

**SUSTAINABLE WASTE MANAGEMENT & RESOURCE  
RECOVERY FOR CLEAN AND HEALTHY VILLAGE**

**(SATHYA NAGAR & PARERI, SINGAPERUMAL KOILPANCHAYAT)**

**CSR Project Funded by**

**M/s Technip FMC, Chennai**

**Executed by**

**IIT Madras**

**Project Coordinators**

**Prof. Ligy Philip**

**Prof. B.S. Murty**

**March 25<sup>th</sup> 2019**

# **SUSTAINABLE WASTE MANAGEMENT & RESOURCE RECOVERY FOR CLEAN AND HEALTHY VILLAGE**

**(SATHYA NAGAR and PARERI, SINGA PERUMAL KOIL PANCHAYAT)**

## **1. PREAMBLE**

Waste management has been a major problem in India, although our country has made quite a lot of progress over the years in other sectors. Human health and well being are closely dependent on hygiene and sanitation, and hence there is an urgent need for improving the hygiene and sanitation conditions through sustainable waste management practices. Innovative and sustainable waste management practices can be adopted for improving the hygiene and sanitation conditions and there by improve the health and also reuse the recovered resources. The Swatch Bharath Campaign launched by the Honourable Prime Minister of India also emphasizes the importance of cleanliness, for the overall development of the nation. **Recently, I.I.T Madras has undertaken a project on the above lines, titled, “Sustainable Waste Management and Resource Recovery for Healthy and Clean Village”.** I.I.T Madras has received funding from M/s Technip FMC, Chennai, for the implementation of this project as part of their Corporate Social Responsibility (CSR) activities. As part of this project, two villages have been adopted as a pilot for demonstrating the management and resource recovery concepts.

### **Anticipated benefits for the adopted villages are:**

- Sustainable improvement of cleanliness and hygiene, and thereby health in the village
- Improvement in income sources through resource recovery (compost from solid waste for agriculture)
- Prevention of contamination of valuable water sources
- The adopted village will be a model clean and healthy village for others to emulate.

## **2. OBJECTIVE**

- To implement integrated municipal solid waste management by collection, segregation, transportation, reduce and reuse of waste;
- To demonstrate complete resource recovery from inorganic waste (through reusing, recycling waste, etc.,) and organic waste (composting) by involving locally trained human resources.

### 3. INITIAL WORK

Initially IIT Madras attempted to implement the project in Thaiyur Panchayat located in Thiruporur Taluk, Kanchipuram district. Baseline and topographical surveys were also conducted. The program was also inaugurated. However, due to non-cooperation of Panchayat president and the local residents, it was decided to change the Panchayat where the program can be implemented smoothly. This decision was taken after discussions with officials from M/s Technip India Limited.

Later, IIT Madras team visited several villages in **Thollazhi Panchayat in Kanchipuram District**, and after due consideration selected Thollazhi colony in Thollazhi Panchayat. This colony has 151 households. Several of the families have Pakka houses. Approximately 30% of households have toilets, while 70% of the population practices open defecation. Therefore, there was certainly a need for providing one or two community toilets at easily accessible locations. Here again, IIT Madras team conducted baseline and topographical surveys and was ready to implement the program. Panchayat President was very cooperative and helped to identify the land where solid waste management facility (compost yard) can be constructed. Panchayat also passed the resolution for handing over the land to IIT Madras for construction of the compost yard. IIT Madras team followed up the process up to the District Collector. However, District Collector advised the IIT Madras team to select some other village where the intervention is required more immediately.

### 4. SELECTION OF VILLAGE FOR IMPLEMENTATION

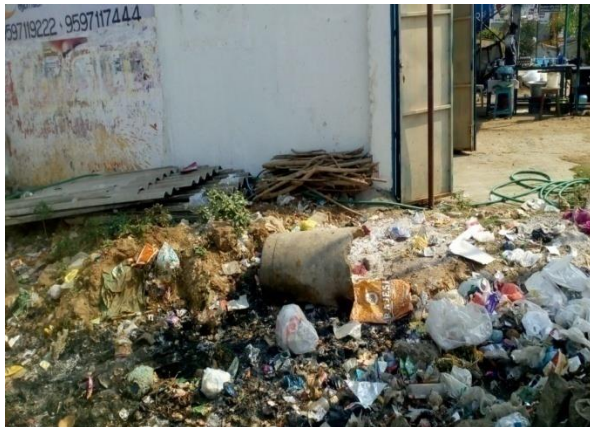
Based on the input provided by the Project Director of the Kanchipuram District, IIT Madras team visited several other villages and did the reconnaissance survey. **This report (Attached as Annexure-III) was submitted to the Collector for further consideration.** After several visits by the IIT Madras team and discussions with the Block Development Officers and the Project Director, SP Kovil village was selected for the implementation of the project. Approval for construction of compost yard on the designated land was obtained from the collector. Project work was also inaugurated. **This is presented in Annexure-IV.** However, after completion of compound wall around the allotted land and finalizing the contractor for constructing the compost yard, the site for construction of compost yard was changed by the then new collector, due to some administrative constraints. Finally, Sathya Nagar and Pareri villages of Singa Perumal Koil Panchayat were chosen for the implementation of the project. Baseline data was collected to plan the execution and the teams appointed by the panchayat were briefed on the execution plan. Following sections explain the details of the project.

## 5. BACKGROUND INFORMATION

Singaperumal Koil (Panchayat) is a census town located near Chengalpet, Kancheepuram District, Tamilnadu. Sathya Nagar and Pareri are part of Singaperumal Koil Panchayat and were selected for sustainable waste management and resource recovery. Sathya Nagar and Pareri consist of 12 streets with 300 concrete houses.

### Waste Management System in SathyaNagar and Pareri before Intervention

As shown in the Fig. 1, there are common pits in the street corners to dispose of the waste. All the waste generated in the houses is dumped into these pits and collected. Organic waste decomposes in these pits, over time while the non-biodegradable waste remains as such.

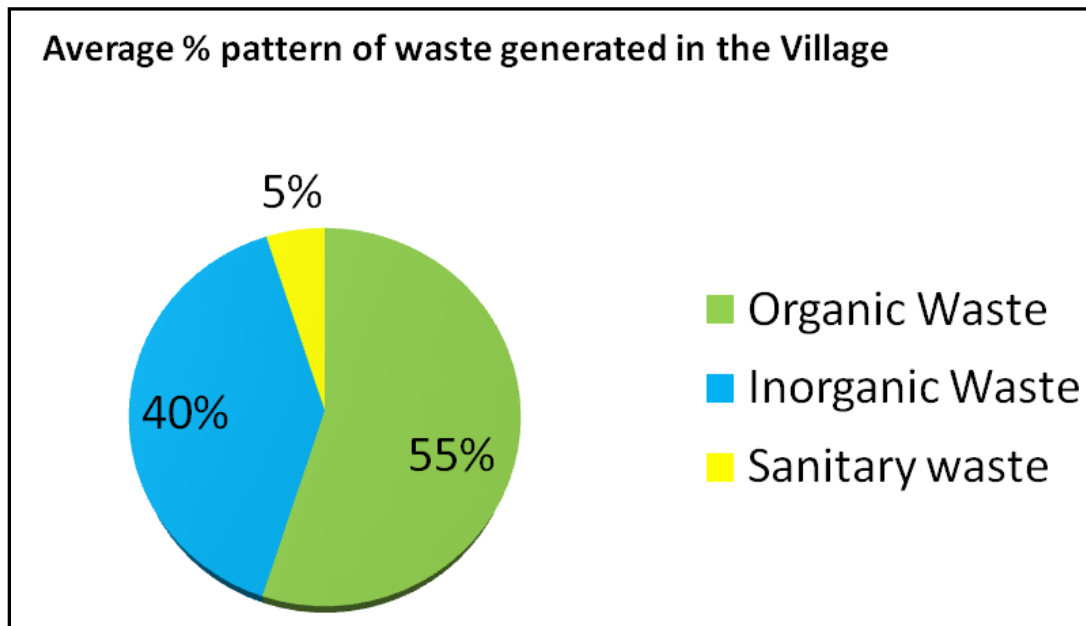


**Fig. 1: Solid Waste Dumping in Sathya Nagar Prior to Intervention**



### **Type of Solid Waste**

Waste samples were collected analyzed for the type of waste. As shown in Fig. 2, 55% of waste is organic in nature, 40% is inorganic in nature and rest 5% is sanitary waste. This information is essential for the design of waste management facility.



**Fig. 2: Characteristic of Solid Waste**

### **Need for Solid Waste Management**

For a town like Singaperumal Koil, the decentralized solid waste management system will be more appropriate. Existing dumpsites are overflowing and finding new dumpsites will be difficult due to a shortage of land within the municipal boundaries and surrounding rural communities. Also, inhabitants of nearby localities will prevent the indiscriminate dumping in their vicinity.

