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## *sustainable waste management*

### From the Chief Editor

**W**aste forms the core of all environmental problems. The safe and cost effective disposal of waste is increasingly becoming important worldwide with higher standards of waste disposal and the pressure to minimize quantities. *Down to Earth* (2000) reported that a total of 36.5 million tonnes/year (36.5 kg / individual) of municipal solid waste is generated in India. Even though there are legislations for handling of wastes like the Municipal Solid Wastes (Management and Handling) Rules 2000, the Biomedical Waste Rules of 1998 and Hazardous Waste Rules of 1989, waste management is still a big problem in India especially in big cities and towns. There are a number of factors which contribute to the inefficient handling of waste in India. These include institutional weaknesses, shortage of human and financial resources, improper technology, improper collection, transportation and disposal and lack of proper planning.

Sustainable waste management policy starts from the baseline objective that the generation of waste should be optimally prevented. The 3Rs- reduce, reuse and recycle reflects the main principles for sustainable waste management. More than the organisational inefficiencies of local bodies, the critical aspect in the failure of sustainable waste management is the apathy of the public and the lack of community participation. NGOs can play a major role in sensitizing the public about sustainable waste management. They can act as intermediaries in implementing the initiatives of the local bodies. In this issue, we have tried to focus on sustainable waste management and the some of the initiatives taken by NGOs in this aspect.

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# Waste Management: A Necessity for the Subsistence of Environment & Mankind

Jose Vadakkal\*

There has been a lot of discussion going on about globalisation and its effect on the cost of medicine resulting in increase in the cost of health care services. Along the same lines, another issue affecting health which needs urgent attention is the problem of waste and waste management. The 'use and throw culture' brought in as part of the globalisation wave sweeping all over the world is generating more waste than in past decades. If the situation is not dealt with in a proper manner it will affect the environment and human lives. Reducing the generation of waste and introducing proper waste recycling and reuse techniques are essential for creating a 'zero waste' environment.

## The 8 Rs of Waste Management

**Refuse:** Refuse to use more than one packing. Do not use disposable vessels and utensils (e.g., plastic cups and plates). Carry a bag when going for shopping to prevent carrying back home many plastic bags.

**Reduce:** Reduce the use of non-degradable materials. Promote the use of degradable materials like jute, cotton, etc.

**Reuse:** Buy things which can be used over a long period of time. Before disposing off things, think whether it can be used in other ways or by other people. Give preference to material which can be used again and again.

**Repair:** Instead of throwing away damaged items, try to repair it and use again.

**Rethink:** Think again before buying things. Buy only things that are environment friendly.

**Recycle:** Collect waste materials, sort them and give for recycling.

**Recover:** Recover usable component from waste (for e.g., manure/compost, bio-gas, etc.).

**Replace:** Replace plastic with more environment friendly materials. Use alternative non-polluting materials like cloth bags, jute, paper, steel, etc.

## Use of Biodegradable Waste

**Reuse of biodegradable waste:** Biodegradable waste including kitchen waste, food leftovers, farm waste, jute, cotton, paper, etc. can be converted to energy and manure. Human and animal waste can also be used for this purpose. Two important methods that can be used for this purpose are bio-gas plant and vermicompost unit.

**Bio-gas plant:** Bio-gas can be produced by installing a bio-gas unit and using animal and plant waste as the raw material. This gas can be utilized for cooking purposes. The slurry that comes out after bio-gas production is a good manure and can be directly used for cultivation. Different models of bio-gas plant are available to cater to the needs of flat owners, houses, hospitals, etc.

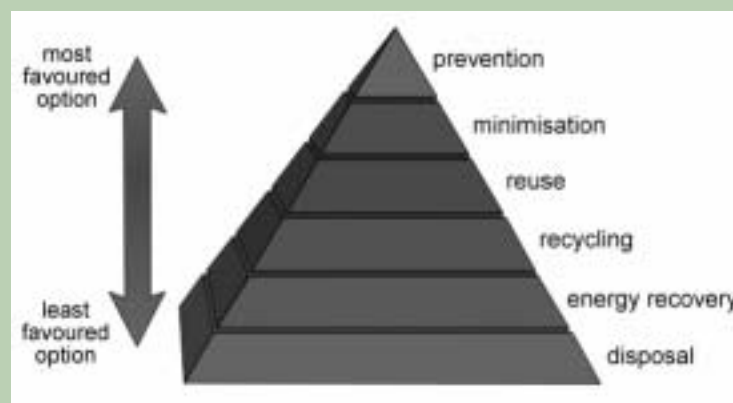
**Vermicompost unit:** All the biodegradable waste can be used in a

vermicompost unit to produce manure. This is highly suitable for cultivation of vegetables and other plants.

If the **8 Rs** are practiced with conviction, there will definitely be a change in the present situation. For this a lot of effort is needed from local authorities, NGOs and civil society.

## The Waste Hierarchy

The waste hierarchy refers to the "3 Rs"— reduce, reuse and recycle, which classify waste management strategies according to their desirability in terms of waste minimization. The waste hierarchy remains the cornerstone of most waste minimization strategies. The aim of the waste hierarchy is to extract the maximum practical benefits from products and to generate the minimum amount of waste.



(www.wikipedia.org)

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**W**aste management is the collection, transportation, processing, and recycling or disposal of waste materials. The term usually relates to materials produced by human activity, and is generally undertaken to reduce their effect on health and environment and to recover resources from them. Waste management can involve solid, liquid or gaseous substances, with different methods and fields of expertise for each.

Waste management practices differ for developed and developing nations, for urban and rural areas, and for residential and industrial producers. Management of non-hazardous residential and institutional waste in metropolitan areas is usually the responsibility of local government authorities, while management of non-hazardous commercial and industrial waste is usually the responsibility of the generator.

