



Annual Report for the year 2012 - 2013

Exnora Green Pammal proudly presents the annual report for the year 2012-2013, which was a vibrant year with many mind blowing activities resulting in protecting the mother earth with community participation. This year saw many new initiatives on the programme side as well as in the administration and human resources side. Many new members were added into the Green Pammal fold to carry out the activities in a more systematic manner.

In this year new projects were introduced as an offshoot of the Solid waste management programmes. Exnora Green Pammal extended its SWM projects to the corporate world starting with HCL and WABCO in the month of June 2012. Kalpakkam DAE Township project was awarded to Exnora Green Pammal on 27th December 2012. New product designs were introduced in the project Avthar upcycling products.

This document reports the activities of the following projects in detail:

- ❖ **Solid Waste Management Projects**
 - a. Pammal Municipality
 - b. Kalpakkam DAE Township
 - c. Kamarhati Municipality, Kolkata
 - d. Pepsico Projects
- ❖ **Waste to Energy projects**
 - a. Community Biogas Plant
 - b. Project Temple Green
 - c. Domestic Biogas plants
- ❖ **Waste to Wealth Projects**
 - a. Charcoal projects
 - b. Vermicompost
 - c. Plastic crushing
 - d. Project Avthar
- ❖ **Sam Foundation Projects**
 - ❖ Training Programmes
 - ❖ Exhibitions
- ❖ **Education and Awareness Programmes**
 - ❖ Awareness Generation programmes
 - ❖ Visitors to the organization
 - ❖ Volunteers and interns to the organization
 - ❖ Participation in international conferences
- ❖ **Awards**
- ❖ **Media Presence**





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About Exnora Green Pammal

Exnora Green Pammal [EGP] works in four states covering 500,000 population on a daily basis providing employment opportunities and enhanced livelihoods to more than 200 'Green Ambassadors' producing 30 tons of vermicompost per day and 50 tons of ordinary compost through windrow method manufacturing 100 upcycled products for consumer use and processing 10 tons of plastics of various categories per day and recycling resources into useful products.

Vision

EGP envision India's municipal solid waste minimized by motivated citizens preventing waste, and by exemplary decentralized recycling and composting services.

Mission

- ❖ To minimize municipal solid waste by advocating and demonstrating the 3 Rs: Reduction, Reuse and Recycling, with a strong focus on peoples' participation.
- ❖ To bring localities into compliance with the Government of India's Municipal Solid Wastes (Management and Handling) Rules, 2000.

Focus Areas

- ❖ Environment Protection
- ❖ Social Entrepreneurship
- ❖ Empowerment for the disadvantaged
- ❖ Education

Projects & Activities

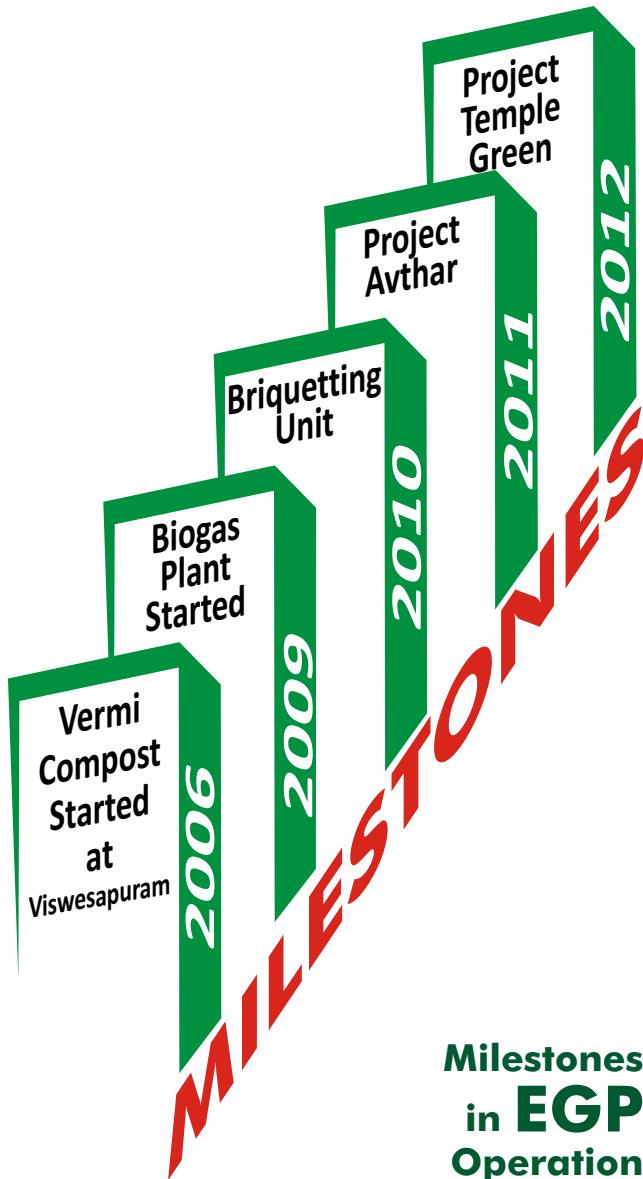
Solid Waste Management (SWM)

EGP conducts wide-ranging SWM programmes including door to door household collections, segregation at source, and resource recovery from wastes. Currently Solid Waste Management programme is successfully implemented in the following places

- ❖ Pammal Municipality, Tamilnadu
- ❖ Kalpakkam DAE Township
- ❖ Sanghareddy, Pothireddy palli AP
- ❖ Kamarhati municipality, West Bengal
- ❖ Panipat municipality, Haryana

Resource Recovery

- ❖ Vermicompost
- ❖ Briquettes
- ❖ Project Avthar upcycling projects
- ❖ Project Temple Green Biogas plants
- ❖ Plastic Recyclables



Exnora Green Pammal





Our Coverage

- ❖ Municipalities
- ❖ Corporations
- ❖ Government Organizations
- ❖ NGOs
- ❖ Institutions
- ❖ Associations
- ❖ Individuals

Accomplishments 2012 - 2013

- ❖ Average of 1000 tons of Waste Collected from Pammal Municipality per month
- ❖ Total of 268 tons of Organic waste utilised for vermicomposting process
- ❖ Total of 115 tons of Organic waste utilised for Bio methanisation process
- ❖ Three new Biogas projects tested and introduced
- ❖ Two new 2 cu.mt Bio gas plants introduced in 2 temples at Pammal
- ❖ Total of 6623 numbers of plastics carry bags each weighing 3gms are offset from land fill
- ❖ Total of 41097 numbers of plastics water pouches each weighing 2gms are offset from land fill
- ❖ More than 1000 pieces of upcycled plastic products produced
- ❖ More than 30 New product designs introduced for plastic upcycling unit
- ❖ Total of 50.6 tons of vermicompost manure produced
- ❖ Average of 30 tons of dry leaves turned into briquettes every month
- ❖ Total of 12 tons of shredded plastics supplied to Municipalities for laying plastic roads
- ❖ Six training programmes conducted for SHGs through SAM Foundation
- ❖ SAM Foundation participated in five Exhibitions on upcycling products
- ❖ One summer camp and one awareness generation programme conducted
- ❖ Many visitors visited EGP
- ❖ Two awards for Ms Mangalam for contribution to environment

Way Forward

- ❖ Capacity building programmes at various levels for Government organization
- ❖ Research on maximum recovery from waste
- ❖ Partnerships with Corporate on CSR

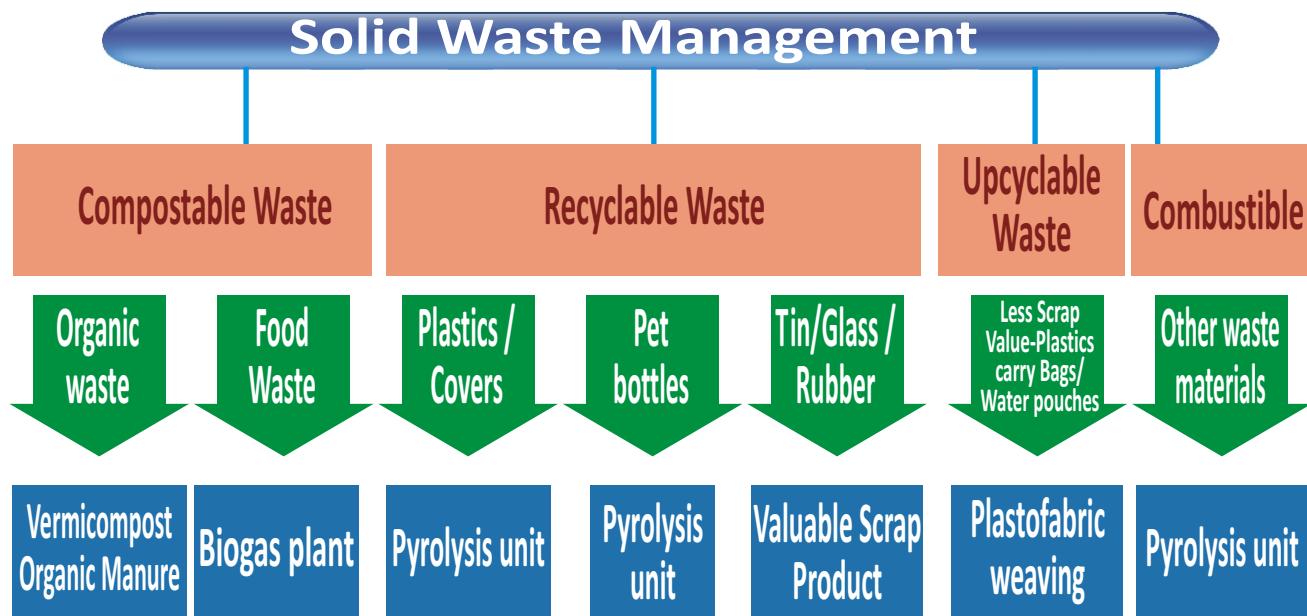




Solid Waste Management Projects

As per the World Bank, in developing countries, it is common for municipalities to spend 20-50 percent of their available recurrent budget on solid waste management. Yet, it is also common that 30-60 percent of all the urban solid waste in developing countries is uncollected and less than 50 percent of the population is served. In some cases, as much as 80 percent of the collection and transport equipment is out of service, in need of repair or maintenance. In most developing countries, open dumping with open burning is the norm.

On the contrary, EGP strongly believes in finding a positive use for each waste stream, and in demonstrating the applicable process or technology for resource recovery from the solid waste management programmes.





Resource Recovery is a new way of thinking about waste. Rather than viewing waste as something to be disposed of, EGP views waste as a resource that can continually provide value and add to the inventory of opportunities available for use by communities. Outputs from human and industrial processes are considered as inputs into other processes to enhance the natural environment. Such a system can provide economic, environmental and social benefits as outlined below:

Environmental:

- ☛ Reduction of greenhouse gas emissions;
- ☛ Provision of carbon-neutral forms of energy;
- ☛ Reduced requirements for new energy sources;
- ☛ Reduction of water pollution methane emissions from landfills; and
- ☛ Reduction of use of high quality, potable water for non-potable purposes.

