



# DEVELOPING INTEGRATED SOLID WASTE MANAGEMENT PLAN

TRAINING MANUAL

***Volume 3:  
Targets and Issues of Concern  
for ISWM***

UNITED NATIONS ENVIRONMENT PROGRAMME

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# **Developing Integrated Solid Waste Management Plan Training Manual**

## **Volume 3**

### **Targets and Issues of Concern for ISWM**

Compiled by



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## Preface

Rapid increase in volume and types of solid and hazardous waste as a result of continuous economic growth, urbanization and industrialization, is becoming a burgeoning problem for national and local governments to ensure effective and sustainable management of waste. It is estimated that in 2006 the total amount of **municipal solid waste** (MSW) generated globally reached 2.02 billion tones, representing a 7% annual increase since 2003 (Global Waste Management Market Report 2007). It is further estimated that between 2007 and 2011, global generation of municipal waste will rise by 37.3%, equivalent to roughly 8% increase per year. Based on incomplete reports from its participants, The Basel Convention estimated that about 318 and 338 million tons **hazardous and other waste** were generated for 2000 and 2001 respectively. **Healthcare waste** is classified as sub-category of hazardous wastes in many countries. As per WHO estimations the total health-care waste per person per year in most low-income countries, is anywhere from 0.5 kg to 3 kg. There is no estimate about *global industrial wastes generation*. The US EPA estimates that, American industrial facilities generate and dispose off approximately 7.6 billion tons of non-hazardous industrial solid waste each year. The EU estimated that its 25 member states produce 700 million tons of **agricultural waste** annually. **Waste Electrical and Electronic Equipment (WEEE) or E-waste** is also one of the fastest growing waste streams and it equals to 1% of total solid waste on an average in developing countries. It is expected to grow to 2% in 2010.

Although considerable efforts are being made by many Governments and other entities in tackling waste-related problems, there are still major gaps to be filled in this area. The World Bank estimates that in developing countries, it is common for municipalities to spend 20-50 percent of their available budget on solid waste management (open dumping with open burning is the norm), even though 30-60 percent of all the urban solid wastes remain uncollected and less than 50 percent of the population is served. . In low-income countries, collection alone drains up 80-90 percent of municipal solid waste management budget. In mid-income countries, collection costs 50-80 percent of total budget. In high-income countries, collection only accounts for less than 10 percent of the budget, which allows large funds to be allocated to waste treatment facilities. Upfront community participation in these advanced countries reduces the collection cost and facilitates waste recycling and recovery.

Hence, developing countries face uphill challenges to properly manage their waste with most efforts being made to reduce the final volumes and to generate sufficient funds for waste management. If most of the waste could be diverted for material and resource recovery, then a substantial reduction in final volumes of waste could be achieved and the recovered material and resources could be utilized to generate revenue to fund waste management. This forms the premise for **Integrated Solid Waste Management (ISWM) system based on 3R (reduce, reuse and recycle) principle**. ISWM system has been pilot tested in a few locations (Wuxi, PR China; Pune, India; Maseru, Lesotho) and has been well received by local authorities. It has been shown that with appropriate segregation and recycling system significant quantity of waste can be diverted from landfills and converted into resource.

**Developing and implementing ISWM requires comprehensive data on present and anticipated waste situations, supportive policy frameworks, knowledge and capacity to develop plans/systems, proper use of environmentally sound technologies, and appropriate financial instruments to support implementation.**

Many national governments, therefore, have approached UNEP, [as reflected in the decision taken by UNEP Governing Council/Global Ministerial Environment Forum during its 25<sup>th</sup> Session in February 2009 (UNEP/GC.25/CW/L.3)] to get further support for their national and local efforts in implementation of the Integrated Solid Waste Management (ISWM) programme.