### Some of the Existing Methods of Waste Processing

#### Landfill

Disposing of waste in a landfill involves burying waste to dispose it of, and this remains a common practice in most countries. A properly-designed and well-managed landfill can be a hygienic and relatively inexpensive method of disposing of waste materials. Older, poorly-designed or poorly-managed landfills can create a number of adverse environmental impacts such as wind-blown litter, attraction of vermin, and generation of liquid leachate. Another common by-product of landfills is gas (mostly composed of methane and carbon dioxide), which is produced when organic waste breaks down anaerobically. This gas can create odour problems, kill surface vegetation, and is a greenhouse gas.

Many local authorities transport waste from urban areas to adjacent rural areas due to non-availability of land in cities and towns. But nowadays they are finding it difficult to establish new landfills in rural areas due to opposition from owners of adjacent land. This fact, as well as growing concern about the environmental impacts of excessive materials consumption, has given rise to efforts to minimize the amount of waste sent to landfill in many areas. These efforts include taxing or levying waste sent to landfill, recycling waste products, converting waste to energy, and designing products that use less material.

#### Incineration

Incineration is a disposal method that involves combustion of waste material. Incineration and other high temperature waste treatment systems are sometimes described as “thermal treatment”. Incinerators convert waste materials into heat, gas, steam and ash.

Incineration is carried out both on a small scale by individuals, and on a large scale by industry. It is used to dispose of solid, liquid and gaseous waste. It is recognized as a practical method of disposing of certain hazardous waste materials (such as biological medical waste). Incineration is a controversial method of waste disposal due to issues such as emission of gaseous pollutants. Incineration is common in countries such as Japan where land is more scarce, as these facilities generally do not require as much area as landfills.

#### Recycling

The process of extracting resources or value from waste is generally referred to as recycling. There are a number of different methods by which waste material is recycled and new methods of recycling are being developed continuously. Some of the commonly used methods are described briefly below:

##### *Physical Reprocessing*

The popular meaning of ‘recycling’ in most developed countries refers to the widespread collection and reuse of everyday waste materials such as empty beverage containers. These are collected and sorted into common types so that the raw materials from which the items are made can be reprocessed into new products. Material for recycling may be collected separately from general waste using separate bins or sorted directly from mixed waste streams.

The most common consumer products recycled include aluminium beverage cans, steel food and aerosol cans, plastic bottles, glass bottles and jars, paperboard cartons, newspapers, magazines, and cardboards. These items are usually composed of a single type of material, making them relatively easy to recycle into new products. The recycling of complex products (such as computers and electronic

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Our country being a developing country is progressing in manifold dimensions. In the fast pace of development, certain elements of destruction are also operating simultaneously. We always focus on positive aspects and ignore the negative conditions.

In the present world of industrialization, some products are costing less but these products are having adverse affects on health of human beings and animals. For example, paper bags are replaced by polyethylene bags. But polyethylene bags are becoming an environmental hazard. Generally, people throw polyethylene bags here and there. It enters into the sewage drain and blocks the flow of dirty water which finally becomes the main reason for malaria. The animals eat these polyethylene bags lying around, which cause stomach problems. Big industries throw the waste created during production process into rivers and big drains which further create problems related to pollution.

The waste management system of a city can be assessed by observing the roads and other public places. The wastes littered around gets collected near roads, rivers, parks and public places. Land is spoiled due to this. Moreover, there is danger of epidemics like jaundice, T.B., skin diseases, etc. It has been seen that wastes are kept untouched for up to four days. If the waste materials are kept unscientifically then it causes creation of methane gas which is harmful to health.

The main responsibility of waste management is with Municipal Corporation or City Council. As per the system, the officials of the Municipal Corporation or City Council should collect the waste and dispose it in a healthy and environment-friendly manner. But practically, this is not being done. Instead, the Corporation collects the waste materials and dumps them outside the city. For this they spend a good amount of money. The government officials are simply playing the role of transporting waste from one place to another.

### **Developmental Efforts of NGOs**

In the past, some NGOs have taken various initiatives regarding cleaning the waste from the city. In this regard, SEWA, Ahemdabad played the leading role. As a part of the cleaning movement, 1000 to 2000 women were associated and organized. The women collected and removed wastes including plastics from roads and homes.

The collected wastes are sold after recycling and the amount is used for giving honorarium to the women who are involved in movement.

In same manner, a NGO named Vatavaran in New Delhi took initiative for collection of wastes from houses. In this regard, the organisation appointed a Sanitation Brigade. The honorarium for these brigades is paid by the NGO. The NGO received income from selling of wastes and collection of fees of Rs.30 to Rs.35 per month from each household. The brigade consists of both males and females. Centre for Development Communication, Jaipur is also involved in the collection of wastes from houses. There are NGOs who are involved in making fertilizers from waste by following two approaches namely, compost and vermiculture systems.

If we assess the afore mentioned efforts of waste management by different NGOs, then we find that many initiatives are not executed by following the participatory approach in which people play active role. In the light of this, we have initiated a waste management programme, named 'SUCHI' based on participatory approach. SUCHI is basically following a decentralized system and is executed as a movement rather than as a programme.

'SUCHI' stands for 'Swach Healthy Urban Clean Hygienic Environment'. The movement started with the active participation of people both in terms of physical activity as well as sharing of views. As a part of the movement, we have developed a questionnaire. The questionnaire explains about the movement and the expenditure to be made by each family for collection of waste from houses. Regarding the expenditure, it was said that each family need to give one rupee every day. Initially 500 questionnaires were distributed. On the commencement of the movement, 125 families registered their names.

