



Solid Waste Management

IN THE WORLD'S CITIES

WATER AND SANITATION IN THE WORLD'S CITIES 2010



SOLID WASTE MANAGEMENT IN THE WORLD'S CITIES

SOLID WASTE MANAGEMENT IN THE WORLD'S CITIES

WATER AND SANITATION IN THE WORLD'S CITIES
2010

United Nations Human Settlements Programme

UN  HABITAT

earthscan

publishing for a sustainable future

London • Washington, DC

First published in 2010 by Earthscan for and on behalf of the United Nations Human Settlements Programme (UN-HABITAT)

Copyright © United Nations Human Settlements Programme (UN-HABITAT) 2010

All rights reserved

DISCLAIMER

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory, city or area, or of its authorities, or concerning delimitation of its frontiers or boundaries, or regarding its economic system or degree of development. The analysis, conclusions and recommendations of the report do not necessarily reflect the views of the United Nations Human Settlements Programme (UN-HABITAT), the Governing Council of UN-HABITAT or its Member States.

Earthscan Ltd, Dunstan House, 14a St Cross Street, London EC1N 8XA, UK

Earthscan LLC, 1616 P Street, NW, Washington, DC 20036, USA

Earthscan publishes in association with the International Institute for Environment and Development

For more information on Earthscan publications, see www.earthscan.co.uk or write to earthinfo@earthscan.co.uk

ISBN 978-1-84971-169-2 hardback

978-1-84971-170-8 paperback

UN-HABITAT ISBN 978-92-1-132218-7

HS/105/10E/

Typeset by MapSet Ltd, Gateshead, UK

Cover design by Susanne Harris

A catalogue record for this book is available from the British Library

Library of Congress Cataloging-in-Publication Data has been applied for

At Earthscan we strive to minimize our environmental impacts and carbon footprint through reducing waste, recycling and offsetting our CO₂ emissions, including those created through publication of this book. For more details of our environmental policy, see www.earthscan.co.uk.

Printed and bound in Malta by Gutenberg Press.

The paper used is FSC certified.

FOREWORD

Regardless of the context, managing solid waste is one of the biggest challenges of the urban areas of all sizes, from mega-cities to the small towns and large villages, which are home to the majority of humankind. It is almost always in the top five of the most challenging problems for city managers. It is somewhat strange that it receives so little attention compared to other urban management issues. The quality of waste management services is a good indicator of a city's governance. The way in which waste is produced and discarded gives us a key insight into how people live. In fact if a city is dirty, the local administration may be considered ineffective or its residents may be accused of littering. Available data show that cities spend a substantial proportion of their available recurrent budget on solid waste management, yet waste collection rates for cities in low- and middle-income countries range from a low of 10 per cent in peri-urban areas to a high of 90 per cent in commercial city centres.

Many developing and transitional country cities have active informal sector recycling, reuse and repair systems, which are achieving recycling rates comparable to those in the West, at no cost to the formal waste management sector. Not only does the informal recycling sector provide livelihoods to huge numbers of the urban poor, but they may save the city as much as 15 to 20 per cent of its waste management budget by reducing the amount of waste that would otherwise have to be collected and disposed of by the city. This form of inclusion in solid waste management shows how spectacular results can be achieved where the involvement of the informal sector is promoted.

The struggle for achieving the Millennium Development Goal and related targets for water and sanitation is being waged in our cities, towns and villages where solid wastes are generated. It is at this level that policy initiatives on solid waste management become operational reality and an eminently political affair: conflicts have to be resolved and consensus found among competing interests and parties.

This publication, *Solid Waste Management in the World Cities*, is the third edition in UN-HABITAT's State of Water and Sanitation in the World Cities series. It aims to capture the world's current waste management trends and draw attention to the importance of waste management, especially regarding its role in reaching the UN Millennium Development Goals. The publication acknowledges the escalating challenges in solid waste management across the globe. It seeks to showcase the good work that is being done on solid waste by cities around the world, large and small, rich and poor. It achieves this by looking at what drives change in solid waste management, how cities find local solutions and what seems to work best under different circumstances. The publication endeavours to help decision-makers, practitioners and ordinary citizens understand how a solid waste management system works and to inspire people everywhere to make their own decisions on the next steps in developing a solution appropriate to their own city's particular circumstances and needs. Most readers will never travel to all the 20 cities featured in this report, but through this publication they will have access to real experiences of people working on the ground. We hope it will provide a reference point for managing solid waste in the world's cities and towns, and that many will follow in the footsteps of our authors, and we can move to an improved set of global reference data.