Many negative impacts result from improper solid waste management which are listed below.

- Uncollected waste may end up in drains and cause blockages.
- Dump sites are breeding grounds for flies.
- Discarded cans, tyres and other containers are breeding grounds for mosquitoes.
- Air pollution results from open burning of waste.

- Environment is affected by degradation of uncollected waste. It also affects the aesthetics.
- Leachate from these uncontrolled dump sites pollutes the nearby surface water bodies and groundwater sources.

The best way to tackle these problems is to adopt community - based decentralized solid waste management. There are several benefits. Localized collection and processing of wastes minimizes the transport of waste to far off dumping sites. It reduces the contamination of groundwater through the seepage of leachate. This model is labour intensive and provides employment opportunity to local inhabitants. Appropriate segregation of recyclable material leads to getting higher prices. Health and social benefits that accrue from proper solid waste management are well known and cannot be over emphasized.

### **Composting**

In the present project it was decided to go for composting for the organic part of the waste. The compost provides an extra source of revenue for the system and helps to maintain the fertility of the soil. Significant amount of research has been carried out at IIT Madras in recent years on composting. Prof. Ligy Philip and her students have developed a composting process which reduces the time of composting as well as results in a very high quality of compost, which meets the international standards. This composting process has been chosen for implementation in the solid waste management facility. **Quality testing** of prepared compost after drying in the air, sieving and obtaining a uniformly granular form for packing were put in place.

## **6. PLAN FOR PROJECT IMPLEMENTATION**

Phase 1: Identified and selected a residential association volunteering team. Core project team members from IIT Madras discussed with them for the collection of baseline data needed for planning the execution.

Phase 2: IIT Madras appointed supervisor and labour team were trained on details of the project and its execution plan.

Phase 3: Awareness campaign was conducted for the villagers on source segregation. 2 different colour bins, stickers and write-ups were distributed.

Phase 4: IIT Madras designed and constructed the dry waste segregation (400 Sqft) & 150 Kg/day composting yard (1320 Sqft).

Phase 5: IIT Madras appointed team has started the door to door collection of waste by categorizing the waste into 3 different types, i.e., wet waste, sanitary waste, mixed waste and dry waste (Inorganic Recyclable waste), segregated at the source i.e. households.

Phase 6: Inorganic waste is further segregated into different types and stored in the storage yard, which is being sold to recyclers at a later date. Organic waste is being composted, processed and packaged for selling in the local market. Mixed waste (mostly inorganic construction debris) is disposed of to the existing common bins once they are filled and will be sent to landfill. Sanitary wastes are collected separately and incinerated in the facility provided in compost yard.

Phase 7: IIT Madras team is closely monitoring the composting being carried out by the village level team, and collecting data on waste received per day, compost produced per day, compost quality and the net returns from the project through sales of inorganic recyclable material and compost..

## **7. PROJECT ACTIVITIES**

### **7.1. January – March 2017: Official Approval for Land Allotment**

To develop action plan for sustainable solid waste management, a formal proposal was submitted to the Panchayat President, who took up the requirement in the local council members' meeting for their approval to allot Panchayat land for the construction of a solid waste management system in the village. The approval by all members was obtained unanimously in the Panchayat meeting held in January 2017 and the documents were processed to block level to in charge-BDO for the approval. The block level approval was obtained in February 2017 and further processed to the final approval of Collector for allotment of the land in March 2017.

### **7.2. March 2017: Baseline Survey at Singaperumal Koil Panchayat**

The baseline survey was conducted to collect information from 300 households in the village. The information collected primarily included the following:

- Demography
- Water Supply

- Solid Waste Disposal

Fig. 3 shows the base line survey in progress.

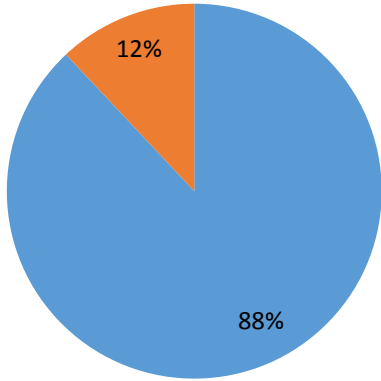


**Fig. 3: Social Survey in Progress**

Results of the baseline survey are presented in Fig. 4. These results helped to design the solid waste management facility.