At the initial stage of the programme, meetings were conducted in eleven colonies. During the meeting, two area leaders were selected by the people. These area leaders played an important role in linking the families with the movement and highlighting the problems of their colony. As a result of their efforts, 450 families registered their names in the movement which were only 125 at the commencement of the programme. Currently, the area leaders are conducting monthly meetings. The leaders discuss the problems and possible solutions for their colonies in the

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\*ASTHA is a well known NGO in Udaipur.

The modern world, highly sophisticated with the facilities of science and technology, has failed to address the issues related to waste management. The whole world has been discussing the issue of waste management for the last two decades, and the public discourse on the same is still going on. The urban environment all over the world faces serious problems in the collection, transportation and safe disposal of solid wastes. In India, municipal solid waste management is one of the most neglected areas of urban development. Financial constraints and non availability of land for safe disposal of solid waste are the major problems that adversely affect the management programmes. Moreover, all sorts of wastes, including e-wastes are flowing from the so called 'developed' countries to India.

Kerala State universally acclaimed as a 'developed' one, face innumerable threats and challenges with regard to waste management. Recent outbreak of epidemics has opened the eyes of people and government, but our cities and towns remain as dumping grounds. More than 80% of drinking water wells in the state are polluted. Of the total waste generated, 65% goes uncollected, which is around 2255 tonnes a day, turning public places into dumping yards. In cities alone, 6 to 8 lakh tonnes of waste go uncollected a year and the State has become a breeding ground for epidemics. The average daily waste generation by an individual is 200 gm in Panchayat areas, 300 gm in municipal areas and 400 gm in corporation areas.

Failure to segregate wastes at the source of generation, absence of timely collection, unscientific and unhygienic transport and unscientific disposal methods are the major drawbacks regarding waste management in the State. All these problems are well understood by all concerned, but the core issue is that Keralites have fallen prey to 'NIMBY' (not in my backyard) syndrome. Each Keralite, irrespective of socioeconomic status, is totally controlled by this syndrome. Neither the individual nor the family is sensitized enough to shoulder the responsibility of managing the waste generated by them and many do not hesitate to dispose wastes along public roads and in drainages. This distorted attitude of Keralites is the root cause of all the issues related to waste management.

### Present Perspectives and Role of Various Agencies

All the agencies concerned and involved in waste management consider the issues as serious and as an immediate need to be addressed. But, the responsible people, individuals and families are under the 'NIMBY' syndrome. State Government and Local Self Government (LSG) limit their responsibilities to mere collection of the wastes and disposal in other destinations. Many LSGs do not exercise their responsibilities that are mandatory. Crores of rupees are spent for transport and disposal, but the problem still remains.

NGOs that are supposed to wake the civil society, by and large remain indifferent to waste management issues. In India, we have 12 lakhs voluntary organizations involved in various areas, such as health, education, social service, community organisation, etc., but only 6% of the organisations are engaged in health issues in general, and if we search the number of NGOs involved in waste management the percentage will go down further. This situational analysis helps us to arrive at the following inferences:

1. People in general need intensive and continuous orientation on waste management issues and practices.
2. Government agencies and LSGs need to be sensitised and pressurized.
3. Attitudinal change of all agencies involved in waste management.
4. Decentralised homestead waste management practices to be promoted.
5. NGOs have a pivotal role to play.

### Role of NGOs

The above-mentioned inferences can be some sort of guiding principle for defining the role of NGOs in waste management. The issue of waste management has political significance and has to be seen in its totality. It should not be confined as environment or health problem. The flow of all sorts of wastes from north to south, clearly validates this argument. Waste management has not found its due space in the manifestos of political parties, and our planning process at various levels has neglected this vital issue. Religious

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and community organisations also have not given due attention to waste management issues. In this context, NGOs must enter into this area without hesitation. The issue of waste management involves a lot of awareness building, motivation, training and interaction, lobbying and advocacy. It has been proved that only NGOs can take up such programmes.

Each NGO involved in waste management should take up research programmes, and conduct training for people, local bodies and political and religious leaders. Data collection on waste management should be an ongoing process. Case studies and newspaper cuttings must be documented. Once sufficient data and information are collected, the same should be disseminated to concerned agencies and organisations. Training modules can be prepared for people at various levels such as students, social workers and LSG members. NGOs must take initiative to conduct a state-level campaign all over Kerala involving all the agencies. This campaign has to be continued at intervals, so that the spirit and enthusiasm will be maintained.

NGOs can take the role of strengthening the LSGs to take up waste management projects properly, as government may not be able to provide the services required by the local

bodies. The enormous potential of religious and community organisations in Kerala can be utilised for building up a mass movement for waste management. NGOs may assume the role of a facilitator by entering into dialogue with these organizations and providing them sufficient information. If NGOs take up this role, the result will be wonderful.

The magnitude of problems and needs of various agencies demand that existing laws and policies on waste management, be analysed and studied. This is an area where NGO intervention is required. NGOs can also moot alternate laws and policies required for implementation of waste management projects. Many initiatives on waste management can be identified in various part of the country. NGOs can study these, identify some best practices and recommend those which can be replicated in other areas.

The problem of waste management with its magnitude, cannot be tackled by a few NGOs. NGOs already involved in this issue, must take initiative to frame a Kerala collective of NGOs, which will come together and plan strategies and share experiences. Different tasks can be entrusted to the members of the collective so that overlapping and duplication can be avoided. Finally, NGOs must take care in maintaining their identity as resource centres and should not succumb to the temptation of taking up projects.

## Municipal Solid Wastes (Management and Handling) Rules 2000

The Municipal Solid Wastes (Management and Handling) Rules 2000 (MSW Rules) which became effective from 2004 provides a framework encompassing collection, transportation, treatment and disposal of municipal solid waste.

As per the MSW Rules of 2000, every municipality is responsible for providing integrated services and infrastructure facilities for solid waste management within its jurisdiction. Its responsibilities are defined all the way from preparing the community for segregated collection to inoffensive storage, transportation, appropriate processing and safe disposal from environmental and health points of view.