Social:

- ☛ Flexible infrastructure that matches the growth of the community; and
- ☛ Provision of local, sustainable employment in new industries based on recovering resources such as biofuels from waste.

Economic:

- ☛ Production of new sources of revenue for communities to offset infrastructure cost;
- ☛ Reduction of the life-cycle cost of infrastructure to taxpayers; and reduction of costs when compared managing each waste stream individually



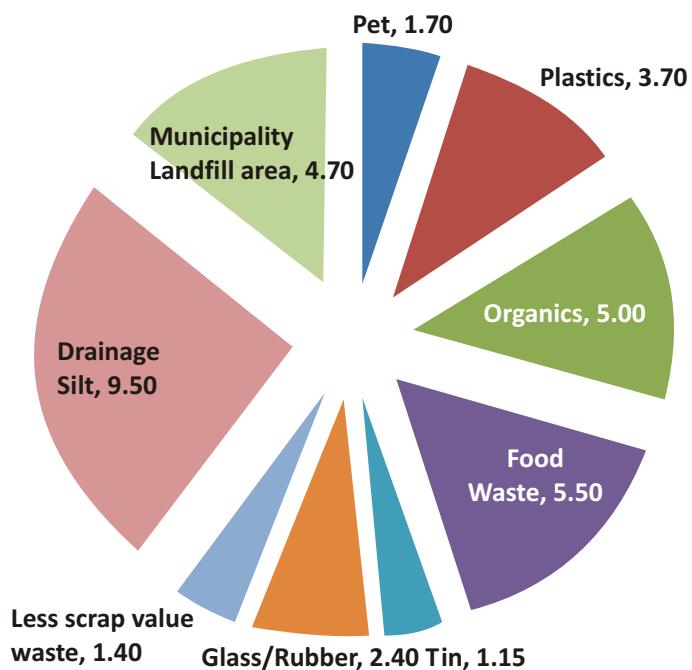
PAMMAL MUNICIPALITY

Pammal Town is a third grade municipality located at a distance of 25 km from Chennai having a population of 1,00,000 consisting of 21 wards with 18200 households, 499 commercial Buildings, 8 Office buildings, total length of storm water drains 51 km, total length of highways Road 5.4 km, Total No. of Municipal streets 111 km Total garbage generation 35 MT/day. The scope of work given to EGP was to manage solid waste in 16 wards (ward No. 1,2,3,4,5,6,12,13,14,15,16,17,18,19,21) by doing primary collection, door to door collection, segregation, secondary collection, drain cleaning, and disposal to compost yard.

The Solid Waste Management programme at Pammal in 16 wards is carried out by Exnora Green Pammal for the past 15 years employing 5 supervisors and 100 workers [Green Ambassadors]

EGP has deployed 10 trucks and 2 mini trucks for the secondary transportation of garbage from the wards to the compost and dump yards at Vishweshapuram.

The workers and green ambassadors are all drawn from the same localities, who were previously engaged in illicit liquor brewing and from leprosy rehabilitation settlements. The workers are part of the SHG federation and they are employed as federation workers. The workers are given the dignity of labour and paid a monthly remuneration.



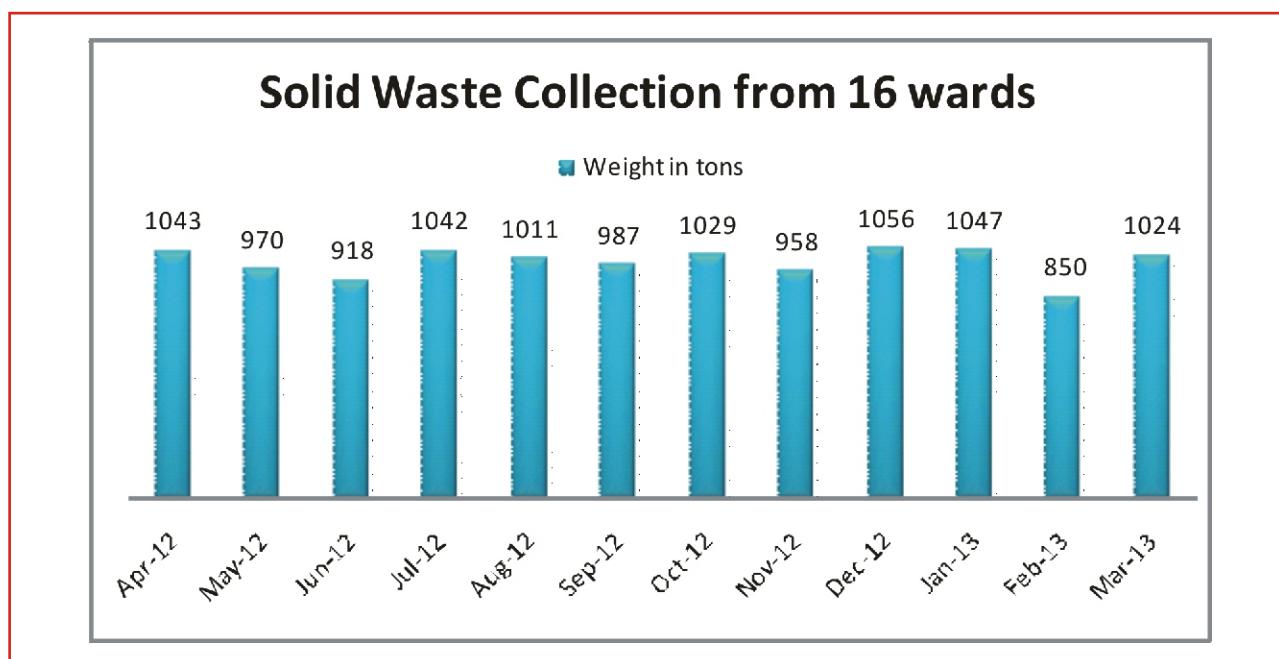
| Waste Segregation at Pammal Municipality | |
|--|-------|
| Type of waste | Tons |
| Pet | 1.70 |
| Plastics | 3.70 |
| Organic | 5.00 |
| Food waste | 5.50 |
| Tin | 1.15 |
| Glass/Rubber | 2.40 |
| Less scrap value waste | 1.40 |
| Drainage Silt | 9.50 |
| Municipality landfill area | 4.70 |
| Total | 35.05 |



Municipal Solid Waste collection data April 2012 to March 2013

| Month | Municipal Solid waste collected [in tons] |
|--------|---|
| Apr-12 | 1042.68 |
| May-12 | 970.24 |
| Jun-12 | 918.362 |
| Jul-12 | 1042.09 |
| Aug-12 | 1010.58 |
| Sep-12 | 986.78 |
| Oct-12 | 1028.87 |
| Nov-12 | 958.41 |
| Dec-12 | 1056 |
| Jan-13 | 1046.95 |
| Feb-13 | 850 |
| Mar-13 | 1024 |

From the Pammal municipality solid waste management programme a total of 11, 934 tons of waste was collected in the year April 2012 to March 2013 from the designated wards and segregated for resource recovery. The month wise garbage collection data for the period April 2012 to March 2013 is furnished above in table format and in chart format below:



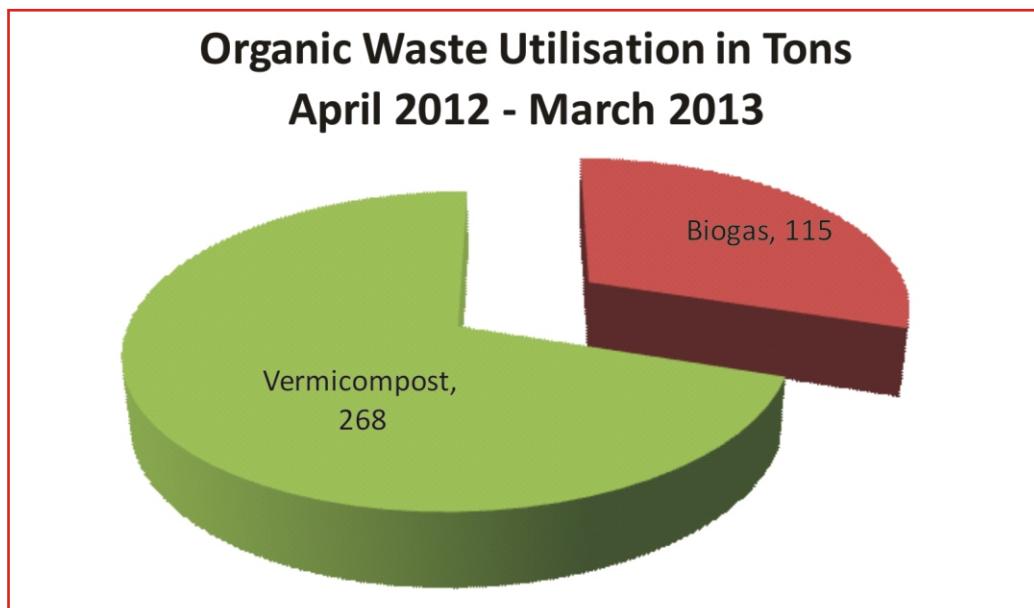
An average of 1000 tons was collected from the solid waste management programmes from Pammal municipality per month. The garbage was collected as segregated waste and roughly about 20% was organic waste and another 20% amounts to food waste, other inorganic and recyclable waste amount to 18% of the total waste generated and combustible waste which is the mixed waste constitute 42% of the waste generated.



Segregation of solid waste

Municipal solid waste was segregated into organic waste, recyclable waste and inorganic waste. The organic waste thus segregated and collected from the municipal solid waste is utilized partly for feeding the biogas plant and partly for the vermicomposting processing shed.

A total of 383.40 tons of organic waste was segregated from the municipal solid waste of which about 115.002 tons was utilized for Biogas production and about 268.659 tons was utilized for vermicomposting process.