In response to this decision and in line with the Bali Strategic Plan for Capacity Building and Technology Transfer, UNEP has developed a programme on integrated solid waste management. This programme includes support for capacity building and technology transfer for ISWM through a number of actions:

1. Guidelines to develop ISWM Management: The four sets of guidelines on ISWM covering waste characterization and quantification, assessment of current waste management system, target setting and identification of stakeholders' issues of concern for ISWM, and how to develop ISWM Plan.
2. Pilot projects on ISWM and emerging waste streams including E-waste, waste agricultural biomass, waste plastics and so on
3. Regional and sub-regional training for policy makers and experts on ISWM and emerging waste streams
4. Interactive advisory support on ISWM and emerging waste streams

This document is the *third* of the four sets of the guidelines on ISWM. This third step is the building block for ISWM Plan as it focuses on target setting and identification of stakeholders' issues of concern for ISWM to achieve the targets.

This document can also be of interest to other interested parties/organisations that aim at supporting decision-makers. They may be:

- consultants working on urban services, recycling, or waste management;
- representatives or staff of other local stakeholders including community groups, NGOs, and the private sector;
- entrepreneurs wishing to expand or strengthen their solid waste portfolios;
- academicians and scholars in urban environmental management;
- the press, especially when seeking background materials;
- donors interested in supporting future waste management activities;
- local experts interested in using or replicating the results;

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***ACRONYMS***

AHP	Analytical Hierarchy Process
ASL	Automated Side Loaders
APC	Air Pollution Control
BEI CHP & RS	The bei cellulose hydrolysis process and reactor system
BMT	Biological and Mechanical Treatment
BMW	Bio-Medical Waste
BOT	Build-operate-transfer
C&D	Construction and Demolition
CDM	Clean Development Mechanism
CD-ROM	Compact Disc Read-Only Memory
CIWMB	California Integrated Waste Management Board
C.L	Confidence Level
CO <sub>2</sub>	Carbon Dioxide
CRT	Cathode Ray Tube
CRV	California Redemption Value
CV	Calorific Value
DEPA	Danish Environmental Protection Agency
DKK	Danish Krone
DPSIR	Driving force - Pressure - State - Impact - Response
DTIE	Division of Technology, Industry and Economics
EIA	Environmental Impact Assessment
EMC	Environmental Management Centre
EnRA	Environmental Risk Assessment
EPA	United States Environmental Protection Agency
EPR	Extended Producer Responsibility
ESTs	Environmentally Sound Technologies
E-Waste	Electronic Waste
EWG	European Waste Catalogue
FOB	Free on Board
GDP	Gross Domestic Product
GHG	Greenhouse Gas
GIS	Geographic Information System
GPS	Global Positioning System
HCl	Hydrogen Chloride
HDPE	High Density Polyethylene
HW	Hazardous Waste
IETC	International Environmental Technology Centre
ISWM	Integrated Solid Waste Management
ISWMP	Integrated Solid Waste Management Plan
IT	Information Technology
IWPM	Integrated Waste Management Plan
KPIs	Key Performance Indicators
LPB	Liquid Paper Board
LR	Landfill Rate
LWAC	Landfill Waste Acceptance Criteria
MB	Megabytes

MBT	Mechanical and Biological Treatment
MC	Moisture Content
MCDM	Multi Criteria Decision Making
MEAs	Multilateral Environmental Agreements
MF	Multi Family residence
MRF	Materials Recovery Facility
MSW	Municipal Solid Waste
MSWM	Municipal Solid Waste Management
NGOs	Non-governmental Organizations
NIMBY	Not-in-my-backyard
O&M	Operations and Maintenance
ODS	Ozone Depleting Substances
OECD	Organisation for Economic Co-operation and Development
PAYT	Pay as You Throw
PE	Polyethylene
PET	Polyethylene Terephthalate
PIC	Project Implementation Committee
PMC	Pune Municipal Corporation
PP	Polypropylene
PPE	Personal Protective Equipment
PRC	People's Republic of China
PS	Polystyrene
PS	Private Sector
PSP	Private Sector Participation
PVC	Polyvinyl Chloride
RAM	Random Access Memory
RDF	Refuse Derived Fuel
RPPC	Rigid Plastic Packaging Containers
SAT	Sustainability Assessment of Technologies
SF	Single Family residence
SP	Strategic Planning
SWAP	Solid Waste Analysis Protocol
SWM	Solid Waste Management
SWOT	Strengths, Weaknesses, Opportunities and Threats
3R	Reduce, Reuse and Recycle
UNEP	United Nations Environment Programme

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