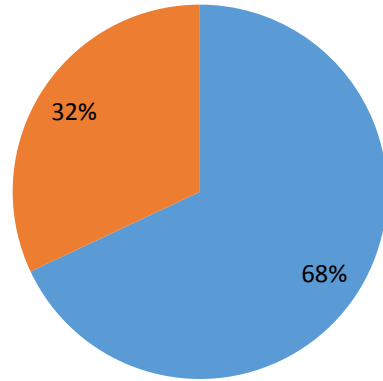
### Toilet Facility in the House

■ Yes ■ No



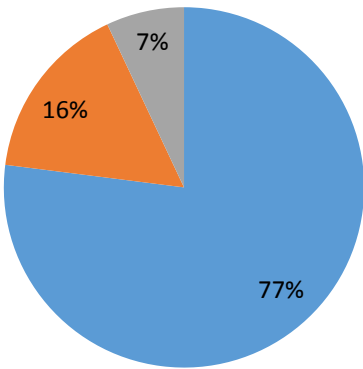
### Type of House

■ Own House ■ Rented House



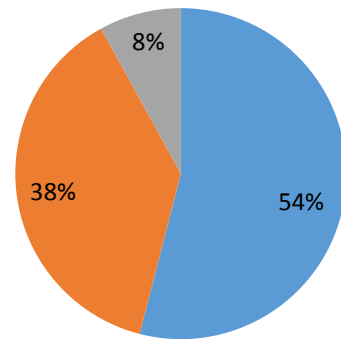
### Type of House Roofing

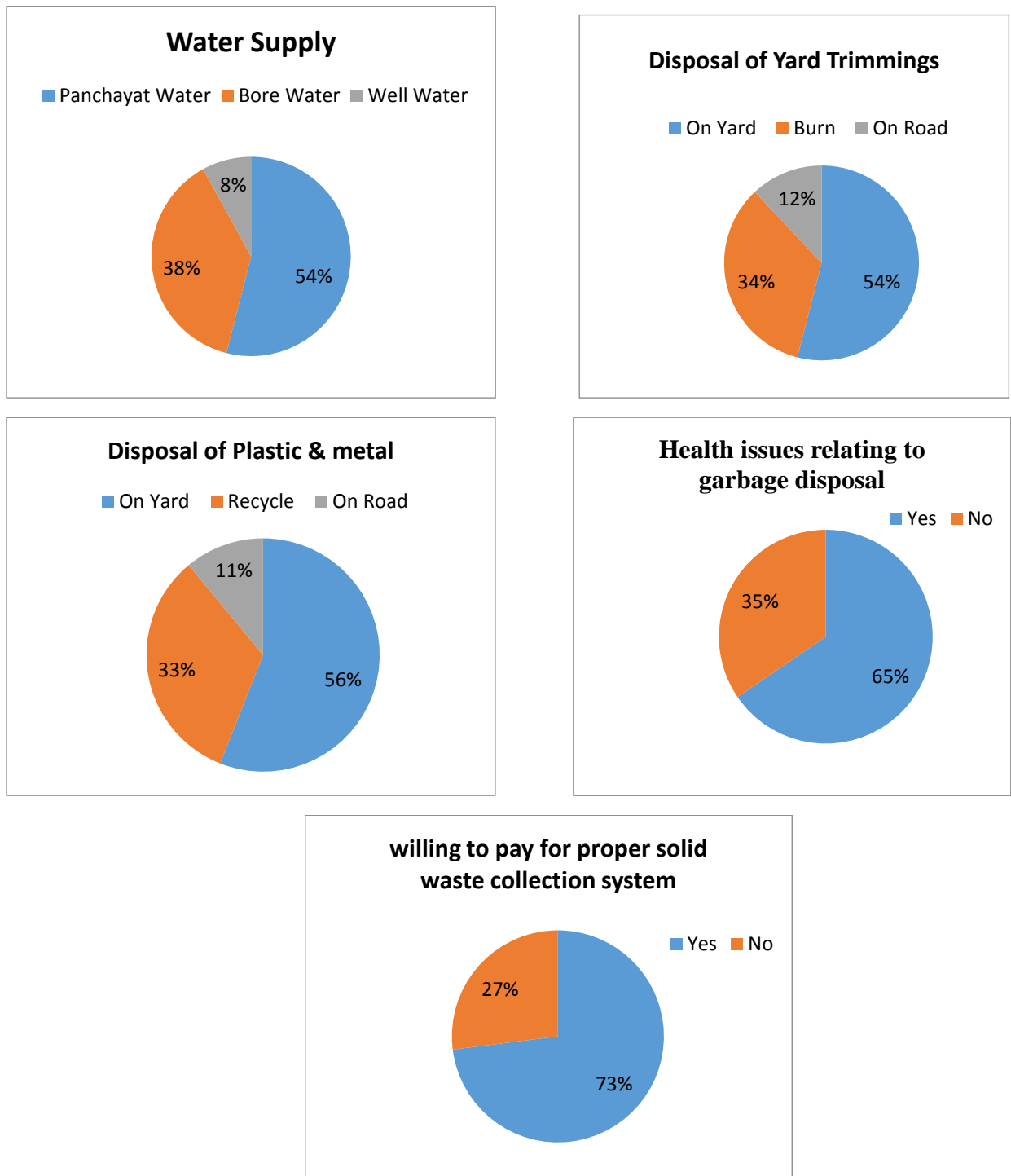
■ Concrete ■ Cement Sheet ■ Thatched



### Disposal of Food Waste

■ Feed to Animals ■ Empty Land  
■ On Road Side





**Fig. 4. Results of Baseline Survey**

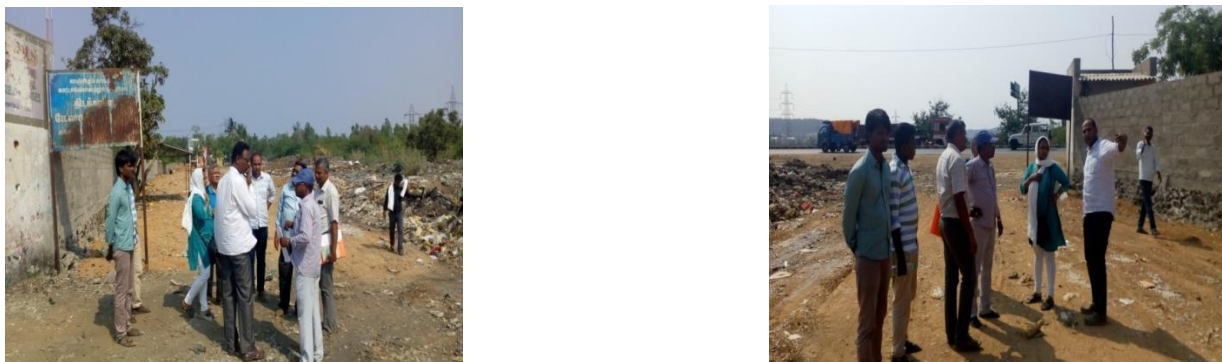


### 7.3. Field Visit on 6<sup>th</sup> April 2017

IIT Madras team visited the proposed compost yard site and the villages (Sathya Nagar & Pareri) on 6<sup>th</sup> April 2017. During the visit the team discussed with the BDO and Panchayat secretary about the situation of solid waste collection and disposal system in the village. Pictures from this field visit are shown in Fig. 5. Allotted land for compost yard is shown in Fig. 6.



**Fig 5. Field Visit on 6<sup>th</sup> April 2017**



**Fig. 6. Allotted Land for Compost Yard**

#### 7.4. 22<sup>nd</sup> April 2017: Project Inauguration at Sathya Nagar

Residents from 300 household of Sathya Nagar and Pareri were invited for the project inauguration function. The function was chaired by Mr. Murali, BDO (V.P) and Mr. Saleem Khan BDO (General) Singaperumal Koil Panchayat, Senior official from M/s: TechnipFMC Chennai, Dr. Ligy Philip and Dr. B.S Murty, Professors from IIT Madras and Mr. Anand, Panchayat Secretary. BDO instructed to distribute the bins to households soon after the construction of compost plant. Pictures from inauguration function are shown in Fig. 7.



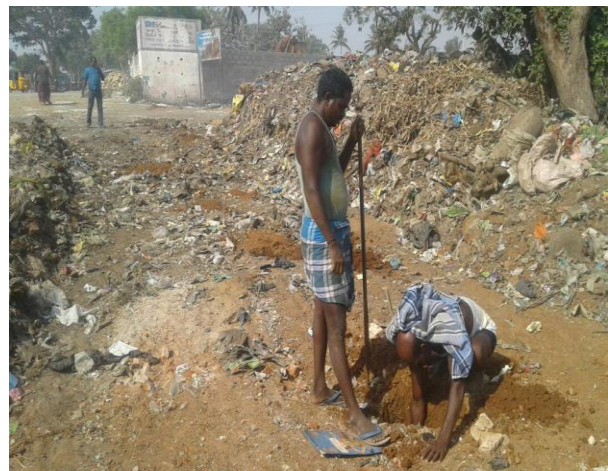
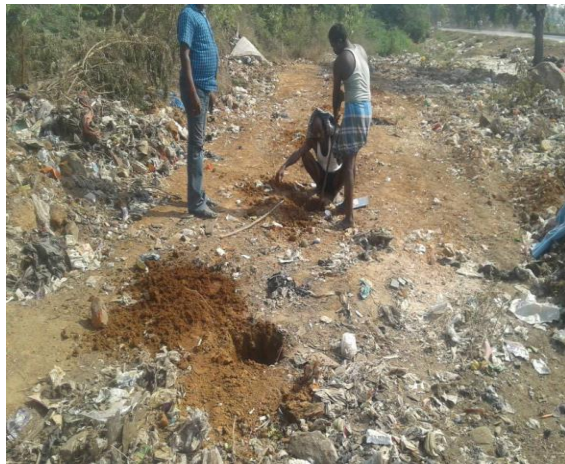




**Fig. 7. Inauguration of Project on 22<sup>nd</sup> April 2017**

### **7.5. May-June 2017: Land Survey at Compost Yard, Site Clearance Work and Fencing Work**

The land for construction of composting plant was approved by the collector and local Panchayat office. After receiving the official documents, the land survey was conducted for the allotted land. Site was cleared and a fence was erected to secure the allotted land. Pictures from these activities are shown in Fig. 8.



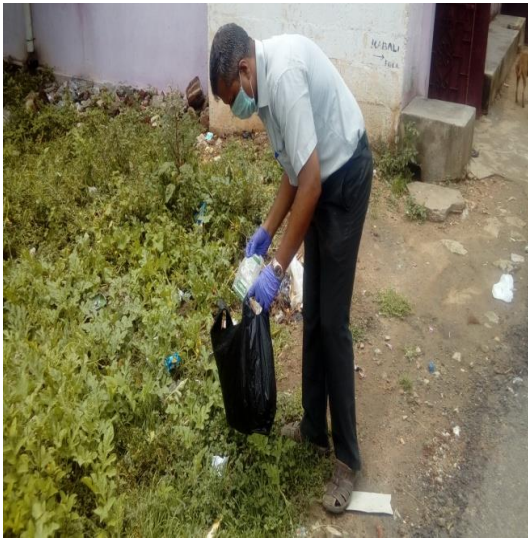


**Fig. 8. Site Clearance and Fencing of Allotted Land**

#### **7.6. August 2017: Mass clean up of Solid Waste in Sathya Nagar and Pareri Villages**

Mass clean-up of solid waste on the streets of Sathya Nagar and Pareri was initiated by IIT Madras to bring about the overall cleanliness of the ward. The clean-up was supported by Mr. Anand, Panchayat Secretary along with volunteers from the village and day wage workers from the panchayat. The task was successfully completed under the guidance of IIT Madras Project team. The residents highly supported this initiative. Pictures from the mass cleanup activity are shown in Fig. 9.





**Fig. 9. Mass clean up of villages in August 2017**

### **7.7. December 2017 – February 2018: Tendering Process for construction of Compost Plant**

The detailed estimate for construction of composting plant was made and the contractor was finalized based on IITM's open tender process. The Tendering process was completed and the contract was won by M/s Venkateswara Decors at a total project value of Rs 34,29,031/-.

### **7.8. February- April 2018: Official Approval for New Land Allotment**

As per instruction given by the then new Collector, already allotted land for construction of compost plant will be used for a commercial complex. The Block Development Officer agreed to provide land for construction of compost plant in SP Koil. A formal proposal was submitted to the Panchayat President,

who took up the requirement in the in local council member's meeting for their approval to allot Panchayat land for the construction of a solid waste management system in the village. The approval by all members was obtained unanimously in the Panchayat meeting held in February 2018 and the documents were processed to block level to BDO for the approval. The block level approval was attained in March 2018 and further processed to the final approval of Collector for allotment of the land in April 2018.

### **7.9. April 2018: Site Preparation at the new Allotted Land**

An old building in the newly allotted site was demolished and the new site was fenced in April 2018. Pictures from this activity are shown in Fig. 10.







**Fig. 10. Site Clearance and Fencing of New Allotted Land for Compost Plant**

#### **7.10. 23<sup>rd</sup> April 2018: Bhoomi Puja t the Site**

Bhoomi Pooja was performed at the new site by Mr. Saleem Khan, BDO, Mr. Anand ,Panchayat secretary and M/s:Venkateswara Decor contractor and Mr. Yoganathan from IIT Madras on 23<sup>rd</sup> April 2018. Pictures from this function are shown in Fig. 11.