Organic waste for manure production

| Organic waste used for Vermicompost manure | |
|--|----------------------------------|
| April 2012 to March 2013 | |
| Month | Organic Waste input [in tonnage] |
| Apr-12 | 11.011 |
| May-12 | 17.99 |
| Jun-12 | 21.798 |
| Jul-12 | 20.762 |
| Aug-12 | 24.71 |
| Sep-12 | 20.013 |
| Oct-12 | 22.399 |
| Nov-12 | 21.399 |
| Dec-12 | 20.65 |
| Jan-13 | 27.881 |
| Feb-13 | 29.33 |
| Mar-13 | 30.716 |
| Total | 268.659 |



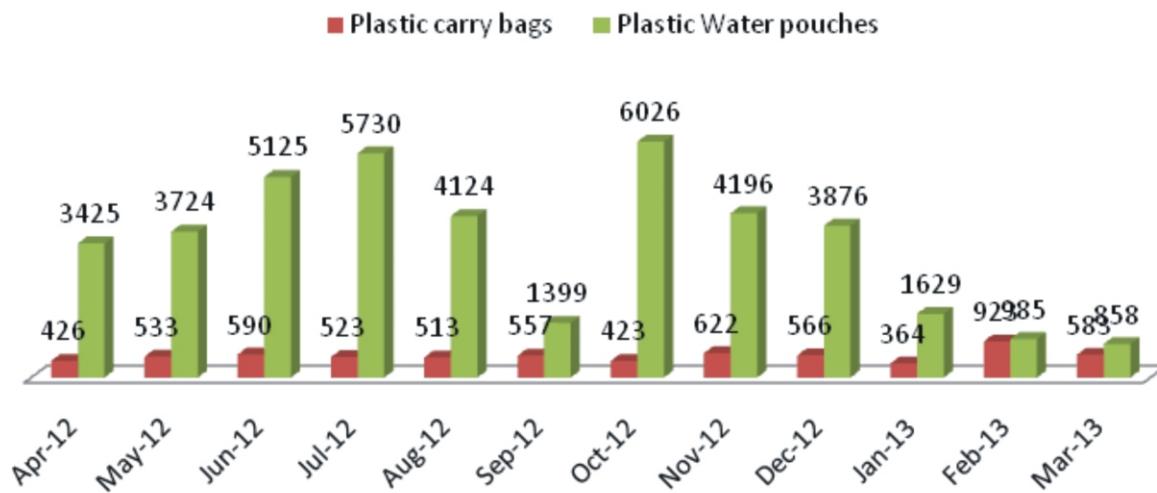
Segregation and utilisation of plastic waste

From the Municipal Solid waste, a total of 6623 plastic carry bags and 41097 plastic water pouches was segregated and utilized for the plastic upcycling project -Project Avthar. Through this upcycling process, a total of 47,720 numbers of plastics carry bags and water pouches have been offset from landing into the landfill and the danger of so many plastics hindering the rainwater reaching the water bodies has been averted.

| Plastic carry bags/ water pouches offset from soil | | |
|--|--------------------|-----------------------|
| Month | Plastic carry bags | Plastic Water pouches |
| Apr-12 | 426 | 3425 |
| May-12 | 533 | 3724 |
| Jun-12 | 590 | 5125 |
| Jul-12 | 523 | 5730 |
| Aug-12 | 513 | 4124 |
| Sep-12 | 557 | 1399 |
| Oct-12 | 423 | 6026 |
| Nov-12 | 622 | 4196 |
| Dec-12 | 566 | 3876 |
| Jan-13 | 364 | 1629 |
| Feb-13 | 923 | 985 |
| Mar-13 | 583 | 858 |
| Total | 6623 | 41097 |

The number of plastic carry bags and water pouches used for plastic upcycling process has been represented through the chart below:

Number of Plastic carry bags and Water pouches





KALPAKKAM DAE TOWNSHIP

Exnora Green Pammal started the solid waste management programme at DAE Township from December 27th 2012. Exnora Green Pammal has undertaken door to door collection of solid waste as well as open area cleaning in the kalmakkam, Anupuram and Bhavini townships.

There are 5500 households which generates 100 - 225 gms [on an average] of kitchen waste (depending on the house hold consumption) which works out to around 0.6 tons to 1.5 tons per day. The open area in all the three townships generates around 5 - 6 tons of dry leaves in a day.



Since its operation from 27th Dec 2012, EGP has transported approximately 1 ton of segregated organic kitchen waste everyday to the compost shed and has produced a yield of approximately 5 tons of rich soil nutrient vermicompost in 3 months time, till 31st March 2013, through the vermicomposting technology.

Source segregation has been EGP's primary focus in solid waste management programme at kalpakkam and the green ambassadors have been provided with colour coded bins for collecting waste and segregating it in their carts. Green bins are used to segregate organic waste, blue bins for non-biodegradable and orange bins for combustible waste. Each household in the township has been provided with colour coded bins- green and blue bins for segregating the waste at the household level itself.

There are altogether 40 green ambassadors who are doing door to door collection at the kalpakkam and Anupuram township. Each ambassador collects about 25 kgs organic waste from the door to door collection. Apart from this another 60 green ambassadors do the open area cleaning work.

EGP insists on segregation of organic waste at source. The implementation of the vermicomposting at DAE township has been made possible because of the segregation of organic waste at the source from the households and at the primary transportation level.

Solid Waste Management Projects



From the kalpakkam and Anupuram townships, a total of 1000 kgs [1 ton] of organic waste is segregated and transported to the vermicompost shed at Kalpakkam sewage plant everyday. Exnora Green Pammal has adopted windrow method for pre curing the open area dry leaves waste and the segregated organic kitchen wastes are decomposed using vermicompost method.



The organic waste collected from the Kalpakkam and Anupuram Township is then transported to the vermicompost shed at kalpakkam Sewage plant. Kalpakkam Town ship has 16 compost bins with a compost holding capacity of 1 ton per bin. The vermicompost shed at Anupuram Township has been rejuvenated now, which also has a capacity of 16 compost bins. Two workers are employed at each of the vermicompost sheds in Kalpakkam and Anupuram townships.





KAMARHATI MUNICIPALITY, KOLKATA

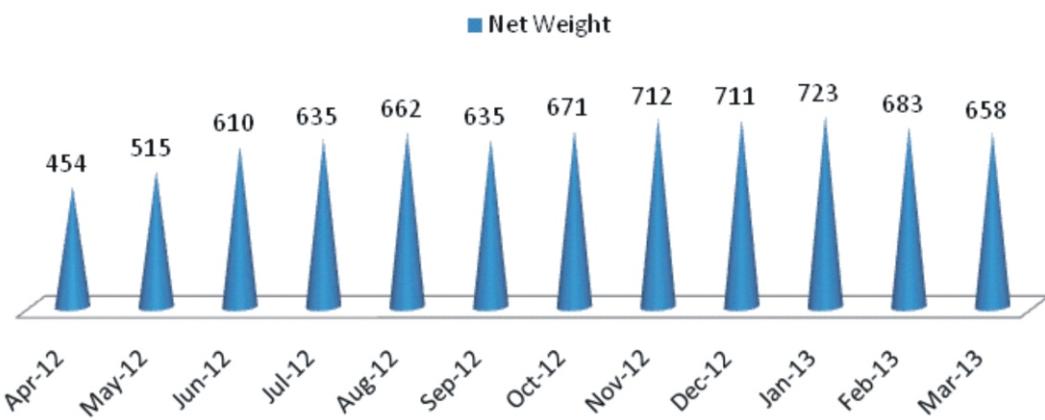
Exnora Green Pammal and Biovision Agro Pvt Ltd jointly implements solid waste management programme in 19 wards in Kamarhati municipality, Kolkata. Door to door household collection of waste, segregation at source and resource recovery from wastes are the works carried out in the 36585 households in the municipality.

Organic waste and inorganic waste are collected by the green ambassadors in green colour and blue colour bins separately on a daily basis. The segregated wastes are transported to the collection points using tricycles by the Green Ambassadors. All the green ambassadors are provided with tricycles. The organic materials are put in the green side of the vat and the mixed wastes from the blue bins are put in blue side of the vats. The mixed waste and inerts are dumped into the yard, whereas the organic waste and recyclable waste are segregated further to recover maximum resources from it.

The unique feature of this programme is that there is minimum handling of waste by workers, the residents give the waste materials in a segregated manner and vats are used to transport the segregated waste in the segregated form. The organic waste are further segregated and composted using vermicompost method.

In the year 2012-13, the organization has lifted an average of 600 tons per month of garbage everymonth and it has produced an average of 14,000 kgs of vermicompost per month.

Waste Collected from 19 wards in Kamarhati Municipality in Tons



The chart shows the amount of waste collected from 19 wards in Kamarhati municipality, Kolkata in tonnage.





BVA has a large scale vermicomposting unit having 60 vermi pits at the shed each one of capacity 10 tons. At present the vermicomposting process is in operation in 30 vermi pits where organic waste such as leaves, kitchen waste and food waste are composted by the introduction of worms.

The municipality has installed a huge electrically operated sieving machine for sieving the vermicompost. Recycling items are also segregated and sent for recycling units and waste is converted into wealth. The organic manure is sold in the name of "Biogreen" as 25 kg pack to farmers and horticulturist.



Vermicompost Manure Production in kgs



From the organic collected from the wards an average of 14,000 kgs of vermicompost is produced every month.



PEPSICO Projects - Panipat, Sanghareddy and Pothireddypalli

PepsiCo's 'waste-to-wealth' waste management model is a unique, employment and income generating four-way partnership model, where PepsiCo partners with the NGO Exnora Green Pammal (EGP), the local municipality and the community

PepsiCo's Waste to Wealth programme operates with sustainable solid waste management system as the goal and having the criteria of pooling the efforts of the stakeholders involved in it such as the local NGO, the municipality and the community partnership in bringing about economically viable, environmentally feasible and socially acceptable waste management programmes.

The partner initialisation started when Exnora International published a press release in the year 2004 inviting corporates to participate in the Waste management programme as part of their CSR activity. As response to the call, Pepsico volunteered to take up the waste management programme as their CSR initiative and visited many MSW programmes in Tamilnadu. Seeing the quantum of activities and resource recovery done at Pammal, Pepsico engaged Exnora Green Pammal in the partnership initiative.

It was the year when Tsunami struck Tamilnadu that PepsiCo as a corporate response and with the partnership of Exnora Green Pammal, wanted to extend support for Tsunami victims in the most affected areas. Sustainability was the key and PepsiCo's initiative was focused on creating replicable, community models that provides clean and healthier environment and improved quality of life to the victims. Priority was given to the most affected areas of Nagapattinam, Cuddalore and Tenkasi in implementing the Solid Waste Management Programmes in partnership with the local municipality and community participation. The successful implementation of the projects reached out to 121,500 people in these three areas. PepsiCo encouraged the replication of these projects in parts of Chennai such as Mangadu, Madambakkam, Adyar poonga, Pallikaranai through which 170,000 people were benefitted.

By the year 2008, PepsiCo was in the scaling up mode and wanted to replicate this sustainability Solid Waste management model in other places of the country, where they had plants. In recognition of the successful implementation of the three projects in Tamilnadu, PepsiCo invited and engaged Exnora Green Pammal to start similar SWM projects in places under the coverage area of their plants. Thus started were the initiatives in Panipet in Haryana and Sangareddy and Pothireddypalli in Andhra Pradesh, which reached out to over 173,500 people.

| Location | Reach achieved as on Dec 2012 | Sustainable projects handed over to local bodies | On going projects |
|--|-------------------------------|--|-------------------|
| Pammal | 105000 | | 105000 |
| Chennai [Pallikaranai, Mangadu, Madambakkam] | 65000 | 65000 | |
| Panipat | 100000 | | 115000 |
| Sangareddy | 58500 | | 58500 |
| Pothireddipally | 15000 | | 15000 |
| Nagapattinam | 50000 | 50000 | |
| Tenkasi | 25000 | 25000 | |
| Cuddalore | 46500 | 46500 | |
| Total | 465000 | 186500 | 293500 |



PepsiCo's initiatives reached out to over an aggregated population of 465,000 people across Pammal, Sangareddy including Pothireddypalli, Panipat, and Mangadu, Pallikaranai, Tenkasi, Nagapatinam and Cuddalore by the end of year 2012.

