

CHECKLIST #6 WASTE MANAGEMENT

Solid waste management projects (residual materials), include collection, sorting, storage, reclamation (composting and recycling) and elimination. In developing countries, between 75% and 80% of all solid wastes are organic in origin and can therefore be composted.

A Questions relating to the location of the waste management project

1. What are the uses, activities and existing infrastructures on the proposed site of project implementation? How large is the population? What is the proximity of residences? What is the town planning scheme? What are the needs, expectations and patterns of consumption of the local population? Have existing waste reclamation patterns (for example, in agriculture and domestic activities) been built upon? What laws and/or government policies apply to waste management? What are the project's environmental objectives? Could the project lead to:
 - displacements of the population and/or losses of territory (as a result of the nuisances associated with a waste elimination site or the appropriation of this site);
 - accentuation of social inequalities (for example, the selection of a waste elimination and/or reclamation site in poorer urban marginal areas without prior consultation of the residents);
 - changes in ways of life (if the indirect effects of the system are not anticipated, for example, an increased demand for non-biodegradable processed products, such as packaging and single-use products, and so on);
 - incompatible uses and/or value conflicts, socio-economic conflicts and conflicts over ownership rights among possible uses of land and solid wastes (interference with other services, residences, tourist attractions; problems, such as odours and noise, related to traffic and the transportation of wastes; if the land use characteristics of the area are not considered, such as non-permanent housing areas and shantytowns, the presence of landowners as opposed to tenants and squatters, single-parent families and street children; if the importation of hazardous wastes into the region is promoted; if the existing informal recovery and recycling sector is not considered; and so on);
 - a reduction in the visual quality of the landscape and neighbouring property values;
 - problems with the supply of water, energy, resources and various services, such as electrical facilities;
 - a decrease or an improvement in the quality of life;
 - greater public acceptance, through public participation in designing the waste management system and choosing the site, for example;
 - greater awareness of the importance of a healthy environment and the principles of waste reduction, recovery, recycling, reclamation and, finally, elimination?
2. What types of environment, landscape, fauna and flora are present? What is their specific importance? Are there nearby bodies of water and waterways, wooded areas, slopes, marshes and other vulnerable sites? Is the area prone to flooding or soil instability? What are the characteristics of the soil (permeability, drainage, texture, and so on) and topography? Could the project have an effect on:
 - environments or sites of economic, ecological, cultural, archaeological or historical importance and the natural resources (water, flora, soils, and so on) they contain;
 - rare or vulnerable species and/or species of economic, cultural and ecological importance (biodiversity)?

B. Questions relating to the preparation of the waste management site

1. What are the various site preparation and construction activities? Will there be demolition, excavation, leveling, clearing, soil denudation, land drainage, construction of fences, access roads or buildings (see appropriate checklists), and so on? What instruction materials and equipment are required? Could the project lead to:
 - changes in, encroachments on and/or the destruction of environments or sites of economic, ecological, cultural, archaeological or historical importance and the resources they contain;
 - soil instability as a result of digging, backfilling, and so on;

- erosion of soils that are fragile, thin, on sloping land or near bodies of water, if there is clearing, soil denudation or use of heavy equipment, for example;
- soil compaction or changes in drainage, soil permeability and/or loss of soil fertility;
- nuisances (foul odours, airborne dust, noise, vibrations, traffic), risks of accidents and/or health risks to workers and the local population while preparing the site;
- problems of soil, air, surface water and groundwater pollution, if construction materials and wastes are poorly managed;
- fair and equitable participation of the local work force and a positive effect on the economy?

