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**SOLID WASTE MANAGEMENT
CHALLENGES AND PROSPECTS**

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SOLID WASTE MANAGEMENT - PERSPECTIVES

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Urban India is likely to face a massive waste disposal problem in the coming years. Until now, the problem of waste has been seen as one of cleaning and disposing of rubbish. However, a closer look at the current and future scenario reveals that waste needs to be treated holistically, recognising its natural resource roots as well as health impacts. Waste can be wealth; which has tremendous potential not only for generating livelihoods for the urban poor but can also enrich the earth through composting and recycling rather than spreading pollution as has been the case. Increasing urban migration and a high density of population has made waste management a difficult issue to handle.

In India, the collection, transportation and disposal of SW are unscientific and chaotic. Uncontrolled dumping of wastes on the outskirts of towns and cities has created overflowing landfills, which are not only impossible to reclaim because of the haphazard manner of dumping, but also have serious environmental implications in terms of ground water pollution and contribution to global warming. In the absence of waste segregation practices, recycling has remained an informal sector working on outdated technology, but thriving owing to waste material availability and market demand of cheaper recycled products. Paper and plastic recycling have been especially growing due to continuously increasing consumption levels of both the commodities.

The ministry of environment and forests had recently legislated the Municipal Waste Management and Handling Rules 2000. This law details the practices to be followed by the various municipalities for managing urban waste. However, the response has been segmented and far from satisfactory. There are many reasons for this. Foremost among them is the fact that it does not address the mechanism for promoting recycling, or waste minimisation. In addition, provisions have to be made for public participation. Other recent policy documents include the ministry of urban affairs' Shukla Committee's Report (January 2000) the Supreme Court appointed Burman

Committee's Report (March 1999), and the Report of the National Plastic Waste Management Task Force (August 1997).

However, in spite of the many rules and regulations in place, they seem to be rather inadequate both in terms of assessing environmental impact of waste and in terms of its economic and social implications. Therefore, for developing countries, recycling of waste is the most viable option for waste management as well and for income generation for the unskilled. Recycling also has a tremendous impact on the environment as it helps to conserve the natural resources. For this all the stakeholders have to play an integrated role in the successful implementation of the SWM programme.

Municipal Committees / Corporations are the main role players in Solid Waste Management. A well-coordinated plan involving all stakeholders will lead to efficient segregation, removal and utilisation of garbage. The municipal agencies have the responsibility to create awareness for which they can take the assistance of the media, i.e. Advertisements in local dailies and audio-visual publicity through radio and TV. They can also inform the citizens about their role, the programme of action and other agencies like NGOs who are involved. The civic agencies should also plan a viable marketing system to ensure that compost is sold.

Communities play a very important role in SWM as the best of schemes go awry without the cooperation of community members. It is the responsibility of each resident to ensure that waste is segregated at source and biodegradable waste conveyed to the collection point from where it would go to the composting area. They must assist the assigned municipal staff in ensuring that the area is kept clean and littering is not permitted. NGOs also play a very crucial role in catalysing community action. Schools can also be invited to participate in these schemes, until the system is set in place and starts working. NGOs should also involve charitable institutions like Rotary, Jaycee, Lions, etc. for financial support.

Business Districts, Community Centres and Markets generate large amounts of waste. Visitors, shoppers and customers litter the area making it a virtual mess and an eyesore. The waste is both biodegradable from eating places and dry / non-biodegradable resulting from packaging, plastic bottles, cups cardboard, etc. Every shop / establishment should have both types of bins with adequate sign posting for proper disposal. This is specially needed for eating places where segregation is necessary. In Kerala, the ragpickers are a nonexistent community. But as a rule, they are an important link in the

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SWM system. They are instrumental in segregating the waste and then taking away the non-biodegradable for selling.

Solid wastes are of different types and from different sources - Municipal, solid waste, Industrial solid wastes and Hazardous wastes. Disposal of Wastes involves composting - Aerobic composting, anaerobic composting, mechanical composting, vermi- composting, etc. Composting-aerobic and anaerobic are two options available to the country for scientific disposal of waste.

Composting of city wastes is a legal requirement provided under the Municipal Solid Waste Management (MSW) Rules 2000, for all municipal bodies in the country. The MSW Rules 2000 requires that "biodegradable wastes shall be processed by composting, vermi-composting, anaerobic digestion or any other appropriate biological processing for the stabilisation of wastes". The specified deadline for setting up of waste processing and disposal facilities was 31 December 2003 or earlier.

The production and sale of city compost is not the primary function of city administrations, but it may prove to be successful if privatised for optimum efficiency and care. The real economic benefits of compost use, like improved soil quality, water retention, biological activity, micronutrient content and improved pest resistance of crops, are equally ignored by policy-makers and fertiliser producers. Fertiliser producers are yet realise that preventing soil depletion and reclaiming degraded soils would in fact increase the size of the market and therefore, also their market share, which is currently threatened by globalisation and world prices that undercut their own. .

