

Utility Management Series for Small Towns

# Water Audit Manual

**UNHABITAT**  
FOR A BETTER URBAN FUTURE



Volume

**4**

## **Water Audit Manual**

Copyright © United Nations Human Settlements Programme 2012

All photographs © UN-Habitat

### **All rights reserved**

United Nations Human Settlements Programme (UN-Habitat)

P.O. Box 30030 - 00100 Nairobi GPO Kenya

Tel: 254 20 7623120 (Central Kenya)

Website: <http://www.unhabitat.org>

Email: [habitat.publications.org](mailto:habitat.publications.org)

HS/121/12E

ISBN (Series) 978-92-1-133404-3

ISBN (Volume) 978-92-1-132534-8

### **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 this publication do not necessarily reflect the view of the United Nations Human Settlements Programme, the Governing Council of the United Human Settlements Programme, or its Member States.

### **Acknowledgements**

Principal Authors:	UN-Habitat Lake Victoria Water and Sanitation Initiative team and National Water and Sewerage Corporation team
Contributors:	Robert Goodwin, Rose Kaggwa and Anne Malebo
Editor:	Lake Victoria Water and Sanitation Initiative team
Design and Layout:	Anne Musotsi

Utility Management Series for Small Towns

# Water Audit Manual

UN  HABITAT





## FOREWORD

Municipal authorities and urban service providers are being increasingly challenged to deliver sustainable services in a rapidly urbanizing world with complex problems resulting from the interplay of climate change, resource constraints and the adverse effects of a sluggish world economy. The need to improve the coverage and efficiency of urban basic services, such as water supply, sanitation, energy, drainage and transportation, has never been greater.



It is now well recognized that the essential pre-condition for improvements in the delivery of urban services, is to establish effective and well run institutions within the framework of a policy environment that promotes investment, a commercial approach to service delivery, managerial autonomy and accountability to key stakeholders, including customers and the Government.

With its mandate to promote sustainable urbanization, UN-Habitat has been in the forefront of international efforts to build the capacity of urban water utilities to face the challenges of expanding access to water and sanitation while improving the efficiency of service delivery. Through its regional and national programmes and the Global Water Operators Partnership Alliance, UN-Habitat provides capacity building for urban water utilities with a focus on business planning, water demand management, improving billing and revenue efficiency, energy audits and planning for climate change adaptation.

The Lake Victoria Region Water and Sanitation Initiative is one of the regional programmes in Africa that has demonstrated the effectiveness of integrating capacity building for urban water utilities with modest investments to improve infrastructure. The first phase of the Initiative has now been completed with impressive improvements in extending access to water and sanitation while enhancing the managerial capacity and operational efficiency of the utilities in the ten pilot towns in Kenya, Uganda and Tanzania. The utilities which have benefited from the capacity building programme have experienced significant improvements in performance in key areas such as revenue enhancement, an expanded customer base and reductions in non-revenue water.

The six training manuals which are included in this Compendium of Training Materials are based on the practical experience of delivering the capacity building programme for urban water utilities in the Lake Victoria Towns. They encompass the key areas of utility management and operations and it is hoped that they will contribute to the knowledge base of training approaches and best practices in the water utility sector in small urban centers.

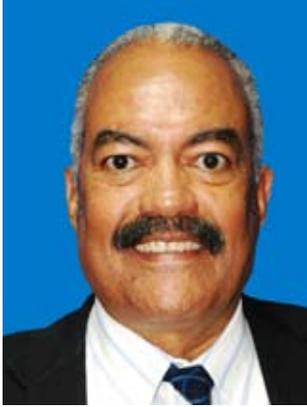


**Joan Clos**

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



## PREFACE



Small water utilities face unique challenges in delivering water and sanitation services to their customers. With a limited revenue base and few opportunities to benefit from economies of scale, they often suffer from severe skill shortages and a long legacy of underinvestment in infrastructure and capacity enhancement. To overcome these challenges, the small utilities need

to maximize their operating efficiencies and ensure optimum utilization of their assets.

Since the year 2006, UN-Habitat has been working with national and regional partners in East Africa to implement the Lake Victoria Water and Sanitation Initiative (LVWATSAN) which seeks to address the water and sanitation needs of small secondary towns in the Lake Victoria Basin. A capacity development programme in utility management and operations has become an integral component of this Initiative, which was started in 10 towns and is now being expanded to another 15 towns in the 5 East African Countries which share the Lake Victoria Basin.

The implementation of LVWATSAN has generated a solid body of knowledge and experience in enhancing the capacity of small utilities to improve their financial viability and operating efficiencies. This experience has been applied to produce a series of Manuals which can be used as training materials to improve the operating performance of small utilities.

The Block Mapping Procedures Manual is part of a Compendium of Training Manuals for Small Water Utilities, produced by UN-Habitat in six (6) volumes, as follows:

Volume 1: Finance Policies and Procedures Manual

Volume 2: Customer Services User Manual

Volume 3: Block Mapping Procedures Manual

Volume 4: Water Audit Manual

Volume 5: Leakage Control Manual

Volume 6: Reduction of Illegal Water Use Manual

The Manuals were produced through a collaborative effort between UN-Habitat and the National Water and Sewerage Corporation of Uganda within the framework of a fast track capacity building programme in utility management and operations which targeted seven small utilities in the towns around Lake Victoria.



**Robert Goodwin**

Unit Leader, Water and Sanitation

Urban Basic Services Branch

UN-Habitat

Nairobi, Kenya



## ABBREVIATIONS AND ACRONYMS

M	Meter
NRW	Non Revenue Water
NWSC	National Water and Sewerage Corporation
UFW	Un-accounted for Water
QMS	Quality Management Systems
L	Litre
Hrs	Hours
No.	Number
%	Percent

预览已结束，完整报告链接和二维码如下：

[https://www.yunbaogao.cn/report/index/report?reportId=5\\_18741](https://www.yunbaogao.cn/report/index/report?reportId=5_18741)