Anna Tibaijuka

*Under-Secretary General, United Nations
Executive Director, UN-Habitat*



ACKNOWLEDGEMENTS

The Water and Sanitation in the World's Cities series, published every three years, was mandated by UN-HABITAT Governing Council Resolution 19/6, adopted on 9 May 2003, following the publication of the first edition, *Water and Sanitation in the World's Cities: Local Action for Global Goals*, in March 2003. This was followed by the production of the second edition, *Meeting Development Goals in Small Urban Centres: Water and Sanitation in the World's Cities 2006*.

This current production of *Solid Waste Management in the World Cities* was funded by the Water and Sanitation Trust Fund of UN-HABITAT, currently supported by the Governments of Spain, the Netherlands and Norway.

The report was prepared under the overall substantive guidance of Bert Diphorn, Ag. Director, Human Settlements Financing Division. The conceptualization of the report and the management of its production was undertaken by Graham Alabaster who was supported by Paul Onyango.

The substantive preparation of the report was undertaken by WASTE, Advisers on Urban Environment and Development. Anne Scheinberg, (WASTE and Wageningen University and Research Centre), David C. Wilson (Imperial College) and Ljiljana Rodic-Wiersma (Wageningen University and Research Centre) were the principal authors/editors. They were supported by a team who made substantial contributions, comprising Lilia G. C. Casanova (CAPS); Bharati Chaturvedi (Chintan Environmental Research and Action Group); Manus Coffey (Manus Coffey Associates); Sanjay K. Gupta and Jeroen IJgosse (Independent Consultants); Reka Soos (Green Partners Romania); and Andrew Whiteman (Wasteaware). The report would not have been possible without the dedication, commitment, professionalism, and passion which the contributing authors undertook their work.

The report benefited from a number of consultations attended by eminent researchers and solid waste management experts. In early 2009, an outline of the report was prepared and in May 2009 the first expert group meeting took place in Gouda, the Netherlands to review the annotated outline. Participants in the expert group included Manus Coffey (Manus Coffey Associates), Edward Stentiford (Leeds University), Sonia Dias, Oscar Espinoza, Sanjay Gupta, Kossara Kisheva, Michael Simpson, Portia Sinnott, Reka Soos, Ljiljana Rodic, Anne Scheinberg, Andy Whiteman, David Wilson, Verele de Vreede, Lilliana Abarca, Ivo Haenen, Valentin Post and Alodia Ishengoma. Bert Diphorn, Graham Alabaster and Paul Onyango oversaw the process for UN-HABITAT. A number of contributors and researchers were identified at the consultations for preparing the 20 city inserts and the key sheets for the report.

The contributors and writers for the city profiles were: Adelaide, Australia by Andrew Whiteman (Wasteaware) and Rebecca Cain (Hyder Consulting); Bamako, Mali by Modibo Keita (CEK, Cabinet d'Etudes Kala Saba), Erica Trauba (WASTE Intern), Mandiou Gassama, Bakary Diallo, and Mamadou Traoré, (CEK); Bengaluru, India by Sanjay K. Gupta (Senior Advisor and Consultant Water, Sanitation and Livelihood), Smt. Hemalatha (KBE, MTech.), BMP Environmental Engineer, Bruhat Bangalore Mahangara Palike, and Anselm Rosario (WasteWise Resource Centre); Belo Horizonte, Brazil by Sônia Maria Dias, Jeroen IJgosse, Raphael T. V. Barros (UFMG), and the team of the Planning Department of SLU; Cañete, Peru by Oscar Espinoza, Humberto Villaverde (IPES), Jorge Canales and Cecilia Guillen; Curepipe, Mauritius by Professor Edward Stentiford (University of Leeds, UK) and Professor Romeela Mohee (The University of Mauritius, Mauritius); Delhi, India by Malati Gadgil, Anupama Pandey, Bharati Chaturvedi and Prakash Shukla (Chintan Environmental Research and Action Group), Irmanda Handayani (WASTE and Chintan Environmental), Jai Prakash Choudhury/Santu and Safai Sena; Dhaka, Bangladesh by Andrew Whiteman (Wasteaware), Monir Chowdhury (Commitment

