skill training stopped, as Vellapakkam Community Hall is used as Flood rescue Centre .
- ✚ The comfortable storage In Mettur dam during the years 2019, 2020 and 2021 upto April, helped to fill up the ponds in the target villages hitting mostly the pond rejuvenation works besides retarding other works as well.
- ✚ SWM works commenced has to be stopped twice in P.Panangudi in 2 different sites initially concurred by Panchayat due to public objection and alternate site is yet to be identified.
- ✚ Water Supply distribution by laying street mains and Household Service connections for which Work Order issued is put on hold due to persistent demand to lay pipes in all the streets and remittance of HSC deposits requiring additional funds. Aftermath tender cancelled and contract awarded.

Annexure 6.5 - Visit of Mr.Kesari SNS Sarma, Officer/MGNCRE, MoHRD, GoI on 25.10.2019 for adoption of project UBA Swachh Ata Action Plan- Visuals



Visit to P.Panagudi School & Gopurajapuram Anganwadi visit



Visit to P.Panangudi Panchayat Office for gathering data and interactions

Annexure 6.6. Awards and recognition for CPCL Project



Mr. Pradeep, Sr. Manager, CPCL receiving IoPE Award

IoPE Hyderabad award for Best practices



CPCL MD receiving Golden Peacock Award



ET Award Certificate



Golden Peacock Award Certificate

Annexure 6.7 Inaugural Function on 01.07.2018- Visuals

Lighting Of Lamp to commemorate the inaugural Function



Skill center Manager receiving Appointment Order



Solar Lantern Distribution by MD/CPCL



Solar Street light inaugurated by MD



Handing over key for the Disabled friendly Scooty with Assistive devices to the beneficiary



Toilet Inauguration by MD CPCL



Skill Development Centre Inauguration



Skill Centre Visit



Solar Lanterns distribution by Collector



Solar Lanterns distribution by CPCL MD



CUBE CEO briefing MD CPCL about Pond works



Solar street Light Inauguration by MD CPCL



Inspection of deep Borewell Drilling in Gopurajapuram



CPCL MD's Interaction with Toilet Beneficiary



Annexure 6.8 Snapshots of CPCL Directors Field Visit on 22.08.2019

Welcoming Dr P B Lohiya, Independent Director & Chairman CSR Sub-Committee, Board-of-CPCL



Welcoming Shri G Aravindan, Director(Operations) and Dr P B Lohiya, Independent Director & Chairman (CSR)



Launching Medical Camp in P.Panangudi



Interacting with the beneficiary about the Disabled friendly vehicle and assistive devices supplied



Tuition Centre Inauguration P.panngudi



Dedicatin the Digital Literacy Device



Play area inauguration



Distribun of Kidos (Learning Maetrials) to Anganwadi Kids



Interaction with Teacher about Literacy devices



Toilet Inauguration



Inspection of Solar Street light & IEC Posters



Discussing Pond Rejuvenation Activity



Visit to Skill Development centre- Computer Training



Skill Centre @ Vellapakkam- Tailoring Template



Annexure 6.9- Poster on Techno Conclave Exhibition on 15.09.2019



Vision New India 2022 - Technology Conclave & Exhibition: Inaugurated by Hon'ble Minister, Heavy Industries & Public Enterprises, Gol at IIT M Research Park, Chennai on 15.09.2019- CPCL Village Development Project Displays



CPCL CSR - Villages Adoption in Nagapattinam Partnership with IIT Madras

Description:

- **Physical progress:** CPCL & IIT Madras have joined hands to adopt 3 Villages in Nagapattinam District covering various activities :
 - > Ponds rejuvenation – Skill training – School & Anganwadi Infrastructure
 - > Pedagogy – Toilet Cum Bathroom Complex – Rainwater harvesting – Drinking Water supply – Solid Waste management – Solar Street Light / Lanterns
- **Financial planning:** The Project Cost will be around Rs.1500 lakh spread over 3 years from 2018-19 till 2020-21.
- **Standard Operating Procedure:** MOU was signed with IIT Madras for the CSR Project of CPCL.
- **Implementation:** being done by the IIT Madras.
- **Beneficiaries:** 425 BPL families.



CPCL CSR - Villages Adoption in Nagapattinam Community Awareness Generation

Organised 36 awareness programs in the adopted villages to sensitise public on waste management, WaSH habits, water conservation & environment. 450 families benefited.

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Annexure 7.1- Detailed Model Specifications of Household Lanterns SOLAR LANTERN SYSTEM WITH 2W LED LIGHTS- APPROVED SPECIFICATIONS

1. Broad Performance Indicators of a W-LED light source based solar lantern system:

- 1) Model as per MNRE specification : Model 1A
- 2) PV module Wattage under STC (Wp) :Min: 3-4 Wp under STC with certifications
Battery Model IA (C-rated) : Min of 1450 mAh or requisite capacity Lithium
Ferro Phosphate(LFP) capacity of 3x3.2 V or
With equivalent Li-NMC Battery
- 3) Light Source : 2.0 Watts cool W-LED luminaire
- 4) Charge Controller : Built-in PWM Regulated type
- 5) Lantern Body : ABS Plastic body/ Poly Carbonate
diffuser and IP 44 protection

2.GENERIC

Model as per MNRE specification	Model 1A
Conforming to specification	MNRE/BIS specification for Solar Photovoltaic Lighting Systems & Power Packs- White LED (W-LED) Based Solar Lantern
Light source (2.0 Watts max.).	White Light Emitting Diode (W-LED) luminaire, dispersed beam, soothing to eyes with the use of proper optics and diffuser. Housing should be suitable for indoor as well as outdoor use.
PV module Wattage under STC (Wp)	Min: 3 to 4 Wp or appropriate Wattage under STC with IS-IEC Certifications
Battery Chemistry	Model IA: Lithium Ferro Phosphate of 3x3.2 V, Not less than 1450 mAh or requisite capacity
Mounting type	Ceiling mounted

3.CONSTRUCTIONAL

PV module chemistry	c-Si, Crystalline silicon solar cells.
Battery Type, Make	Li ion Battery .LFP/Li-NMC/ CHARGEABLE & REPUTED MAKE. Battery should conform to the latest MNES, BIS/ International standards.
Lantern Body	ABS Plastic/ FRP
Diffuser	Acrylic/Poly carbonate/GLASS
USB port for Mobile Charging	Yes

4.FUNCTIONAL

Module efficiency	The module efficiency should not be less than 12%.
Idle current (mA)	≤ 1
Light Output (As per MNES stipulations)	Multiple Light levels: The lamp should have two levels of light (operation at 100 % power and 60% power) to take care-of the different lighting needs, as per the User requirements.
W-LED Colour temperature	5500-degree K to 6500-degree K. The W-LED(s) should not emit ultraviolet light
Efficiency (%) of electronic system	≥ 85 . PCB containing the electronics should be capable of solder free installation and replacement
Indigenously manufactured PV module	Yes
Electronics protections	Compatible to IP 65 PROTECTION

Necessary cables and connectors as part of supply	Should be available
USB Port for mobile charging	Should be available
W-LED watts	Less than or equal to 2 Watts. The Make, model number, and technical characteristics (including IESNA LM-80 report) of W-LEDs used in the lighting system is to be given besides L70 and allied reports conforming to BIS/International Standards.
Duty Cycle	The Solar lantern should provide a minimum of 4 hours of lighting per day under average daily solar radiation conditions of 5 kWh/sq.m. on a horizontal surface.
Indicators	The system should have two indicators, Green- Charging (Indicate charging under progress and should glow only when the charging is taking place) and Red- Discharging (Indicate the battery “Load Cut Off” condition)
OPERATION and MAINTENANCE MANUAL	Manual, in English and the local language, should be provided with the Solar Lantern.

5.CERTIFICATIONS

Availability of Test Reports from Govt/NABL ILAC accredited Lab covering all the parameters as per MNES/BIS specifications	Shall be made available. To be produced by the Supplier
Test Report No. & Date	Shall be specified
Name of Test Lab	To be indicated
Address of the Test Lab	To be indicated

PV module certification	For humidity, freeze and damp heat tests certificate conforming to IEC 61215 Edition II / BIS 14286 from NISE/an NABL or IECQ accredited laboratory
LED Certification	Technical characteristics (including L70 & IESNA LM80 report) of W-LEDs used in the lighting system is to be given from NISE/an NABL or IECQ accredited laboratory .
Warranty for Battery	The battery must have FIVE (5) years for MNRE Model IA with LiFP Battery
Warranty for complete Solar Lantern (Years)	>= 5 Years. The complete Solar Lantern with W-LED will be warranted for five years. The Warrantee/ Guarantee Card to be supplied with the Solar Lantern must contain the details of the system supplied.

SOLAR LANTERN TECHNICAL DETAILS

The LED based solar lantern shall be Indigenous make conforming to the MNES/BIS/ International specifications based below referring MNES model I.A:

1. PV MODULE

- (i) Indigenously manufactured PV modules should be used in the solar lantern.
- (ii) The PV module should have crystalline silicon solar cells, and should have humidity, freeze and damp heat tests certificate conforming to IEC 61215 Edition II / BIS 14286/IS-IEC 61730 from NISE/an NABL or IECQ accredited Laboratory.
- (iii) The PV module must have a minimum of 4 W_p at a load voltage* of 8.6 V for 6 volt battery or appropriate voltage for charging of battery used, under the standard test conditions (STC) of measurement.
- (iv) **The module efficiency should not be less than 10%.**
- (v) The terminal box on the module should have a provision of opening it for replacing the cable, if required.
- (vi) There should preferably be an arrangement (stand) for mounting the module at an optimum angle in the direction facing the sun.
- (vii) A foil/ strip containing the following details should be fixed inside the module so as to be clearly visible from the front side:-

- a) Name of the Manufacturer and/ or distinctive Logo
- b) Model and/ or Type No.
- c) Serial No.
- d) Year of manufacture
- (vii) **A distinctive serial number starting with NSM will be engraved on the frame of the module or screen printed on the tedlar sheet of the module.**

*The load conditions of the PV module are not applicable for the system having MPPT.

