



NSWAI ENVIS

Municipal Solid Waste Management Newsletter



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SMART WASTE MANAGEMENT



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SMART CITIES NEED SMART WASTE MANAGEMENT

The speedy swell in population demands for more infrastructure and construction facilities. Employment opportunities coupled with the government's agenda to create new 100 Smart Cities is resulting in the emergence of new cities and urban areas. Smart city needs to be environment friendly to become sustainable in long run. A smart city aligns its incentives to reduce the amount of trash going to the landfill and increase the amount of recycling.

Hence, solid waste management systems would be one of the vital components of the smart cities. The efficiency of solid waste management system would depend on the active participation of all the stakeholders and citizens. SWM is of vital importance to an urbanized region which faces the constant pressure of increasing population density, rising infrastructural demands and expanding inflow of immigrants.

Any system to manage waste will not succeed unless citizens proactively participate in it. Hence, the awareness among the citizens becomes vital. People need to be made aware about the concept and context of waste segregation that has not kicked off well in the country so far. In many developed countries, a very few amount of waste gets disposed into the dumping yard and the most of the waste is recycled.

There are other aspects through which smart waste management plans can be formulated. The government also needs to focus on using technological measures like vehicle tracking, sensor enabled system, smart waste collection solutions among others to make waste management easy, efficient and smart in the upcoming smart cities. Waste management systems should be able to provide real time data on waste levels enabling on-demand waste collection. The effective use of such system coupled with proper recycling of waste will help in making a cleaner, pollution free environment for its citizens.

Dr Amiya Kumar Sahu
NSWAI Envis Coordinator

News

Food Waste A threat to climate, water, land and biodiversity

The wastage of a staggering 1.3 billion tonnes of food per year is not only causing major economic losses but also wreaking significant harm on the natural resources, says a new FAO report.

In addition to its environmental impacts, the direct economic consequences to producers of food waste (excluding fish and seafood) run to the tune of \$750 billion annually.

“We all – farmers and fishers; food processors and supermarkets; local and national governments; individual consumers – must make changes at every link of the human food chain to prevent food wastage from happening in the first place, and re-use or recycle it when we can’t,” said FAO Director-General José Graziano da Silva.

“In addition to the environmental imperative, there is a moral aspect: We simply cannot allow one-third of all the food we produce to go to waste, when 870 million people go hungry every day,” he added.

Effective waste management needed in Kullu valley: Report

A report on the composite plan on environmental issues facing the Kullu and Manali areas, which was drawn up by the Himachal pollution board last year, pointed out waste management schemes were not receiving sufficient financial support from the state government.

It proposed adoption of a “cluster approach” in which all urban local bodies and areas that have untapped potential to attract tourists potential are clubbed.

Owing to urbanization several new urban and suburban areas are springing up in the Kullu and Manali valley even outside the municipal limits. The report stated an estimated 3 million tourists visited the valley and, in the next few years around 5 million visitors are expected to come to the area every year. “Considering the couple of day occupancy, they will generate approximately 10 mt of solid waste scattered around scores of small tourist destinations in the valley,” it added.



Govt to simplify waste disposal process



The environment ministry plans to simplify approvals needed for disposal of waste through an integrated waste management information system. It will also modify archaic rules to tailor them to present-day needs. The ministry in the past few years has realized that there is an urgent need for a more comprehensive and holistic approach to ensure environmentally sound management of all kinds of waste through a single platform, an official said on condition of anonymity. “Thus, we have undertaken a task to develop an integrated waste management information system, which will have an interface with the presently operated Web-based operations by SPCBs (state pollution control boards) in their functions in granting CTCs (consent to construct) and CTOs (consent to operate),” the official said. This means the online platform will integrate various types of approvals with respect to waste management at the SPCB level. The information with respect to CTC, CTO and authorization will be updated for online processing of such applications.

SWM to get more funds from corporation

The Aurangabad Municipal Corporation (AMC), which is spending 21-22% of its total budget on solid waste management every year, may have to earmark more funds under the head from the next financial year. It will have to do so after the state government on Friday directed all the civic bodies in the state to allocate at least 25 % of their annual budget on waste disposal and management.

While promoting Prime Minister Narendra Modi’s Swachh Bharat Abhiyan, chief minister Devendra Fadnavis also directed the civic bodies to segregate garbage at source if they want land to dump waste. Unless these conditions are fulfilled, the local self bodies will not receive any grants under the 14th finance commission.