**Fig. 11. Bhoomi Puja on 23<sup>rd</sup> April 2018**

### 7.11. Progress of the Construction of Compost Yard

Following pictures show the progress in the construction of the compost yard.



**Fig. 12. Foundation Marking; 26-4-2018**





**Fig. 13. Excavation for Foundation: 27-04-2018**

After excavating, dressing of inequalities in foundation marking area surface was carried out. Earth work excavation by mechanical (hydraulic excavator) was carried out. Excavation was done on (4ft\*4ft\*4ft 6 inch) size of 20 columns, including dressing of sides and ramming of bottoms, getting out the excavated soil and disposal of surplus excavated soil as directed.



**Fig. 14. Excavation Surface Dressing: 3-05-2018**

Cutting, bending, straightening work of 16 mm and 8mm diameter bars was done as per required lengths and measurements. Binding and Tying of mat footing and column up to ground level has been done.







**Fig. 15. Reinforcement Bars for Footings: 7-05-2018**

Sand filling and PCC 1:4:8 on dressed surface was done and footings were placed by 14-05-2018. Ready mix concrete of M25 grade was placed on all footings size (3ft 6inchx3ft 6inchx6 inch). Pedestal Step footing size (1ft 6inchx1ft 6 inchx1ft 6inch) was also concreted on all footings. Column of size (2ftx1ftx1ft) of all footings was concreted up to ground level.





**Fig. 16. Reinforcement of Footings: 14-05-2018**

Excavation for placing PCC 1:4:8 has been done between all columns. Sand filling was done in all excavated areas for plinth beam. PCC 1:4:8 was placed in all excavated areas by mixer Machine.



**Fig. 17. PCC for Plinth: 26-05-2018**



The shuttering of plinth beam with column outline was then carried out up to all columns. Concrete of M25 grade by ready mix machine was placed in all shuttered areas (1ft x 9 inch x total length) for plinth. Curing of plinth beam has been done regularly on the morning and evening.



**Fig. 18. RCC for Plinth Beam: 3-6-2018**



**Fig. 19. RCC for Columns**



**Fig. 20. RCC Lintel Beam with Sunshade**



**Fig. 21. RCC on Columns and Welded Plate**





**Fig. 22. RCC for Second Lintel Beam: 7-7-2018**



**Fig. 22. Curing and Brick Work: 19-7-2018**





**Fig. 23. Brick Work, Window Grill and Truss: 3-9-2018**



**Fig. 24: Plastering, Flooring, Roof Sheet and Compost Bins**

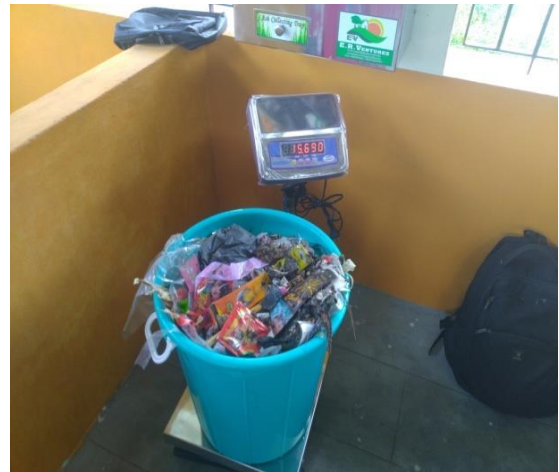




**Fig. 25. Painting and Ramp Flooring: 10-11-2018**

#### **7.12. Door to Door Garbage Collection and Processing in the Yard**

After building work was fully completed, collection of waste from households started on 17.11.2018 by the employed staff. This waste is weighed in the yard, ground and kept for composting. Door to door collection and processing in the compost yard are shown in Fig. 26.







**Fig. 26. Door to Door Collection and Processing in the Compost Yard**

A training program on scientific composting was conducted for the staff employed from the village. The training program was imparted by the doctoral scholar Ms. Anu Rachel from IIT Madras, who has been researching on this process for the last five years. Pictures from this training program are shown in Fig. 27.



**Fig. 27. Training Program on Composting Process**

### **7.13. Water for the Compost Yard**

A bore well was drilled at the site for compost yard to pump water required for operating the compost yard. The depth of the bore well is 450 feet. The drilling operation for bore well is shown in Fig. 28.



**Fig. 28. Bore Well Drilling**

## 8. Awareness Programme

Awareness programme was conducted at Government Higher Secondary School, Singaperumal Koil on 17-11-2018. Persons from about 80 households participated in the awareness programme. The following topics were covered in the awareness training programme: Solid Waste Management (Mr. Dawood, Greenenvironment & Mr.Yoganathan, Project staff IIT), Personal Hygiene & Water quality (Mr. Kaviarasan, Project Staff IIT Madras) and video show about importance of community participation in solid waste management Project. Pictures from awareness program are shown in Fig. 29.



**Fig. 29. Awareness Program Conducted on 17-11-2018**

## 9. Compost Yard Inauguration

The Solid Waste Management project inauguration was held on 20-11-2018. The guests from M/s Technip, Prof. Ligy Philip, Prof. B. S. Murty and Panchayat Secretary, Singaperumal Koil Panchayat inaugurated the newly built compost plant at Singaperumal Koil. Two different coloured bins (Green colour for degradable waste and Blue colour for non degradable waste) were distributed to the targeted households. Pictures from the inauguration program are shown in Fig. 30.

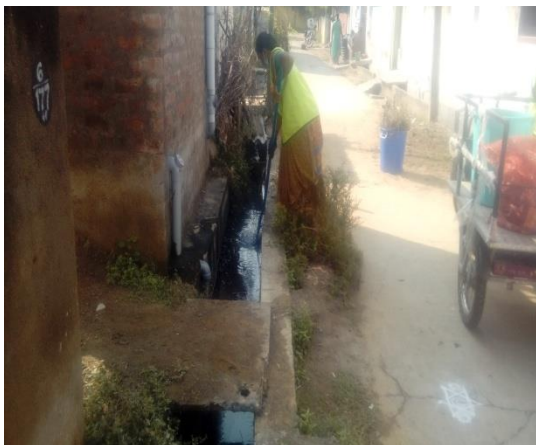




**Fig. 30. Inauguration Program: 20-11-2018**

#### **10. Mass Cleaning Operation: 27-11-2018**

On 27-11-2018, a mass cleanup drive was held in Anna Nagar area in Singaperumal Koil Panchayat. In the mass clean up the garbage from the road sides and street corners, vacant land and panchayat open drains were removed and transferred to Panchayat dump yards. Pictures from this activity are shown in Fig. 31.



**Fig. 31. Mass cleaning in Anna Nagar Area of Singa Perumal Koil Panchayat**

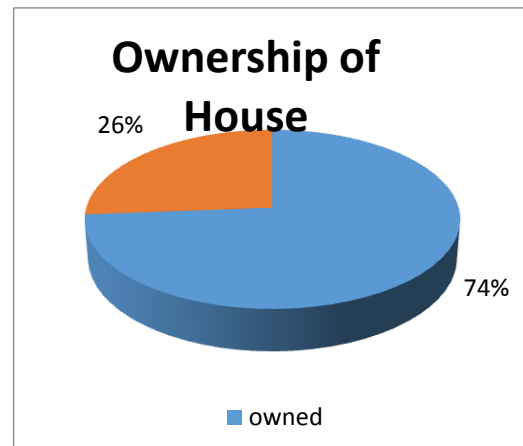
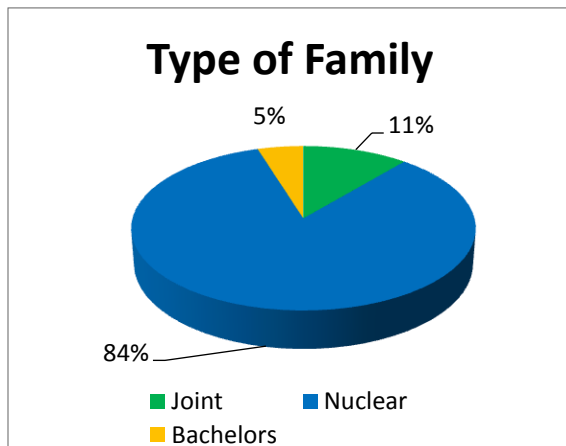
## **11. Baseline Survey**

Baseline survey was conducted for 350 households of Anna Nagar and JJ Nagar areas of Singaperumal Koil Panchayat during the month of October 2018 because these areas were also now included for solid

waste management. Progress of base line survey is shown in Fig. 32, and results from base line survey are shown in Fig. 33.