For the collection stage, the Rules recommend door to door collection of segregated waste, as well as separate collection from slaughter houses, meat and fish markets, fruit and vegetable markets, etc. with the objective of 'managing to make use of' highly biodegradable waste.

With regard to the treatment, the Rules recommend adoption of suitable technology or a combination thereof with the objectives of making use of wastes and to minimize burden on landfill. For the biodegradable fraction of waste, the Rules recommend treatment by composting, vermicomposting, anaerobic digestion or any other appropriate biological process. In other cases, options of incineration with or without energy recovery and pelletisation are also suggested.

For the last element in the integrated chain, i.e. disposal, the Rules recommend land filling of only that type of waste which is neither recyclable nor biologically processable. It also insists on prevention of run off to water bodies, provision for leachate collection and treatment system and installation of gas collection system to control odour and for the safety of nearby properties.

[www.envfor.nic.in](http://www.envfor.nic.in)

[www.green-ensys.org/site/publications/MSW\\_Rules\\_%20A\\_critique.pdf](http://www.green-ensys.org/site/publications/MSW_Rules_%20A_critique.pdf)

# NEWS FROM CEVA

## Coordination of Projects

At present, CEVA is coordinating forty eight development projects supported by KKS, Germany. Out of these, seven are coordinated by CEVA, Eastern Regional Office, fourteen by CEVA, Northern Regional Office and twenty seven by CEVA, Kochi office. The following are the new projects sanctioned during the last six months.

| Projects Sanctioned in 2007-08  |  |
|---|--|
| Name of the Project   | Implementing Agency  |
| Mangrove Conservation and Livelihood Support Project, Rangabelia  | Tagore Society for Rural Development, West Bengal                      |
| Relief and Rehabilitation Programme, Potashpur  | Kajla Jan Kalyan Samity, Midnapore, West Bengal.                       |
| Sustainable Development and Resource Management, Surendranagar  | Jeet Praksh Trust, Nanikatechi, Gujarat                                |
| Integrated Community Development Project, Deepdi  | CEROWC, Bhopal, Madhya Pradesh   |
| Drinking Water Project, Bettiya, Chattisgarh  | Amar Jyoti Ashram, Chottebettiya, Chattisgarh                          |
| Rural Development and Sustainable Income Generation , Veerapandi  | Karl Kübel Institute for Development Education, Coimbatore, Tamil Nadu |
| Seruthur New Life Project, Nagapattinam   | PEACE Trust, Dindigul, Tamil Nadu                                      |
| Socio-economic Empowerment for Marginalised Farmer and Landless Families through Integrated Watershed Development, Dindigul | PEACE Trust, Dindigul, Tamil Nadu                                      |

## Onam Celebrations in CEVA, Kochi

Onam was celebrated in CEVA, Kochi office on 25<sup>th</sup> August 2007 with much fervour. The guest of honour for Onam celebrations of 2007 was Mr. Ralf Tepel, Executive Director of KKS, Germany who was in Kerala during the period. The CEVA staff members arranged a floral carpet as well as a traditional 'onam sadhya' to mark the occasion. The celebration was graced by the presence of the Moderator of CEVA, Rev. Fr. Austin Kalappurackal as well as the executive committee members. Mr. Tepel held meetings with the staff of CEVA as well as Executive Committee during the visit.



## Workshop on Reporting and Documentation

The General Social Apostolate of CMI congregation conducted a three day workshop on reporting and documentation. It was held at Chavara Hills from September 13<sup>th</sup> to 15<sup>th</sup>, 2007. Thirty four representatives from different provinces attended the workshop. During his inaugural address, Very Rev. Fr. Antony Kariyil, the Prior General recalled that Blessed Chavara should be considered as a pioneer in realising the need for documentation. Mr. P. J. Ignatius, President of CEVA, in his message said that even though CMI congregation is doing lot of work for the disabled and the underprivileged, it is never reflected in any of the government records or other official records because of the lack of proper documentation.



The main resource person for the training was Mr. Tom Jose from Karl Kübel Institute for Development Education (KKID), Coimbatore. Mr. Jose emphasized the need for proper documentation and discussed about the various methods used for the purpose. His session consisted of presentations, lectures and

group discussions. Apart from Mr. Tom Jose, Mr. Aravind Kumar from Indian National Trust for Art and Cultural Heritage (INTACH) also talked about the different types of documents, and how to preserve and retrieve old documents. Mr. Albert Joseph, Director of Functional Vocational Training and Research Society (FVTRS) informed the participants about the various schemes of the organisation for giving skill training for dropout children, and advised the representatives from different provinces to make use of the opportunity.

In his concluding remarks, the General Counselor of Social Department, Fr. Austin Kalapurackal, urged the participants to adopt effective reporting and documentation system for ensuring the continuity of the social activities. The participants agreed that the workshop was useful and felt that this kind of training should be held at unit level and province level.

## Workshop on Monitoring Indicators

In an effort to develop some commonly agreed indicators for measuring the achievement of targets of development projects implemented in India, representatives of KKS, Germany, KKID, Coimbatore and all three offices of CEVA had a three-day workshop in KKID, Coimbatore from the 5<sup>th</sup> to 7<sup>th</sup> October 2007. The workshop was attended by Dr. Sigrid Maurer and Mr. Arno Eul from KKS, Germany, Fr. Varghese Kokkadan, the Executive Secretary of CEVA, Fr. Thomas Medeckal, Regional Secretary of CEVA, the coordination staff of CEVA, Mr. Tom Jose, Senior Programme Officer, KKID and two Project Officers of KKID.