Imbibing PepsiCo's sustainability motto, Exnora Green Pammal effectively transferred the knowledge and the strategies of Waste management programme and empowered the local panchayats in Pallikaranai, Mangadu, Madambakkam, Tenkasi, Nagapattinam and Cuddalore areas to take over the activities. The efforts put in for the sustenance of the programme became fruitful as, at present the local bodies in these areas are fully equipped to continue on their own.

Exnora Green Pammal (EGP) has sustained the initiatives taken in Pammal, Panipet, Sangareddy and Pothireddy palli with continuous performance delivery for the purpose of providing clean and healthier environment for 293,500 people concerned in these areas. Through quarterly reports and yearly review meeting, the progress of the programme is evaluated.

EXNORA PANIPAT NAVANIRMAN SAMITI, PANIPAT

Exnora Green Pammal in partnership with Exnora Panipat Navanirman Samiti, Panipat with the support of PEPSICO and the Panipat Municipality implements solid waste management programmes in 15,000 households. The unique of this programme is that the programme is supported by community's participation in the form of user payment and PEPSICO funding. The samiti members are very vibrant and each one of them exhibit high level of ownership of the programme. The programme is operated with 7 supervisors and about 60 workers who do door to door collection and street cleaning activities

Republic Day Tableau - January 26th 2013

EPNS participated in the Republic day parade programme at Panipat and a tableau was floated during the parade. Like last year, EPNS tableau received the best tableau award during the Republic Day Programme.





DC Welcoming Meeting

The Samiti members met the new DC on courtesy basis when Sri. Mona Nivas was appointed as the new DC for Panipat Municipality on the 17th May 2012 and a welcoming programme was arranged for her on the 27th May 2012 at Model Town, in a programme where 100 local people attended the programme.



Awareness programme 5th June 2012 World Environment Day

On the 5th June 2012, the World Environment Day was observed by EPNS and an awareness programme on Solid waste management was conducted at a new place at Jagannath Vihar, where there are 300-350 households in the old housing board colony. Soon solid waste management programmes will be started in this place.



Vermicomposting Activities

The vermicompost shed has about 30 vermicomposting pits and the organic waste collected from the households are segregated and composted in the shed using vermicompost method. Around 50-75 kgs of vermicompost is harvested everyday.





WASTE TO ENERGY PROJECTS

Waste-to-energy (WtE) or energy-from-waste (EfW) is the process of creating energy in the form of electricity or heat from the incineration of waste. WtE is a form of energy recovery. Most WtE processes produce electricity directly through combustion, or produce a combustible fuel commodity, such as methane, methanol, ethanol or synthetic fuels.

Community Biogas Plants

A considerable amount of food gets wasted in the restaurants. Once this food gets to the landfill, it then generates methane, a greenhouse gas 23 times as potent as carbon dioxide in trapping heat within our atmosphere.

EGP uses bio-methanisation technology to provide solution to this problem and effectively use the waste to produce electricity to illuminate street lights and to produce cooking gas through a model biogas plant at Pammal, Chennai, which has a capacity of producing 25 Cub.mt and electricity output of 5 kVa per day.

The unique feature of this biogas plant is listed as follows:

1. Uses Food waste as input material
 - a. Food waste from canteens at corporate houses
 - b. Food waste from Restaurants in pammal municipality
2. Provides cooking gas for households
3. Provides electricity illuminating 75 bulbs in 3 streets at sankar nagar, Pammal municipality

As part of the Corporate Social Responsibility [CSR], Wabco and HCL facility at Ambattur and Sholinganallur provide their food waste as feed for the biogas plant.

| Biogas Power Plant | | |
|---------------------|------------|------------------------------|
| Engine & Input Data | | |
| Month | Food waste | Unit of Electricity produced |
| Apr-12 | 2491 | 6229 |
| May-12 | 2240 | 5898 |
| Jun-12 | 7843 | 7813 |
| Jul-12 | 7659 | 7799 |
| Aug-12 | 6509 | 7522 |
| Sep-12 | 7979 | 8309 |
| Oct-12 | 9041 | 8529 |
| Nov-12 | 12584 | 7780 |
| Dec-12 | 8851 | 7953 |
| Jan-13 | 6073 | 7873 |
| Feb-13 | 7529 | 8072 |
| Mar-13 | 6435 | 8109 |
| Total | 85234 | 91886 |



The chart below shows the amount of food waste fed into bio gas plant every month and the electricity production in units per month. An average of 7,000 kg of food waste used for feeding the bio gas plant every month and as a result of it, an average of 8,000 units of electricity was produced every month. The food wastes are collected from HCL, WABCO facilities from Ambattur and Sholinganallur.

It means that 7000 kgs food waste was offset from landfill area and converted to electricity to provide lighting facility for Shankarnagar area in Pammal every month. Through this a savings of Rs.2000 has been achieved every month.

Engine Power Generation and Food Waste

Input Data in kgs





NEW BIOGAS PROJECTS

EGP is continuously introducing many new projects through research and development using new techniques to suit the requirements of the users as well as to compliment the environmental protection. Since two years EGP has done extensive research on smaller and portable bio gas plants for individual and household requirements. The research has been successful and bio gas plants has been developed using FRP Structures.

New Biogas Projects

Domestic Biogas Plants

EGP wants to popularize the effective use of food waste generated at restaurants and hotels and places where there is generation of considerable food waste and to introduce the zeroing of food waste in their own premises. EGP has fabricated floating type domestic biogas plants using FRP structures of different capacities starting from 2kg capacity of food waste.

EGP has successfully installed one plant in a physically challenged children's home at kolathur, two plants for canteens one at Aminjikarai and two other plants for domestic use. All the plants are working effectively with maintenance consultation given by EGP.



At present there are two types of domestic plants available with EGP one is the floating type biogas plants and the other is the static type FRP domestic plant. EGP is currently experimenting with a horizontal digester, which EGP is hopeful to introduce in the market soon.





Temple Green Project

EGP introduced a new concept called the Temple Green Project, where the waste from the temples such as flowers, milk, prasadham, fruits and cow dungs are used to produce biogas for preparing prasadhams in the temple premises itself. Through this project many corporate houses and social action groups like Rotary international are encouraged to sponsor for the temples as part of their Corporate Social Responsibility programmes. Two successful temple projects have been completed and running well



Inauguration of Biogas Plants at Arkeeswarar Temple

On 15th December 2012, the inaugural function of the Temple Green Biogas Plant was conducted at the Arulmigu Aarkeswarar and Suriamman Temple at Pammal, which was sponsored by Ms Manjula, President, Inner Wheel Club of Chennai Gemini with the support of Thiru. Anandha Mudaliar and Brothers, Honorary Trustee, Arulmigu Aarkeswarar and Suriamman Temple, the plant marketed by Sam Foundation for Eco Friendly Environment and maintained by Exnora Green Pammal.

The inaugural function was arranged by the Inner Wheel Club of Chennai Gemini with the support from Exnora Green Pammal. Swamiji Sadachara Das Sharma of Hare Krishna Movement cut the ribbon and inaugurated the biogas plant, with Ms. Vasumathi Marimuthu, District chairman of Inner Wheel District 323 lighting the biogas stove and the traditional boiling of milk.

Earlier the function started with the Thamizhthai vazhthu and the traditional lighting of kuthuvilaku and it was well attended by Ms. Mangalam Balasubramanian, Chairman, Exnora Green Pammal, the Chairman of Pammal Municipality, Mr. C.V. Elangovan, Mr. Vinayam (4th ward councilor) and Mr. Thanigaivelu, Trustees of Aarkeswarar and Suriamman Temple and Guruvayurappan Temple Trustee. Earlier in the day, Ms. Lakshmi, Regional Director of Municipal Administration for Chengalpet Region visited the Biogas plant along with her commissioners and engineers.

Through her association with Ms. Mangalam Balasubramanian, Ms. Manjula came to know about the Temple Green project and having witnessed the successful operation of project implemented in other temples, liked to adopt and implement the project Temple green. Thus the project was implemented at the temple and many more such projects in the long run.





Waste to Wealth Projects

Waste to wealth projects are projects which can generate revenue through upcycling, recycling and recovery of resources and it provides livelihood opportunities for many besides reducing the burden of end up in the landfill.

Waste to Wealth Projects

Briquettes making Project at Pammal

The coconut leaves from the wards are used for making briquettes, which are used for industrial boilers. The briquettes prepared. Charcoal is the blackish residue consisting of impure carbon obtained by removing water and other volatile constituents from animal and vegetation substances. Charcoal is usually produced by slow pyrolysis, the heating of wood, bone char, or other agricultural substances in the absence of oxygen environment.

Charcoal briquettes

1. Long cooking time
2. High-end product
3. High calorific value
4. Consistent quality
5. Very long burn
6. Made with natural components



An average of 30 tons of dry leaves are collected from Pammal municipal solid waste management programme every month and using the briquetting technology an average of one ton of briquettes was produced every month during the period 2012-13. It was sold to tea shops and ironing shops for Rs.20 per kg.



Vermicompost Production at Pammal

Vermicompost is rich in NKP (nitrogen 2-3%, potassium 1.85-2.25% and phosphorus 1.55-2.25%), micronutrients, beneficial soil microbes and also contain 'plant growth hormones & enzymes'. It is scientifically proving as 'miracle growth promoter & also plant protector' from pests and diseases. Vermicompost retains nutrients for long time and while the conventional compost fails to deliver the required amount of macro and micronutrients including the vital NKP to plants in shorter time, the vermicompost does.