However, with the AMC recently getting upgraded from class ‘D’ to class ‘C’, it is not liable for grants under the 14th finance commission. But if the civic body meets the conditions, the state government may soon provide it land for a new dumping yard.

UEZ to explore waste management, river cleaning projects

French utility services provider SUEZ environment is eyeing in India business from waste management, river cleaning and the upcoming smart city projects.

The firm -- subsidiary of Paris-headquartered Suez Group -- provides water treatment facilities in India since early 1980s.

"We are growing here with a year-on-year growth between 10 to 15 per cent... We have a USD 100 million business here," SUEZ environment India Managing Director Shyam J Bhan said.

According to SUEZ environment Chief Executive Officer Jean-Louis Chaussade: "Australia business is around USD 1 billion and in China we manage a business of about USD 1 million.

DPR in Vizag



The GVMC will go in for a world class solid waste management and disposal process based on a detailed project report to be prepared by infrastructure development company IL&FS. The report is expected to be submitted by March 15. Municipal Commissioner Pravin Kumar said on Wednesday the agency was appointed by the State Government through AP Urban Finance and Infrastructure Development Corporation (APUFIDC). Representatives of IL&FS have been provided the required data. They interacted with the officials concerned.

Describing the efforts so far made by GVMC in SWM as piecemeal, he said the DPR would recommend waste to energy process in public private partnership (PPP). "GVMC will give land on lease and the agency will produce energy from waste and sell it," he said. There will be no pollution and plasma technology would be used in the process of waste disposal. The agency will recycle for all waste, including debris from buildings from which bricks will be made.

It would take six months for the process of finalising an agency through global tendering. Mr. Pravin Kumar said the model adopted in various colonies in Delhi was quite successful. He would go abroad to see the methods there.

Govt Seeks Ties With European Nations on Hazardous Waste



While India was "cleaner than other countries" in term of climate change impact at this stage of economy, there is concern over hazardous waste management and the country was looking for cooperation from European countries in the area. "Our co-processing of hazardous waste is not even 1 per cent. And, there is a tremendous scope of co-operation with the European countries," Additional Secretary, Ministry of Environment, Susheel Kumar said.

He was speaking at the '7th EU-India Environment Forum' here, themed on role played by resources efficiency and the circular economy in meeting environmental challenges.

"Our growth so far has been cleaner than other countries at this stage of economy, in terms of climate change impact and not the pollution aspect.

"If you see growth and pollution linkage.... We have traditionally a sustainable lifestyle, and our emission per unit of GDP (Gross Domestic Product) is much lower than any other country at this stage of economy," he said.

Pitching for suitable legislative framework and institutional efficiency at all levels of the government and other stakeholders, Kumar said, work was on to get a suitable business model of cooperation between India and the European countries, but there was a need to expedite it.

Automatic waste collection

Towards Z

As waste management operations all over the world attempt to become cleaner and greener in the face of new legislation, some companies are looking to move away from the older systems of collecting and transporting waste by road and are taking the whole thing underground.

Even though pneumatic waste collection systems have been around for decades, they are experiencing an upsurge in popularity, as cities are becoming increasingly aware of the problems related to conventional methods of waste collection. The trend to incorporate automated waste collection systems into new housing development projects is rising, particularly in Europe, and in Asia where South Korea, Taiwan and Hong Kong are leading the way in implementing this type of technology.

The system is remotely monitored and controlled by operators at the waste station. In addition, some staff is needed to handle the system maintenance when required. No personnel are needed in the actual collection and

Waste collection points of the pneumatic system encourage the users to recycle more efficiently. The inlets are never full and the fact that there are no unsightly piles of waste or unpleasant odours is beneficial for both the cleanliness and image of the area



Zero Waste

Features of Automated Waste Collection System

- AWS through chute system from high rise buildings
- Minimal human intervention thus minimal negative impact on health
- Minimize space requirement
- Waste sucked through pipes at a speed of 90 km/hr
- Segregation of waste through sensors
- Waste Treatment through Plasma Technology
- New system for collection, not a time proven
- Extra space requirement for utility corridor within the road section
- The garbage transport underground pipe network runs parallel with the other infrastructure services

transport of waste from the collection point to the waste station.

As well as savings from reduced personnel costs, waste vehicle and fuel costs, there are various ways in which automated waste collection systems benefit not only the city image but the environment.