## Annual Project Holders' Get-together 2007



CEVANRO and ERO organized the annual project partners' meet at Hotel Sonar Bangla, Puri (Orissa) from November 3<sup>rd</sup> to 5<sup>th</sup> 2007. Thirty seven participants from 21 NGOs took part in the event. During the meet CEVA staff introduced the new monitoring and evaluation formats to the participants. The event concluded with a sight-seeing trip in and around Puri and Bhubaneswar.

The major project holders' get-together of

2007 of South Indian partners of KKS, Germany was held at KKID, Coimbatore on the 8<sup>th</sup> and 9<sup>th</sup> of October 2007. Representatives from 21 partner organisations participated in the get-together. Dr. Sigrid Maurer, Coordinator, Development Cooperation from KKS, Germany was present during the get-together. An input session on monitoring and evaluation was held on the first day. Mr. Suranjan Reddy was the resource person for the same. Another session on 'NGOs and Business Ventures' was conducted by Mr. T.K. Nathan. On the second

day the representatives from the various projects made a brief presentation on 'impact assessment' in their projects. The workshop concluded with a discussion on new formats for monitoring and reporting.



## Christmas Celebrations in CEVA, Kochi

The Christmas celebrations at CEVA, Kochi was held on 21<sup>st</sup> December 2007. Representatives from eleven SHGs facilitated by CEVA along with the executive members of CEVA and staff of CEVA, Kochi participated in the celebrations. Singing carol, cutting the cake and exchanging of Christmas gifts were part of the celebrations.

## Trip to Parambikulam

Staff of CEVA, Kochi along with some of the executive committee members of CEVA went for a two-day trip to Parambikulam Wildlife Sanctuary in Palakkad and Preshitha Service Society in Pollachi. It was organized as part of the CEVA day celebrations on July 31<sup>st</sup> and 1<sup>st</sup> August 2007.



## Kavach Project



The Kavach project which is being implemented by CEVA, NRO has been awarded the golden status for its performance. The project aims at restricting the spread of HIV among the truck drivers and the associated high-risk population. The project supported by TCI with financial assistance from Bill and Melinda Gates Foundation was started in 2005. CEVA, NRO has been judged as one of the best implementing agencies of the project. Master Trainers of NACO across the different parts of the country visited Kavach project and were exposed to its field activities.

## Visit of German Delegates

Dr. Andreas Pfeil from German Embassy, Mr. Peter Runge from VENRO (a network of German NGOs) and Mr. Norbert Noisser from Hessen State Agency in Germany along with Mr. Ralf Tepel Executive Director of KKS, Germany visited some of the projects supported by KKS in Tamil Nadu. They appreciated the work done by GSHEC, Karamadai, NMCT and KKID in Coimbatore in implementing development projects. Apart from these projects, Mr. Runge, Mr. Noisser and Mr. Tepel also visited the tsunami rehabilitation projects implemented by PEACE Trust, Udayam and CRDS along the Tamil Nadu coast.



Ms. Doris Von Werner from Benshiem Hilfe and Mr. Ralf Tepel from KKS visited Catholic Charities, Jharkhand and Kajla Jan Kalyan Samity, West Bengal for reviewing the progress of the KKS projects implemented by them. They visited the projects from 17<sup>th</sup> to 23<sup>rd</sup> November 2007 and were accompanied by Mr. Soumyendra Roy.

### RTI: NGOs must reply

Non-Government Organisations (NGOs) receiving grants or aid for specific projects come under the Right to Information Act and are required to provide information to the public under the Act. They also need to designate information officers to answer the public's queries, as per the ruling of the State Information Commission (SIC) of Kerala. In a recent precedent-setting order, the SIC held that any NGO receiving government aid – even if the aid is for a specific project – was liable to provide information sought by the members of the public. The order, issued by the State Chief Information Commissioner and all the three State Information Commissioners, was on a petition against two NGOs who had refused to provide information on their spending of government aid sought by a member of the public.

The commissioners stated that “the public have an inalienable right to know how the government money is spent and whether it is spent for the purposes for which it is provided and, if it was spent, also, in the manner in which it was meant to be spent”. The State Chief Information Commissioner clarified that when an NGO is given aid for specific projects, the RTI applies only to that project. Many NGOs get funding from variety of sources, including from overseas. The NGO could be deemed a public authority to the extent of government funding or to the specific project for which funding is provided.

*The Hindu, 8 January, 2008, Kochi edition*

## My Surat Experience

L. N. Sethumadhavan\*

I am narrating this as a humble citizen of our country. I want to share with you what I have really seen and experienced in Surat City – rapid transformation from the **filthiest** city to one of the **cleanest** cities in India.

Like many other Keralites, I too left my home state in search of a good job soon after my engineering graduation in 1965. I was fortunate to get a job in Larsen & Toubro Limited, (L&T) Mumbai – a leading engineering conglomerate today. After 22 years in Mumbai, my company transferred me to the new Heavy Engineering Unit at Hazira, near Surat.

Although I was happy on my assignment in the new Heavy Engineering Unit of L&T at Hazira, which ‘*make things that make India proud*’, my family was terribly upset and disappointed. They have come from congested city of Mumbai to the filthiest city in India. Garbage everywhere, mosquitoes and rats enjoying life and all kinds of sicknesses (all of us were affected by the dreaded Falciparum Malaria within the first few months and this was recurring year after year). On top of all these, the city was highly polluted, had narrow roads, unorganised and undisciplined traffic, unhygienic food stalls and hotels, poor medical facilities, etc. In short, if cleanliness is next to godliness, Surat was very close to hell.

The plague which broke out in Surat in September, 1994, created horrors in India and abroad. Most of the people fled from the city. Surat was like a haunted city – everything was quiet and standstill. Those who remained in the city were wearing masks and consuming tetracycline tablets for survival. You know all that happened from the newspapers. Foreign airlines stopped service and Indian export suffered. Indians in general and Suratians in particular were not welcome anywhere.