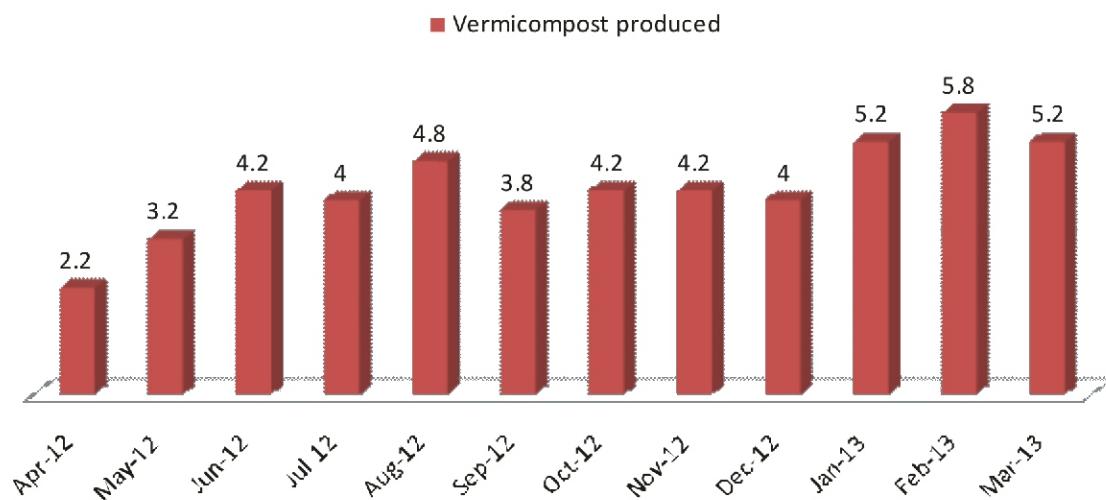
The segregated organic waste from the solid waste management programme is brought to the compost yard and using vermins the waste is composted and made into rich organic manure suitable for agriculture as well as horticulture.

The vermicompost thus prepared is packaged in the name of ExOrCo Excellent Organic Compost and sold @ Rs.15 per kg. During the period April 2012 to March 2013, Pammal facility has produced 50.6 tons of vermicompost

Vermicompost manure April 2012 to March 2013

| Month | Vermicompost produced (tons) |
|--------------|------------------------------|
| Apr-12 | 2.2 |
| May-12 | 3.2 |
| Jun-12 | 4.2 |
| Jul-12 | 4 |
| Aug-12 | 4.8 |
| Sep-12 | 3.8 |
| Oct-12 | 4.2 |
| Nov-12 | 4.2 |
| Dec-12 | 4 |
| Jan-13 | 5.2 |
| Feb-13 | 5.8 |
| Mar-13 | 5.2 |
| Total | 50.6 |

Vermicompost produced in Tons





Vermicompost Production at Kalpakkam

| Household collection of waste average Days of collection | 600 kgs per day of organic waste [1 st day] | Reduction of volume by 50% on the 10 th day | Maintaining optimum temperature for 7 days | Output at the end of 35 days only vermicompost |
|--|--|--|--|--|
| Till 31 st March 2013 3 months time | 54000 kgs | 27000 kgs | 18000 kgs | 5400 kgs for 3 months |

Since 27th December 2012 to 31st March 2013, the 54 tons of kitchen waste collected through door to door collection and segregation method has yielded 5.4 tons of vermicompost, a very good nutrient for plant growth. The residue and the left over materials are used as inoculums to hasten the composting process in dry leaves composting as a pre curing process.

Dry Leaves Manure Production Table

| Open area collection of waste average Days of collection | 5000 kgs per day of dry leaves [1 st day] | Reduction of volume by 50% on the 10th day |
|--|--|--|
| Till 31 st March 2013 3 months time | 450000 kgs | 225000 kgs |

The dry leaves collected from the open area cleaning amounts to 450 tons in 3 months and through the windrow method, pre curing of the dry leaves happens and as reduced organic manure, the yield is about 225 tons in 3 months time. The humus is used as a good source of manure for horticulture crops.





Plastic crushing unit at Pammal

Segregation of waste is practiced in EGP right from the source of collection. The pet bottles are segregated and collected from the solid waste management programme and they are crushed using a plastic crusher and sent to pyrolysis unit for further process.

The thin plastic covers are not recyclable and the only ways of disposing them are incineration or landfilling. One of the best uses of plastic waste is to use it alternatively for something or along with something by recycling or upcycling.

Plastic Roads have been tried and tested and have proved to be an eco friendly, efficient way of road construction. Many municipalities have tried this out and EGP has supplied the shredded plastic covers for this purpose. The thin plastic covers collected from the SWM programmes are shredded using a plastic shredding machine and then mixed into bitumen to create a strong bond. This plastic is melted, not burned and therefore there is gaseous residue. It is completely eco-friendly. The other advantages include:

- Longevity: upto 3 times that of the current methods of road construction
- No cracking or potholes
- Resistance to water
- Reduced cost of maintenance
- Reduced stress on bitumen which is not an unlimited resource either.

We have supplied shredded plastic covers to the following municipalities:

- Arakonam municipality 250 kg
- Pallavaram municipality 2.5 tons
- Maraimalainagar municipality 2 tons
- Avadi municipality 1 ton
- Pammal municipality 5 tons





Project Avthar Upcycling Product

Upcycling is the process of converting waste materials or useless products into new materials or products of better quality or for better environmental value. Water pouches and plastic carry bags find their usefulness by using the upcycling process. The waste plastic pouches and carry bags that are collected from the solid waste management programmes are washed, cleaned and made into plastic thin sheets and fed into handlooms to make useful products. By this process, the waste plastic that would otherwise go to the landfills and clog to prevent water from entering the soil is averted.

Thanks to this process, it gives employment opportunities to the underprivileged as well as helps in reviving the handloom industry.

A range of wide variety of products are made using this technology for office, personal and household utilities and it uses minimal or no power to create a product.

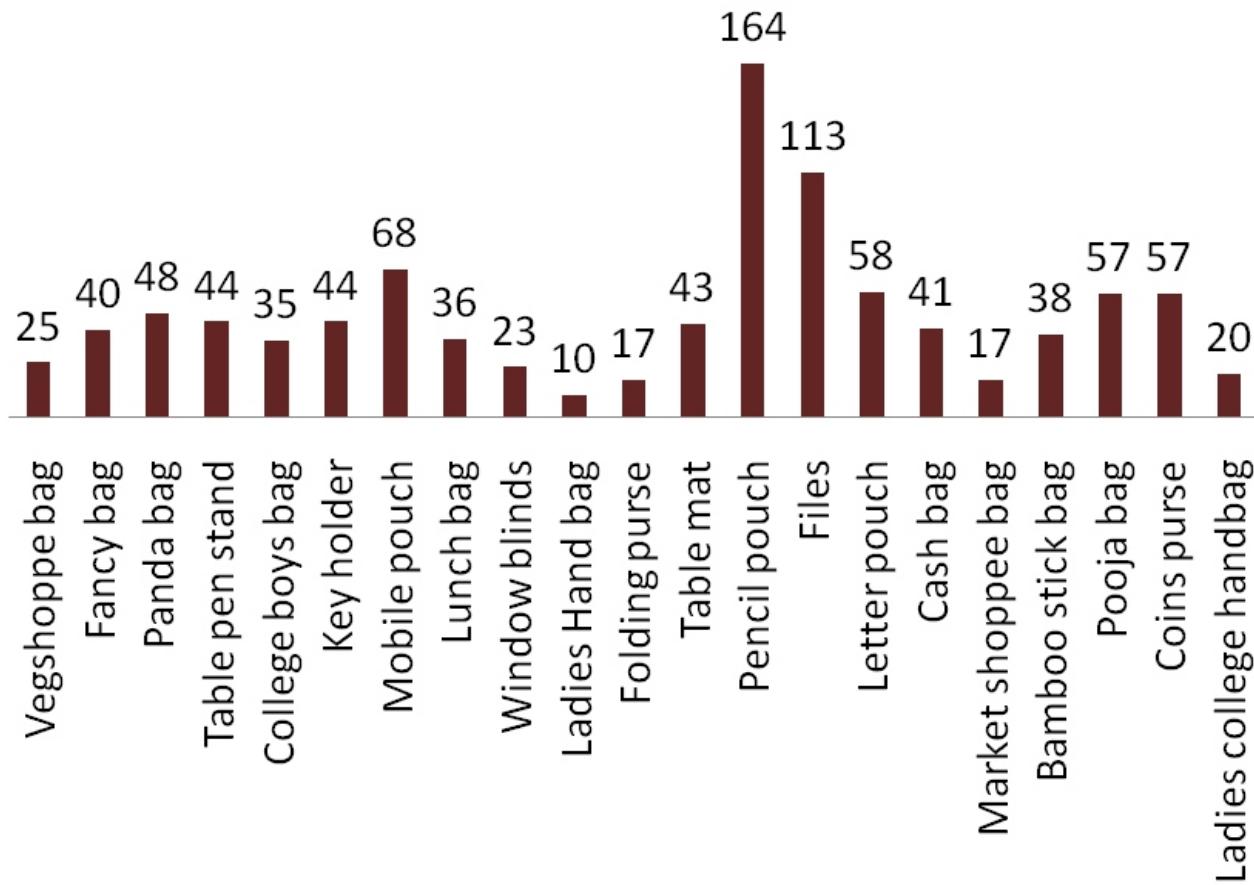
EGP does not want to introduce this product as yet another product in the market, but wants the customer or the buyer to understand the significance of the product and how the customer is contributing to the environment by purchasing such a product. Hence EGP has not launched this product as a commercial one, but has introduced it through word of mouth and through exhibitions and road shows.





Avthar Products Production Table

April 2012 to March 2013



Waste to Wealth Projects



SAM FOUNDATION for Eco Friendly Environment

SAM Foundation for Eco Friendly Environment is a section 25 company has been promoted by Exnora Green Pammal, a not-for profit organization working in Solid waste Management to impart knowledge on the methods, procedures and techniques of waste management, waste disposal, and pollution control and maintain clean and healthy environment.

The Foundation has been established to provide technical know-how, render consultancy services and prepare overall project plans/studies for government bodies, companies, corporations, corporate houses with special reference to waste disposal and to impart training to personnel from the above fields.

TRAINING PROGRAMMES

SRM University Potheri 7th April 2012

Students of school of nursing from SRM university from Potheri visited EGP and the students were given an introduction to waste, details of resource recovery and Vermicomposting methods.

Guduvancheri Municipality April 2012

Around 10 workers of the municipality were trained on segregation of garbage of their municipal waste and were sensitized about the probable resource recovery and the recyclable properties of some waste materials.

Tambaran Municipality June 2012

Training on plastic crushing was given to 250 SHG members representing 25 SHG groups and also more than 12 Sanitary inspectors and mastry from the surrounding municipalities were given training on plastic carry bags shredding. The machinery was in place and they were trained on operating the machinery as well as how to segregate the plastic waste of crushable quality.

Briquettes and Aricanut plate training August 2012

Around 25 SHG members from Gowl Bazar area were trained on briquettes making and Aricanut plate making. The SHG members were given details on sourcing and processing of the coconut leaves from the solid waste as well as on making Aricanut plates

Recycling of waste materials August 2012

Training on recycling of waste materials was given to students of Sri Ram School of Thiruneermalai on making useful products from plastic waste and on segregation techniques in the month of August 2012.



Training on Mushroom Cultivation

MCRC and Sam Foundation jointly conducted training programmes on mushroom cultivation, briquetting and Recycled paper for SHG women in pammal area on the 11th and 12th December 2012.