2. BATTERY

Model-IA

(i) **Lithium-Ferro Phosphate of 3X 3.2V, 1450mAh (or requisite) capacity or Li-NMC of appropriate capacity**

(ii) Battery should conform to the latest BIS/ International standards. Endorsement Certifications are to be produced from an NISE / an NABL or IECQ accredited Laboratory.

3. LIGHT SOURCE

I. The light source will be of White Light Emitting Diode (W-LED) type. The lamp should have two levels of light (operation at 100 % power and 60% power) to take care-of the different lighting needs, as per the User requirements. The luminous performance of LEDs used should not be less than 30 lumen watt. Minimum level of illumination from W-LED lantern (at full brightness level) should be as follows:

S. No.	Distance away from the centre point in feet	Illumination required in Lux	
		When detector is horizontal	When detector is at 90°
1	1	50.0	160.0
2	2	10.0	50.0
3	3	04	22.0
4	4	2.5	15.0
5	5	1.5	08

II. The colour temperature of W-LED(s) used in the system should be in the range of 5500 degree K –6500 degree K.

III. W-LED(s) should not emit ultraviolet light.

IV. The light output from the W-LED should be constant throughout the duty cycle.

V. The housing should be suitable for indoor as well as outdoor use.

4. ELECTRICAL:

- ✚ Input Voltage: 6.00V (Nominal)
- ✚ Input Current: < 450 mA
- ✚ Input Power: < 2.5 W
- ✚ Output power: > 2.0 W
- ✚ Efficiency: ≥ 85%
- ✚ Load disconnect battery voltage: 5.30 ±0.1V
- ✚ Load reconnect battery voltage: 6.50 ± 0.1V

5. ELECTRONICS

- I. Efficiency of the electronic system should be at least 85%.
- II. Electronics should have temperature compensation for proper charging of the battery throughout the year.
- III. The idle current should be less than 1 mA
- IV. The PCB containing the electronics should be capable of solder free installation and replacement.
- V. Necessary lengths of wires/ cables, switches suitable for DC use and other protections should be provided.
- VI. The system should have a USB port for mobile charging

5.1. ELECTRONIC PROTECTIONS:

- I. Adequate protection is to be incorporated for “No Load” condition, e.g. when the lamp is removed and the lantern is switched ON.
- II. The system should have protection against battery overcharge and deep discharge conditions.
- III. The load reconnect should be provided at around 80% of the battery capacity status.
- IV. Adequate protection should be provided against battery reverse polarity.
- V. A fuse should be provided to protect against short circuit conditions.
- VI. Protection for reverse flow of current through the PV module should be provided.
- VII. During the charging, lamp cannot be switched “ON”.
- VIII. **INDICATORS:**

- ✚ The system should have two indicators, green and red.
- ✚ The green indicator should indicate the charging under progress and should glow only when the charging is taking place. It should stop glowing when the battery is fully charged.
- ✚ Red indicator should indicate the battery “Load Cut Off” condition.

6. QUALITY AND WARRANTY

- I. The complete Solar Lantern with W-LED will be warranted for five years.
- II. The **battery** must be warranted for a minimum period of Two (2) years for Model – I and **FIVE (5) years for Model – IA**
- III. The Warrantee/ Guarantee Card to be supplied with the Solar Lantern must contain the details of the system supplied.

7. OPERATION and MAINTENANCE MANUAL

An Operation, Instruction and Maintenance Manual, in English and the local language, should be provided with the Solar Lantern. The following minimum details must be provided in the Manual:

- ✚ Basic principles of Photovoltaics.
- ✚ A small write-up (with a block diagram) on Solar Lanterns - its components, PV module, battery, electronics and luminaire and expected performance.
- ✚ Significance of indicators.

- ✚ Type, Model number, Voltage, capacity of the battery, used in the system.
- ✚ The make, model number, country of origin and technical characteristics (including IESNA LM-80 report) of W-LEDs used in the lighting system.
- ✚ Clear instructions on mounting, operation, regular maintenance and troubleshooting of the Solar Lantern.
- ✚ Instructions on replacement of battery.
- ✚ DO's and DONT's.
- ✚ Name and address of the contact person for repair and maintenance during the warranty.

Annexure 7.2 - Detailed Technical Specifications of Solar street Light Solar Street Light System 18 W with compatible PV Module and Lithium Ferro Phosphate Battery Pack- Specifications for Two in one Integrated Model

1.Performance Parameters Abstract (Two in one Integrated Model):

- a) General Specifications : As per applicable MNES updated Model
- a) Physical parameters:
 - PV module Chemistry : Monocrystalline / Polycrystalline silicon Solar
 - PV module (Wp) power : Min 60 Wp under STC or requisite capacity
 - Battery Chemistry : Lithium Ferro phosphate(LFP) Battery
 - LFP battery capacity : Min 190 Wh Li-FePO4 Battery (**12 V/16Ah @C/10 or actuals**)
 - Charge Controller : PWM/MPPT Regulated & with PIR Motion Sensor
 - Operational conditions : i) Ensure IP 65 certification.
ii) Shall resist coastal weather conditions and Wind resistance of 140 km/h.
- b) Lighting Parameters
 - LED Capacity : 18 W White LED(W-LED)
 - LED fixing arrangement: Mounted on metal core PCB fixed to Aluminum Alloy heat sink
 - Driver parameters : Efficiency >90 %
 - LED Life time : L 70 rating for lumen maintenance is 50,000 hr
 - Lumen Depreciation (LD):L79Test Report for Performance at 50,000 hours
 - Light output : Luminous flux of Lm with
 - Colour Temperature : 5500K-6500K
 - Duty Cycle : Dusk to dawn as per MNRE specs with Motion sensors.
 - Optics : Special angle to suit intended design for street light situation
 - Motion Sensors : PIR Type
- c) Mounting of light : Pole mounted on a 5 m high pole (**Gr 355 steel**)
 - Mounting Height : 4-4.5 m high on the light mast
 - Light mast(GI pole) : Galvanised 3.4 mm thick pole with 76mm top dia pole.
 - Base Plate : 16 mm thick of 200*200 mm size duly galvanized.
 - Foundation Bolts : 4 nos of Holding-down bolts of size M16 X 500
- d) Protection Provided : Charge Controller, Battery deep discharge protection, Over charge protection, Load open Protection & Motion sensors, IP65.
- e) Warranty : Minimum of 5 years for the System
- f) Certifications : Conform to IEC 61215 Edition II, *IS-IEC* 61730 Relevant IEC /BIS 14286 & IP 65 from NISE, NABL or ILAC/IECQ accredited laboratories with Test Reports

2.GENERIC

Conform to specifications	As per latest MNRE specification for Solar Photovoltaic Module; Power Packs with LIP battery - White LED (W-LED) based Solar Street Lighting Systems satisfying relevant IEC/BIS standards
Model as per MNRE Specification	Applicable Model with latest configurations
PV module chemistry (Crystalline silicon solar cells)	<ol style="list-style-type: none"> 1. Cell Chemistry: Mono or Multi Crystalline Silicon 2. Front Face: Tempered glass (low iron) 3. Encapsulate: Ethylene Vinyl Acetate 4. Frame: Anodized Aluminum 5. Junction Box: IP 65
PV module (Wp) under STC (Wp)	Min Wp: 60 or requisite capacity. The All in one model is not preferred so as to avail maximum efficiency of the PV panel
Battery	Model with adequate Lithium Ferro Phosphate (LFP) Battery pack. Operates from dusk to dawn at full brightness. Min 1900 Wh Li-FePO4 Battery pack (12 V/16Ah @ C/10) or actuals
Duty cycle of W-LED light of Max 18 W capacity	Dusk to dawn as per MNRE with adaptive modes of full brightness for 1 st 4 hours (6 to 10PM) and thereafter 50% glow with 100% full brightness on PIR motion detection within 10 m.
Colour temperature (deg K) of White - LED of 18 W	5500 deg K to 6500 deg K

Battery capacity (12V-AH @ C/10) to be selected as per model in line with MNRE specification for guidelines	Min of 190 WAh
Scope of supply	With erection and commissioning

3.CONSTRUCTIONAL

Autonomy	3 days or minimum 42 operating hours per permissible discharge
Type of Light source	White light emitting diode (W-LED) integrated with separate PV module. LED lamps of CREE/NICHIA/ OSRAM/SEOUL/PHILIPS LUMILEDS/LEDNIUM or equivalent shall only be used.
LED Fixture:	ABS plastic/Aluminum fixture with acrylic/UV stabilized Poly carbonate cover with IP 65 protection and impact resistance greater than or equal to IK05
Light output (Lux) Must declare as per MNRE specification	Minimum 16 lux when measured at the periphery of 4 meter diameter from the height of 4 meter
Duty cycle	Dusk to dawn as per MNRE with adaptive modes of full brightness for 1 st 4 hours (6 to 10PM) and thereafter 50% glow with 100% full brightness on PIR motion detection within 10 m.
PV module efficiency (%)	> / = 12

<p>No load current consumption (mA) Must declare (not more than 20 mA)</p>	<p>≤ 20 mA</p>
<p>Necessary cables and connectors as part of supply of lighting system</p>	<p>Water-proof fixtures conforming to IP65 is part of the system</p>
<p>MOUNTING OF LIGHT</p>	<p>a) A corrosion resistant metallic frame structure should be fixed on the pole to hold the SPV module. b) The frame structure should have provision to adjust its angle of inclination to the horizontal between 0 and 45, so that the module can be oriented at the specified tilt angle. c) The pole should be made of Galvanized Iron (GI) pipe / as per IS standards. d) The height of the pole should be 5 meters above the ground level, after grouting and final installation. e) The lamp housing should be IP 65 and should be painted with a corrosion resistant paint. f) The light will glow at full brightness for the initial 4 hours (6 to 10 pm) and reduce to 50 % brightness run mode with 100 % full bright adaptive mode on PIR detection within 10 m radius.</p>
<p>Light Mast</p>	<ul style="list-style-type: none"> ✚ Height above GL :5 m pole and light mounting at 4-4.5 m height ✚ Dia of the Lamp post: Minimum of 76 mm dia at top fabricated with 3.4 mm thick MS plate and hot dip galvanizing ✚ Base plate : 16 mm thick & 200 *200 mm size ✚ 4) Foundation Bolt: 4 nos of Holding-down bolts of size M16 X 500 /IS 5624-1993

