Decentralised Wastewater Treatment Systems (DEWATS) and Sanitation in Developing Countries



A Practical Guide

Editors: Andreas Ulrich, Stefan Reuter and Bernd Gutterer

Authors: Bernd Gutterer, Ludwig Sasse, Thilo Panzerbieter and Thorsten Reckerzügel

BORDA

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WEDC is one of the world's leading education and research institutes for for developing knowledge and capacity in water and sanitation for low- and middle-income countries. Education and training programmes at postgraduate-level include Water and Waste Engineering and Water and Enviromental Management.
WEDC research and consultancy is directed towards the study of aspects of infrastructure and services (especially related to water and sanitation) in low- and middle-income countries.

BORDA was founded in 1977 in Bremen Germany as a non-profit professional organisation with the goal of developing new methods of using renewable energy to alleviate poverty and, through the implementation of development programmes, to improve the living conditions and social structures in disadvantaged communities abroad.

Unlike other organisations, in the struggle against poverty BORDA focuses on the facilitation of basic needs services in the sectors of water, wastewater, solid waste and energy. To achieve this, partner structures, with the participation of all stakeholders, are advised and assisted in the stablishment and organisation of innovative basic needs services (BNS); this occurs during all phases of planning and construction up to the stages of operation and maintenance.

Editors of the publication are:

- Andreas Ulrich (BORDA Director)
- Stefan Reuter (BORDA Vice Director)
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- Bernd Gutterer (PhD): Chapters 1–7
- Ludwig Sasse: Chapters 7–10, Sections 11.4–11.5
- Thilo Panzerbieter Sections 11.1–11.3
  (Section 11.3 in collaboration with Andreas Schmidt)

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This publication is a collective effort. Since the early 1990s BORDA has collaborated with a multitude of individuals and institutions throughout Europe and Asia to develop the DEWATS approach. The first DEWATS Handbook was published by Ludwig Sasse in 1998. It served as an instruction manual focusing on the technical design. A wealth of experience in demand-oriented technology adaptation and dissemination has evolved since then, including public health and community-based sanitation. This book presents the collaborative efforts made by a wide range of professionals from local and central authorities, from private businesses and international donors, NGOs, community-based organisations and academia. Therefore, this publication could not have been realised without the generous contribution of the many individuals and organisations who shared their experience and expertise. In particular the editors would like to express their gratitude to following partner organisations and individuals:

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1 Introduction

Water is a key feature of public concern worldwide. Inappropriate use and poor management of water resources have an increasingly negative effect on economic growth, on social welfare and on the world's eco-systems.

For a long time the need for efficient wastewater treatment was ignored by many public authorities. As a result the performance of existing treatment technologies and the conditions of sanitation facilities are rather poor. At many locations the sewage is just drained to surface or ground waters without adequate handling.

Recently, decision makers, planners, engineers and civil society stakeholders have launched multiple initiatives to answer the question facing many developing countries: *How to ensure a good performance and a high coverage of wastewater treatment under rather difficult conditions with financial constraints and limited human and institutional capacities?*

In the 1990s an international network of agencies and NGOs drew conclusions about the deficiencies of existing infrastructure development and produced the so-called "DEWATS approach." DEWATS is designed to be an element of comprehensive wastewater strategies: not only the technical requirements for the efficient treatment of wastewater at a given location, but the specific socio-economic conditions are also taken into consideration.

By its principles of "reliability" and "longevity", the permanent and continuous treatment of wastewater flows ranging from 1–1000m³ per day, from both domestic and industrial sources, should be guaranteed. With its flexibility, efficiency and cost effectiveness, these systems are planned to be complementary to centralised wastewater treatment-technology and to strategies reducing the overall generation of wastewater.

The international discussion about the conservation of water resources and more target-oriented poverty-alleviation strategies create a favourable environment for new sanitation approaches and innovative wastewater treatment solutions.
In many countries a rapidly upcoming market for DEWATS and a demand for efficient Community-Based Sanitation (CBS) can be observed.

Based on the experiences and "good practice" of numerous programmes and projects, this book aims to present the most important features for successful DEWATS dissemination:

- driving forces and decision parameters for innovative wastewater and sanitation strategies.
- options for a comprehensive technology choice
- planning instruments for wastewater treatment and sanitation mapping
- presentation of the DEWATS approach and good practices in DEWATS
- basic knowledge about the process of wastewater treatment
- the technical components of DEWATS
- design principles for DEWATS
- guidelines for programme development and implementation of DEWATS based CBS programmes.

Since wastewater treatment and sanitation, with all its implications, is such a complex subject, the content focuses on providing a basic knowledge that is relevant for DEWATS dissemination. As a practical guideline it should support decision making, planning and implementation activities. For very specific questions, additional literature can be consulted. A selection of books and articles can be found in the appendix.


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