### A Success Story

Right under my eyes, I saw Surat city once branded as one of the filthiest city, getting transformed to the second cleanest city of India, in about 18 months which was a marvelous achievement. This transformation of Surat was spearheaded by swift and striking initiatives taken by the Surat Municipal Corporation (SMC). These were strengthened by the positive, proactive participation of other stakeholders of the city. The birth rate, death rate and infant

mortality, which were showing a desirable downward trend in the last three decades, have further improved in the post-plague period. Community participation played a key role in the rapid implementation of decisions taken by the Corporation. Following the disaster, there was a change in the attitudes of the citizens; they began to participate proactively in improving living conditions in the city. In addition to the administrative changes, changes in some of the laws had an important role to play by making citizens aware of, and responsible for, certain preventive actions.

### Total Quality Management

I found most of the elements of Total Quality Management (TQM) in the achievement of SMC. I would like to share the information about this in TQM perspective.

**POLICY AND STRATEGY:** What is the MISSION – the purpose – of (SMC)? During an interaction with Mr.S.R.Rao, then Municipal Commissioner of SMC, I found out that it was one of the first issues he brought up in front of his 15000-member family of SMC employees.

He asked his senior colleagues:

- What kind of corporation do you wish to be part of?
- What purpose justifies our existence?
- What kind of relationship should we all have?
- What values should we uphold?

They were all highly efficient and competent officials but miserably de-motivated. The questions raised by the Municipal Commissioner had its effect. Realisation of the important role they have to play awakened them. They cascaded the message down. A transformation in attitude started.

**PEOPLE MANAGEMENT:** What is the general scenario in a public organisation in this country?

- Political interference
- Many vested interests
- Multiplicity of unions
- Demoralised employees (no self respect)
- Clumsy systems

This is a perfect climate for non-performance. But if we apply the universal rule, a strong and determined leadership can change the scenario. The whole SMC team worked 15-16 hours a day and proved non-believers wrong. They worked in terrible conditions. It required mental courage

*Continued on page 15...*

\*L. N. Sethumadhavan is the Retd. Sr. Dy. General Manager, Larson & Toubro Limited, Surat.

## E-Waste – An Indian Perspective

Electronic waste or e-waste is one of the rapidly growing environmental problems of the world. In India, the electronic waste management assumes greater significance not only due to the generation of our own waste but also dumping of e-waste particularly computer waste from the developed countries.

### Definition

Electronic waste or e-waste is the term used to describe old, end-of-life electronic appliances such as computers, laptops, TVs, DVD players, mobile phones, mp3 players, refrigerators, etc. which have been disposed of by their original users. Computer waste is the most significant of all e-waste due to the gigantic amounts as well as the rate at which it is generated. In addition, its recycling is a complex process that involves many hazardous materials.

### E-Waste Hazards

Electrical and electronic equipment are made up of a multitude of components, some containing toxic substances which can have an adverse impact on human health and the environment if not handled properly. Often, these hazards arise due to the improper recycling and disposal processes used.

For example, Cathode Ray Tubes (CRTs) have high content of carcinogens such as lead, barium, and other heavy metals. Breaking, recycling or disposing CRTs in an uncontrolled environment without the necessary safety precautions can result in harmful side effects for the workers and release toxins into the soil, air and groundwater. Another dangerous process is the recycling of components containing hazardous compounds such as halogenated chlorides and bromides used as flame retardants in plastics, which form persistent dioxins and furans on combustion at low temperatures.

Landfill, one of the most widely used methods of e-waste disposal, is prone to hazards because of leachate which often contains heavy water resources. Mercury, cadmium and lead are among the most toxic leachates. In addition, landfills are also prone to uncontrolled fires which can release toxic fumes.

### E-Waste Management Challenges in India

The following are the challenges faced by India in managing e-waste:

- Rapidly increasing e-waste volumes, both domestically generated as well as through imports. Imports are often disguised as second-hand computer donations towards bridging the digital divide or simply as metal scrap.
- No accurate estimates of the quantity of e-waste generated and recycled.
- Low level of awareness amongst manufacturers and consumers of the hazards of incorrect e-waste disposal.
- Widespread e-waste recycling in the informal sector using rudimentary techniques such as acid leaching and open air burning, resulting in severe environmental damage.
- E-waste workers have little or no knowledge of toxins in e-waste and are exposed to serious health hazards.
- Inefficient recycling processes result in substantial losses of material value.
- ‘Cherry-picking’ by recyclers who recover precious metals and improperly dispose of the rest.

### E-Waste Policy in India

The Government of India has reiterated its commitment to waste minimization and control of hazardous wastes, both nationally and internationally. The Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and Disposal was signed by India on 15th March 1990, and ratified and acceded to in 1992. As per the Basel Convention, India cannot export hazardous wastes listed in Annex VIII of the Convention from the countries that have ratified the ban agreement. However, the agreement does not restrict the import of such wastes from countries that have not ratified the Basel Convention. It is through the orders of the Supreme Court that the import of such wastes is now banned in the country.

The legal basis therefore is regulated in the “Hazardous Waste Management and Handling Rules (1989/2000 amended)”. This document also controls the import of hazardous waste from any part of the world into India. However, import of such waste may be allowed for processing or reuse as raw material. There is no specific legislation pertaining to the management of e-waste so far.

*Reference: Materials from Toxic Link, [www.e-waste.in](http://www.e-waste.in)*

## Conversion of Garbage into Wealth and Health Security

Joseph K.D.\*

A healthy environment is important for the development of a nation. The responsibility for keeping the environment healthy is not only with the government. People also should act responsibly to create a healthy environment. It is expected that, with the knowledge of sanitation and its application in daily life, people will be able to lead a healthy life in a healthy environment.