4.CERTIFICATIONS

Battery Type, make and model	C-rated LiFePO4 battery with Certified Test Reports for the product from Relevant IEC /BIS 14286 & IP 65 from NISE, NABL or ILAC / IECQ accredited laboratories.
PV module certification	For humidity, freeze and damp heat tests certificate conforming to IEC 61215 Edition II , <i>IS-IEC</i> 61730 / BIS 14286 from an NABL or IECQ accredited laboratory besides the metallurgical test report for the crystalline materials, heat sink etc used in SPV module construct.
LED Luminaire standards	To be supported with all allied test reports including L70, LN79 and allied Test Reports to substantiate conformance to IS 1944/IEC60598 or other relevant standards
RoHS Compliance	Supply only ROHS-compliant products and provide written documentation supporting compliance .
Electrical safety	Conform to applicable IEC/BIS specifications
IP65 Protection	Provide endorsement certification
Warranty for street lighting system including battery (Years)	>/=5 including LED luminaires and Electronic drivers
Warranty for Pv module (Years)	> / = 25
Availability of test reports from Central Government or NABL or ILAC accredited Lab covering all the parameters as per MNRE specification	Yes

Test Report No.	Latest certificate To be appended by the vendor
Test Report date	To be indicated
Name of Test lab	To be specified by the Vendor
Address of the Test lab	To be specified by the Vendor
5.Operations & maintenance	As per MNES specifications, a Manual both in English and Tamil comprising the pertinent details thereof should be given

ACTIVITIES OF CUBE

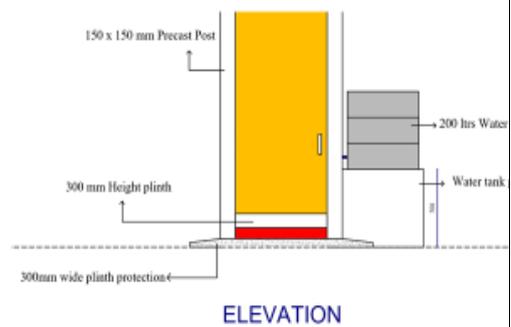
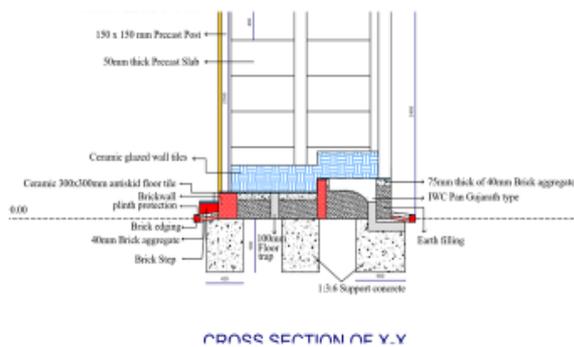
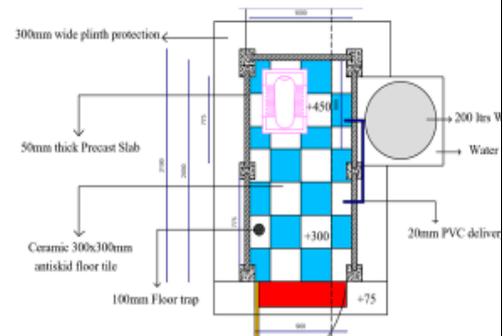
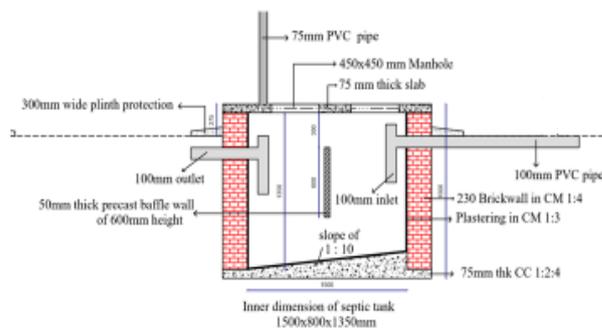
Annexure 8 -1. Household Toilet Construction Stage Photos



8.2 .Model Toilet already Constructed (no Bathing facility):



