# CHAPTER 23

# ENVIRONMENTAL AND HEALTH IMPLICATIONS OF WASTE MANAGEMENT IN DEVELOPING COUNTRIES


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# Environmental and Health Management in Developing Countries

## Introduction

*The aim of this chapter is to present an overview of the current waste management strategies employed in developing countries, highlight the environmental and health implications and suggest ways of improving the situation.* Many developing countries are faced with varying stages of their development, from the need to accelerate socio-economic development on the one hand and how to deal with the effects of rapid growth in population, land use, resource use and increased waste generation on the other. Notwithstanding the complexities of developing countries' situation, *waste management poses new challenges and opportunities. Waste Management is a tool for environmental protection, preventive medicine and urban hygiene.* Waste avoidance and recycling also help conserve scarce natural resources. Waste, simply defined as "useless remains or by products" in themselves, with the exception of a small percentage of toxic or potentially infectious materials, do not pose a direct threat to health. The biggest threat to health from waste is when it is left uncollected, or improperly stored or disposed. They can attract vermin and insects, which are carriers of disease and pose real threats to public health. They also have the potential to contaminate water sources, air and land (soil), bringing aesthetic, environmental and health risks. The most commonly encountered risks associated with urban waste in developing countries are summarised in the paper. The most significant risk from improper waste management is that of health as the majority of deaths in developing countries are caused by diseases transmitted by human waste (infections and parasitic diseases) and airborne wastes (respiratory diseases). The identification of the sources and types of waste helps to limit the potential for harm as it enables the correct handling procedures to be followed which are appropriate to waste type.

*Waste in developing countries can, for practical purposes, be divided into the following categories: Municipal Solid Wastes, Building and Construction Wastes and Industrial Wastes and Liquid Wastes.* Proper treatment of wastes can help to protect health and minimise environmental risks. *The most common methods of waste treatment and disposal in developing countries are sanitary landfills, composting, incineration and anaerobic digestion.*

For developing countries whose limited resources are already over stretched in dealing with the HIV/AIDS, famine and refugees crisis, the adoption of the Waste Reduction, Reuse and Recycling, the 3R's of environmental conservation strategy present the most prudent way forward.

## Background

It is often said, and certainly is true, that development is a two-edged tool where its effects on health and the environment are concerned. While it is proven, that the economic and technological outcomes of development have helped raise standards of living and health, uncontrolled, hazardous side effects have resulted in health impairment and extensive environmental changes. On the other hand, a lack of development usually means that society is unable to provide the basic services necessary to improve the people's well being.

Developing countries, most of which are already troubled by HIV/AIDS, Famine and refugee crises, find themselves under increasing pressure (both internal and external) to accelerate their socio-economic development and industrialisation processes. Most of these countries lack the requisite resources (human, financial and infrastructure) to adequately forecast, cater for and deal with the negative effects of development, rapid population growth and urbanisation.

**Waste,** simply defined as "*useless remains or by products*" is one of the by-products of the development processes that presents new challenges and opportunities especially for developing countries. Most human activities create waste. Waste takes many forms, and is derived from many sources: municipal wastes, from households, shops and offices; health care wastes; industrial waste; agricultural wastes; waste from construction and demolition; and special or hazardous wastes. Assessing the waste quality and composition is an important first step before deciding on a waste management strategy, and will also provide an opportunity to evaluate the implications for health and the environment. The majority of these wastes are not, in themselves, a direct threat to health but their correct management can help to minimise or avoid associated risks. The greatest threat to health from waste is when it is left uncollected, or improperly stored and or disposed. They can attract vermin and insects, which are carriers of disease and pose real threats to public health. They also have the potential to contaminate water sources, air and soil.

Generally, there is no single "correct" way to collect, handle and dispose of wastes, but a range of options. These must be tailored to local circumstances, such as the amount and climate, and economic conditions. In any case, proper treatment of wastes can help to protect health and minimise environmental degradation. Waste management authorities must encourage the minimisation of both the quantity and toxicity of wastes as a matter of expediency. Sound management of the remaining wastes will help to protect the environment, prevent disease and promote urban hygiene.

