

## **GENERATING WEALTH FROM WASTE**

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**August 1999**

Over the years the enormous increase in waste materials generated by human activity, industries, hospitals etc., have lead to harmful effects on public health, environment and the welfare of mankind. The quantum and diversity of such waste materials along with the limited capacities of the global environment to absorb these wastes without serious environmental and ecological consequences has lead to worldwide concern about an urgent need to adopt efficient, scientific and safe methods for the treatment, processing and disposal off wastes.

Most of the waste generated in the country finds its way into rivers, ponds and land without appropriate treatment resulting in harmful gases, bad odour and pollution. The harmful side effects of these are being felt by all citizens, adversely affecting their quality of life. While advancement in medicine is manifold, the diseases linked to environment and pollution is also rapidly increasing.

There is an immediate need not only to minimise the generation of wastes and to reuse and recycle them; but more important to find alternative outlets and techniques for recovery of energy, which holds immense promise. The wastes generated may be in either solid or liquid form and may be classified as hazardous wastes, which pose a particular threat and general wastes. Hazardous wastes, which include used needles and syringes, tissues, toxic chemicals lead to diseases like aids, hepatitis, etc.

The problem of waste management can be mitigated through the adoption of improved methods of collections and transportation, scientific methods and environment friendly technologies for treatment and processing of wastes before it is disposed off. These technologies would not only reduce the quantity but also improve the quality of waste to meet the required pollution control schemes besides generating substantial energy.

The first problem of waste management pertains to collection and transportation. Studies conducted indicate that the per capita generation of municipal solid wastes in urban areas is about 0.4 kg per day. Similarly about 150 litres. per capita per day of sewage (liquid waste) is also generated. In addition, large quantities of waste are also generated by several industries such as sugar, distilleries, pulp and paper, hospitals, tanneries, etc. Various techniques have been tried for the collection and transportation of these wastes for onward treatment. The cost of this includes the salaries of sweepers, garbage collectors, trailers, etc. and if not done leads to dirty neighbourhoods. A successful and simple solution to such a problem was found in Mozambique where the citizen was paid equivalent to 0.70p per kg of garbage deposited in the common city dump. This lead to the citizens not only keeping their neighbourhoods clean but also earning in the process. On the other hand, the municipal corporation which was spending over a rupee per kg on salaries and collection of these wastes found the system more efficient and cost effective. A simple solution through community participation was hence evolved converting the wastes into wealth for the citizens.

The major potential for converting wastes into wealth in our country lies in the fact that estimations show that about 1000 MW of power from urban and municipal wastes and about 700 MW from industrial wastes in the country can be generated. This potential is likely to increase further with economic development.

Some of the technological option for recovery of energy from wastes includes:

- **Anaerobic Digestion/Biomethanation:**

The biogas produced can be utilised for cooking, heating, generating power or electricity, gas engines, low-pressure gas turbines or steam turbines and can also be used as soil conditioner or manure.

- **Landfill gas recovery :**

The gas, which generally last for 10 years or more, can be used as a source of energy for heating/cooking or electricity.

- **Incineration:**

It generates thermal energy for heating/power generation and is relatively odourless and hygienic.

- **Densification/Pelletization:**

It can be conveniently stored and transported and used for combustion process and utility boilers.

Although the government of India and a number of international donors have various schemes for solid waste management systems, unfortunately the awareness of these schemes and related grants is not there in most parts of the country. The projects which could normally be totally funded through grants would not only be at zero cost to the state but would enable it to convert the wastes into wealth. As advisors to various state governments and also responsible for environment audit, I feel that the profession of chartered accountancy should also look at advising on more macro issues like this. This would result in not only additional wealth but would also enhance the quality of life for our future generations and us