8.3. Modified Toilet Design with Bathing Area based on Community Feedback:



8.4. Modified Toilet with bathing Facility- Construction Stage Photos



8.5. Modified Toilet with bathing Facility Completed first and handed over:

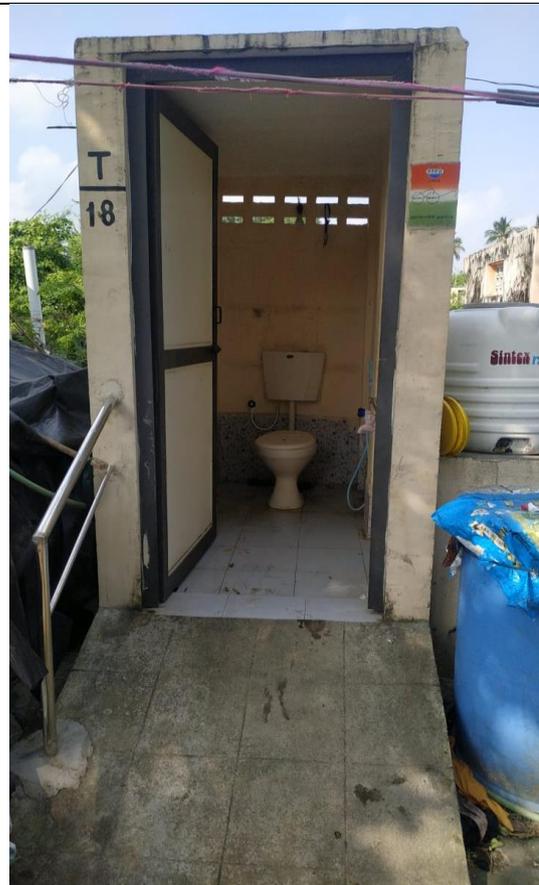




Indian Water closet



8.6. Household Toilet numbering with CPCL Logo Tiles & Differently-abled friendly Toilet



**Differently-abled friendly Toilet:
6 nos with European closet**

Annexure: 9 - REJUVENATION OF PONDS- Photos at various Stages

Pond desilting view



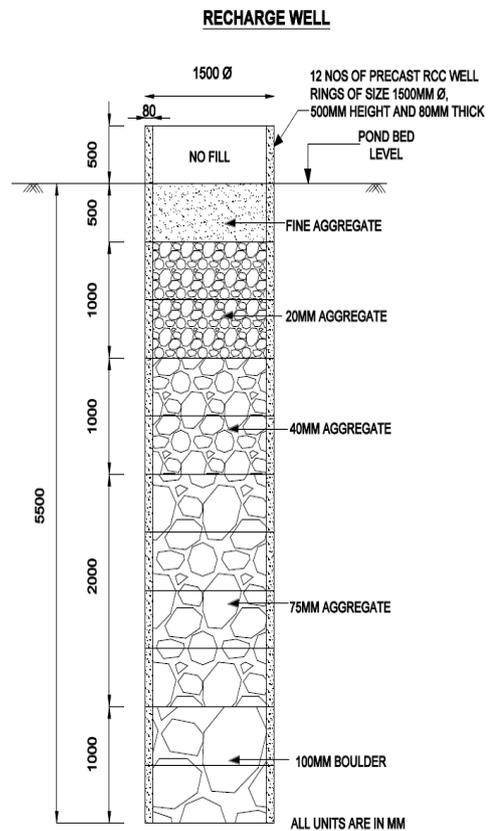
Slope pitching with Precast slab



Toe Wall Construction view



C/S of Recharge Well in Ponds



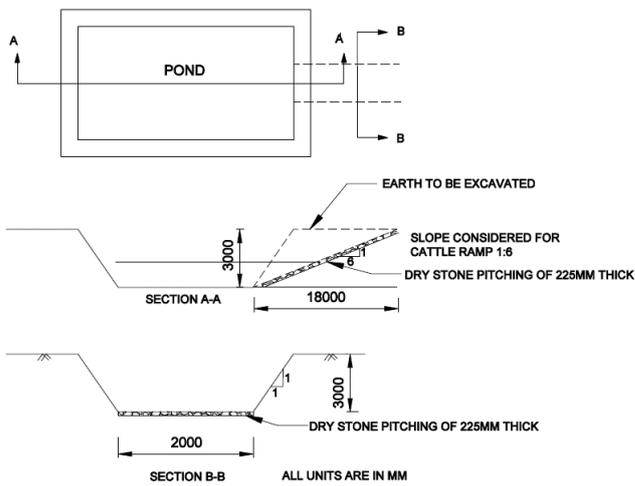
Recharge Well executed Pond



Bathing Ghat executed Pond



CATTLE RAMP



Before Annankoil kulam



After Annankoil kulam



Before Thalayari kulam



After Thalayari kulam



Construction Stage Mariammankoil kulam



Completion stage Mariammankoil kulam



Construction Stage Annapulla kulam



Completion Stage Annapulla kulam



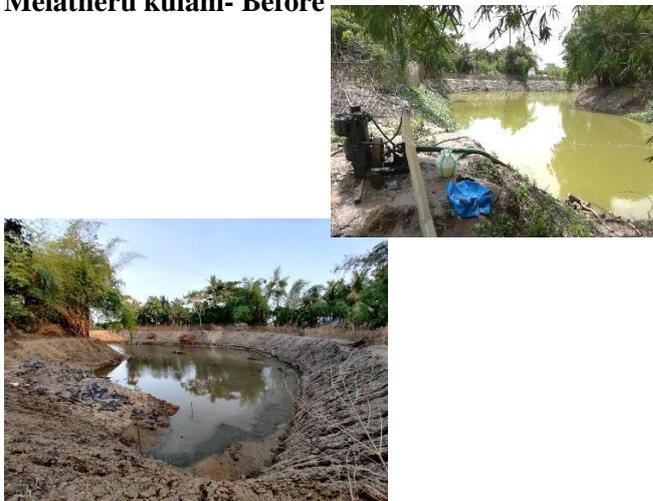
Construction Stage Sivankoil kulam



Completion Stage Sivankoil kulam



Melatheru kulam- Before



Melatheru kulam- After



Ponniveetu kuttai, P.Panangudi- Before



Ponniveetu kuttai, P.Panangudi-In progress



M.Panagudi Agrahara kulam-Before



M.Panagudi Agrahara kulam-In progress



CPCL Manager Mr.Pradeep's Visit



Chinnakulam Works in progress



Thiruvasal kulam-P.Panangudi Desilting



Ponniveetu ukktai after desilting stage

Guard posts provided in pond



Guard posts provided in pond



Annexure 9.1. Pond Full View of few Rejuvenated Ponds

Kuyavan kuttai- M.Pannagudi



Sivankoil kulam- S.Panangudi/Gopurajapuram



Panangudi- Mela Theru Kulam



M.Pangudi- Agrahara kulam



Annankoil Kulam



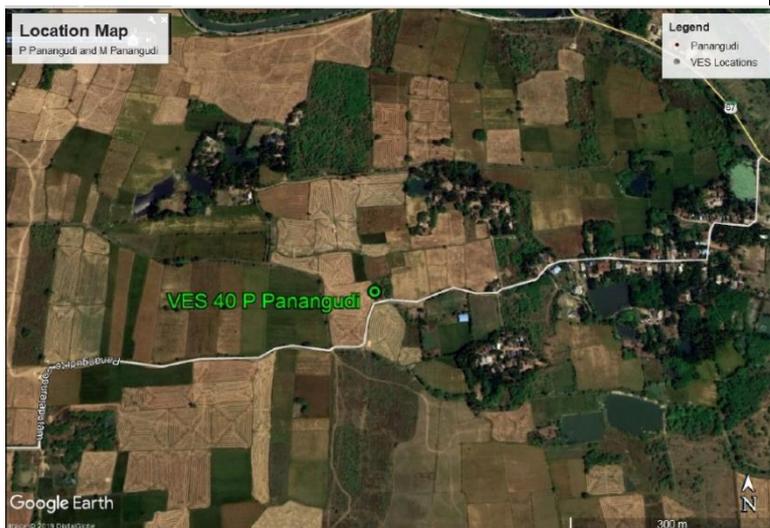
Pomi Veettu Kuttai



Annexure 10- Water Supply Improvements

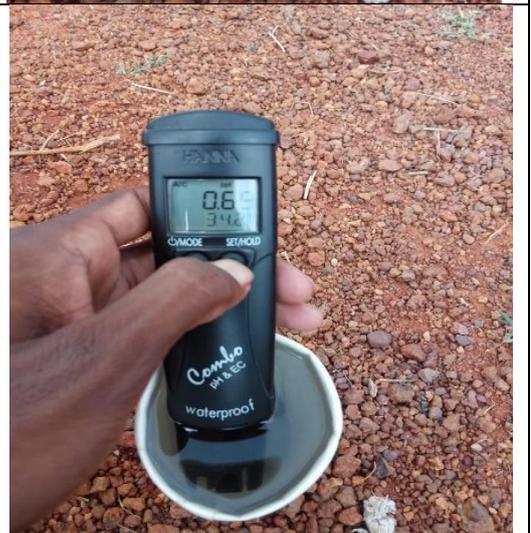
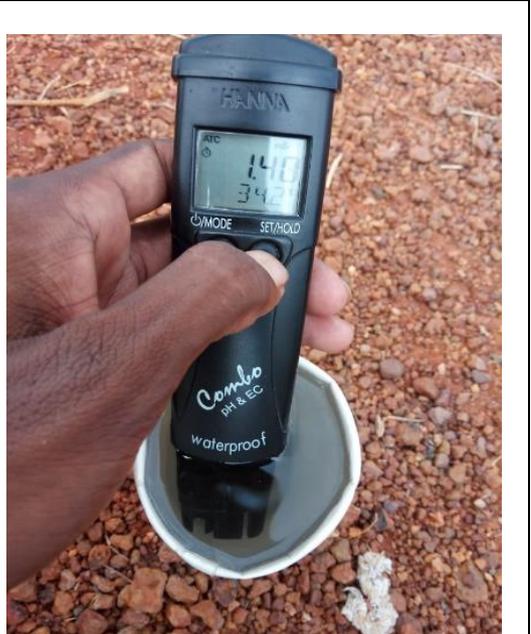
Annexure 10.1 -Glance of P.Panangudi Deep Borewell Source Creation





10.2) Glance of Gopurajapuram, Sivankoil Deep-Borewell Source creation





Annexure 10.3 Panangudi Additional Deep Bore Well Source Creation Atlas
Drilling: 05.03.2021 to 18.03.2021 Logging: 18.03.2021 Casing pipe erection: 19.03.2021



Annexure 10.4 Water Supply PUMPING SYSTEM-Photos at a Glance



Power connection to Pumpset



Borewell supply- Discharge at roof level of OHT



Valve chambers and Gate valve fixing under progress

Sluice Valve fixing along branches



PVC Encasing pipes across road crossing



Tee Junction in branches



Double Air valve

Joinery coupler for HDPE pipes



After Jointing



Annexure 10.4.1 - Broad Technical Specifications of Submersible Pumpset:

- (a). THREE PHASE SUBMERSIBLE PUMPSET SUITABLE FOR 150MM DIA BOREWELL AS PER IS 8034/2002 WITHOUT PANEL BOARD:
- (b). Supply and delivery of clear water vertical wet type submersible pumpset suitable for 150mm dia borewell conforming to IS 8034/2002 as amended thereafter and BEE 3 Star Rated capable of discharging noted LPM against head of water column due to all

causes. The pump shall be with stainless steel shaft and dynamically balanced bronze or Cast SS impeller, brass screws and CI FG 200 grade pump bowl/diffuser with ISI mark. The pump shall be directly coupled to a continuous rated two pole suitable wet type vertical squirrel cage induction motor as per IS 9283 /1995 as amended there after, suitable for operation in AC three phase 415 V \pm 10%, 50HZ \pm 5 %

- (c). The non-return valve located at the top of the pump in the discharge outlet connection is to be designed with minimum friction . The pump should be directly coupled to 2880 rpm, 3 phase, 50 Hz, 415V \pm 6% & 415V-15% squirrel cage induction motor suitable for star delta starting and for continuous operation The pumpset should be provided with 5m length of suitable size PVC insulated copper flat cable for connecting the pumpset, starter & Isolator.excluding cost of item 1.2
- (d). Supply and delivery of clear water vertical wet type submersible pumpset of Duty:122 LPM*104 m Head having 90 m depth below GL from a Deep bore well of 300 m Depth(Vide Item no: III (B)-3.1 S.no: 50, page":102 of TWAD Board SSR for 2018-'19 as per the specifications indicated above and with BIS Standard Mark and Energy Labelling etc complete
- (e). Approved Brands for Pumps: Grundfos, Krilosker, Texmo, Crompton.
- (f). THREE PHASE PANEL BOARD-STAR DELTA WITH TWO LEVEL GUARD AND AUTO START vide item no: III (B), 11.2-3, Page: 114 of TWAD Board SSR 2018-'19 extracted below: a) Supply and delivery of wall mounting type control panel made up of M.S. sheet 18 SWG vermin proof, box type with hinged front door and fixed sides with inter locking facility suitable for running one pump set alone at a time for erection in control room complete with internal wiring of control panel with provision for cable entry and for delivery including two coats of enamel paint over red oxide and shall be provided with the following configurations which are suitable for the motor offered in item No.: 1.1 with Timer facility SOR P.NO.118/16-17
- (g). Supply and delivery of Fully automatic air break STAR DELTA STARTER suitable for the Pumpset configuration specified in Item I.A conforming to IS13947, IEC 60947-1 suitable KW rating for operation in AC/ three Phase/50Hz (\pm 5%) and 415V (\pm 10%) including 3 pole magnetic contactor with under voltage release - 3 nos., CT operated Ammeter(65 mm dia) with suppressed scale, Voltmeter (65mm dia), Voltmeter selector switch, Miniature circuit breaker, Thermal Overload relay, Air Break contactors suitable for next Standard higher KW rating, Single phasing preventor, dry running preventor and On/Off Push button switches, wiring with 1

sq.mm/4 sq. mm copper PVC insulated cable, powder coated vermin proof box, including the capacitor (the cost of capacitor is to be taken separately).

(h). Supply and delivery of PVC INSULATED SINGLE CORE MULTI STRAND FIRE RETARDANT FLEXIBLE COPPER CABLE WITH ISI MARK CONFORMING TO IS 694/ 1990 from EB pole to panel board of following sizes as per SoR 2018-'19, Item .. V.2 (d) of Page 192

(i). 56/0.3 (4 sq.mm) wire Length in Metre

(j). MIXED DI ELECTRIC CAPACITOR WITH TNEB TEST CERTIFICATE WITH ACCESSORIES INCLUDING BANKING CONFORMING TO IS 2834: Supply and delivery of medium voltage Automatic power capacitor control unit as per IS 2834 , suitable for 415 volts, 3 phase, 50 Hz. AC supply .with TNEB test certificate and accessories.duly banked with copper bus bars of ample current carrying capacity, sheet steel terminals, cable gland unit rating plate as per site conditions, tie rod , gasket, base frame and etc. complete with adequate size cable of required length for capacitors bank to maintain 0.95PF lead current to be provided with banking arrangements and connected to the main panel board with all accessories as per CEIG requirements (The rate for mixed DI Electric Capacitor with Test Certificate given as Rs.466/- per KVAR is inclusive of Banking charges, such as providing of copper bus bars with provision for adding at least 2 capacitors at later date, cable entry box, fabricating charges etc. complete.)