At the model biogas plant, a mushroom cultivation shed was constructed. Around 7 SHG women from the pammal area attended the training programme and got trained in this skill as a livelihood option programme. Ms. Shivasankari of MCRC trained the SHG women. The mushroom seeds put in the shed started to grow and gave a yield of approximately four kilos



Recycled paper Training - 11th and 12th December 2012

At Exnora Green Pammal office, the training session for Recycled paper was conducted for 8 SHG women from the pammal municipality area. The different process involved in preparing the recycled paper was demonstrated and the women also participated and did it by themselves. The trainers encouraged them to do the different process and get hands on experience in it.



Briquettes making - 13th and 14th December 2012

At Natham-Kariacheri Village, near kalpakkam, a training session for briquettes making was conducted for 35 and 40 SHG women from the natham-kariacheri village for 2 days on the 13th and 14th Dec 2012. The training was given by Mr. Ravichandran from MCRC. The facilities were provided by Sam Foundation for Eco Friendly Environment.

Pozhichalur Municipality 28th December 2012

Around 15 SHG members from Pozhichalur municipality were given training on Vermicomposting techniques



EXHIBITIONS

E-bay exhibition on 8th October 2012

On the invitation of Mr. Karthic Srinivas of Give Team of E-bay Paypal pvt ltd, Exnora Green Pammal conducted an exhibition cum sale at their office premises on 8th October 2012 on plastic upcycling products

Around 50 different items were kept for display and around 50 people visited the stall. The visitors to the stall showed great interest in the product and were told about the importance of the product and how it offsets plastic waste getting into the soil. Impressed on the green value, some of them placed orders for the product.



EAT Festival at Elliots Beach from 12th to 14th October 2012

On the invitation of Rotary Club, Exnora Green Pammal participated at the EAT festival conducted by Rotary from the 12th to 14th October 2012.

Exnora Green Pammal shared a stall space along with Go Green and displayed the Biogas domestic plant all the three days of the Festival.

The staff of Exnora Green Pammal explained about the Biogas plant and the details of its installation and use to the visitors. Many visitors visited the stall and about 32 visitors recorded their visit and their interest in knowing more about biogas.





Exhibition cum sale at Virtusa, DLF building, Porur

On the 14th December 2012 there was a Conference arranged at Virtusa with Exnora Green Pammal, EAI by Virtusa India team and Sri Lanka team and an exhibition of the Projects of Exnora Green Pammal such as Temple Green project, the project Avtar and the TREE courses.

The message on upcycling of plastic waste was conveyed through the products on display as to the harmfulness of littering plastic bags in the street and why the pilferages to the landfills and water bodies should be arrested and how these up cycled products are effective in the bigger context was shared and demonstrated to the employees of Virtusa. The response of the Virtusa's employee was so positive that the sales of the products were very good and there had been some placement of orders as well.

Exhibition at Great lakes Institute of Management 9th February 2013

Great lakes institute of management, Kalpakkam invited EGP to their first Karma Yoga Annual Convention, held on the 9th of February 2013 (Saturday). It was an all-inclusive platform that brought together farmers, businessmen, self-help groups, non-governmental organizations, students, local Panchayat leaders and every stake-holder relevant in the rural development scheme together under one roof. The programme was conducted with the festive air of a carnival, where EGP exhibited its products for exhibition cum sales cum awareness generation among the college students, villagers and farmers in the locality to know about the importance of recycling plastic waste. Some of the Vermicompost packets were also kept for sale at the stall.



L&T exhibition 2nd March 2013

March 2nd was observed as Green Day at the L&T Campus to commemorate the 5th anniversary of L&T Project Greenhands. The EHS and CSR team in association with ECC Recreation Club presented a one day fun-filled meaningful program for school students as a part of National Safety Day (March 4) celebration. Through Maanavasenai Trust, EGP got the opportunity to participate and exhibit our products in the programme.





AWAWARENESS GENERATION PROGRAMMES

In May 2012, Exnora Green Pammal organized a community awareness programme on the importance of source segregation, converting kitchen waste into manure through composting and segregating paper and plastic waste that can be recycled.

It initially started with awareness campaign on the concept through Street Play followed by door to door field work and distribution of 'Green Bag' in each house for the segregation of dry waste in the bag which will be recycled as useful products.



C.V. Elangovan, Pammal Municipality Chairman, handing over covers to residents for segregating recyclable waste.



Street play at Pammal on Waste Segregation

Exnora Green Pammal deployed a resource team based in Tiruchi, "Mugavari" to perform a street play in Krishna Nagar in Pammal Municipality. Mugavari has been reaching out the community on issues relating to education, health and environment through street plays and other direct intervention programmes. The street play is part of efforts by Exnora Green Pammal (EGP), with support from Pammal Municipality, to ensure that best solid waste management practices are followed. Plastic segregation covers were distributed to the general public to sensitize them on the implications of global warming.

Summer camp for children- May 2012

Exnora Green Pammal initiated a month long summer camp from 1st May to 30th May 2012, in order to reinforce the concept of Source Segregation and to develop Children's interest towards environment, and to bring out children's talents like painting & writing slogans to convey enviro messages. Children learnt the skill of doing things differently & creatively helping them to shine as outstanding student. In follow-up to this the Children painted picture and wrote slogans with the motto of conveying environmental messages to the public. The workshop was mainly organized with the objective of ensuring children's responsibility in protecting their own environment.

The children were appreciated for their participation by issuing certificate and prizes in the valedictory function.





The World Ozone Day 16th September 2012

The World Ozone Day was commemorated on 16th September 2012 by the Pammal Magalir Federation and the Department of Environment for the state. The Director of the Department of the State for Environment Dr. H. Malleshappa, I.F.S flagged off a rally to create awareness among the locals on the importance of the Ozone layer and the possible ways to arrest depletion of the layer and planted trees at the community biogas premises earlier in the day.

Since 1995, on 16 September each year, the International Day for the Preservation of the Ozone Layer is celebrated. This date has been designated by the United Nations General Assembly in its resolution 49/114, to commemorate the signing of the Montreal Protocol on Substances that Deplete the Ozone Layer. This commemoration around the world offers an opportunity to focus attention and action at the global, regional and national levels on the protection of the ozone layer.

Around 50 women from the self help groups in Pammal joined together in an awareness rally chanting slogans to plant more trees, to not to use plastic products, to reduce the use of vehicles and to use cycles often, to do rainwater harvesting and not to cut trees. The women members gave away handbills containing awareness message to the locals and demonstrated by collecting waste product and materials on the road.

Er. Kirubakaran from the Tamilnadu State Pollution Control Board gave an overview on what an ozone layer is and how it gets affected by the negligence of humans and the waste created by them in his speech. He appealed to the participants of the rally to take the awareness of not using plastic bags and to go back to the days where there was little usage of plastics. In his speech, the state coordinator for the national Green Corps Mr. L. Durai, insisted on the importance of growing greeneries in the locality and appealed to create awareness on trees plantation.

In his Special address, the Director of the Department of the state for Environment, Dr. H. Malleshappa, I.F.S, congratulated the many good activities of the Pammal Magalir Federation on Environmental issues. He wished to continue their good work and appealed to the members to continue to give patronage to this good cause. Accepting the wishes, Ms.

Mangalam Balasubramanian said that their motto is to think globally, act locally and do domestically and reminded the Department of the state for Environment on the proposal sent by the Federation for planting trees on the Sengazhaneer Hill and the successful completion of the de-silting of the temple tank, which has increased the water table in the area to 15 feet from 80 feet.





VISITORS TO THE ORGANISATION

EGP's wide range of activities attracts many visitors who like to visit the facility for exposure visit ranging from Government, Municipality and Cantonments, International Teams, Corporate, NGOs, Colleges and Schools. Some of them come for learning for academic use, some others on replicating the Pammal Model, yet others visit to partner with EGP convinced by the work and environmental benefits that it provides the society.

Government Visitors

RDMA visit 27th March 2012

The Regional Director of Municipal Administration of Kancheepuram District visited the facility on 15th December 2012 and commended the excellent work performed at the Community Biogas and Vermicomposting shed and asked her engineers to strategise to do such work in other municipalities.



Cantonment of St Thomas Mount and Pallavaram March 2013

Estate Officer from the Cantonment of St. Thomas mount visited Pammal facility and witnessed the works undertaken at the door to door collection, segregation, Community Biogas plant and Vermicompost shed and wanted to replicate the Pammal model at the Cantonment of Pallavaram.



Municipality

Sanitary inspectors, Engineers and Commissioners from Chennai Corporation and neighbouring Municipality visit Pammal Municipality for getting to know about the effective solid waste management programme implementation and monitoring activities and implement in their own Municipalities.



Foreign Delegations Visit

US Embassy 9th February 2013

Mr. Benjamin Embury and Ms. Michelle from the US Embassy visited the pammal facility and a detailed presentation was given to them on the solid waste management programmes carried out in pammal. They were particularly interested about the community biogas plant and the Vermicomposting process. They were also briefed about the plastic upcycling unit. They were interested on the empowerment components for women and the sustainable livelihood options for them.



Australian delegation 7th Jan 2013

A delegation of 17 members from Australia visited Exnora Green Pammal on 7th Jan 2013 under the leadership of Ms. Emma, Coordinator. Mr. Mike Dendle, Managing Director, The centre for Social Response, Australia was also among the delegations. The delegation consisted of mostly engineers from varied discipline, who are either students or working for some organization. The delegation was given a small presentation on EGP and its activities.

The delegation was escorted to visit the programme activities in the field level and a demonstration of the paper recycling bag making activities was also demonstrated to them. The delegation visited the biogas plant at Suriamman Temple and the temple tank adjoining the temple. The delegation also visited the community biogas plant and the mushroom shed.



Youth Organisations

Youth for Seva 10th October 2012

Youth For Seva (YFS) is a youth voluntary service organisation started in April 2007 in Bangalore to provide opportunities for youth who wanted to take active part in community development despite time constraints. The goal of YFS is to support schools, NGOs, government hospitals and other organizations in the social sector through volunteers who can help them mitigate some of their shortcomings and challenges. Around 15 young people visited EGP and learnt about how the environment is affected and what could be done as civic responsibility to stop the damage caused to mother earth as well as how to manage the damage already done.



Sri Ram Engineering College October 2012

Youth members from Sri Ram Engineering College visited the facility and had a discussion with the managing trustee on the different kinds of environment protection works done at EGP.

EAI October 2012

Around 50 members who were CEOs and possess prominent position in the industry and different corporate offices visited EGP and got to know how EGP is working in the field of waste to energy and waste to wealth projects. The team was amazed to see the work done through the upcycling unit and was interested in purchasing some of the items for their use.



Partner Organization Visit

PEPSICO Visit 28th Dec 2012 and 14th March 2013

Mr. Sunil Duggal, Corporate Affairs, PEPSICO visited Exnora Green Pammal on 28th December 2012 and witnessed the programme activities of EGP on that day.