But in reality this does not happen. Even in states like Kerala, once an apotheosis of community health and civic well-being, the health department is struggling with the task of containing communicable diseases such as chikungunya and dengue, which are vector-borne diseases. It is said that you reap what you sow; if you litter and foul your surroundings, then the environment will strike back in the form of vector-borne diseases.

In the wake of the spread of chikungunya viral fever, the Government of Kerala has launched a campaign to create awareness among the state's residents about the need to keep their surroundings clean. The Government hopes to rope in people from all walks of life to take part in the sanitation drive. As part of the drive, Kongad Gramapanchayath mooted the idea of decentralized treatment of garbage through an inclusive and participatory approach. It is roping in students, merchants, voluntary organisations, local clubs and environmental activists in a campaign to declare the rural town garbage-free.

Kongad Sanitation and Drainage Development Society was promoted by the combined effort of Attappady Social Service Organisation (ASSO) and the Kongad Gramapanchayath as an innovative project under the Kerala Rural Water Supply and Sanitation Agency (KRWSA). ASSO was instrumental in mobilizing the resources for the launching of a people's participatory, self sustainable and innovative model project to address the environmental problem of this rural town.

### Waste Treatment Programme

#### Objectives:

- To immediately stop indiscriminate littering and to reduce environmental pollution.
- To improve the landscape and develop hygienic conditions in the rural town.
- To raise public awareness of hygiene protection.

- To promote public participation in the field of environmental and sanitary protection.
- To encourage people to lead civilized life with high awareness about sanitation and environmental protection.
- To convert the garbage into wealth by producing vermicompost that is highly useful for the production of organic agricultural products.

### Operation and Management

There are 298 business shops in the Kongad rural town. A social survey was conducted among the merchants and institutions in Kongad town to assess the quantity of daily garbage produced in the form of biodegradable and non-degradable waste. This rural town was under the threat of communicable diseases due to the indiscriminate management of garbage and liquid waste.

The Kongad Gramapanchayath developed the infrastructure and institutional arrangement for the vermicomposting of the biodegradable garbage of the rural town with the technical guidance of ASSO and the financial assistance of KRWSA. The Kongad Sanitation and Drainage Development Society (KSDS) is the legal entity to manage and sustain the solid cum liquid waste processing and management. KSDS has selected 15 unemployed women and trained them in the collection and grading of garbage and the processing of vermicompost.

### Waste Management Strategies

Vermicomposting is the process of feeding of earthworms with organic waste and conversion of this waste material into vermicompost (organic manure made by the earthworms). It is the accelerated and controlled decomposition of organic waste, using composting worms and mesophilic bacteria active in the temperature range of 20°C to 26°C. The primary objective of this system is disposal of organic waste/wet garbage, and the secondary objective is generation of vermicompost organic manure.

Organic waste or biodegradable waste is the waste of plant and animal origin. It includes kitchen waste including tea leaves, egg shells, fruit and vegetable peels, cooked food scraps, meat and bones, garden waste including leaves and grass, carton waste, cardboard waste and paper waste.

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## Extended Producer Responsibility

Extended Producer Responsibility (EPR) is a strategy designed to promote the integration of all costs associated with products throughout their lifecycle (including end-of-life disposal costs) into the market price of the product. The basic principle of EPR is that producers should be held accountable for the entire lifecycle of the products including the packaging introduced into the market. The idea aims at building a sense of eco-responsibility among profit-minded corporates.

EPR should involve three integral components:

- Product take-back programmes
- Remanufacturing
- Redesigning

### Product take-back

The producer of the product should also shoulder the responsibility when it is discarded. This is the first and foremost step in EPR. The company should do this directly or through a third party.

These types of wastes are 100% recyclable and comprise around 67% of the solid waste in a rural town.

The earthworms used for the purpose are surface-burrowing ones also known as composting worms. These types of earthworms feed on rotting organic material. A blend of composting worms – African L Terestris, Nightcrawlers (Eudrilus Eugeniae), Eisenia Foetida and Perionyx Excavatus – is most ideal in Indian conditions.

Organic garbage is the food of earthworms. The trained workers systematically prepare compost out of it. In this process, initially microbes breakdown the garbage biologically by the process of decaying. The decayed material is added to the soil and form the food of earthworms. The earthworms eat this along with the soil and bring out manure soil in the form of excreta. This manure is good for vegetation and results in the speedy growth of crop.

Earthworms by their excreta, secretions and dead bodies give nutrient elements to vegetation and adds vital humus to the soil. They make the soil fertile and living. With the use of vermicompost, within a period of 35 days, the number of leaves on the tree are doubled, length and breadth of leaves increase, spread of tree increases, roots also increase

### Remanufacturing

The procured e-waste should be used as an effective resource base so that the maximum recoverables re-enter the manufacturing process. This will reduce the dependence on virgin raw materials.

### Redesigning

Redesigning the products especially computer and its components is a front-end solution to the e-waste menace. Some of the redesigning components that will effectively address the problem include:

- Designing the computers to ensure clean and safe mechanism for recovering raw materials.
- Clearly indicating hazards of dismantling and recycling in the form of warning labels.
- Replacing the hazardous substances in the manufacturing with suitable alternatives.
- Including provision for upgradation in computers.

*Reference: Materials from Toxic Link, www.wikipedia.org*

three times. The amount of nitrogen increases in the soil. Amount of phosphorous and potash also increases. If there are enough number of earthworms in the soil, 10% less water is needed. Salinity also decreases. It is observed that constant use of vermicompost is beneficial for the plants as well as for soil.