Annexure 10.5

Water Supply Distribution Works- Procurement of pipes nearly completed

LICENCE NO, MARKING & DIMENSIONAL TESTS FOR UPVC PIPES



DIMENSIONS & MARKING FOR FITTINGS



HYDROSTATIC PRESSURE TEST FOR PIPE & FITTINGS



Sample Pieces

Testing In process

After Testing

Annexure 10.6 Construction of 45 K OHT

Precast Elements Production for OHT



● ○ REDMI NOTE 6 PRO
MI DUAL CAMERA



2021/3/25 14:43

FOSROC
Constructive solutions

Fosroc Chemicals (India) Pvt Ltd.
41st KM, NH4, Kufuvannahalli Post, Nelamangala Taluk, Bangalore Rural Dist., Karnataka- 562 111.
Phone: 080 33289 6189/19, E-mail: india@fosroc.com

Invoice No: _____ Date: 24.12.2020

TEST CERTIFICATE

Product Name : CONPLAST SP430 – INBNG 3
Batch No. : IN1MF00549768B
Base : SNF
Appearance : A Brown Colour Liquid
Storage Condition : Cool & Dry. Away from direct sun
Month of MFG : December - 2020
Expiry Month : 12 months from the date of mfg.

SR.NO.	TEST	VALUE OBTAINED	LIMITS AS PER IS 9103 : 1999 Reaffirmed 2004 Edition 2.2 – (2007-08)	UCM
01	Relative Density	1.154	± 0.02 of the value stated by the manufacturer	-
02	pH	6.94	Min 6.00	-
03	Dry Material Content	29.02	± 5% of the value stated by the manufacturer	% by mass
04	Chloride Content	0.002	Within 10% of the value or within 0.2% whichever is greater as stated by the manufacturer	% by mass

Certified that the above material confirm to the specification.
Certified By: S. Subba Rao

This is computer generated report and does not require any signature.

● ○ REDMI NOTE 6 PRO
MI DUAL CAMERA

Testing of Materials during Factory Inspection

**Annexure 11- Household Drain Field System for treatment of wastewater
Wastewater Treatment System with Drain-field in Households**



Annexure 12 - SWM Progress Photos for M.Panangudi Compost Yard



SWM Site levelled and cleared for execution

Foundation Trenching under progress



Progress Photos



Annexure 13- P.Pnangudi Community Hall Hall Construction- Photos

13.1 Structural and architectural Drawings of Community Hall at P. Panangudi



School Building Architectural Drawings.zip

- <https://maps.google.com/?q=10.844443,79.813217>

13.2 Construction stage Photos

Bhoomi Pooja



pagnibhulil loortaxa bna haryitnummo xol baxabaxo xiqaj imoooff



38UD



CUBE

E2TIE ZTIE TUU QVITZIEZ QVITZIEZ

Soil Test in progress

Construction in progress



Construction in progress



Construction in progress



Superstructure works in progress

1st Floor Superstructure under progress



Superstructure works in progress



Annexure 14- P.Panangudi School Construction Photos

 <p>School Building Drawings - P.Panangudi</p>	<p>Construction of School Building - https://maps.google.com/?cid=706411677640362626</p>
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CONSTRUCTION OF NEW SCHOOL BUILDING : -

Page 46



Site Setting Out



Footing RCC Completed & Grade Beam in Progress



Centre for Urbanization, Buildings & Environment, IIT Madras

CPCL Village Adoption CSR Project – QPR – Q1 – 2020-21



P.Panangudi School Building in progress



progress

P.Panangudi School Building in progress



02/09/20 10:55

Roof slab completed



Panangudi School Building completed



Annexure 15- Anganwadi Renovation-Photos

Anganwadi – Renovation works in Panangudi, Gopurajapuram and Nariman Anganwadi- **Plans and Working drawings**

- <https://maps.google.com/?q=10.844009,79.798119>, <https://maps.google.com/?q=10.826228,79.796624>

P.Panangudi Anganwadi renovation



P.Panangudi Anganwadi Renovation



14/08/20 17

Narimanam Anganwai Renovation



13/08/20 10:33

Narimanam Anganwai Renovation



Annexure 15.1

Photos of Construction of Toilet Block in Gopurajapuram School



Gopurajapuram – Construction of Toilet Block & Renovation works in School Building and PVC Coated Chain link fencing Detailed drawing
- <https://maps.google.com/?q=10.844009,79.798119>

Annexure 16 - Branding Initiatives & Concrete Bench provision Photos



Display Boards and Village Signages Fixed at site



Annexure 17-Photos during CPCL MD, Directors Visit- Photos

Modified Toilet completed, Inaugurated and handed over by Mr.Kaushik, Senior Manger, CPCL- 5/2019



CPCL MD dedicating the Toilet to the beneficiaries on 01.07.19



CPCL MD Visit on 01.07.2019- Mariammankoil pond Rejuvenation work



CPCL MD visit on 01.07.2019- CEO, CUBE Explaining rejuvenation work



CPCL Director Handing over Toilet on 22.08.2019



CPCL MD interacting with beneficiaries 01.07.19

CPCL Directors Visit 22.08.2019- Pond Rejuvenation - P.Panangudi- Annapulla Kulam



CPCL Directors inspecting Mariammankoil Pond Rejuvenation at Vellapakkam



CPCL Directors Visit 22.08.2019- CUBE Works



Director's Interaction with Community



CPCL Directors Visit on 22.08.2019 -Water supply pumping main Works commencement



CPCL Sr.Manger handed over the Toilet on 20.12.2019



PCL Sr.Manger visit on 20.12.2019



CPCL Sr.Manger visit on 20.12.2019



Annexure 17.1- Sensitisation Meeting Photos- Gramasabha , Officials & Public Meet



**CUBE representative in Republic Day Grama Sabha
26.01.2020**



**CUBE representative in Republic Day
Grama Sabha 26.01.2020**



Deputy Collector Nagai on 23.09.2020 – Site Visit

**Discussion with Panchayat President
Panangudi on 21.02.2020**



**Deputy Collector Nagai on 23.09.2020 for Approval
for Water Supply Lines & Compost Yard**



**Discussion with BDO on 23.09.2020 for
resolving Compost yard site issue and
water Supply distribution works**

Discussion with Villagers about Pond works



**Discussion with Villagers about Pond
works**



Annexur 18.1 Republic day 2020-Grama Sabha resolutions of Panangudi and Gopurajapuram Panchayats

1. Panangudi Panchayat Resolutions

26.1.2020

நீற்று சமாஜம் - பனங்குடி ஊராட்சி

P. பனங்குடி ஊராட்சி சபையினால் - காலை 11:00 மணி

4 மணிக்கு பின்புள்ளும் P. பனங்குடி தொழிலாளர்களின் போராட்டம்
அதன் காரணமாக, பஞ்சாயத்து சபையினால் (கருத்து) உடனடி
கேள்விகளுக்கு 1 மணி உடனடி பேரம் கேட்டுக் கொள்ளும்.

உடனடி கேள்விகளுக்கு மின்னணு Revetment wall எண்ணிக்கை
கேள்விகளை வைக்கிறார்

P. பனங்குடி யில் IIT பேரம் 3 மணிக்கு முதலாம்
கேள்விகளுக்கு இயங்கும் முதலாம் பகுதி கட்டிய வேண்டுகோளை
கேட்டு கொள்ளும்.

CPCL பேரம் காரணம் முதலாம் பகுதி கட்டிய வேண்டுகோளை
காரணம், பஞ்சாயத்து கட்டிடம் கட்டி கொடுக்க 1 மணி உடனடி
2 மணிக்கு முதலாம் பகுதி கட்டிய வேண்டுகோளை கேட்டுக் கொள்ளும்
காரணம் பனங்குடி கட்டிடம் கட்டி கொடுக்க R.M. காரணம்
முதலாம் பகுதி கட்டிய வேண்டுகோளை.

முதலாம் பகுதி கட்டிய வேண்டுகோளை முதலாம் P. பனங்குடி
கேள்விகளை கேட்டு CPCL Tution கேள்விகளை Centre
காரணம் பனங்குடி கட்டிடம் கட்டி கொடுக்க முதலாம் பகுதி கட்டிய வேண்டுகோளை
முதலாம் பகுதி கட்டிய வேண்டுகோளை முதலாம் பகுதி கட்டிய வேண்டுகோளை.

2 மணிக்கு முதலாம் பகுதி கட்டிய வேண்டுகோளை முதலாம் பகுதி கட்டிய வேண்டுகோளை
முதலாம் பகுதி கட்டிய வேண்டுகோளை முதலாம் பகுதி கட்டிய வேண்டுகோளை
முதலாம் பகுதி கட்டிய வேண்டுகோளை முதலாம் பகுதி கட்டிய வேண்டுகோளை
CPCL முதலாம் பகுதி கட்டிய வேண்டுகோளை கேட்டுக் கொள்ளும்
- வைக்கிறார்.

