



Solid waste management in Punjab

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SOLID WASTE MAY generally be categorised as domestic, industrial, agricultural, construction/engineering, commercial and biomedical. The generation and proper management of solid waste is almost directly proportional to the economic status of any community. A high economic status means generation of relatively high quality waste and high probability of its appropriate management/gainful re-utilisation. If improperly disposed/managed, as is the case in India, the waste may create wide ranging environmental and health problems, including the spread of severe epidemics. Wise or sound management of garbage involves participation of each agency or person concerned for segregation at source, proper collection, transportation and environmentally safe disposal, besides recycling and reuse.

Garbage problems in Punjab

Punjab — the grain basket of India, is the major agricultural State of the country. More than 83 per cent of its area is intensively cultivated. A population of 2.02 crore persons (1991 census) is residing in 134 towns and 12,342 villages. Ludhiana, Jalandhar, Amritsar and Patiala, with a total population of above 60 lac persons, are the major towns facing river garbage related problems.

Total household waste being annually generated in the state is about 2.99 million tonnes of which 1.46 million tonnes is generated in urban areas. 30.9 million tonnes of livestock waste (dung etc.), 36.8 million tonnes agro waste comprising 15 million tonnes rice straw, 3.3 million tonnes rice husk and 18.5 million tonnes wheat straw is generated every year. However, 11.3 million tonnes rice straw and 3.7 million tonnes wheat straw is burnt in the field itself. Besides, 2.9 million tonnes of industrial solid waste of which 1.8 million tonnes is flyash from thermal power stations is being generated. As regards hazardous waste from hospitals about 700 tonnes are being generated in the state.

There is a vast difference between the problems of garbage disposal and management in urban and rural areas. In towns and cities, the municipal waste from various sources is dumped in low lying areas. In villages, it is generally used to fertilize the fields.

Thus, the unscientifically managed solid waste which has been termed a "nuisance" in towns and cities is a reusable resource in villages.

Garbage management in rural areas

In rural Punjab, which consists of 12,342 villages, the garbage is being managed by the residents through per-

sonal efforts. The household waste and cattle dung (left out after making dung cakes) is generally collected at places owned by individual households for annual use in agricultural fields.

Farmers purchase the garbage of non-agricultural communities as well. The characteristic feature of this rural solid waste is that it is generally free from/or contains only a negligible percentage of glass or other non-biodegradable materials and paper, as these are sold by the households to the *Kabaris* (waste collectors). Broken glass or other shrapnel are carefully removed to prevent injury to human or cattle during agricultural operations.

Construction waste is utilised for landfilling. Waste paper is sometimes used in making small containers after treatment and mixing with bentonite. Waste rags are used in cleaning of house floors, engines etc.

The agro-residues are either burnt in the field or are collected for household fuel. They are also sometimes burnt for generating smoke in the cattle sheds to protect cattle from mosquitoes and flies during summer/monsoons.

A part of the agro-residues are laid on the cattle shed floor daily to provide a drier floor. The agro-residues and the cowdung (*gobar*) are later collected together from the floor to serve as manure. Burning of agro-residues causes air pollution, leads to a considerable loss of biomass resource, and has an adverse impact on soil microflora and fauna.

Therefore, appropriate technologies need to be developed for the reincorporation of agro-residues into fields.

Garbage problems in urban areas

The situation is entirely different in the urban areas of Punjab. Whole waste is left for the Municipal Corporation to carry to the common dumping ground. Environmental specifications are grossly flouted causing environmental and health hazards. The dumping sites are not properly managed. Nor are suitable green belts or plantations of trees and shrubs provided inside the dumping yard to protect the surrounding areas from the effects of solid waste pollution. This state of apathy exists inspite of the known fact that plantations of a number of tree species help to contain solid waste within the specified areas. Plants themselves aid in the quick degradation of solid wastes and create conditions conducive for the growth of micro-organisms responsible for degradation of wastes. Besides, plants provide greenery and a clean environment. Steps desired to be undertaken as part of post-dumping process are also never practised.