The method used in making vermicompost is an Environmentally Sound Technology (EST) according to the criteria defined by the United Nations Environment Program (UNEP). EST is defined by UN as being less polluting, using resources in a sustainable manner, recycling waste and handling waste in environmentally acceptable way. Vermicomposting has significant advantages over other waste disposal methods like landfill and incineration as per the criteria defined by the UNEP.

The efforts put in by Kongad Gramapanchayth is laudable. But this needs to be replicated in other parts of Kerala if it has to retain its stature as a State that is clean and green. Who will take up this uphill task of providing rural sanitation as done in the Kongad Gramapanchayath? Some sort of cooperation, collective leadership and social action and happy blending of the efforts of the Government, non-official public bodies and non-governmental organizations are needed for the creation of healthy living conditions in the State.

*Continued from page 4...*

monthly meetings. As per the collection system, the wastes (dry and wet) are collected by 'Healthy Friends' (volunteers). The total team of SUCHI movement consists of five Healthy Friends and one supervisor besides the area leaders.

The impact of the movement is impressive. At present, the colonies are clean, and dogs and vermins are not wandering here and there. The natives of other colonies are contacting the representatives of the movement for replication.

*Continued from page 11...*

and determination to stand in filth. When one sits in office, away from field, the information one receives will be distorted – it may be garbage. With their actual physical presence at site, senior colleagues can find out the problems of junior colleagues.

**RESOURCE MANAGEMENT:** Improved civic services, sewage systems and new roads and bridges are attracting more and more business houses. Information systems are so wonderfully managed that relevant information from all the six zones are available to the commissioner on daily basis and cumulative basis.

**CONTROL ON PROCESSES:** SMC after brain storming have come out with piece-rate system for many vital activities. Whether it is sweeping, garbage collection, road construction or other repetitive processes, the implementation is very fast. All non-value adding activities are getting reduced.

**EMPLOYEES SATISFACTION:** It is common knowledge that if technology was the panacea, Japan would have never beaten the Americans. It is believed that only 5% of performance of an employee is dependent on training, reward, skill or competence. 95% of performance of an employee comes from his attitude.

**CUSTOMER SATISFACTION:** Today everyone in Surat is proud of his/her city, because:

- The city transformed rapidly from the filthiest to the cleanest
- They have a responsive Corporation – The complaints are listened to and acted upon within time frame.

It is creditable that people who were showing apathy to good civic sense are whole-heartedly supporting the SMC.

## **Conclusion**

In the present system of waste management there is absence of people's participation and rules and regulations regarding throwing wastes on roads. We think that municipal council should develop a waste management system based on participatory approach. In this regard, various committees can be formed at the colony level. We believe that both the people's committees at the colony level and the municipal council can work together and make their city green and clean. But there is a need for strong commitment to achieve this end.

Even a petty vegetable or fruit-seller is conscious about his/her role in keeping the city clean.

## **RESULTS AND IMPACT ON SOCIETY**

- SMC has transformed the city from one of the filthiest to the second cleanest city in India within a short period.
- Pollution levels have dropped and waste management has improved.
- Health of the citizens have improved.
- SMC has recovered properties worth several million rupees from vested interest.
- SMC has proved that dynamic change is possible in government set-up also.
- SMC has proved that politicians, administrators, media – all can work together harmoniously for a noble cause.
- Citizens have become responsible with civic sense and protection of environment is given due importance.
- SMC has started getting the taxes with a smile.
- Citizen's complaints are solved within specified service level.
- SMC is sharing the success story for the benefit of other cities.

## **Conclusion**

Kerala can have its right place as 'God's own Country' in the world map, with growing investment in ayurvedic medicines, information technology, tourism, marine products, top quality education centres, etc. Unfortunately, the conditions especially in the cities here are going from bad to worse. We need a TQM approach. We need to change our mind set. We need to examine and correct the education system because change is easily possible only at the young age.

*Continued from page 3...*

equipment) is more difficult, due to the additional dismantling and separation required.

### *Biological Processing*

Waste materials that are organic in nature, such as plant material, food scraps and paper products can be recycled using biological composting and digestion processes to decompose the organic matter. The resulting organic material is then recycled as mulch or compost for agricultural or landscaping purposes. In addition, waste gas from the process (such as methane) can be captured and used for generating electricity.

There are a large variety of composting and digestion methods and technologies varying in complexity from simple home compost heaps, to industrial-scale enclosed-vessel digestion of mixed domestic waste. Methods of biological decomposition are differentiated as being aerobic or anaerobic methods, though hybrids of the two methods also exist.

### *Energy Recovery*

The energy content of waste products can be harnessed directly by using them as a direct combustion fuel, or indirectly by processing them into another type of fuel. Pyrolysis and gasification are two related forms of thermal treatment where waste materials are heated to high temperatures with limited oxygen availability. Pyrolysis of solid waste converts the material into solid, liquid and gas products. The liquid and gas can be burnt to produce energy or refined into other products. The solid residue (char) can be further refined into products such as activated carbon. Gasification is used to convert organic materials directly into a synthetic gas composed of carbon monoxide and hydrogen. The gas is then burnt to produce electricity and steam.

### **Avoidance and Reduction**

Another important method of waste management is to prevent the creation of waste materials. Methods of avoidance include reuse of second-hand products, repairing broken items instead of buying new, designing products to be refillable or reusable (such as cotton instead of plastic shopping bags), encouraging consumers to avoid using disposable products (such as disposable cutlery), and designing products that use less material to achieve the same purpose (for e.g., lightweighting of beverage cans).

Usually a combination of these methods are used for waste management in different parts of the world. As mentioned earlier, the choice of method will also depend on whether the area is developed or developing, urban or rural.

### **Reference**

[www.wikipedia.org](http://www.wikipedia.org)

*The views expressed in this publication are those of the contributors. They do not necessarily reflect the views of CEVA*

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