Annexure: 18
Conciliatory Meetings with public and Officials on 23.09.2020- Photos



23/09/20 10:43
 Deputy Collector Nagai on 23.09.2020 for Approval for Water Supply Lines & Compost Yard



30/09/20 17:3
 Discussion with BDO on 23.09.2020 for resolving Compost yard site issue and water Supply distribution works

Discussion with Villagers about Pond works



Discussion with Villagers about Pond works



Site visits by deputy collector, Nagapattinam on 23.09.2020



ACTIVITIES OF UNITEDWAY

Annexure -19 Details of the awareness programs conducted

S. No	Location/Village	Date	Program Details	Methodology	No of Participants/Units
1	Primary School, Panangudi	08-Jul-19	Swachhata Pakhwada	Tree Plantation Program	7 Trees
2	Panangudi School	09-Jul-19	Swachhata Pakhwada	Short Film Screening	62 Students
3	Gopurajaputam School	09-Jul-19	Swachhata Pakhwada	Short Film Screening	25 Students
4	Panangudi School	10-Jul-19	Swachhata Pakhwada	Drawing Competition	15 Students
5	Gopurajaputam School	10-Jul-19	Swachhata Pakhwada	Drawing Competition	10 Students
6	Panangudi School	11-Jul-19	Swachhata Pakhwada	Drinking water (RO) Inauguration	62 students and staffs
7	Gopurajaputam School	11-Jul-19	Swachhata Pakhwada	Drinking water (RO) Inauguration	25 students and staffs
8	P. Panangudi	12-Jul-19	Swachhata Pakhwada	Community Cleaning Drive	30 Residents
9	Gopurajapuram	13-Jul-19	Swachhata Pakhwada	Community Cleaning Drive	40 Residents
10	M. Panangudi	29-Aug-19	Swachhata Ki Sewa	Tree Plantation and Solar Lantern awareness (How to use)	5 Trees
11	S. Panangudi & Gopurajapuram	30-Aug-19	Swachhata Ki Sewa	Solar Lantern awareness (How to use) and Rain Water Harvesting	40 Residents
12	P. Panangudi	31-Aug-19	Swachhata Ki Sewa	Solar Lantern awareness (How to use) and Rain Water Harvesting	25 Residents
13	M. Panangudi	23-Sep-19	Swachhata Ki Sewa	Competitions & Game Show on Avoid Plastic Save Earth awareness	30 Students & Residents
14	S. Panangudi	25-Sep-19	Swachhata Ki Sewa	Competitions & Game Show on Avoid Plastic Save Earth awareness	18 Students & Residents
15	Vellapakkam	25-Sep-19	Swachhata Ki Sewa	Competitions & Game Show on Avoid Plastic Save Earth awareness	20 Students & Residents
16	P. Panangudi	25-Sep-19	Swachhata Ki Sewa	Competitions & Game Show on Avoid Plastic Save Earth awareness	22 Students & Residents
17	M. Panangudi	24-Sep-19	Swachhata Ki Sewa	Cultural Show on Avoid Plastic Save Earth awareness	30 Residents
18	P. Panangudi	24-Sep-19	Swachhata Ki Sewa	Cultural Show on Avoid Plastic Save Earth awareness	50 Residents
19	Gopurajapuram	24-Sep-19	Swachhata Ki Sewa	Cultural Show on Avoid Plastic Save Earth awareness	25 Residents
20	Vellapakkam	24-Sep-19	Swachhata Ki Sewa	Cultural Show on Avoid Plastic Save Earth awareness	45 Residents

S. No	Location/Village	Date	Program Details	Methodology	No of Participants/Units
21	Gopurajapuram, Vellapakkam	26-Sep-19	Swachhata Ki Sewa	Awareness Program in partnership with IITM on SWM, Personal Hygiene & Sanitation, Water Quality & Conservation	130 Residents
22	P. Panangudi	27-Aug-19	Swachhata Ki Sewa	Awareness Program in partnership with IITM on SWM, Personal Hygiene & Sanitation, Water Quality & Conservation	150 Residents
23	P. Panangudi	28-Sep-19	Swachhata Ki Sewa	Mural Art on Avoid plastics	20 Students
24	P. Panangudi & S. Panangudi	02-Oct-19	Swachhata Ki Sewa	Plastic Waste Shramdaan	30 Volunteers
25	M Panangudi	02-Feb-20	To promote cleanliness in the villages	Rangoli Competitions by SHG Members on the eve on Women's Day	130 residents participated
26	P. Panangudi	8-Mar20	To promote cleanliness in the villages	Rangoli Competitions by SHG Members	
27	P.Panangudi	11-Mar 20	Career Guidance Program	Career guidance program for unemployed youths in the villages	52 students

Annexure-20 Awareness Programme Photos

1. Social and Toilet household Survey



2. WaSH Awareness Activities

WaSH Awareness in P.Panangudi:



WaSH awareness in Gopurajapuram



Community Interaction



Awareness among Children S.Panangudi

3.SWM awareness Activities



SWM awareness among villagers



Street Cleanliness campaign





Awareness among school children

Cleanliness Drive- Rangoli competition



**Distribution of Cloth bags
4.Hand Wash awareness**



FSWM awareness- Waste Segregation and measures



Street plays for Awareness generation



Street plays

Awareness among Anganwadi kids

Tree plantation & awareness among kids



Display Boards

Awareness messages- Display on walls



Free Tuition Centre activities

Annexure 21-Pedagogy Improvements

Donation of Furniture- Gopurajapuram



Supply of IEC material- Food and Nutrition



Supply of digital Literacy Gadgets



Digital literacy device in P.Panangudi School



Distribution of kids learning materials



Distribun of Kidos (Learning Maerials) to Anganwadi Kids



Free Tuition centre for School children-3 photos

Tuition Centre Inauguration @ P.Panangudi



Career Guidance and awareness for Youths



Gopurajapuram School upgradation under Pedagogy Improvements



Annexure22-Medical camps and Disabled Friendly measures

camp was organised to apply for Unique Disability ID (UDID).—19 Participants from Target villages



CPCL Directors Kickstart Medical camp organized for School Kids at P.Panangudi School on



Disabled friendly Vehicles provided to support the mother to care such child



Annexure 22.1 Covid awareness Activities



Supply of mask & hygiene products



Awareness messages



கொரோனா நோய் குறித்த தவறான தகவல்களும் அதற்கான விளக்கமும்

தவறான தகவல் (Myth)	விளக்கம் (Fact)
✗ வெய்யான காசினால் கொரோனா நோய் பரவலாக தடுக்கிறது.	✓ இலகுவாக வெய்யான காசினால் உயிர் தப்பிவிடுவதால் கொரோனா நோய் பரந்திருக்கிறது.
✗ கடுமையான குளிப்பால் கொரோனா நோய் வராமல் தடுக்கிறது.	✓ இது உண்மை அல்ல.
✗ 10 வினாடிக்கு ஒரு முறை ஆட்களிடம் கொரோனா நோய் பரப்பி உயிரை இழக்கவாய் வாய் ஆகியவை.	✓ இலகுவாக கொரோனா நோய்க்கு 10 வினாடிக்கு மேல் தொடர்பு இல்லை.
✗ பூச்சு உயிரினங்கள் கொரோனா வைரஸ் தொற்றுக்கு தடுக்கிறது.	✓ இது தவிர்த்து ஆதாரம் இல்லை.
✗ 'ஒரு உயிர்' மற்றும் 'முடிவாக விசுக்கு' போன்றவை கொரோனா வைரஸ் கொல்லும்.	✓ இவை கொரோனா தொற்றுக்கு தடுக்க போதுமான அளவுக்கு குறைந்தது 20 வினாடிக்கு குறைந்தது சிறந்த விசு தான்.
✗ திரைப்படம் மற்றும் தொழில் கொள்கை கொரோனா வைரஸ் தடுக்க இயலும்.	✓ திரைப்படம் மற்றும் தொழில் கொள்கை தடுக்க இயலும். கொரோனா வைரஸ் தடுக்க இயலும். கொரோனா வைரஸ் தடுக்க இயலும்.
✗ 'தொல்லைகோள்' மூலம் கொரோனா வைரஸ் அழிந்து விடும்.	✓ இவை: "தொல்லைகோள்" மூலம் உயிர் தப்பிவிடும்.
✗ கொரோனா வைரஸ் வைரஸ் மட்டுமே பரந்திருக்கிறது.	✓ இவை: கொரோனா வைரஸ் அழிந்து விடும். தொற்றுக்கு தடுக்க போதுமான அளவுக்கு குறைந்தது 20 வினாடிக்கு குறைந்தது சிறந்த விசு தான்.

For more information
104 24 Hours State Control Room
 Toll Free Number : 1800 120 555550
 Landline : 044-2651 0400 / 044-2651 0500 / 044-2651 0600 / 044-1927 4446
 Mobile : 94448 40498 / 94448 43477

கொரோனாவிலிருந்து உங்களை தற்காத்து கொள்ள...

- முகக் கவசம்**
வெளியில் மற்றும் பொது இடங்களுக்கு செல்லும் போது முகக் கவசம் கட்டாயம் அணிய வேண்டும்.
- வாய் மற்றும் மூக்கினை மூடுதல் துழும்புப்போதும் / இருமும் போதும்**
கைக்குடை அல்லது மெல்லிழைத்தாள் (Tissue Paper) உபயோகிக்க வேண்டும்.
- சமூக இடைவெளி**
பொது இடங்களில் மற்ற நபர்களுடன் இருந்து குறைந்தது 1 மீட்டர் சமூக இடைவெளியை பின்பற்றவும்.
- கை சுத்தம் போதுமான**
வெளியில் சென்று வந்த பின்பும், சாப்பிடுவதற்கு முன்பும் கைகளை சோப்பினால் 40 வினாடிகள் நன்றாக நேய்த்து சுத்தம் வேண்டும்.

பொதுமக்கள் நலன் கருதி வெளியீடுகோள்

Annexure 23.1.

SPECIFICATIONS FOR INSTALLATION OF SOLAR STREET LIGHT SYSTEM

Specifications:

Type of light	: Two in one type
Luminary wattage	: 18 W LED
Battery	: Lipe4
Panel	: 60 Wp
Pole Height	: 5 meters with base plate

Installation & commissioning:

Civil work : After the location marking the done by the concerned authorities, the pit work started with the dimension of 45x45x80 mm. The concrete mixer (M15 grade) was illed in the pit upto 30 mm from low level of the pit and J bolt was positioned using template. The concrete was filled in the rest of the portion. After 2 days of curing, the Pole was ixed.