One of the main environmental benefits is reduced CO₂ emissions, which is a result of reduced waste vehicle traffic. Reduced waste vehicle traffic also means a more pleasant and safe environment for people living in the area where the system is in use.

Typical application areas for pneumatic collection systems include large metropolitan and residential areas, high-rise buildings, public spaces, healthcare facilities, and hotel and office complexes. The system life cycle depends on several factors, such as the amount of collected waste, the climate of the operating environment and ground conditions.

Pneumatic waste collection systems provide notable long-term cost savings. In order to operate, systems require personnel at the waste station and for maintenance but no manpower is needed in the actual collection and transportation of waste to the waste station. In addition, no waste trucks are needed to collect waste containers from residential areas, bringing savings in fuel costs and vehicle costs.

While the initial investment cost for a pneumatic system is higher than that of traditional methods, the operating cost of the old system is usually considerably higher, and after the typical estimated payback period of 10-12 years, the pneumatic system is considerably more economical than the conventional one.

In addition to cost savings, pneumatic waste management systems have environmental benefits. As there are no waste collection trucks circling around the residential areas, there are less fuel emissions, less traffic and fewer accidents. It has also been discovered that the waste collection points of the pneumatic system encourage the users to recycle more efficiently. The inlets are never full and the fact that there are no unsightly piles of waste or unpleasant odours is beneficial for both the cleanliness and image of the area. Another benefit is that a pipeline-based waste collection system is very flexible and the system does not get congested even at peak times.

Source: www.waste-management-world.com



Biomass Utilization Technology For sustainable future

**Technology to efficiently recover electricity and fuel
from biomass waste**



Rapid rate at which fossil and residual fuels are releasing hazardous gases into the atmosphere has raised international concern and has spurred intensive efforts to develop alternative, renewable, sources of primary energy.

Biomass as the solar energy stored in chemical form in plant and animal materials is among the most precious and most promising alternative fuels not only for power generation but also for other industrial and domestic applications on earth.

It provides not only food but also energy, building materials, paper, fabrics, medicines and chemicals. Biomass has been used for energy purposes ever since man discovered fire.

Biomass wastes can be transformed into clean energy and/or fuels by a variety of technologies, ranging from conventional combustion process to state-of-the art thermal depolymerization technology. Besides recovery of substantial energy, these technologies can lead to a substantial reduction in the overall waste quantities requiring final disposal, which can be better managed for safe disposal in a controlled manner while meeting the

pollution control standards.

There are a number of challenges that inhibit the development of biomass energy. In this regard, formulation of sustainable energy policy and strategies in addressing these challenges is indeed a pre-requisite for the development and promotion of biomass energy. Major available biomass utilization technologies are described and their advantages and disadvantages are discussed here.

It is important to say, that biomass absorbs the same amount of hazardous gases in growing that it releases when burned as a fuel in any form. This means that biomass contribution to global warming is zero. In addition, biomass fuels contain negligible amount of sulphur, so their contribution to acid rain is minimal.

Over millions of years, natural processes in the earth transformed organic matter into today's fossil fuels: oil, natural gas and coal.

Source: Siemens Energy and Alternatenergymag

Waste Landfill technology

Redeveloping landfill sites

Less than one percent of household waste in developed countries ends up in a rubbish dump. The rest is recycled in different ways. Land-filling has decreased and material recovery, biological treatment and incineration for energy recovery have increased as a result of more sorting of waste at source and changes in waste treatment.

An engineered landfill site allows final disposal of solid waste in a secure manner by minimizing the impacts on the environment. The location, management, closure and re-use of landfills can be a fraught process. In recent times, there have been a number of glaring mistakes in reusing landfills around the world, resulting in the need for stringent guidelines around the closure and reuse of landfills.

Historically, landfills have been filled old quarries in urban areas which often end up surrounded by the encroaching urban development and became valuable land.

Understand the Dynamics of Landfills

Commonly found in landfills, putrescible materials are anything organic, including kitchen scraps, paper, timber, cardboard or yard waste. Nutrient rich leachate and gases are produced when these types of materials breakdown. The type of leachate and gas produced vary depending on the degradation stage; however the most common are methane and carbon dioxide. Methane can be produced in vast quantities and, as it is lighter than air, can rise up through landfill and cover and can get caught in buildings and services where it can collect at levels higher enough to explode. Prior to the mid 1970s, landfills were often burnt and poorly compacted with minimal interim cover, and were not designed to mitigate and recover leachate or gas. Landfills constructed since the 1970s are better managed but still produce gas and leachate. Consequently, leachate and gas can create problems if you wish to reuse or develop on or near a landfill. The following simple rules will help during planning stage.