Garbage management problems

Garbage management problems generally arise due to:

- Irrational disposal of garbage by the households, industries, public offices, hospital etc.
- Unscientific collection and management of garbage which is being dumped in the open places.
- Economic constraints of the Municipal Corporation.
- Lack of sufficient technical manpower.
- Deficient infrastructure.
- Lack of public awareness regarding ill effects of unscientifically managed solid waste.

As per preliminary investigations undertaken some-time back regarding Ludhiana, it is estimated that the municipal garbage contains roughly 55 per cent organic waste like food waste, fruit, grasses, leaves, paper etc., 19.6 per cent incinerable waste like leather, textile waste etc., another 19.6 per cent is recyclable waste like glass, metal etc. leaving only 6.8 per cent waste of the total garbage as inert matter which requires dumping at suitable places (Ladhar, 1993). This data, however, lacks the information regarding hazardous wastes of hospital and industrial origin as well as information regarding other physico-chemical parameters like per cent Volatile matter, Calorific value, Ash, Chemical analysis, LL Value, C/N Ratio, etc.

Disadvantages of unsound management

Unscientific disposal and management of solid wastes causes severe, sometimes irreparable, damage to the environment and public health both in the short term and the long term range. The direct and indirect damage caused by the present trend in disposal of solid waste includes:

- *Prime land wastage:* Waste is generally disposed in the low lying areas including wetlands. As land is becoming extremely precious day by day, its use for dumping solid waste may not be tolerated for long.
- *Health risk/unhygienicity:* Diseases like typhoid, yellow fever, cholera, encephalitis, filariasis, dysentery etc. are associated with unsanitary garbage disposal.
- *Resource wastage:* The majority component of urban garbage is organic waste material which is a rich energy resource. Other useful constituents include glass, paper, plastic, rags, metals etc. recycling of which considerably reduces manufacturing inputs.
- *General environmental pollution:* Unscientific waste disposal is inflicting irreparable damage to our fragile/tender environment as soil is getting "sick", wetlands polluted, air dirtier and so on.

Percolation of leachates are degrading the ground water quality — the availability of which is already preciously scarce in towns.

Moreover, polluted surface water and the solid waste dumped in lowlands act as rich breeding grounds for disease carrying organisms.

Sound management of garbage

The environmental and health hazards of improper disposal of garbage are well understood. And yet, management approaches still lack farsighted policies and programmes. In fact, we all ignore our ecological obligations.

Some points for environmentally sound management of urban garbage are:

- Every individual should contribute towards waste minimisation at source, segregation and management.
- Re-use/recycling of utilisable components of Municipal Solid Waste (MSW) may be made essential.
- MSW contains fairly good quantity of biomass which after segregation treatment and appropriate blending can be used as fuel, fertilizer etc. which can supplement conventional resources. However, finding/establishing new economical and acceptable way-outs like fuel pelletisation of combustible components, vermiculture biotechnology etc. is essential.
- There is a need of refining/improving the conventional ways of disposal like land filling, composting, etc.
- To adopt an integrated approach for the management of garbage, studies for undertaking survey and analysis of garbage being generated, along with past, present and future trends in its management etc. need to be initiated immediately.
- Attention needs to be paid to improve technologies for absolutely safe disposal of hazardous wastes.
- Plantation of suitable trees, shrubs, climbers and grasses along the boundary of dumping ground as green belts and within the yard in specific rows is extremely essential. This will not only help in preventing undue dispersal of garbage in surrounding areas but also in promoting the natural degradation process by providing suitable conditions for multiplication of micro-organisms.
- Garbage collection points at appropriate places in whole of the town should be provided during the town planning and subsequent development process to avoid problems in future.
- "Pay as you throw" principle needs to be adopted.

Finally, the attitude of the general public needs to be changed and the consciousness, responsibilities and moral/ethical behaviour of each and every individual needs to be strongly built up.