Pole & light fixing on top

better

connected with

was

1. Before that the Solar panel was fixed using ‘H’ type angle of the pole with required angle suites as per the location for performance of the solar panel.

2. After fixing the panel, the two in one Street light with built in Battery (Lipe4 type) fixed. The PV panel cable was

Two in one light and battery charging started and Green light glowing in TIO light.

3. After checking the light function the pole will be fixed on the ‘J’ bolt appropriately and full tight will be done

Luminary function

inform

: During day time the battery will get charge and the light will be in OFF conditions. The read light will blinking and the status of the battery. After Sun set the light will glow automatically. The motion sensor will be activated if any

glow

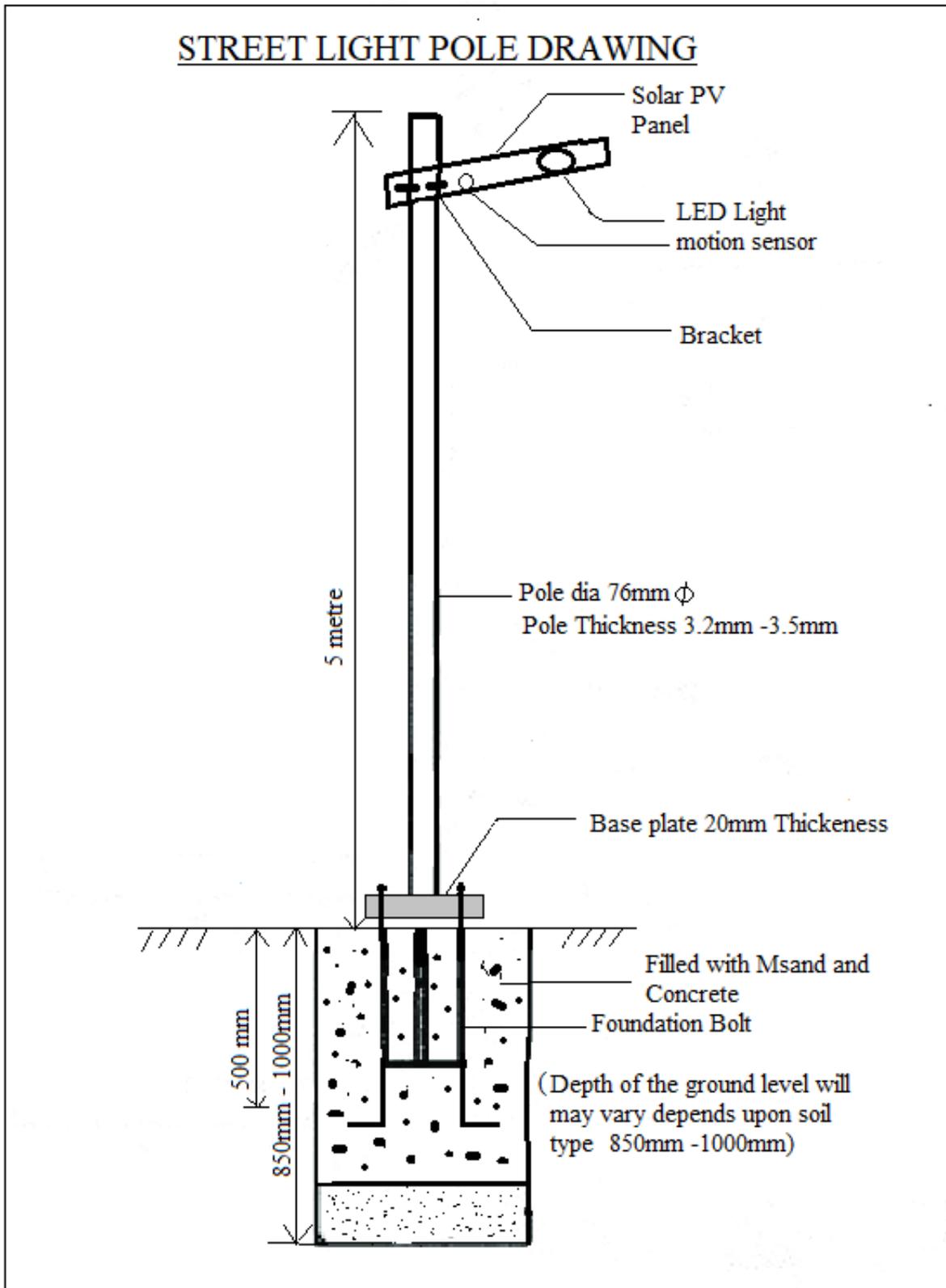
movement,

movement within 10 meter radios and the luminary will

100% of its output. After 1 minutes, if there is no

the light output will reduce to 40% and glow. This will
enhance the battery life and performance.

Annexure 23. Solar street light Installation Drawing



Annexure 23.1 -Solar lanterns and street lights

**Solar Lanterns Distribution inaugurated on 01.07.2019
By District Collector**



Lanterns glow during power cut



**Solar street lights inaugurated on 01.07.2019
By CPCL MD**



Solar Lanterns Distribution



Solar Street lights illuminate Streets



Directors visit 22.08.2019 - Solar street lights



23.1 Drone Image showing the Glimpse Solar Street Lights Glow at Night



Glow of Lanterns



Street Light glow



Street light glow



Street light glow



23.2 Solar Street Light- Execution Stage Photos



23.3 Operation & Maintenance Photos



Periodic preventive visit during Dec 2020



Villagers Check Street light glow at Gopurajapuram



24.ANNEXURES OF SKILL DEVELOPMENT ACTIVITIES OF CSIE

Annexure 24.1: Household survey to assess skill requirement

Village:

Part I: Household details

1. Address:

2. Number of youths in the Household (Age group: 15 – 30):

3. Youth 1 details:

No	Detail	Youth 1	Youth 2
1	Age:		
2	Current educational status:		
3	If employed, occupation:		
4	Gender		

Part II: Skill requirement (choose one or more choices)

No	Detail	Youth 1	Youth 2
1	Aspiration Job		
2	Skill Preferred	<ul style="list-style-type: none"> <input type="radio"/> Mechanical Welder/Turner/Fitter <input type="radio"/> ICT IT Literacy/Application <input type="radio"/> Tailoring/embroidery <input type="radio"/> Automotive/Forklift <input type="radio"/> Electronics Repair/assembly <input type="radio"/> Other 	<ul style="list-style-type: none"> <input type="radio"/> Mechanical Welder/Turner/Fitter <input type="radio"/> ICT IT Literacy/Application <input type="radio"/> Tailoring/embroidery <input type="radio"/> Automotive/Forklift <input type="radio"/> Electronics Repair/assembly <input type="radio"/> Other

Annexure24.2: Sample results of the survey

Door.No	Age	Gender	Education Qualification	Occupation	Aspiration Job	Skill Preferred
18/2	19	Female	Diploma in Nursing	Nurse	Head Nurse	Nil
15/2	23	Male	Diploma in EEE	Rigman (Contract Basis)	Electrical related	Electronics
15/2	24	Female	B. Sc (Maths)	Unemployed	Computer related	ICT
3A	25	Male	10th	Harbour Labour	Driver	Automotive
3A	25	Female	B. A	Married	Nil	Nil
3	28	Male	9th	RCC Fitter	Driver	Automotive
3	20	Female	10th	Married	Nil	Nil
2/2A	29	Male	10th	Driver	Crane Operator	Automotive
2/2A	26	Male	12th	Harbour Labour	Business- Poultry Farm	Nil
10/2A	18	Male	B. E in Computer Science*	Student	Software Engineer	ICT
10/2A	16	Male	12th*	Student	Engineer	ICT
5	28	Male	9th	Mason	Business- Construction	Nil
5	20	Female	10th	Married	Teacher	Teacher Training

Annexure 24.3- Completed Activities under Skill development Initiative:

The completed activities under Skill Development initiative is shown is briefly itemized below in the chronological order

- 1) Baseline survey of all the three villages covering all the households and the youth in the respective households (defined as in the age group 15-30) have been completed. Refer Appendix 1.
- 2) Village Consultation Meeting held at the following places on the dates 16-17 Feb 2019. The objective is to inform the villagers about the skill development initiative, clarify any doubts, distribute applications (in Tamil, English) and identify areas of skill training. A brief report is in Appendix 2.
- 3) A follow up visit was done on Wed, 27 Feb 2019 to collect the forms and plan the launch of the skill development centres. A brief report is in Appendix 3. A total of 43 applications received from both villages.
- 4) First skill development centre established in Vellapakkam Panchayat in Gopurajapuram.
- 5) Two skills identified for training. They are a) tailoring and b) IT skills.
- 6) Machines and infrastructure established at the centre.
- 7) Instructors and Centre manager appointed from the village.

- 8) Centre inaugurated by DC and CPCL MD on 01 July 2019.
- 9) First batch for both the skills started on 15 July 2019 with a total batch size of 28 participants, of which 21 are enrolled for tailoring and 7 are for IT skills.
- 10) First batch completed their training in Dec 2019 in IT and Tailoring skills. They completed 280 hours of training as per the skill sector council norms.
- 11) Graduation ceremony is held on 09 Jan 2020 to issue the certificates. 21 participants received their certificates of completion. 7 participants had dropped out of the course due to their personal issues. The chief guest was Shri. Kumar, CM, CPCL. As part of the ceremony, a 1-day workshop on Entrepreneurial Development Program was organized. Faculty from Puduchery University conducted the workshop.
12. Twelve participants from the first batch of tailoring have started Mother Theresa women's Self-Help Group since January 2020 and the details of the members are shown below in the Annexure. They were provided two tailoring machines to work in the skill development centre. Currently they are producing safety face masks. Current level of production is 900. 300 masks are distributed to the village and 700 to the government. A box of 700 face masks was received by Mr. Raghavan, Tahsildar, Social Welfare Department, Collectorate Office, Nagapattinam district on 07 April 2020.
13. Second batch of skill training in IT and tailoring started from Jan 2020. IT enrollment is 7 and for tailoring it is 16 participants. Refer **Appendix 8 and 9** for details of the participants.
14. Due to demand from the village, spoken English classes for school students has been started at Skill development centre, Vellapakam, from 25 January. The classes are being conducted during weekends from 1000 – 1300 hr. 40 students are enrolled in the weekend course.
15. The classes are stopped since 24 March 2020 due to government notification regarding the pandemic. They will resume as per government notification.
16. Due to pandemic, all the classes were stopped during the entire Q1 2020-21.
17. Participants from the batch of tailoring course who came together continued to produce value through self-employment opportunities.
- 18) Discussions are going on with TANSTTIA FNF Service Centre (TFSC) a non-governmental body of the Tamil Nadu Small & Tiny Industries Association to connect the SHG with small textile industry, who are affected by reverse migration caused due to the pandemic.
- 19) Due to pandemic, all the classes were stopped during Q2 2020-21.