Redeveloping Landfills for Future Use

Light on Landfills: Solar energy covers turn maxed-out landfills into solar farms. The goal for this new capping system is to create an alternative to traditional landfill covers that will create revenue, boost renewable energy use, and utilize obsolete land. These sites can also be used as runway and parks after consulting experts in the field.



Source: *Environment Earth Sciences*

PET Bottle Recycling

Reduce, Reuse, Recycle

The biggest problem with plastic recycling is that it is labour intensive and this is because it is difficult to automate the sorting process. Numeric codes are used to indicate different types of plastic. New mechanical sorting processes using spectrometry are being developed and implemented to increase plastic recycling capacities and efficiency.

Containers are usually made from a single type of plastic, making them relatively easy to sort. However, mobile phones for example, usually have various components made from different types of plastic. New research and development programmes are being set up to improve disassembling technologies and to increase the recovery and recycling rates of plastic products.

Unlike metals, recycling usually affects the physical properties of plastics to some extent. This makes it difficult to recover large amounts of certain types of plastics for use

in the same applications that they were originally produced for. Thanks to intensive research and technological developments made by recycling companies, recycled plastic can be used in almost as many applications and products as those using virgin materials.

Collection and Recycling to make diverse products

Under the 3R policy (Reduce, Reuse, Recycle), Japan has been collecting PET bottles, food trays, and cans separately for reuse as recycle resources in the manufacturing of new products. PET bottles are collected in accordance with the Act on the Promotion of Sorted Collection and Recycling Containers and Packaging, and they are used to make a variety of textile products, etc. Relatively high-grade PET bottles are collected and remade into PET bottles or carpets with the high technology possessed by Japan.



Recycling Facts

- ◆ One tonne of recycled plastic saves 5,774 kWh of energy, 16.3 barrels (2,604 litres) of oil, 98 million Btu's of energy, and 22 cubic metres of landfill .
- ◆ There is an 80 to 90% reduction in energy consumption by producing recycled plastic compared to producing plastic from virgin materials (oil and gas).
- ◆ Recycling a single plastic bottle can conserve enough energy to light a 60-watt bulb for up to six hours.
- ◆ Recycling 5 PET plastic bottles produces enough fibre for one t-shirt.
- ◆ Recycling 100 million cell phones saves enough energy to power more than 194,000 US households for one year.
- ◆ Worldwide trade of recyclable plastics represents is valued at \$5 billion per year and is estimated to represent a total of 12 million tonnes.
- ◆ EUROPE recycled 21.3% of plastic waste during 2008 representing about 5.3 million tonnes.
- ◆ A recent study shows that if all landfilled plastics waste are recycled or recovered into energy, then 7% of EU quota of CARBON GAS REDUCTION will be fulfilled.

Source: Bureau of International Recycling and Ministry of Environment, Japan

Case Study

Decentralize Waste Management A Viable Solution

The General Pool Residential Accommodation (GPRA) complex at New Motibagh is 110 acre campus housing about 1000 families of bureaucrats and their domestic helps. The GPRA complex was constructed and maintained by the National Building Construction Corporation (NBCC) Ltd. The NBCC put in place a decentralized waste water and municipal solid waste management system for the houses at New Motibagh and integrated a solar energy street lighting and solar water heating system with the housing plan. The project demonstrates that clean environment is not a burden on the exchequer or the ecosystem.

Waste Water Management

Of the eight lakh litres of water consumption, 5.6 lakh litres is treated in a decentralized waste water treatment plant within the campus using the Moving Bed Bio-reactor (MBBR) technology. The direct savings of the decentralized waste water system is Rs 14.60 lakhs per annum on account of saving surcharge of 50 percent on water bill for non-disposal of sewage to municipal system. The recycling of sewage to obtain secondary treated water from the decentralized Sewage Treatment Plant (STP) and using the same for gardening and horticulture in the campus to the tune of about five lakh litres per day saves Rs 27.50 lakhs per annum.

Use of sludge cake from the STP for horticulture, is responsible for saving an additional Rs 2 lakhs per annum. The total net saving is Rs 5 lakhs per year after the fixed cost and O&M are deducted. In addition, the complex is able to give about 50,000 litres per day of treated water to the NDMC for its gardens and parks at no cost.