After a brief presentation on the history of association and programmes of EGP, Mr. Sunil was escorted to witness the Door to door collection activity at VOC nagar 3rd street. Ms. Mangalam explained on how the door to door collection mechanism happens and source segregation happening at the cart itself. The primary and secondary collection and transportation was also demonstrated to him and how their funds find a meaning in the implementation of the programme.

Mr. Sunil was then escorted to the Suriamman Temple where a new biogas plant has been installed under the Temple Green project. He also visited the suriamman temple tank and an explanation of how the desilting of the tank was carried out in 2001 and how the ground water level recharge process has benefitted the locals and neighbours. Mr. Sunil then discussed about the way forward and the requirement for 2013 along with the core planning team.



Later in the month of March 2013, Muna Ali, CSR programme, PEPSICO visited Pammal Facility as part of her partner orientation and visited the activities such as door to door collection and segregation activities. She also interacted with the community members on their participation and EGP's contribution in the solid waste programme.

Muna also met the VOC Nagar Association members and interacted with them about the association and EGP relationship components. Later in the day, she met the Green Ambassadors and interacted with them about how working with EGP has improved their life style and how they were before coming to work with EGP. She commended that the workers have all been dressed in uniforms and using gadgets required for the work.





TATA Global Beverages Visit - 5th March 2013

A four member team from TATA Global Beverages project visited EGP and the works carried out with regards to the Plastic upcycling unit. The entire process starting from door to door collection, Source segregation to secondary transportation of the plastic carry bags to natham-kariacheri village was shown to them. The team met with the workers at the plastic upcycling unit at natham-kariacheri village and interacted with them on how their life has been impacted - changed or affected by working in the unit and how they are capable of leading their lives efficiently. The interaction was focused on the empowerment of the SHG women who are coming from the SC/MBC community. Earlier in the day, the team was presented with the case studies of the workers depicting how EGP has impacted their lives and how positive their lives have turned out to be.



Visitors



Delegates from ITC

Mr. Sivaraman and two other delegates from ITC limited visited the Pammal facility and expressed their commendation on the activities performed at the community Biogas plant and through the plastic upcycling projects.



Volunteering Events

Walt Disney Volunteers August 2012

Walt Disney volunteers participated in yearlong programmes, once a quarter. Nearly 50 walt Disney volunteers engaged in greening activities and developing Eco friendly student parks. 100 trees were planted. Arecanut plates were produced.



HCL and Wabco volunteering participatory event

April 2012

Nearly 5000 to 8000 officers in these two firms volunteered in segregating waste at source to facilitate better resource recovery and reduce the quantum going to landfills



Ebay Volunteering

Through the Give Team E-bay staff members volunteered to conduct exhibition at their premises and also installed a biogas small plant as their corporate social responsibility in an orphanage at kolathur.



Student's Internship Programme

- ◆ Australian Student, Ms. Rosie, did a one year project on community Biogas
- ◆ One month intensive block placement was completed by Ramya, MSW student from Loyala college, as part of her master's degree in the month of May 2012
- ◆ Research work by Dr. Sowmya, a Ph.D student from Anna university on waste water recycling at upcycle unit during March to July 2012 was conducted
- ◆ Ms. Mary baitihun from Meghalaya was deputed from Kanthari organization, kerala for a six weeks internship during the months November to February 2012.
- ◆ Mr. Sascha Ternes, a bachelors degree engineering student from Germany completed three months internship on a new project on horizontal digester, as a prerequisite to his masters engineering college during October 2012 to March 2013



Participation in International SWM conferences

Ms. Mangalam Balasubramanian, participated and presented keynote address, paper and presentations in the following places ;

- ◆ International conference on SWM organized by Tamilnadu Government, February 2012
- ◆ Presentation at Loyola college, May 2012
- ◆ Presentation at Jeppiar College, June 2012
- ◆ Presentation at Chennai Trade Centre, July 2012
- ◆ Presentation at Go green seminar Rotary International, August 2012
- ◆ Presentation on "Social Entrepreneurship" at MGR University, December 2012
- ◆ Presentation at International conference on **Waste Wealth and Health**, Bhopal, Feb 2013

Awards

- ◆ In October 2012, **Ms. Mangalam Balasubramanian** was awarded "**Manava Seva Ratna**" award by the Kanchi Kamakoti Peedam, Chennapuri Bhaktha Samajam lauding her efforts for social service
- ◆ In March 2013, commemorating the World Women's day, the Nandalala Seva Samiti Trust recognized **Ms. Mangalam Balasubramanian's** contribution to the society for "**Her meaningful life**"

Media Presence

Exnora Green Pammal has uploaded many videos and documentaries on its activities, Green ambassadors on Youtube. You may visit the following links for videos on Exnora Green Pammal

- ◆ **Hello Garbage** - <http://www.youtube.com/watch?v=YVbOFApeyEM>
 - ◆ **Exnora Green Pammal Biogas plant** - <http://www.youtube.com/watch?v=u6n7mrF-FJw>
 - ◆ **Green ambassadors / CNN - IBN Coverage** - <http://www.youtube.com/watch?v=OTNNXP3Navs>
- Awareness Generation** - <https://www.youtube.com/watch?v=tt7sHTjtg0U>

You may also visit www.greenvpammal.in and www.samfoundation.in **for more details**



News Paper Clippings

THE FINANCIAL EXPRESS

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Postcards of Change

Pammal cuts its waste: Community at work

Segregating dry garbage from wet, and recycling much of it



ISHER JUDGE AHLUWALIA

Pammal is a small town in Kanchipuram district of the state of Tamil Nadu. Its independent population of 85,000 and a floating population of 15,000. This little town, less than half an hour's drive from the Chennai International airport, made a transition from a town panchayat to a Municipal-pinity only in 2005, but it has shown what community action can do to solve the problem of solid waste management.

Like any other city or town in India, Pammal suffered from garbage, put out by households, rotting in unattended dustbins, and spilling over onto the streets and pavements. Since Pammal has no underground sewerage system and the Municipalities have been unable to open storm water drains on both sides of the roads/lanes in recent years, the problems of managing solid waste are compounded by the absence of the infrastructure for managing liquid waste.

In 1993, a group of middle class women in Ward #1 of Pammal decided to clean up their surroundings and their surroundings. They decided to buy a cycle rickshaw for collecting garbage from the 200 households in their Ward for delivery at the roadside dustbins, and charged the households ₹10 per month for the service. When residents living near these dustbins objected, the group decided to minimise waste by recycling and composting. They stopped collecting kitchen waste from the rest and used the former to make compost under a tree in Dhanvantri garden. This would mean less garbage at the roadside bins and less work for the local authorities to move this from the dustbins and

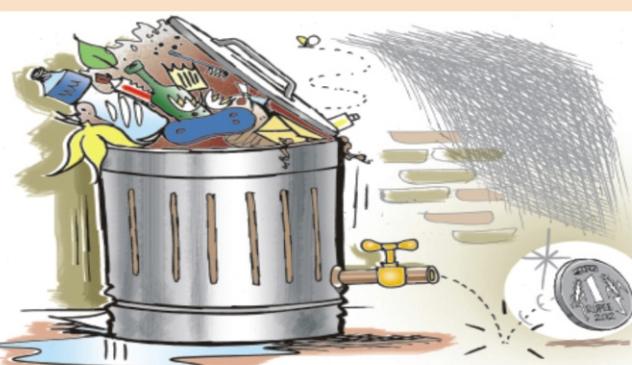
arrange for its disposal. In 1994, they formed a self-help group (SHG) and received some land as donation from the Sankara Eye Hospital that their community bank could expand. With a loan of ₹60,000 from a bank, they put up a vermicomposting shed and began the process of converting waste into wealth. This was before 2000, when the Municipal Solid Waste (MSW) Management and Handling Rules were first announced by the Government of India, requiring (i) door-to-door collection of segregated waste, and (ii) recycling and composting to minimise disposal in landfills.

For the SHG in Pammal, the next break came in 2004-05 with a grant of ₹13.25 lakh from PepsiCo for building infrastructure on the site, and buying a truck for collecting waste. By 2005, there were covering 7 Wards and by 2006, all 21 Wards. PepsiCo helped out with ₹17 lakh towards meeting the operating expenses in 2005-06 in the course of the expansion.

The transition from a SHG to a non-government organisation was made in 2006 when they registered as Exnora Green Pammal (EGP), a non-government organisation. The town panchayat gave them 1.1 acres of land. They bring residents, local government, schools and businesses together to comply with the MSW Rules.

EGP spreads awareness of the impending disaster. Solid waste in India is growing at a rate of 10% per annum, twice the current level by 2017; plastic waste has increased fourfold since 1990, and is projected to increase tenfold by 2030. The problem can be made more manageable if much of the garbage is recycled, and only 20% or so of the waste is left to be properly disposed.

EGP has been building capacity in waste management through community development, while raising awareness of the importance of reducing and recycling waste to improve the quality of environment in which we live and the public health conditions we create for ourselves. They have integrated their



activities with those involved in the recycling of materials.

The kitchen waste is converted into vermicompost (organic manure), charcoal briquettes and biogas. The compost is packed as 'EXORCO' brand and sold to farmers in the nearby villages. The biogas is used to power the plant. The quality resulting from the use of segregated waste. The Central Pollution Control Board of India tested EXORCO compost samples and found only 11 mg of lead content per kg, much below the safety standard of 100 mg per kg. The daily average generation of biogas is 30 cubic metre. Dry leaves are converted into charcoal briquettes and sold. The plastics (carry bags and water pouches) used for recycling and converted into handbags, office files, wall hangings, etc. EGP has received an EESO certification for reducing carbon emissions by over 8,000 tonnes by 2011.

What started as a simple initiative to clean up the surroundings of their homes in 1993, has turned into a civil society movement to work towards a clean environment. EGP has responded to the call to go beyond the borders of Tamil Nadu by adapting their model of solid waste management to other local governments.

Until two years ago, households in Pammal paid ₹10 to ₹25 per month for collection. The Municipality has taken over this responsibility in their budget. Households contribute their segregated dry and wet waste at

source to EGP which by and large covers their processing cost. Financial support for Panipat and Sangareddy is provided by PepsiCo under their CSR plans through annual MoU with EGP. For Kamarahatty and Panathyti the Municipalities pay for the process. The NGO Vision (a private firm) pay for the management cost, and the community pays for the primary collection cost.

When I visited Pammal a few days ago, the town was in the midst of a major month-long campaign (sponsored by PepsiCo) to raise awareness of the importance of segregating dry and wet waste. It was great to see the collaboration with the famous Mugavari team from Trichy using street theatre and folk dances through Paratal and Ooty type methods to communicate. The performances are combined with door-to-door field work, and residents are given

a white bag with instructions on how it is to be used for carrying dry waste to the Green Ambassadors, some of whom I saw at work, whistling as they approached the bins of each household to collect the waste. They were coherently at work cleaning the streets. Runya, the young and enthusiastic coordinator of the month-long campaign, is a gold medallist from Loyola College.