- 20) In anticipation of the unlocking of lockdown, preparations for the opening of the centre were started in the second half of Sep 2020.
- 21) In order to expedite of skill training, it was decided to simultaneously start the third batch. Hence, the centre manager distributed applications in all the villages, Panangudi, Vellapakkam and Gopurajapuram, Kuthalam, Palanallur, Puzhanallur and Narimanam.
- 22) A total of 72 applications were received. They are being considered.
- 23) It was decided to select TFSC as the third party to assess and provide services for accreditation of the centre. TFSC is the training partner for National Skill Development Corporation (NSDC) and Tamil Nadu Skill Development Corporation (TNSDC).
- 24) The value addition by the SHG from the first batch of participants in tailoring stands at Rs. 29,000/- till the end Q2 FY 2020-21.
25. Second batch for Computer and tailoring was completed in Dec 2020. External examination was conducted by TFSC on 05 Jan 2021. Attendance sheets, grades and visuals are given in separate attachments. Certificates are being prepared.
26. Third batch for computer and tailoring is going on. Classes were stopped during the recent cyclones and the untimely rains during the last week of Christmas. The details of the students are given in separate attachment. In Computer, 12 beneficiaries and in tailoring, 22 beneficiaries have enrolled.
27. Third batch for Computer and tailoring was completed in March 2021. External examination was conducted by TFSC on 13 March 2021. Attendance sheets, grades and visuals are given in separate attachments. Certificates are ready. All the pending certificates will be issued in April 2021.
28. Fourth batch for Computer and tailoring started in March 2021.
29. Summary of the total beneficiaries in numbers as on Q4 FY 20-21 is given in Appendix 10.
30. The activities are going on to make the skill centre as a training centre with TFSC and make it come under the PMKVY scheme to get financial assistance.
31. CSIE will continue to provide support to make it as a training centre under TFSC.

Annexure 24.4.**1)FIRST BATCH SCHEDULE OF COMPUTER COURSE**

S.NO	NAME	AGE	QUALIFICATION	ADDRESS
1.	K.Aarthi	21	B.A.B.ED.,	D/O Kristober, Vellapakkam Narimanam (po)
2.	R. Kavitha	21	B.B.A	D/O Ramamoorthi, Vellapakkam, Narimanam (po)
3.	V.Vikneshwari	21	B.COM	D/O Veeramani, Vellapakkam Narimanam (po)
4.	M.Jayanthi	28	12 TH STANDARD	D/O Mosas, Vellapakkam Narimanam (po)
5.	R.Senthamilarasi	21	DCE	D/O Rajenthiran, Vellapakkam Narimanam (po)
6.	R.Thenkumaran	23	DCE	S/O Ravichanthiran, Gopurajapuram,(po)
7.	S.Vignesh	27	BBA	S/O Somu, Vellapakkam Narimanam(po)
8.	T.Vignesh	24	BBA	S/O Thamiyan Raj, Vellapakkam, Narimanam(po)

Annexure 24.4

2.FIRST BATCH SCHEDULE OF TAILORING COURSE

S.NO	NAME	AGE	QUALIFICATION	ADDRESS
1.	M.Durga	18	10 th Standard	D/O. Muniyamuthu, Vellapakkam, Narimanam(po)
2.	G.Karthiga	19	10 th Standard	D/O. Govintharaj Vellapakkam, Narimanam(po)
3.	R.Rajeshwari	29	BBA	W/O. Ravintharan Vellapakkam, Narimanam(po)
4.	T.Chitra	30	12 th Standard	W/O.Thava Selvam Vellapakkam. Narimanam(po)
5.	R.Ramya	27	10 th Standard	W/O. Raj Kumar Vellapakkam, Narimanam(po)
6.	A.Manimegalai	33	8 th Standard	W/O. Anbalagan Vellapakkam, Narimanam(po)
7.	S.Vidhya	36	8 th Standard	W/O. Sivasubramaniyan Vellapakkam, Narimanam(po)
8.	S.Vijayalakshmi	29	12 th Standard	W/O. Sivakumar Vellapakkam. Narimanam(po)
9.	E.Tamilarasi	30	10 th Standard	W/O. K.Ilayaraja Vellapakkam, Narimanam(po)
10.	P.Uthayarani	33	8 th Standard	W/O. Pathmanathan Vellapakkam, Narimanam(po)
11.	P.Jeeva	30	10 th Standard	W/O.Pushparaj Vellapakkam, Narimanam(po)
12.	K.Kaliyammal	22	12 th Standard	D/O Rajendran Vellapakkam, Narimanam
13.	K.Kanmani	18	BSC	D/O.K.Kasinathan Vellapakkam, Narimanam

S.NO	NAME	AGE	QUALIFICATION	ADDRESS
<u>1</u>	K.Kanmani	20	B.SC	D/O K.KASINATHAN VELLAPKAKAM
<u>2</u>	R.Rajeswari	29	BBA	W/O RAVINTHARAN VELLAPAKKAM
<u>3</u>	G.Karthika	20	10 TH	<u>D/O GOVINTHARAJ</u> <u>VELLAPAKKAM</u>
<u>4</u>	S.Aarthirai	19	B.SC	<u>D/O</u> <u>C.SIVASHANMUGAM</u>
<u>5</u>	R.Sathya	26	DT.ED	<u>W/O N.RAMESH</u> <u>NARIMANAM</u>
<u>6</u>	V.Vinotha	17	BIO.TECH	<u>D/O VENKADASALAM</u> <u>NARIMANAM</u>
<u>7</u>	U.Sowmiya	19	BA	<u>D/O UMASANGAR</u> <u>NARIMANAM</u>

Annexure 24.5.1: Second Batch of Tailoring				
SI NO	NAME	AGE	QUALIFICATION	ADDRESS
1	K. Aarthi	21	B.A,	D/O Kritoper, Vellapakam
2	K.Ananthi	24	8 th h	D/O Selvaraj, Sanniyasi Panangudi
3	S.Sangeetha	34	10 th	W/O Sivakumar, Narimanam
4	M.Sathya	24	10 th	W/O Manikandan, Vellapakam, Narimanam
5.	R.kaliyammal	18	10 th	D/O.Rajendran, Vellapakam
6.	J.Deepa	29	8 th	W/O Jayashankar, Narimanam
7	J.Roobiyamary	29	+2	W/O Jayaraj, Vellapakam
8	V.Vigneshwari	21	B.com	D/O P.Veeramani, Narimanam
9	T.Mariyammal	35	8 th	W/O Thevanathan, Vellapakam
10	S.Bhuvana	24	+2	W/O Srinivasan, Vellapakam
11	V.Jayathi	29	9 th	W/O Venniraj, Vellapakam
12	N.Jayalakshmi	29	10 th	D/O Naganathan, Panagudu
13	P.Nivetha	24	10 th	D/O Balakrishnan , Panangudi
14	M.Chitra	37	10 th	W/O Murugesan, Sanhasi Panangudi
15	J.Devi	32	8 th	W/O Jayavel, Vellapakam
16	P.Mariyapunitha	34	12 th	W/O Permandas, Vellapakam

<u>Annexure 24.6</u> SHG from the first batch tailoring		
	NAME	ADDRESS
Motivator	E.Tamilarasi	W/O K.Ilayaraja,vellapakkam
Representative	S.Vijayalakshmi	W/O Sivakumar,vellapakkam
Members	M.Durga	D/O Muniyamuthu,vellapakkam
	G.Karthiga	D/O Govintharaj,vellapakkam
	R.Ramya	W/O Raikumar,vellapakkam
	A.Manimegalai	W/O Anbalagan,vellapakkam
	S.Vidhya	W/O Sivasubramaniyan,vellapakkam
	P.Uthayarani	W/O Pathmanathan,vellapakkam
	R.Rajeswari	W/O Ravindran,vellapakkam
	K.Kaliyammal	D/O Rajendren,vellapakkam
	T.Chitra	W/O Thava selvam,vellapakkam
	S.Jeeva	W/O pushparaj,vellapakkam

Annexure 25: CSIE Skill Development - Visuals

Skill survey



Vellapakkam Skill centre Inauguration by District Collector, SP, Nagai & CPCL MD on 01.07.2019

Skill Centre Inauguration by District Collector on 1.7.19



Skill Centre Ivisit by CPCL MD on 1.7.19



Tailoring Training



Computer training



First Batch Training- Graduation ceremony on 09.01.2020



Second batch Training- assesment by TFSC on 05th Jan 2021

Computer assesment test by TFSC



Tailoring assesment Test by TFSC



Self-employed beneficiaries from the first batch

Self-employed beneficiaries from the first batch



Third batch Training Assessment test by TFSC on 13th March 2021



Photo of I&T Trainees 3rd Batch



Photo of Tailoring Trainees 3rd Batch



ICT RESULT SHEET
13.03.2021.pdf



ICT ATTENDANCE SHEET 13.03.2021.pc



GARMENT RESULT SHEET 13.03.2021.pc



ICT ATTENDANCE SHEET 13.03.2021.pc

CPCL Directors visit on 22.08.2019



Tailoring training



CPCL Sr.Manager visit on 20.12.2019