Solid Waste Management

The Solid Waste Management project installed by Green Planet Waste Management Private Limited (operator) in collaboration with the NBCC cost around Rs 20 lakh on account of providing 4000 Square feet for covered sheds. All other expenditure of approximately Rs 50 lakhs on machinery, garbage bins at common places, collection trolleys/cycle rickshaws and O&M have been made by the operator. The operator has been authorized to use the campus for green slogans, sponsorship and other advertisements for revenue generation.

The total generation of waste from the households and shops is 1.5 MT while the garden waste accounts for another 1 MT. Of the household waste, the wet compostable waste from households is about 1 MT per day which is converted to compost using the Excel method, This is followed by composting in trays kept on racks, humidified and turned daily for about 3-4 weeks. Thereafter it is cured, sieved and



packaged to be sold at Rs 5 per kg.

Similarly, for enhancing segregation of all dry waste at source, a campaign to separate dry waste in homes besides the materials recovery shed would increase the revenue generated from selling recyclables and reducing hazardous components in the compost.

Financial viability

The total monthly expenditure including depreciation, return on investment, management charges, consumables, work force salary, and maintenance, as claimed by the operator, is about Rs 3 lakh. While the monthly revenue generation from sale of 12.5MT of compost (there is a 50-60 percent reduction by weight during composting due to evaporation, and other reasons) at Rs 5000 per MT, and recyclable materials fetches about Rs 2.37 lakh per month. The operator is presently claiming a shortfall of Rs 65,300 per month.

Although, the pellets made from the garden waste like lawn cuttings and garden pruning, using a well-designed garden waste dryer and pellet maker, have not been marketed and are lying packaged at the site. It is estimated that of the 12-12.5 MT of pellets generated per month. This would cover the shortfall and generate a small surplus by yielding Rs 90,000 per month.

The energy savings from the solar street lighting at the GPRA complex, scientifically installed to cover all significant areas of the campus including internal roads, common areas, parking lots and bungalows numbering about 300 street lights, help in saving at least Rs 2.69 lakhs per month or about Rs 32.28 lakh a year. Along with solar water heaters, the savings on electricity is close to Rs 35 lakh a year.

Therefore, a decentralised integrated solid waste, waste water and solar energy project for about 1000 households can achieve clean and green surroundings in addition to financial savings to the tune of Rs 40-50 lakh per annum. This is in addition to achieving green surroundings, ground water recharge and the reduction in carbon footprint, which is yet to be monetized.

Upcoming Events

ISWA Beacon Conference on Waste Prevention and Recycling

The focus of this conference will be on re-use, circular economy and extended producer responsibility

From: 27-29th may 2015

Venue: Vienna, Austria

Organizer: INTERNATIONAL SOLID WASTE ASSOCIATION (AUSTRIA)

Email: iswa@iswa.org

WasteTech-2015

From: 26 April 2015 - 28 June 2015

Venue: Moscow, Russia

Website: <http://www.waste-tech.ru/>

ISWA Beacon Conference on Waste to Energy Facilities in Emerging and Developing Economies: Challenges and Options

From: 16 April 2015 - 17 April 2015

Venue: Philadelphia, PA U.S.A.

Organizer: ISWA and WMAM - the Waste Management Association of Malaysia

15th International Automobile Recycling Congress IARC 2015

From: 24 March 2015 - 27 March 2015

Venue: Berlin, Germany

Website: www.icm.ch/

NSWAI ENVIS 2015

One Day Workshop on Municipal Solid Waste Management With Special Emphasis on Plastics Waste Management

From: 20 March 2015 - 20 March 2015

Venue: Kolkotta

ICSW 2015

The Thirtieth International Conference on Solid Waste Technology and Management

From: 15 March 2015 - 18 March 2015

Address for Correspondence

Spaze IT Park, B – 1136 C,
Sohna Road, Sector 49,
Gurgaon, Haryana-122001

Phone

+91 9967671952

Visit us at

www.nswaienvis.nic.in, www.nswai.com

Email us at

nswai@envis.nic.in, nswaindia@gmail.com

Dr Amiya Kumar Sahu

NSWAI Envis Coordinator

Rajiv Ranjan

I.T. Assistant

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Feedback for the newsletter would be appreciated.***