WASTE NOT WANT NOT

Large quantities of natural resources are used for construction, energy, industry, or food. Consequently large quantities of waste are discarded, particularly in the richer countries. Outworn materials have traditionally been dumped into landfills causing environmental pollution and threats to health, and taking up sizable areas of land.

Wastes vary greatly. They may consist of:

- chemically inert materials, such as bricks and masonry from demolished buildings, some excavation wastes from development sites, and most mining wastes. These are not chemically damaging but are produced in very large quantities.
- chemically reactive substances that are essentially harmless to the environment and people (e.g. gypsum from plaster);
- chemically reactive wastes that can cause pollution of water and harm to people or wildlife. These include domestic wastes that are discarded in large volumes; and
- hazardous wastes that are dangerous to people and the environment including a wide variety of inorganic and organic chemicals and radioactive wastes.

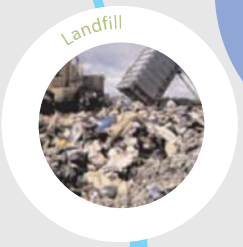
The first two groups are essentially harmless while the second two pose significant problems. Mixing more and less hazardous wastes makes the whole volume hazardous. These must be kept apart so that as much as possible can be used – to make waste a resource, not a burden. That is well understood in the World's poorest communities and during national crises but forgotten during prosperity.

The best approach is not to produce waste in the first place and to use wastes that are produced again. The worst option is to discard waste. This leads to the waste hierarchy;

- re-use goods – for instance architectural salvage;
- recycle materials – for instance paper, fabrics, glass, metals, plastics. This depends on separation of types of waste at the household or factory level. Much construction and demolition waste is crushed and sorted on the demolition site, as well as at dedicated recycling sites. It can be difficult to change behaviour but producers of goods can be made responsible for taking them back and recycling them. Taxation is used as an incentive to reduce landfill and also to stimulate recycling of construction aggregates, by taxing newly dug aggregates but leaving recycled alternatives tax free;
- composting – anaerobic decomposition of plant wastes provides a soil-like product for agriculture and horticulture;
- recover value by producing energy from incineration and landfill; and
- dispose of waste by incineration or landfill as a last resort.

Landfills use old quarries or other depressions in the ground. Inert materials can be tipped directly. Reactive and decaying materials have to be carefully contained. The void is lined and capped with clay. Sites are preferably located on impermeable geological strata. Drains collect leachate. Gases from decomposition include inflammable methane. This can be tapped and used to produce power or heat. Old incinerators can vent harmful emissions into the air.

Solid mining wastes are deposited in tips to be replaced in the mine when extraction ceases, or blended into the landscape. Fine-grained semi-fluid wastes (tailings) are held as slurry behind a dam. Care is needed to ensure tip or dam stability.



Modern incinerators operate at high temperatures reducing harmful emissions if properly operated. Again the heat can be used. Combustion residues, if not contaminated, can be used as aggregates.

Using the waste hierarchy, landfill would be largely limited to polluting and hazardous residues needing careful containment. But the waste hierarchy should not be followed blindly. Local landfill of some wastes may be environmentally better than taking these long distances for recycling or recovery. Wastes should generally be managed closed to where it is produced and using the best environmental options for that area. When any major new development is designed appropriate means for dealing with wastes should be incorporated.

Radioactive wastes remain dangerous for long periods and are best stored underground, isolated from interaction with groundwater (e.g. in certain clays, salt deposits, massive granites etc). It is prudent to have a means for recovery and removal if locations prove to be unsatisfactory.

The European Union Waste Framework Directive and various related Directives give a strong basis for more sustainable management of wastes. Suitable sites, where risk of environmental damage is low, must be identified, and operated and monitored to ensure minimum adverse impacts.

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These leaflets have been prepared by Dr B R Marker OBE (UK) in collaboration with Professor Dr J J Pereira (Malaysia) and Professor I A Nyambe (Zambia)

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