C. Questions relating to the waste management system's operational phase

1. What are the types, quantity and composition of the wastes to be collected (household, industrial, manufacturing, medical, agricultural, sewage sludge, and so on)? Do they contain toxic substances? How will the waste be collected (containers, equipment, and so on)? Will the project rely on voluntary disposal? Who will be responsible for collecting, sorting, storing, eliminating and reclaiming solid wastes? How will site security be maintained and who will be responsible for it? Is the waste management system approach based on waste reduction, elimination or reclamation? Depending on the technologies and processes involved, what are the risks of pollution of surface water, groundwater, soil and air? Are these pollution risks associated with nuisances (noise, odours, vibrations, dust, smoke, traffic), risks of accidents (transportation, spills, explosions, fires, and so on) and health risks (respiratory or skin problems, and so on) to workers and the local population? Are the proposed technologies and processes suited to the environment? If wastes are to be buried, what is the life expectancy of the site? How will the site be monitored during operations and following closure? Will closure of the site include restoration of the environment? In general, could the project lead to:
 - changes in environments or sites of economic, ecological, cultural, archaeological or historical importance and the resources they contain;
 - water and soil pollution by liquid and solid biological and medical wastes (slaughterhouse wastes, medication, syringes, blood-contaminated linen and bandages, bacterial and viral sources, and so on) and/or by heavy metals and other hazardous products (oil, batteries, paint, glue, solvents, acids, and so on);
 - dispersion of wastes and poisoning of livestock and humans if solid wastes are stored uncovered and access to the site is not restricted (spread of diseases and accumulation of toxicity in the food chain);
 - contamination of drinking water sources;
 - surface water and soil pollution resulting from the run-off of rainwater, through improperly stored solid wastes or compost, and into waterways;
 - eutrophication of bodies of water, that is, a significant input of organic matter from improperly stored wastes or compost;
 - groundwater and soil pollution through the seepage of leachates (soluble portion of decomposing solid wastes) if the landfill limit has been reached, if soils are permeable or lack sealing, if soil drainage is rapid or if the site does not have an adequate leachate recovery system, if soils have a high porosity or a low degradation capacity, if the leachate treatment system is inadequate and/or if the groundwater table is high or too close to the solid wastes being stored or buried (in general, soils consisting of clay and organic matter tend to attenuate the effect of contaminants more than sand, silt and gravel soils);
 - problems of migration, in the unsaturated zones of soils, of gases produced by anaerobic decomposition (without oxygen) of wastes buried without appropriate measures for gas ventilation and recovery, which could result in long-lasting underground fires, underground explosions, losses of deep-rooted vegetation and damage to infrastructure foundations;
 - air pollution by methane, carcinogenic volatile organic substances (benzene, for example) and other gases produced by biodegradation, if solid wastes are stored uncovered;
 - air pollution by dust particles carrying pathogens and hazardous products, if solid wastes are stored uncovered;
 - air pollution by toxic gases, metallic particles, methane, carbon and sulphuric compounds, if wastes are incinerated without adequate filtration measures;
 - nuisances (foul odours, airborne dust, noise, vibrations, traffic), risks of accidents and/or health risks to workers and the local population (in the absence of vermin control measures,

- adequate site security, control of incoming and outgoing traffic, adequate equipment, appropriate cleaning and maintenance of protective clothing and equipment, and so on);
- a reduction in problems associated with uncontrolled dumping of wastes;
 - a reduction of wastes at the source;
 - greater assumption of responsibility by waste producers through agreements, compliance with instruments of control applied and reinforced by responsible authorities and/or taxes on solid wastes;
 - increased involvement of the community in taking charge of its development through public consultation, participation, awareness activities and training during each stage of the project and the waste management system, and in maintaining, monitoring and closing the system?
2. With respect specifically to reclamation (composting and recycling), could the project lead to:
- problems with contamination of the products to be recycled, if collection and sorting are not determined by the quality of the proposed reclamation;
 - contamination of agricultural products by toxic substances (for example, heavy metals) or by pathogens contained in organic fertilizers, for example, if wastes are improperly sorted or compost is inappropriately formulated, if solid wastes are not composted under aerobic conditions (with oxygen) and/or if the compost application rate is too high;
 - benefits to crops by using compost produced under aerobic conditions (with oxygen), using adequate mixing and aeration, without unpleasant odours, and through proper solid waste management;
 - a reduction in wastes eliminated (recovery, recycling, composting) without being detrimental to the existing informal recovery and recycling sector and without creating problems with energy consumption for recycling processes (glass, paper, plastic, aluminum, and so on);
 - the opportunity for the population to use recovered and recycled products (fabrics, iron, furniture, books, games, and so on) and to enjoy the possible economic benefits of these products;
 - entrepreneurial capacity-building and marketing of recycled products and compost to the population and all its specific groups?