## Risks Associated with Waste

There are three *major categories of risks associated with waste*, namely: aesthetic, environmental and health. The most significant is that of health as the majority of deaths in developing countries are caused by diseases transmitted through human waste (infections and parasitic diseases), i.e. Malaria, Cholera, Dysentery, Salmonellosis, Helminthic diseases, etc. and airborne wastes (respiratory diseases), i.e. aggravation of asthma, bronchitis, Acute Respiratory Infections, etc. The most commonly encountered risks and their effects are exacebated by the processes of urbanisation and industrialisation increase these risks.

## Waste Management

The best way to manage waste is to avoid its generation (if it's possible). Developing countries have the opportunity to learn from the mistakes of developed countries in the management of wastes; they can adapt cost effective and environmentally sound waste management techniques, using available appropriate technologies.

Action to improve waste management should be integrated, with a need to consider health, safety, environmental and economic aspects from "cradle to grave" or the Life Cycle Management approach. This approach is based on the principle that, in order to minimise the adverse environmental impact of the use of manufactured products; it is necessary to manage what happens to the physical resources (i.e. materials and energy).

## Waste Minimisation

*Waste minimisation or reduction is recommended as the most important management technique to be applied to solid wastes.* The easiest and most environmentally friendly way to manage waste is to avoid its production (waste avoidance). Although it will never be possible to completely avoid the generation of waste, the local authority's objective should be to encourage waste producers to take a series of steps, each of which contributes to the avoidance of some amount of the waste, or perhaps reduces the toxic or harmful portion.

*Waste minimisation measures may range from quick simple action without cost to long-term measures with higher capital investment.* For example, some of these may involve small behavioural changes such as writing on both sides of a paper, etc or initiating an investment scheme, ie purchase of a photocopier which automatically prints on both sides of paper sheets.

Waste *Re-use and Recycling* Waste materials, *Re-use and Recycling* the other 2R's of environmental conservation technique, represent an important component of any serious attempt to address the waste management problem in developing countries. The first step will be to introduce appropriate legislation and economic opportunities with respect to encouraging recycling and re-use activities.

## Recommendation - Waste Management Strategy for Developing Countries

*A sustainable and proactive approach to waste management needs to take into consideration the complete process of gathering and assessing information on wastes and their management, setting objectives, determining legislative, economic and organisational requirements and communicating the appropriate information to the public.*

Such an integrated strategy ought to include the following objectives:

### *To minimise Wastes:*

1. Stabilise or reduce production of wastes for final disposal;
2. Reinforce procedures to quantify amounts/types of wastes;
3. Set target for capacity building and ensure the implementation of waste minimisation policies;
4 Provide incentives to reduce unsustainable; and
5. Waste production, develop national waste minimisation plans

### *To maximise Environmentally Sound Waste Re-use/Recycling:*

1. Strengthen national re-use/recycling systems;
2. Ensure availability of relevant information;
3. Put in place policy instruments to encourage re-use/recycling;
4 Develop national programs with re-use/recycling target; and
5. Initiate public information and awareness programs.

### *To promote Environmentally Sound Waste Disposal:*

1. Develop national waste management plans;
2. Encourage waste management within each major settlement; and
3. Apply the "Polluter Pays Principle" to the disposal of waste.

## Conclusion

There are a number of risks associated with waste management. Waste left uncollected are the ones which have the most potential for harm. Those which are improperly managed or stored also present hazards. Good management practices can minimise most health and environmental risks and their implications. Consistent with the Agenda 21 philosophy, waste management strategy should therefore aim to ensure that sustainable and environmentally sound waste management practices are put in place to support such principles: as preservation, protection and improvement of the quality of the environment, and contribution towards the protection of human health.

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