**Fig. 33. Baseline Survey in Anna Nagar Area of S. P. Koil Panchayat**



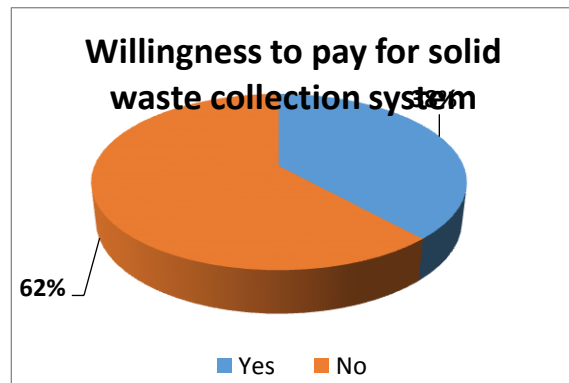
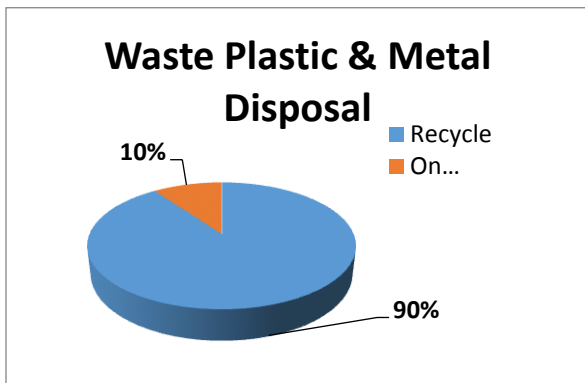
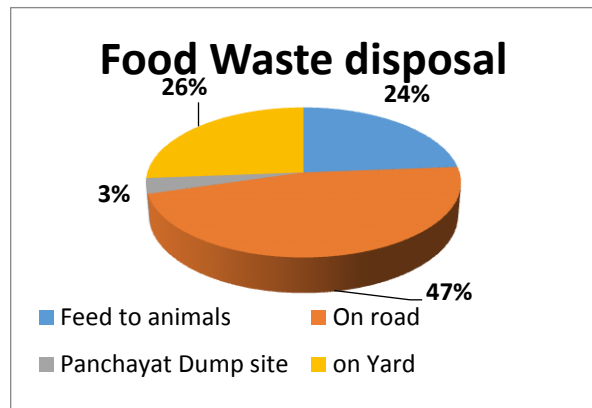
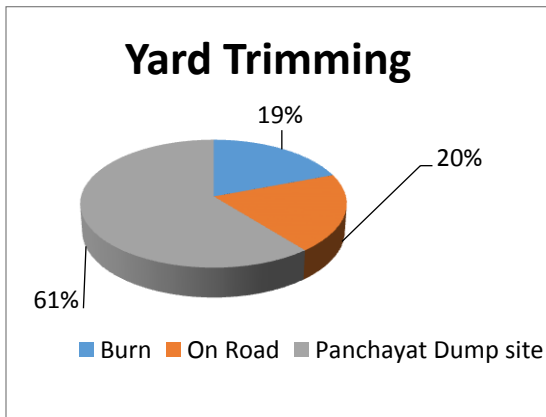
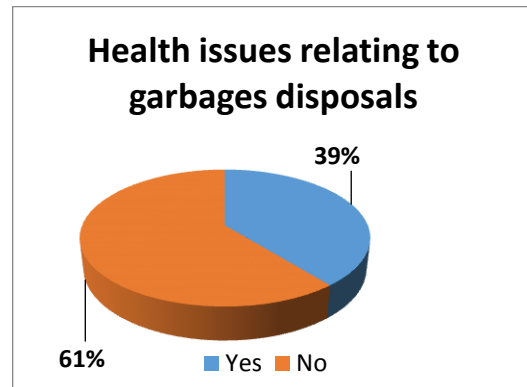
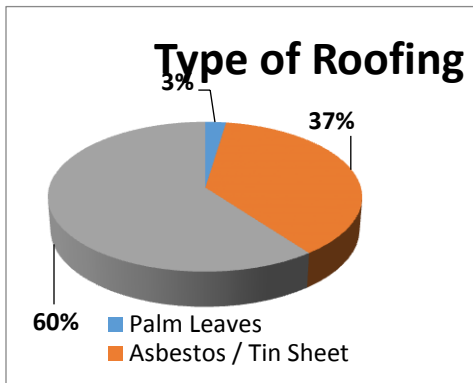


Fig. 34. Results of Base Line Survey in Anna Nagar



## 12. Composting Process

The steps involved in composting process are shown in Fig. 35. The different steps involved are: (i) collection and drying of organic waste in the yard, (ii) shredding of organic waste, (iii) spreading of the waste in the compost box, (iv) temperature profiling during composting, (v) stabilised compost, (vi) sieving of the final compost and (vii) compost ready to get packed for sale.



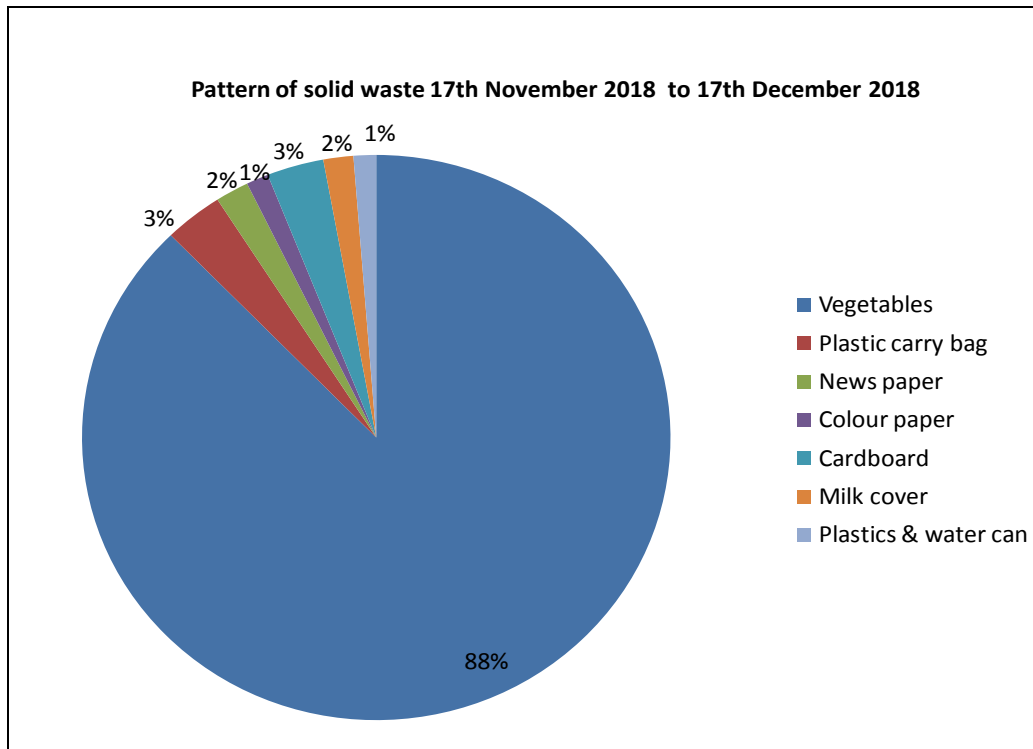




**Fig. 35. Steps in Composting Process**

### 13. Data on Waste Collected and Compost

The different operations in solid waste management are being monitored and pertinent data is presented below. Fig. 36 shows the components of solid waste collected in S. P. Koil Panchayat for the samples collected during the period 17<sup>th</sup> November 2018 to 17<sup>th</sup> December 2018. Same information is provided in Table-1.



**Fig. 36. Components of solid waste in S. P. Koil Panchayat**

**Table: 1 Data on Solid waste characterization**

MONTH	Vegetables in Kg	Plastic Carry Bag in Kg	News paper in Kg	Colour Paper in Kg	Card board in Kg	Milk cover in Kg	Plastics & water can in Kg	White sheet in Kg	Wastages goes to land fill in Kg	Glass bottle in No. Pcs.	TOTAL in Kg
Nov-2018	271.8	12.41	6.82	0	14.47	5.62	4.3	0	60	31	333.4
Dec-2018	476.7	15.17	8.87	10.42	12.23	8.43	6.28	0	60	0	576.63
<b>TOTAL WEIGHT</b>	<b>748.5</b>	<b>27.58</b>	<b>15.69</b>	<b>10.42</b>	<b>26.7</b>	<b>14.05</b>	<b>10.58</b>	<b>0</b>	<b>120</b>	<b>31</b>	<b>910.03</b>

Table-2 provides the data on compost generated in the compost yard for the same period of 17<sup>th</sup> November 2018 to December 17<sup>th</sup> 2018. A total of 72 kg of compost was generated. Table-3 provides the data on inorganic waste. Non-degradable inorganic waste is sent for recycling as shown in Fig. 37. An income of Rs. 858/- has been generated in one month by selling the recyclable inorganic waste.