Consultants), Shafiul Azam Ahmed, Dr Tariq bin Yusuf (DCC), Prof. Ghulam Murtaza (Khulna University) and Dr Ljiljana Rodic (Wageningen University); Ghorahi, Nepal by Bhushan Tuladhar (ENPHO, Environment and Public Health Organization); Kunming, China by Ljiljana Rodic and Yang Yuelong (Wageningen University); Lusaka, Zambia by Michael Kaleke Kabungo (Lusaka City Council – Waste Management Unit) and Rueben Lupupa Lifuka (Riverine Development Associates); Managua, Nicaragua by Jane Olley (Technical Advisor for UN-HABITAT Improving Capacity for Solid Waste Management in Managua Programme), Jeroen IJgosse (Facilitator and International Consultant for UN-HABITAT Programme “Improving Capacity for Solid Waste Management in Managua”), Victoria Rudin (Director of the Central American NGO ACEPESA, partner organization for UN-HABITAT Improving Capacity for Solid Waste Management in Managua Programme), Mabel Espinoza, Wilmer Aranda, Juana Toruño and Tamara Yuchenko (Technical Committee from Municipality of Managua for UN-HABITAT Improving Capacity for Solid Waste Management in Managua Programme); Moshi, Tanzania by Mrs Alodia Ishengoma (Independent Consultant), Ms. Bernadette Kinabo (Municipal Director Moshi), Dr Christopher Mtamakaya (Head of Health and Cleansing Department), Ms Viane Kombe (Head of Cleansing Section), Miss Fidelista Irongo (Health Secretary), Mr Lawrence Mlay (Environmental Health Officer); Nairobi, Kenya by Misheck Kirimi (NETWAS), Leah Oyake-Ombis, Director of Environment, City Council of Nairobi / Wageningen University) and Ljiljana Rodic (Wageningen University); Quezon City, the Philippines by Ms Lizette Cardenas (SWAPP), Ms Lilia Casanova (CAPS), Hon Mayor Feliciano Belmonte, Hon Vice Mayor Herbert Bautista, Quezon City Councilors, Quezon City Environmental Protection and Waste Management Department headed by Ms Frederika Rentoy, Payatas Operations Group, Quezon City Planning and Development Office, Ms Andrea Andres-Po and Mr Paul Andrew M. Tatlonghari of QC-EPWMD; Rotterdam, The Netherlands by Frits Franssen (ROTEB retired), Joost van Maaren, Roelof te Velde (ROTEB), Anne Scheinberg and Ivo Haenen (WASTE); San Francisco, USA by Portia M. Sinnott (Reuse, Recycling and Zero Waste Consultant) and Kevin Drew (City of San Francisco Special Projects and Residential Zero Waste Coordinator); Sousse, Tunisia by Verele de Vreede (WASTE), Tarek Mehri, and Khaled Ben Adesslem (Municipality of Sousse); Tompkins County, USA by Barbara Eckstrom (Tompkins County Solid Waste Manager), Kat McCarthy (Tompkins County Waste Reduction and Recycling Specialist), Portia M. Sinnott (Reuse, Recycling and Zero Waste Consultant) and Anne Scheinberg (WASTE); and Varna, Bulgaria by Kossara Bozhilova-Kisheva and Lyudmil Ikonov (CCSD Geopont-Intercom).

The key sheet authors were Ellen Gunsilius and Sandra Spies (GTZ), Lucia Fernandez and Chris Bonner (WIEGO), Jarrod Ball (Golder Associates), Nadine Dulac (World Bank Institute), Alodia

预览已结束，完整报告链

<https://www.yunbaogao.cn/report/index/>