



GOOD PRACTICES

FOR REGULATING WASTEWATER TREATMENT

Legislations, Policies and Standards

This report was commissioned by:

The UNEP Global Wastewater Initiative
in collaboration with WaterLex.



WaterLex

WaterLex is an international public interest development organization based in Geneva, Switzerland. It is a UN-Water Partner with UN ECOSOC special consultative status. Its mission is to develop sustainable solutions based on human rights to improve water governance worldwide, particularly in regard to consistent water law and policy frameworks. It works with an alliance of interested parties to improve water-governance frameworks, bringing them in line with country obligations under international human rights law. It is an official member of the UNEP Global Wastewater Initiative.

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The Global Wastewater Initiative

The Global Wastewater Initiative (GW²I) is a voluntary multi-stakeholders platform aiming to provide the foundations (including information, tools and policy mechanisms) for partnerships to initiate comprehensive, effective and sustained programmes addressing wastewater management. The GW²I intends to bring a paradigm shift in world water politics; to prevent further pollution and damage and emphasize that wastewater is a valuable resource for future water security. The Secretariat for the GW²I is provided by the Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities (GPA), a UNEP administered intergovernmental mechanism.

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Foreward

Wastewater management encompasses a broad range of efforts that promote effective and responsible water use, treatment and disposal, and encourage the protection and restoration of watersheds. In most countries, wastewater laws generally define institutional roles and responsibilities, laying the foundation for sustainable wastewater management. Other countries, however, may need to strengthen related legislation.

Through the Global Wastewater Initiative, hosted by the Global Programme of Action for the Protection of the Marine Environment from Land-Based Activities (GPA), and other relevant activities, UNEP is committed to promoting sustainable wastewater management. This entails cross-sector global collaboration with governments and other agencies to develop and implement effective legislation, innovative financial mechanisms and wastewater management infrastructure, especially in developing countries.

Wastewater management is challenging on several levels at once.

In most countries, wastewater management is given less priority than water provision, although both are important. An effective national policy is needed to promote the importance of sanitation, set priorities and mobilize resources. However, even with such a policy in place, political will is vital to move from theory to action.

Another issue is the variation in laws, regulations and best practices for the operation and design of wastewater reuse facilities. These standards and guidelines help protect public health, as well as the environment. As such, they must be carefully adapted to local conditions. Lack of agreement about best practices, can however undermine the impact of laws and regulations, putting health and environment at risk.

This publication presents an objective and critical analysis of successful cases for regulating wastewater treatment and management in six selected countries: Argentina, Austria, Finland, Jordan, Singapore and South Africa. It also reviews procedures and processes in the implementation of wastewater legislation, thus providing an understanding of good practices. Whatever their current status with respect to wastewater legislation, all countries may find this compilation a useful tool for addressing the global wastewater challenge.



A handwritten signature in black ink that reads "Achim Steiner". The signature is fluid and cursive, with the first letters of the first and last names being capitalized and prominent.

Achim Steiner
United Nations Under-Secretary-General and
Executive Director, United Nations Environment Programme

Good Practices for Regulating Wastewater Treatment: Legislation, Policies and Standards

Table of contents

Chapter 1: Executive Summary	3
Chapter 2: Background and Context of Wastewater Regulation	6
Chapter 3: Case Studies	31
Argentina: Matanza-Riachuelo River Basin	32
Australia	40
Finland	50
Jordan	59
Singapore.....	66
South Africa	75
Chapter 4: Lessons Learned and Recommendations.....	81
Fact Sheets	103
Matanza-Riachuelo River Basin, Argentina: Civil Society Commitment.....	104
Australia: Environmental Awareness.....	106
Finland: Regional Cooperation	109
Jordan: Policy Effectiveness.....	112
Singapore: Innovative Water and Wastewater Management.....	114
South Africa: A Human Rights-based Approach	118

Chapter 1. Executive Summary

There is increasing evidence that freshwater quality is in decline across the world. Over the past three decades, the continuous growth in volumes of untreated wastewater as well as the release of hazardous chemicals and materials into watercourses have created an urgent need to monitor and control water quality. In this sense it is both important and timely to examine different local responses to wastewater challenges that have proven their effectiveness. Where good practices exist, it is important that these be documented and shared as learning experiences and as a source of inspiration for both policymakers and practitioners looking for ways to surmount these challenges. This e-book is a response to this need, providing an overview of successful cases, procedures and processes in the implementation of wastewater legislation from different developed and developing countries around the world. This book has four objectives: First, it aims to provide an overview of wastewater legislation adopted by a range of developed and developing countries. Second, it aims to make local lessons in wastewater treatment, disposal and reuse accessible to those who may be considering reform of their own wastewater management practices. Third, it aims to promote the adoption of appropriate standards on the operation and maintenance of wastewater facilities. Finally, it aims to contribute to the exchange of wastewater legislation knowledge and best practices among experts and professionals within the field.

It is important to underline the fact that wastewater regulation and implementation can be highly context specific: Wastewater is managed in a large diversity of climatic systems, with varying water resources availability, levels of economic development, types of economic activity and settlement patterns, all of which impact on the general challenge of wastewater management / water quality management. In the selection of cases, care has been taken to ensure a broad geographical coverage, different levels of economic development and a diversity of wastewater challenges. The cases reviewed cover, amongst other things, subjects such as the contents of wastewater legislation, norms and standards used, water reuse options, and effluent quality standards. However, each case has a unique story to tell, with its own particular combination of historical background, wastewater management practices, operational challenges, operational opportunities, legal framework, and policy guidance. Therefore, each case is presented as a separate narrative, providing the opportunity to explore the internal dynamics and key features that make it stand out as a good practice.