**Table 2: Details of the compost generated in Anna Nagar –SP Koil**

S.No	Details	Weight in kg
1	Compost generated from 17 <sup>th</sup> November-2018 to 17th December-2018	72
2	Compost Sold out	NA
3	compost given to Panchayat at free of cost	NA
4	compost given to various nursery gardens as samples @ free of cost	NA
5	Compost in storage	NA

**Table 3: Data on Inorganic Waste (27-12-2018)**

27.12.2018	recycle wastes discharged to wastemart		
items	quantity/kg	rate	amount
colour cardboard	25	3	75
brown cardboard	19	7	133
news paper	21.3	9	191.7
milk cover	7.15	7	50.05
oil cover	4.75	6	28.5
Plastics	12.5	16	200
water bottle	5.5	15	82.5
medicine bottles	4.45	2	8.9
aluminium cover	1.3	40	52
Silver	0.25	33	8.25
Metals	2.25	3	8
glass bottles	38nos	0.5	19
	1nos	1	1
		total amt	857.9
		SAY	RS.858



**Fig. 37. Non degradable Waste being sent for Recycling**

Table 4 provides the characteristics of final compost. It can be clearly seen that the final compost has very high quality and meets all the standards for getting used as manure.

**Table 4: Final compost quality**

(Compost sample collected in February 2019 from SP Koil Compost Plant)

<b>Parameters</b>	<b>City Compost standard (FCO standard, 1985)</b>	<b>Final Compost sample</b>
Moisture, percent by weight	15.0-25.0	13.3
Colour	Dark brown to black colour	Dark brown to black colour
Odour	Absence of foul odour	Earthy smell and absence of foul odour
Particle size	> 90% of material should pass through 4mm IS sieve	> 90% of sample passed through 4mm IS sieve
Bulk density (g/cc)	< 1.0	0.4
Total organic carbon, percent by weight	➤ 12.0	57.7
Total Nitrogen (as N), percent by weight	➤ 0.8	3.0
Total Phosphates (as P <sub>2</sub> O <sub>5</sub> ), percent by weight	➤ 0.4	0.2
Total Potash (as K <sub>2</sub> O), percent by weight	➤ 0.4	2.2
C:N ratio	< 20	9.4
pH	6.5-7.5	8.1
Conductivity (ds/m)	< 4.0	4.6
Pathogen (MPN/100mL)	Nil	Nil
Tolerance limit (N+P+K)	> 1.5	5.3
Seed germination index	> 80%	176.2



#### **14. WAY FORWARD**

Due to various administrative problems, the project site was shifted four times. As a result, the construction of the composting shed and implementation of the project got delayed significantly. The waste collection and segregation has started only in November, 2018 after the shed construction was over. This has given only five months' time to train the villagers on waste segregation, collection and composting. Moreover, the Panchayat is not in a position to take over the project due to the forthcoming elections. **To leave the project to villagers at this juncture may not be advisable. It is advisable to handhold the villagers and waste management project for at least one more year so that the project will be successful.** TECHNIP may take a decision on this. The amount needed is the salary component of three people from village, awareness programs, operation and maintenance of the system, salary for IIT Madras staff, Travel expenditure and analyses charges. **To continue the project from IIT Madras side, a funding to the tune of Rs 20 Lakhs is required.**

## Annexure 1: Old land allotment approval letter

மாவட்ட ஆட்சித் தலைவர் / தலைவர், மாவட்ட ஊரக வளர்ச்சி முகமை,  
காஞ்சிபுரம் மாவட்டம் அவர்களின் செயல்முறைகள்

முன்னிலை - திருமதி. இரா. கஜலட்சுமி, இ.ஆ.ப.,

ந.க.எண். 1180/2013/அ12

நாள். 1.03.2017

பொருள் : திடக்கழிவு மேலாண்மை திட்டம் - காஞ்சிபுரம் மாவட்டம் - காட்டாங்கொளத்தூர் ஊராட்சி ஒன்றியம் சிங்கப்பெருமாள் கோயில் ஊராட்சி - சத்தியா நகர் மற்றும் பாரேரி - சென்னை ஐ.ஐ.டி நிறுவனம் மூலம் சமுதாய பங்களிப்பாக ( C.S.R Project) திடக்கழிவு மேலாண்மை திட்டத்தினை ஒரு வருட காலத்திற்கு மேற்கொள்ள அனுமதி வழங்கி உத்தரவிடப்படுகிறது.

பார்வை : 1.வட்டார வளர்ச்சி அலுவலர்(கிஊ) காட்டாங்கொளத்தூர் ஊராட்சி ஒன்றியம் ந.க.எண் 1748/2016/ஆ3 நாள் 27.02.2017  
2.திருமதி.லிஜிப் பிலிப் பேராசிரியர், சிவில் பொறியியல் துறை ஐ.ஐ.டி.சென்னை கடித எண் 09.02.2017 நாள் 11.02.2017

### உத்தரவு

சென்னை ஐ.ஐ.டி நிறுவன சிவில் பொறியியல் துறை பேராசிரியர் பார்வை 2ல் கண்டுள்ள கடிதத்தில் காட்டாங்கொளத்தூர் ஊராட்சி ஒன்றியம் சிங்கப்பெருமாள் கோயில் ஊராட்சி கீழ்க்குறிப்பிட்டுள்ள பகுதிகளில் சமுதாய பங்களிப்பு மற்றும் சொந்த நிதியின் மூலம் திடக்கழிவு மேலாண்மை திட்டம் மேற்கொள்ள ஒருவருட காலத்திற்கு அனுமதி கோரியுள்ளார்.

சிங்கப்பெருமாள் கோயில் 1. சத்தியா நகர் தெரு 1 வீடுகள் எண்ணிக்கை 135  
2. பாரேரி தெரு 3 வீடுகள் எண்ணிக்கை 230  
365

உரக்குழி அமையும் இடம் சர்வே எண் 120/2 மொத்த பரப்பளவு 4.89.0 ஹெக்டேர் அளவில் 2400 சதுர அடி.

பார்வை 1ல் காட்டாங்கொளத்தூர் ஊராட்சி ஒன்றியம் (கிஊ) வட்டார வளர்ச்சி அலுவலர் மேற்படி நிறுவனத்திற்கு திடக்கழிவு மேலாண்மை மேற்கொள்ள அனுமதி வழங்க பரிந்துரை செய்துள்ளார்.

இதற்கிணங்க சென்னை ஐ.ஐ.டி நிறுவன சிவில் பொறியியல் துறை பேராசிரியர் திருமதி.லிஜிப் பிலிப் என்பவருக்கு சமுதாய பங்களிப்பு மற்றும் சொந்த நிதியில் ( C.S.R Project) சிங்கப்பெருமாள் ஊராட்சியினைச் சேர்ந்த கீழ்க்கண்ட பகுதிகளில் திடக்கழிவு மேலாண்மை பணிகள் மற்றும் உரக்குழி அமைக்கவும் ஒருவருட காலத்திற்கு செயலாக்கவும் அனுமதி வழங்கி உத்தரவிடப்படுகிறது

சிங்கபெருமான் கோயில் 1. சத்யா நகர் தெரு 1 வீடுகள் எண்ணிக்கை 135  
2. பாரேரி தெரு 3 வீடுகள் எண்ணிக்கை 230  
365

உரக்குழி சர்வே எண் 120/2 மொத்த பரப்பளவு 4.89.0 ஹெக்டேர் அளவில் 2400 சதுர அடி.  
மட்டும் அனுமதிக்கப்படுகிறது.

மேலும் திடக்கழிவு மேலாண்மை கீழ்க்கண்ட பணிகள் சொந்த செலவில் மேற்கொள்ளப்பட வேண்டும். ஒரு வருடகால முடிவில் இத்திட்ட அலகு, வட்டார வளர்ச்சி அலுவலர் (கி.உ) வசம் ஒப்படைக்கவேண்டும் என்ற நிபந்தனையுடன் இந்த அனுமதி வழங்கப்படுகிறது.

உரக்குழிகள் அமைத்தல்  
பணியாளர்கள் நியமித்தல்  
குப்பைகள் சேகரித்தல்  
மிதி வண்டி மூலம் உரக்குழிக்கு குப்பைகள் எடுத்து வருதல்  
குப்பைகளை வகைப்பிரித்தல்  
இயற்கை உரத்தினை உருவாக்குதல்  
திட்ட செயலாக்க இடத்திற்கு பாதுகாப்பு வேலி அமைத்தல்

காட்டாங்கொளத்தூர் ஊராட்சி ஒன்றிய (கி.உ) வட்டார வளர்ச்சி அலுவலர் மேற்படி நிறுவனம் திடக்கழிவு பணிகள் மேற்கொள்ள தொழில்நுட்ப மற்றும் நிர்வாக ஆலோசனை வழங்க கேட்டுக்கொள்ளப்படுகிறது

3/4  
John 01.3.17  
மாவட்ட ஆட்சித்தலைவர்

பெறுநர்

திருமதி.லிஜிப்பிலிப் பேராசிரியர்,  
சிவில் பொறியியல் துறை,  
ஐ.ஐ.டி. நிறுவனம் சென்னை 600036

வட்டார வளர்ச்சி அலுவலர் (கி.உ)  
காட்டாங்கொளத்தூர் ஊராட்சி

நகல்

வட்டார வளர்ச்சி அலுவலர் (கி.உ)  
ஊராட்சி ஒன்றியம் காட்டாங்கொளத்தூர்

மே. 0.3.17 அம் 1748/16/2017 அம்: 6.3.17

சீமந்தபட்டினம் உள் வட்டாரம்  
இயல்பு சேவையின் அடிப்படையில்.

