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# **Solid Waste Management in Developing Countries: Status, Perspectives and Capacity Building**

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# Key Solid Waste Issues in Developing Countries

1. Substantial population growth in urban centers
2. Lack of legislation and policies for realistic, long-term planning
3. Inadequate storage and limited collection
4. Lack of proper disposal
5. Use of inappropriate technology and equipment
6. Scavenging
7. Insufficient knowledge of basic principles

# 1. Population Trends

- Sizeable population increase
- Migration from rural to urban centers
- Lack of infrastructure to provide basic services to migrants

## 2. Lack of Legislation and Policies

- Lack of rules and regulations pertinent to solid waste
- Tendency toward crisis management
- Lack of training and methods to collect reliable data
- Existing plans may be inappropriate:
  - written by people unfamiliar with area
  - unrealistic in terms of infrastructure, equipment, financial and human resources, and others



### 3. Inadequate storage and limited collection

- Inappropriate storage of waste
- Urban poor receive minimal, if any, waste collection service
- High-income areas receive between 60% and 80% coverage
- Human settlements
  - simply evolve without planning
  - generally do not pay taxes or solid waste fees
  - do not receive services

# Storage





# Collection



# 4. Lack of Proper Disposal

- Use of dump sites
  - uncontrolled dumping
  - scavenging
  - animal feeding
- Low or no costs associated with siting or operations



# Asia





# Asia



# Manila, Philippines



Payatas -- Manila, before slide

# Manila, Philippines



Payatas -- Manila, after slide



# Final Disposal



# Final Disposal





# Final Disposal









# Very Few Sanitary Landfills

- Limited access to properly operated sanitary landfills:
  - siting difficulties
  - higher capital and operating costs
  - low or no tipping fees
- Lack of engineering know-how



# 5. Inappropriate Technology and Equipment

- Equipment beyond economic lifespan (i.e., collection vehicles > 20 years)





# 6. Scavenging





# Scavenging













# Scavenging for Recycling





# **Proposed Strategy for Capacity Building in Management of Solid Wastes in Developing Countries**

# Key Objectives of Strategy

- Increase knowledge of solid waste management to all members of the community
  - Improve lives and health
  - Enable local communities to properly store, collect, transport, treat and dispose of solid waste

# Strategies

- Two general types of capacity building:
  - Public officials
  - General Public

# Strategy for Public Officials

- Develop and put into practice specific programs for each of the following categories in the public sector:
  - Elected officials
  - All “permanent” employees in local government
  - Members of Environmental, Solid Waste Management, Public Health and related areas

# Strategy for Elected Officials

- Discuss:
  - General concepts of waste management and major phases: storage, collection, transport/transfer, recycling, etc.
  - Need for having a reliable final disposal site
  - Importance of planning and of having a good plan for cost recovery
  - Need for enforcement of laws and regulations
- Explain general benefits to community
  - Improvements in public health
  - Better quality of life
  - Financial benefits
  - Better image for community leaders leading to popularity and more votes



# Strategy for All Permanent Municipal Employees

- Discuss:
  - General concepts of waste management and major phases: storage, collection, transport, etc.
  - Importance of “leading by example”
  - Need for enforcement of laws and regulations
- Explain general benefits to community
  - Improvements in public health
  - Better quality of life
  - Improved image for civil servants
  - Cost savings

# Strategy for Environmental, Solid Waste Management, Public Health and related areas

- Discuss:
  - In detail, concepts of waste management and major phases: storage, collection, transport/transfer, treatment, disposal
  - Relationship to public health
  - Need for enforcement of laws and regulations
- Explain general benefits to community
  - Improvements in public health and environmental protection
  - Better quality of life
  - Improved image for civil servants
  - Cost savings

# Strategy for Environmental, Solid Waste Management, Public Health and related areas

- In most cases, this strategy **will not** be successful if:
  - Office of solid waste and other related areas are not assured of continuity (remain in job despite changes in political leaders) by instituting modifications to general practice of wholesale changes to personnel when elected officials change

# Strategy for Public Education

- Must be developed in close cooperation with professionals knowledgeable of local conditions
- Rely on all methods of communication popular in specific area  
(TV, radio, church, etc.)
- Supported by well-prepared NGOs
- Must be conducted continually over several years

# Public Education

- Use simple language (illiterates, pictograms)
- Use local dialect as needed
- Leverage participation of school children and universities
- Involve media, business leaders, community leaders, and NGOs

# Keys to Success

- Political will to solve the problem of waste management
- Institute measures to retain properly trained personnel in office
- Willingness to put cost recovery mechanisms into place

# Keys to Success

- Encourage development of realistic plans:
  - pilot projects to demonstrate viability
  - use of appropriate technology  
(site selection, facility design)
  - secure available resources  
(financial and human for sustainable operations)
  - determine availability of markets for recyclables  
(product quality)