Among the numerous awards received by EGP and its dynamic founder-leader, Margalata Balasubramanian, is the 'Best Practice' award in 2009 in the 'Promising Practices' category for the Pammal SWM project. Mrs Balasubramanian has reservations about the role private sector can play in this field. As she put it, "Rewarding waste managers on the basis of tonnage of trash transported and dumped, leaves no room for waste reduction. The community has to get involved in the primary task of waste reduction and waste segregation."

On the economics of the solid waste management operation, the experience of EGP shows that only about 50% of the operating costs are covered by recycling, etc., and the rest have to be provided either by the community or the local government or a corporate social responsibility budget. There is a good case for more government spending in this vital area, which has serious implications for public health. A green tax can help mobilise funds. But even more important than the money is the need for governments to engage their communities in addressing the challenge of waste reduction, waste segregation at source and waste recycling. Disposing of the rest of the waste would then be a manageable business. Pammal has shown the first steps in this direction.

Isher Judge Ahluwalia is Chairperson, ICRIER and also former Chairperson of the High Powered Expert Committee on Urban Infrastructure Services, which submitted its report to MoUD in March 2011

Pammal shows way to tackling garbage

Corporation-NGO project envisages segregation of waste, composting

Staff Reporter

CORPORATION: A corporation-ngo government organisation partnership Pammal has set in motion

the locality last month.

The measure contained from the compost will be served, packed and sold to farmers in neighbouring villages. Paper,

• 10-ground plot earmarked

• Land granted by Pammal Special Grade Panchayat

in the project, will be replicating a model it has been running in three weeks for the past eight years, said Margalata Balasubramanian, the Executive Director

of Environment Department. Allowing self-help groups to run the plants would be helpful, as its production activities, a jobless crowd in urban areas

solid waste management through composting techniques that could be practised at different levels.

3. Mathematics, Joint 13

पाहर को पवित्र
मंगलम्

குப்பைப்ரச்சனை: சென்னைக்கு வழிகாட்டும் பம்மல்

Corporation to adopt Pammal model
Mayor impressed with solid waste management practices

நாற்பது நாட்களில் பண்ணும் பம்மல்



DOWNTOWN

Disney staff brighten park in Pammal

As part of their corporate social responsibility project.

K. MANIKANDAN

Residents of Pammal still remember a small patch of land adjacent to Anna Salai that was an eyesore. Garbage from many localities used to be dumped at this patch of land abutting the Surya Arman Temple Tank. The tank's bund too was taken over by a dense outgrowth of vegetation of thorny bushes. People used the spot as public convenience and the place was useful for miscreants.

But that was in 2000. Today, the tank presents a serene look, filled with clean water. The tank bund has been created into a walker's pathway and the dump yard has been converted into a children's park. Members of Exnora Green Pammal, led by Mangalam Balasubramanian, initiated a movement to transform the land around the temple tank 12 years ago and in a matter of three months, it was changed completely.

"For 12 years now, children have been using the park. The park has a few sculptures that we scooped out while desilting and deepening the

tank," recalls Ms. Balasubramanian. In the evening hours, the park becomes lively with children enjoying a breath of fresh air in the open and playing in the equipment inside the park.

To spruce up the park, a team of 27 employees from Walt Disney paid a visit on April 13. They cleaned the park, painted the doors and also came up with a series of paintings on the walls of the park. According to the staff, they volunteered to clean the park as part of their corporate social responsibility project.

The temple tank is spread over five acres and nearly one-fourth of it has been created as a settlement tank. Due to the natural gradient, grey water from many areas of Pammal and Shankar Nagar made their way into the tank.

To prevent this, they had created the settlement tank, where the sewage would stagnate and sediments would settle down. Once in three months, they would pump out the sewage and this way, they ensure that not a drop of sewage contaminates the tank. Even during Monsoon, only residual water would enter the tank, while the sediments would settle down in the settlement tank.

Compared to many other water bodies in the southern suburbs of Chennai, quality of water in the tank was far better, Ms. Mangalam added.



GIVING A FRESH LOOK: Volunteers of Disney sprucing up the children's park in Pammal.

PHOTO: A. MURALITHARAN



EXNORA GREEN PAMMAL

1, 22nd Street Sri Sankara Nagar
Pammal Chennai-600075.

BALANCE SHEET AS AT 31.03.2012

| LIABILITIES | SCHEDULE | Rs. | ASSETS | SCHEDULE | Rs. |
|-------------------|----------|------------------|----------------|----------|------------------|
| CAPITAL FUND | I | 1,915,876 | FIXED ASSETS | VI | 2,450,509 |
| GENERAL RESERVE | II | 5,141,188 | DEPOSITS | VII | 2,409,501 |
| UNSECURED LOANS | III | 200,350 | ADVANCES | VIII | 1,901,489 |
| SUNDAY.CREDITORS | IV | 70,672 | SUNDAY DEBTORS | IX | 220,900 |
| OTHER LIABILITIES | V | 72,371 | BANK BALANCES | X | 336,914 |
| | | | CASH BALANCE | | 81,144 |
| TOTAL | | <u>7,400,457</u> | TOTAL | | <u>7,400,457</u> |

For EXNORA GREEN PAMMAL

Mangalam B S.Balasubramanian
MANGALAM BALASUBRAMANIAN
MANAGING TRUSTEE TRUSTEE

Place : CHENNAI
Date : 22.11.12



As per our report of even date
For MASILAMANI & CO
Chartered Accountants

V.RAMALINGAM
Partner





Government of India



सत्यमेव जयते

INCOME-TAX DEPARTMENT ACKNOWLEDGEMENT

Received with thanks from EXNORA GREEN PAMMAL a return of income and/or return of fringe-benefits in Form No. ITR 7 for assessment year 2012-2013, having the following particulars.

| | | | |
|--|---------------------|-----------------------------------|------------|
| Name | EXNORA GREEN PAMMAL | PAN | AAATE2554P |
| Flat/Door/Block No | 1 | Name of Premises/Building/Village | |
| Road/Street/Post Office | 22nd STREET | Area/Locality | PAMMAL |
| Town/City/District | CHENNAI | State | TAMILNADU |
| Designation of Assessing Officer (Ward/Circle) | | | |
| Status Code | | Original | |

| | | |
|----------------------------------|----|--------|
| 1 Gross total income | 1 | — |
| 2 Deductions under Chapter-VI-A | 2 | — |
| 3 Total Income | 3 | — |
| 3a Current Year Loss (if any) | 3a | — |
| 4 Net tax payable | 4 | — |
| 5 Interest payable | 5 | — |
| 6 Total tax and interest payable | 6 | — |
| 7 Taxes Paid | | |
| a Advance Tax | 7a | — |
| b TDS | 7b | 494293 |
| c TCS | 7c | — |
| d Self Assessment Tax | 7d | — |
| e Total Taxes Paid (7a+7b+7c+7d) | 7e | 494293 |
| 8 Tax Payable (6-7e) | | |
| 9 Refund (7e-6) | | 494293 |

| | |
|--------------------|--|
| Receipt No Date | Seal and signature of receiving official |
|--------------------|--|

ASK No: 001311212147806
 Date/A.Y: 31-12-2012/2012-13
 PAN: AAATE2554P / ITR7
 Name: EXNORA GRE
 RRR/BIN: CA201041751/ R00007/12
 AO: DIT (EXEMPTION IV), CHENNAI



**SAM FOUNDATION FOR ECO FRIENDLY ENVIRONMENT**

1, 22ND STREET, SRI SANKARA NAGAR,
PAMMAL, CHENNAI - 600 075.

BALANCE SHEET AS ON 31/03/2012

| SOURCES OF FUNDS | SCHDULE | 31.03.2012 | 31.03.2011 |
|-----------------------------|----------------|-----------------------|----------------------|
| SHARE HOLDERS' FUNDS | | | |
| Share Capital | I | 100000 | 100000 |
| Un Secured Loans | II | 1030000 | 850000 |
| | | <u>1130000</u> | <u>950000</u> |

APPLICATION OF FUNDS**FIXED ASSETS**

| | | | |
|--------------------|-----|---------------|---|
| Gross Block | III | 950000 | 950000 |
| Less: Depreciation | | <u>238681</u> | <u>711319</u> <u>123750</u> <u>826250</u> |

CURRENT ASSETS,**LOANS & ADVANCES**

| | | | |
|------------------------|----|---------------|---------------|
| Cash and Bank Balances | IV | 107878 | 172679 |
| Loans & Advances | V | <u>60000</u> | <u>0</u> |
| | | <u>167878</u> | <u>172679</u> |

Less: CURRENT LIABILITIES**AND PROVISIONS**

| | | | |
|-------------------------|----|----------|--|
| Outstanding Liabilities | VI | <u>0</u> | <u>167878</u> <u>66000</u> <u>106679</u> |
|-------------------------|----|----------|--|

MISCELLANEOUS EXPENDITURE**TO THE EXTENT NOT WRITTEN****OFF OR ADJUSTED**

| | | | |
|-----------------------|-----|---------------|--|
| Profit & Loss Account | VII | <u>250803</u> | <u>250803</u> <u>17071</u> <u>17071</u> |
| | | | <u>1130000</u> <u>950000</u> |

Place: Chennai

Date : 03.09.2012

Compiled as per books and information furnished

For SAM FOUNDATION FOR ECO
FRIENDLY ENVIRONMENT

Managing Director

For Masilamani & Co.,
Chartered Accountants

V. Ramalingam
Partner

Director





SAM FOUNDATION FOR ECO FRIENDLY ENVIRONMENT

1, 22ND STREET, SRI SANKARA NAGAR,
PAMMAL, CHENNAI - 600 075.

PROFIT & LOSS ACCOUNT FOR THE YEAR ENDED 31/03/12

| | SCHEDULE | 31.03.2012 | 31.03.2011 |
|--------------------------|----------|---------------|---------------|
| INCOME | | | |
| Solid Waste Mgt Receipts | | 10000 | 10000 |
| Training Charges | | 0 | 325000 |
| | | 10000 | 335000 |
| EXPENDITURE | | | |
| Bio Gas Plant Expenses | I | 39200 | 0 |
| Administrative Expenses | II | 84001 | 225321 |
| Maintenance Expenses | III | 5600 | 0 |
| Depreciation | | 114931 | 123750 |
| | | 243732 | 349071 |
| NET LOSS | | 233732 | 14071 |

Place: Chennai

Date : 03.09.2012

Compiled as per books and information furnished

For SAM FOUNDATION FOR ECO
FRIENDLY ENVIRONMENT

Yanganam R
Managing Director.

S. Venkateshwaran
Director

For Masilamani & Co.,
Chartered Accountants


V. Ramalingam
Partner





This EGP Document was prepared by :

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