பெறுநர்  
சீமந்தபட்டினம்.

வட்டார வளர்ச்சி அலுவலர் (கி.உ)  
(ம) தி. அலுவலர்  
காட்டாங்கொளத்தூர் ஊராட்சி.

NBA Documents\2017\CSR - letter.docx

- i) உத்தரவையின்மீது [உள்ளடக்கம் தொடர்பான தீர்மானம்]
- ii) உத்தரவையின்மீது உத்தரவையின் தொடர்பான தீர்மானம் [உள்ளடக்கம்]
- iii) காட்டாங்கொளத்தூர் வட்டார வளர்ச்சி அலுவலர் (கி.உ) உத்தரவு



## Annexure 2: New land allotment approval letter

<p>பெயர் திரு.பா. பொன்னையன் இ.ஆ.ப. மாஹ்ட்ட. ஆட்சித் தலைவர்/கோட்டுவகையர் மாஹ்ட்ட. ஊராட்சி வளர்ச்சி மூலம், காஞ்சிபுரம் மாஹ்ட்டம்.</p>	<p>பெயர் காட்டக் கொளத்தூர் ஊராட்சி ஒன்றியம் காட்டக் கொளத்தூர் ஊராட்சி ஒன்றியம், காஞ்சிபுரம் மாஹ்ட்டம்.</p>
<p>ந.க.எண்.1180/2013/அ12, நாள். 28.03.2018</p>	
<p>பொருள் -</p>	<p>திடக்கழிவு மேலாண்மை திட்டம்- காஞ்சிபுரம் மாஹ்ட்டம்- காட்டக்கொளத்தூர் ஊராட்சி ஒன்றியம்-சிக்கப்பெருமாள் கோயில் ஊராட்சி-சத்தியா நகர் மற்றும் பாறேரி-சென்னை ஐ.ஐ.டி நிறுவனம் மூலம் சமுதாய பங்களிப்பாக(C.S.R.Projet) திடக்கழிவு மேலாண்மை திட்டத்தினை ஒரு வகுட காலத்திற்கு மேற்கொள்ள அனுமதி வழங்கியது தற்போது மாற்று இடத்தில்(சிக்கப்பெருமாள் கோயில்-அண்ணா நகர் குடியிருப்பு-தங்கம்மாள் காலனி) அமைக்க வட்டார வளர்ச்சி அலுவலர்/தனி அலுவலர் ஒப்புநகத்தின் அடிப்படையில் பணி மேற்கொள்ள கோருதல்-சார்ந்து.</p>
<p>பார்வை -</p>	<p>1)மாஹ்ட்ட ஆட்சித் தலைவர் காஞ்சிபுரம் அவர்களின் கடிதம் ந.க.எண்.1180/2013/அ12, நாள்.01.03.2017.</p> <p>2)வட்டார வளர்ச்சி அலுவலர்(கி.ஊ), காட்டக்கொளத்தூர் ஊராட்சி ஒன்றியம் அவர்களின் ந.க.எண்.1748/2016/ஆ3,நாள்.09.02.2018.</p> <p>3)செயற்பொறியாளர்(ஊ.வ),காஞ்சிபுரம் அவர்களின் ஆய்வறிக்கை நாள்.26.03.2018.</p> <p style="text-align: center;">*****</p>
	<p>பார்வை 1ல் காணும் கடிதத்தில் காட்டக்கொளத்தூர் ஊராட்சி ஒன்றியம் ,சிக்கப்பெருமாள் கோயில் ஊராட்சி,சத்தியா நகர் மற்றும் பாறேரி-சென்னை ஐ.ஐ.டி நிறுவனம் மூலம் சமுதாய பங்களிப்பாக திடக்கழிவு மேலாண்மை திட்டத்தினை அனுமதி வழங்கி உத்தரவிடப்பட்டது.</p> <p>பார்வை 2ல் காணும் வட்டார வளர்ச்சி அலுவலர் (கி.ஊ) காட்டக்கொளத்தூர் கடிதத்தில் திடக்கழிவு மேலாண்மை திட்டத்திற்கு தேர்வு செய்யப்பட்ட இடத்தில் தற்போது,RURBAN திட்டத்தின் மூலம் பணிமேற்கொள்ளப்படவிருப்பதால்,மாற்று இடமான சிக்கப்பெருமாள் கோயில்-அண்ணா நகர் குடியிருப்பு பகுதியிலுள்ள தங்கம்மாள் காலனியில் ஊராட்சிக்கு சொந்தமான இடத்தில் குப்பைகள் தரம் பிரிக்கும் கொட்டகை அமைக்க அனுமதி கோரியுள்ளார்.</p>
	<p>பார்வை 3ல் காணும் செயற்பொறியாளர்(ஊ.வ), காஞ்சிபுரம் அவர்களின் ஆய்வறிக்கையின்படி பின்வரும் நிபந்தனைகளுடன் செயல்படுத்த தெரிவிக்கப்படுகிறது.</p> <p><b>நிபந்தனைகள்</b></p> <ol style="list-style-type: none"> <li>1. ஒப்புநகத்தினை ஒவ்வொரு ஆண்டும் புதுப்பிக்க வேண்டும்.</li> <li>2. அருகிலுள்ள குடியிருப்புகள் மற்றும் பொதுமக்களுக்கு பாதிப்பு ஏற்படா வண்ணம் செயல்படுத்த வேண்டும்.</li> <li>3. விதிமுறைகளுக்கு புறம்பாக செயல்படும் பட்சத்தில் அனுமதி எவ்வித முன்னறிவிப்பின்றி ரத்து செய்யப்படும்.</li> <li>4. அரசு/உள்ளாட்சி அமைப்புகளின் இடத்தின் மீது எவ்வித உரிமைமீடும் கோர முடியாது.</li> </ol>
<p>E:\A11-MAPS files\IT CSR -SWM.docx</p>	

5 உருவாக்கப்படும் சொத்துக்கள் உள்வாங்கி அமைப்புகளிடம் ஒப்படைக்கப்பட வேண்டும். அதன் மீது நிறுவனம் எவ்வித உரிமையும் கோர முடியாது.

மேற்படி தெரிவிக்கப்பட்டுள்ள நிபந்தனைகளுடன் ஐ.ஐ.டி நிறுவனத்திற்கும், காட்டங்கொளத்தூர் வட்டார வளர்ச்சி அலுவலர்க்கும் இடையே ஒப்பந்தம் ஏற்படுத்தி(Agreement)அதன் அடிப்படையில் பெருநிறுவனங்களின் சமூக பொறுப்பு திட்டத்தின்கீழ் மேற்கொள்ள வட்டார வளர்ச்சி அலுவலர்(கி.ஊ), காட்டங்கொளத்தூர் அவர்களுக்கு தெரிவிக்கப்படுகிறது.

ஓம்'பா.பொன்னையா  
மாவட்ட ஆட்சித் தலைவர் / பெருந்தலைவர்,  
மாவட்ட ஊரக வளர்ச்சி முகமை,  
காஞ்சிபுரம் மாவட்டம்.

//உத்தரவுப்படி//

உதவி திட்ட அலுவலர்(உ.க.அ.டி)  
மாவட்ட ஊரக வளர்ச்சி முகமை,  
காஞ்சிபுரம் மாவட்டம்.

நகல்.

1.திருமதி,லிஜிப் பிலிப் பேராசினியர்,சிவில் பொறியியல் துறை ஐ.ஐ.டி சென்னை .600 036.

2.செயற்பொறியாளர்(ஊ.வ),காஞ்சிபுரம் உபகோட்டம், காஞ்சிபுரம் மாவட்டம்.

## ANNEXURE-III

### Field Report Prepared by IIT Madras

Date: January 23<sup>rd</sup> 2017

After the discussions with District Collector, Kanchipuram and Project Director, DRDA, we collected the list of Panchayats from the PD's office where the intervention regarding solid waste management can possibly be made. Field visits were made to these Panchayats and relevant information was collected from the Panchayat officials. In all the Panchayats, Panchayat officials were very cooperative and accompanied the IIT Team to show the present status of solid waste and also show possible locations for construction of compost yard. List of Panchayats visited by the IIT Madras Team is given in Table-1.