However, the book does more than review cases: Chapter two is devoted to a global overview of emerging trends, looking at the emergence of wastewater treatment, disposal and re-use in a historical perspective. It analyses the variety of operational challenges arising from biological contamination, nutrient enrichment and inorganic pollutants as well as financial challenges in infrastructure development and maintenance. It provides an overview of generic solutions that have been developed in response to these challenges at the operational level, as well as describing the evolution of international thinking on wastewater issues, moving from international declarations and agreements over the decades to the various key anchor points in international law that are applicable in the context of wastewater management. Finally, chapter 2 turns to national law, covering the normative framework for licensing, prohibitions, sanctions and standards as well as procedural norms applicable to wastewater, before going into complementary legal families such as environmental law, public health law, and planning systems.

In chapter three, the first “good practice” case to be treated is the Matanza Riachuelo River Basin in Argentina, where human rights law was applied to overcome institutional fragmentation between the various jurisdictions in the basin and drive a process that led to a significant clean-up of the river. The case stands out in the sense that a change in the approach to river basin management was

driven by a ruling of the Supreme Court, and also by the rather unusual fact that a multistakeholder body from civil society was placed in charge of overseeing the implementation of the court ruling by government agencies.

The second case is from the city of Melbourne in Australia, where the cleansing capacity of nature itself is applied in one of the world's largest lagoon-based wastewater treatment plants, showing how "natural infrastructure" can be applied to good effect even for very large cities. Ten large ponds covering 11,000 hectares both cleanse the wastewater of 1.6 million people and are registered as a wetland of significance by Ramsar as they are a home to a large diversity of bird species.

Next, Finland is taken as an example of comprehensive success, embracing tailor-made technology choices appropriate to both urban and rural settings, institutional innovation in the form of water cooperatives, strictly enforced permit procedures under national law and good observance of EU directives and UNECE commitments. After this the attention turns to Jordan, where operational practices, driven by very high levels of water scarcity, have resulted in exceptionally high performance in wastewater treatment and effluent re-use. In addition the country boasts some of the highest rates of connection to wastewater systems in the Middle East and well developed, demand driven standards for wastewater treatment linked to re-use for irrigation. Singapore, the following case, illustrates the fact that high economic growth rates do not have to go hand in hand with wastewater problems. Singapore has invested heavily in production of water from wastewater treatment, installing some of the world's first plants for large scale indirect potable reuse. Water pollution was treated as a political priority, leading amongst other things to the development of discharge standards, pre-treatment requirements, the unification of pollution control, sewerage, drainage and environmental health under one ministry, the separation of rainwater used water-collection systems, and the introduction of regular water-quality monitoring.

Last but not least, South Africa faced increasing water scarcity in an economy with strong roots in the potentially highly polluting mining sector and a history of dispossession that required strong action to ensure access to safe water for the previously disadvantaged population. In the 1990s it replaced its Uniform Effluent Standards by more stringent Receiving Water Quality Objectives and formulated its commitment to ensure access of the previously disadvantaged to water supply and sanitation in the Water Services Act of 1997 and the masterly and much cited Water Act of 1998. The latter Act has clearly formulated water and sanitation as human rights, as well as the rights of future generations, translating human-rights objectives into clear and measurable targets, while emphasising the importance of participatory processes and sustainability.

Chapter 2. Background and Context of Wastewater Regulation

1. Historical perspective

Water is an essential resource for life and almost all kinds of economic activity. It is fundamental for our daily household activities, and it is a central aspect of public life. Unfortunately, water utilisation does often involve varying degrees of pollution, producing wastewater. This wastewater needs to be treated and safely disposed of, if it is not to negatively affect the water quality of other users or cause damage to ecosystems. Therefore the treatment and disposal of wastewater needs to be effectively regulated, and legal frameworks need to be effectively implemented, and enforced, for water resources to bestow a full range of benefits to humans, to ecosystems and to the environment and, ultimately, for sustainable development and operation to take place.

Wastewater has not been seen as a global concern until fairly recently. However, over the past decades, the continuous growth in volumes of untreated wastewater as well as the release of hazardous chemicals and materials into watercourses, and indirectly into groundwater as a result of wastewater disposal on the ground and underground, has created an urgent need to monitor and control water quality in the wastewater-receiving water bodies, above and below the ground. These challenges of managing wastewater have a long history: For instance, in the late 19th century and early 20th century, the first centralized sewage systems were developed in the United Kingdom and the United States. But as industrialisation, urbanisation and population pressure increased, so has the need to confront the increasing volume of wastewater which was polluting water bodies in and around cities and towns. The decades since the Second World War have seen an increasing emphasis by local governments, states and international aid agencies being placed on water quality, pollution control, and the provision of clean drinking water and sanitation.

Fortunately, recent developments in wastewater management have immense potential to help alleviate some of the problems of water supply, pollution control, waste recycling, health issues related to water-borne diseases, and environmental protection. There are a number of recent trends in wastewater management, which vary according to climatic differences and levels of development and financial resources available for investment. These affirm that far from being only a nuisance, wastewater is now increasingly being seen as a resource, as technologies have advanced and treated wastewater can now be used in industrial processes, for irrigation and for potable water. In terms of

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