Vermiculture- also offers the scope to utilize below ground microorganisms to develop and maintain the biological fertility of soil. Compost has been one such technology. Earthworms have been known as farmers' friends for long. The Ministry of Urban Development and Poverty Alleviation (CPHEEO) recently short listed Morarka Foundation to provide know how for conversion of city waste into vermicompost under Supreme Court direction for all municipal towns having more than 10,00,000 population as an "Appropriate Technology On Solid Waste Management".

In the future, Waste treatment technologies will most likely promote sustainable economic development, particularly in terms of saving resources and energy. They will also contribute to improvement of both social systems and technical development in response to tomorrow's "circulation-type" societies. Recycling, which is economically efficient and based on appropriate

waste treatment, will be important, but gradual progress is also expected in reducing waste discharge volumes both at the individual level through lifestyle changes, and at the corporate level through efforts at so-called "zero emission." Increases in material recycling, thermal recycling, appropriate processing of toxic matter, and technologies to preserve life environments will be seen.

Following is a short survey of some of the municipal solid waste treatment technologies that can be expected to see in the future.

<p>Gasification and Ash Melting Technology</p>	<p>This is considered the next-generation waste incineration technology because it simultaneously reduces dioxins, cuts exhaust, melts ash using the energy of the waste itself, and allows material recycling. Systems are roughly classified into kiln, fluidized bed, and shaft incinerator types, and more than a dozen major manufacturers are competing intensely in their development. Several plants with shaft incinerator systems are already in use for incinerating municipal solid waste, and the first kiln type plant is under construction. A number of problem are as have been identified, including the need for stable waste quality, stable control over power generation, and durability of the ash incinerator. These problems notwithstanding, however, widespread use of these systems is possible if their practicality and reliability in actual use can be confirmed.</p>
<p>Thermal Decomposition Technology for Dioxins</p>	<p>Inflammable dechlorination is representative of this technology. In this process the fly ash is heated in a reduction atmosphere, causing a dechlorination reaction that decomposes the dioxins within the fly ash. Around 95 percent to 99 percent of the dioxins are decomposed. Because the equipment is compact and inexpensive, its installation can</p>

	<p>be expected in both new and existing incinerators.</p>
<p>Technologies for Conversion of Waste Plastics to Oils</p>	<p>This technology, representative of the material recycling technologies, thermally decomposes waste plastics and converts them into oils and gases. Several manufacturers are already operating trial plants. Problems still to be resolved include reducing manufacturing costs, achieving stable residue processing, and developing markets for the resulting product. The Law for Promotion of Sorting and Recycling of Containers and Packaging does not apply to waste plastics until the year 2000. While the effect of this technology on reducing waste is often compared with blast furnace intake and thermal recycling methods, we can expect to see its industrialization.</p>
<p>Pneumatic Transportation of Municipal Solid Waste</p>	<p>This technology, which uses a suction method to transport municipal solid waste, is effective for office buildings or housing complexes in which a public utility conduit has been provided during urban redevelopment. The initial investment is high, but handling is safe and hygienic. Systems of this type are now operating in about 20 buildings, and small-scale systems using vacuum trucks are undergoing trial testing. Cost-performance remains the key factor in gaining widespread use of this technology. The possibility is high for its future use in reducing cleaning costs in large urban redevelopment projects, in buildings such as hotels and hospitals that require a high degree of cleanliness, and in condominiums for the elderly.</p>

Solid Waste Management :

To effect and ensure that community projects are successful and fulfilling the greater objectives of environmental safety and natural resource conservation, they have to be adequately supported from all the agencies concerned. There should be recognition and support for such work by the different institutions from various stakeholders. This will help to bring the work into the larger public space, and will help to review the rules and regulations, both for enhancing and for providing incentives to such community waste management systems.

1. Solid waste management in India: options and opportunities
Gupta S, Krishna M, Prasad R K, Gupta S, Kansal A. 1998. Resources, Conservation and Recycling 24(2): pp. 137-154
2. Article Written by Professor Takashi Gunjima, Sanwa Research Institute, supervised
3. Standard handbook of Hazardous Waste Treatment & Disposal, by Freeman H.M., McGraw Hills.
4. Bartone, C.R. 1995. "The role of the private sector in developing countries: Keys to success. Paper presented at ISWA Conference on Waste Management - Role of the Private Sector, Singapore, 24-25 September 1995.
5. Municipal Solid Waste (Management & Handling) Rules 2000, Ministry of Environment & Forests, Government of India, issues on 25 September 2000
6. Patel. Almitra H, Using city compost for urban farming in India .