**Table-1: List of Panchayats provided by PD, DRDA**

No.	Name of Panchayat	Name of Block	Name of Panchayat Secretary	Name of Zonal Deputy BDO
1	Polichalur	St. Thomas Mount	Sankaran	Amul RAJ
2	Chithalappakkam	St. Thomas Mount	Rajendra Sedhupathy	Ravikumar
3	Urapakkam	Kattankolathur	Karunakaran	
4	S.P.Koil	Kattankolathur	Anand	Dhanasekaran
5	Thalamabur	Thiruporur	Manogar	Balasubramaniyan
6	Thirumangalam	Sripemumpudur	Ganesan	Elumalai
7	Manimangalam	Kundrathur	Gopal	

In the Kattankolathur block, the team visited one additional village named Sathya Nagar as suggested by the Panchayat secretary. In the list given by the PD, the IIT team did not visit the villages in Thalamabur Panchayat, Thiruporur block because PD advised that very many number of high rise buildings exist in this area and the garbage disposal and segregation is really not a problem because the Panchayat is already taking care of garbage segregation and disposal.



Following is a brief summary of the observations made during the field visit.

### 1. St. Thomas Mount Block

In the St. Thomas Mount block the team visited the Ward-1 and Ward-9 in Polichalur Panchayat. The total number of households in the Ward-1 is around 350. Number of commercial establishments (shops) is 9. Number of streets is 15. The total number of households in Ward 9 is around 400. There are 10 shops in this area. There is a residents association in this ward and so conducting awareness programs will be easy. The Panchayat Secretary took the team to every street and showed the types of house and garbage dumping sites. Figure 1 shows the photographs taken during the field visit.



**Fig.1. Photographs from Field Visit to Polichalur in St. Thomas Mount Block**

Panchayat Secretary also showed the possible site for the construction of composting plant. **The present classification of this site is “unapproved land”**. Therefore, permission from the collector needs to be

obtained under the provision of special permissions. This site is very close to the Adyar River. **Also, it is informed by the Panchayat Secretary that the land is illegally occupied by some persons and so it requires eviction.** Therefore, IIT Madras team has serious apprehensive about intervention in this Panchayat.

In Chithalapakkam Panchayat, the team visited one area (TNHB Apartments) where majority of the residences are apartment type houses. There are about 330 households spread over 9 streets. At present, Panchayat is regularly collecting the garbage and is dumping at temporary locations in the nearby area (Fig. 2). Proper land is not available in this area for constructing the compost yard. Residents association has shown one site for the construction of composting plant. **However, this site is very close to a lake and so is not suitable for compost yard construction. Also, enough space is not available and filling up of part of lake is required,** which should not be done under any circumstance. Moreover, these locations are very urbanized and the funding agency has reservations about interventions in such areas.



**Fig.2. Photographs from Field Visit to Chittalapakkam in St. Thomas Mount Block**



## 2. Sriperumbathur Block

In Sriperumbathur Block, the Panchayat Secretary showed Thirumangalam village. In this village, majority of the houses are concrete houses with the toilet facility in the house. There are about 400 households in this village. The main source of drinking water is Panchayat water supply. In this village, the Panchayat is regularly collecting garbage from the households. However, they are not doing any segregation and disposal is also a problem. At present the garbage is being dumped close to the burial ground on a temporary basis. For this village also the Panchayat is looking for suitable place. Panchayat Secretary showed one possible site. **However, this site is part of a burial ground. Also, the site has been already allotted to SIPCOT, although SIPCOT is not using the land at present.**



**Fig. 3. Photographs from Field Visit to Thirumangalam in Sriperumbathur Block**

## 3. Kundrathur Block

In this Panchayat, the IIT Madras team was taken to Manimagalam Village. In this village also, majority of the houses are concrete houses. There are about 450 households in this village. The main source of drinking water is Panchayat water supply. Panchayat is regularly collecting the garbage from the households. Panchayat Secretary has shown a possible site for construction of the composting plant.



However, this site is inside officially declared burial ground (Mayyana Porambok). Therefore, special permissions need to be obtained from the Collector to construct anything at this site.



**Fig. 4. Photographs from Field Visit to Manimangalam in Kundrathur Block**

#### **4. Kattankolathur Block**

In Kattankolathur block the Panchayat secretary showed two areas: Urapakkam and Singaperumal Koil (S.P Koil). In Urapakkam area, total number of habitations are 14. The total population in the Panchayat is 70,460. Number of commercial establishment is 10 shops. In this area, garbage is regularly collected by the Panchayat. However, one can see garbage on the roadside. In this Panchayat, the secretary showed a site in a place called Rajiv Gandhi Nagar. However, it was found that the land is **classified as “Gramma Nathom” i. e., land suitable for residential area**. IIT Madras team checked with the Tahasildar office regarding the site. They are apprehensive about construction of composting plant at this location. Also, the site is very near to the residential area and local residents are highly likely to oppose construction of compost yard here. So intervention in this area is not prudent.



**Fig. 5. Photographs from Field Visit to Urapakkam in Kattankolathur Block**

In Singaperumal Koil area, IIT Madras team was taken by the Panchayat secretary to Sathya Nagar and nearby areas located on G.S.T Road (NH). This village was chosen by the Panchayat secretary because this village is located near to the proposed site. Total number of households in this area is about 350 and additionally 50 shops are there. **The site shown by the Panchayat Secretary comes under the classification of Meichel i.e., land reserved for cattle grazing.** IIT Madras team was informed by the Tahasildar office that the land can be used only for cattle grazing and no permanent building should be constructed on that land. This land requires reclassification before allocation for construction of compost yard.







**Fig. 6. Photographs from Field Visit to Sathya Nagar in Kattankolathur Block**

### **Summary**

IIT Madras Team has visited six villages in St. Thomas Mount Block (2); Sriperambathur block (1); Kundrathur block (1) and Kattankolathur block (1). In all these villages, there appears to be some problem or the other with regard to land availability for construction.

- In Polichalur (St. Thomas Mount), the land shown by the Panchayat Secretary is close to the Adyar River and is presently under illegal occupation.
- In Chittalapakkam (St. Thomas Mount), the site shown by the Panchayat Secretary is close to a water body (lake) and is not sufficiently large.
- In Thirumangalam (Sriperambathur), the available land is within burial ground, and is already allotted to SICOT although it is left unused by SIPCOT.
- In Manimangalam (Kundrathur), site is available within the land classified as burial ground.
- In, Urapakkam (Kattankolathur), land is available close to residential area. Also, the land is designated as “Gramma Nathom” i. e., land suitable for residential area.
- In, Sathya Nagar (Kattankolathur), land is designated as Meichel i.e., land reserved for cattle grazing.

**Intervention of PD (DRDA) and the Collector of Kanchipuram is sought to resolve these problems.**



## **ANNEXURE-IV**

IIT Madras team visited Sathya Nagar and Paari Eri on 6<sup>th</sup> April 2017 along with block developmental officer (Mr. Murali) and the Panchayat Secretary (Mr. Anand) to inspect the land allocated for construction of the compost plant and also initiate the process for implementation. It was observed that a lot of garbage has been dumped by the highways department in the designated land. This needs to be cleared. It was also decided to build a low-cost compound wall at the front of the land (facing the highway) in order to secure the place and prevent future dumping. Pictures taken during the visit are presented below.



**Land for Proposed Compost Plant**





**Site Visit to Land Allocated for Compost Yard**





### **Site Visit to Sathyanagar Village**

Site visit to Sathya Nagar village has indicated that garbage is being thrown all around the place and intervention is very much required to make the village clean and healthy. It was also observed that storm water drainage is existing in the village. So a small bore system can be integrated with this for collecting the grey water and the overflow from septic tanks and subsequently treating the same. This can be taken as part of the next phase of activities.



## INAUGURATION OF THE PROJECT

An inaugural function was held in Sathya Nagar village on April 22<sup>nd</sup> 2017. The function was attended by the BDO, Panchayat Secretary, Prof. Ligy Philip, Prof. B.S. Murty, Mr. Joseph (and the other team members from IIT Madras) and officials from Technip India Private Limited. About 80 residents from the village participated in the function (Photographs are shown below). Importance of the project for cleanliness and health of the residents was stressed upon all the speakers. Villagers present in the function informed that they would extend all the cooperation for the success of the project. IIT Madras team also presented to the villagers about the importance of solid waste management and the need for segregation of the waste into biodegradable and non-biodegradable parts at the source itself. A tricycle for collection of solid waste from individual houses and subsequent transport to the compost yard was presented to the panchayat. IIT Madras team also held discussions with a few local residents from the village for the purpose of entrusting them the job of solid waste collection and operation of compost yard.



**Inauguration of the Project on April 22<sup>rd</sup> 2017**