



Best Practices

in Policymaking for Integrated Water and Wastewater Management

Case Dominican Republic

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Strategies for Policymaking for Integrated Water and Wastewater Management

Dominican Republic: Integrating Wastewater Reuse into Water Quality Regulations



Figure 1: Treated wastewater can be a valuable resource, but the Dominican Republic lacked the regulations to allow reuse. (Photo: © GIZ/CRew+/IndhiraDeJesús)

Background

Freshwater in the Dominican Republic (DR) is a resource under pressure, and large areas of the country could face water scarcity starting from 2025¹. Agriculture accounts for approximately 75% of the country's water demand², The sixth IPCC report predicts a decrease in precipitation and an increase in aridity, with more severe agricultural and ecological droughts for the Caribbean³. In this "new normal," the reuse of wastewater can become a lifeline for agriculture and other uses.

Wastewater reuse (also known as water recycling or water reclamation) involves recovering wastewater from various sources, treating it, and returning it to supply systems or natural water bodies for use in agricultural irrigation, drinking water supply, non-potable domestic use, groundwater recharge, industrial processes, and/or environmental restoration. Water reuse can be an alternative or complement to existing water sources and can be used to enhance water security, sustainability, and resilience.⁴

In general, we can discuss planned or unplanned reuse. Unplanned wastewater reuse refers to situations where a water source consists substantially of previously used water. A common example of unplanned water reuse occurs when communities obtain their water supply from a river or canal that receives domestic or agricultural wastewater discharges, often without prior treatment. Planned wastewater reuse refers to water systems designed with the objective of beneficially reusing recycled water supply. In Latin America, the most common form of reusing municipal or urban wastewater is for agriculture, but for the most part, it is unplanned use.⁵

In the driest areas of the planet, wastewater is recycled for agricultural uses, irrigation of gardens and green areas, aquifer recharge, industrial uses, non-potable urban uses, and even potable uses. The World Bank states that a paradigm shift in wastewater management is needed, recognizing wastewater as a valuable resource from which energy and nutrients can be extracted, in addition to being an additional water source, within the context of a circular economy.⁶

¹ Ministry of Economy, Development and Planning (MEPYD), 2018. Contexto Actual del Agua en la República Dominicana

² Intergovernmental Panel on Climate Change (IPCC), 2021. Regional fact sheets – Small Islands

³ National Institute for Hydro Resources (INDRHI), 2012. Plan Hidrológico de la República Dominicana.

⁴ United States Environmental Protection Agency (USEPA) 2012. Guidelines for Water Reuse.

⁵ Food and Agriculture Organization of the United Nations (FAO), 2018. Water Reuse in Latin America and the Caribbean: Principles, Status, and Needs.

⁶ World Bank, 2020. From Waste to Resource: Changing Paradigms for Smarter Interventions in Wastewater Management in Latin America and the Caribbean.

The Challenge

The legal and institutional framework for water management in the Dominican Republic is complex, with several overlapping competencies among institutions. However, concerning environmental water quality regulations and wastewater discharge, the legislation is very clear, granting the Ministry of Environment and Natural Resources all the necessary competencies. Law 64 of the year 2000, on environment and natural resources, explicitly states that wastewater can be reused as long as it is treated in compliance with the regulations issued by the Ministry of Environment and Natural Resources of the Dominican Republic.

Wastewater reuse exists in the agricultural, tourism, and industrial sectors in the country. However, reuse is mostly unplanned and unregulated, and therefore in violation of the country's environmental law. Particularly in the agricultural sector, which is the largest water user in terms of demand volume, the reuse of treated or untreated municipal wastewater occurs informally and without monitoring by authorities. This poses a risk to the health of field workers and consumers of agricultural products.

Certain forms of reuse are legally carried out, especially in the tourism and industrial sectors, based on specific permits issued by the Ministry. However, to develop a comprehensive policy regarding wastewater reuse, the Ministry of Environment and Natural Resources of the Dominican Republic must first establish minimum requirements in terms of water quality parameters for reuse. It is essential to ensure that wastewater reuse aligns with the country's freshwater and coastal water quality objectives, and that institutional actors agree on the basic parameters that need to be monitored and met. Achieving this requires a participatory process involving various institutions with relevant expertise.

Relevance for Development

Developing a regulation for the reuse of wastewater in the Dominican Republic is the first step towards a comprehensive wastewater reuse policy that will contribute to the achievement of three of the goals of SDG 6 “Clean water and sanitation”. These goals have been included in the Document Proposal of the Pact for Water 2021-2036 of the Dominican Government, namely:

- By 2030, improve water quality by reducing pollution, eliminating dumping, and minimizing the discharge of hazardous materials and chemicals, halving the percentage of untreated wastewater, **and substantially increasing safe recycling and reuse globally.**
- By 2030, substantially increase the **efficient use of water resources** across sectors and ensure the sustainability of freshwater withdrawals and supplies to address water scarcity and substantially reduce the number of people experiencing water scarcity
- By 2030, **implement integrated water resources management at all levels**, including through transboundary cooperation, as appropriate.

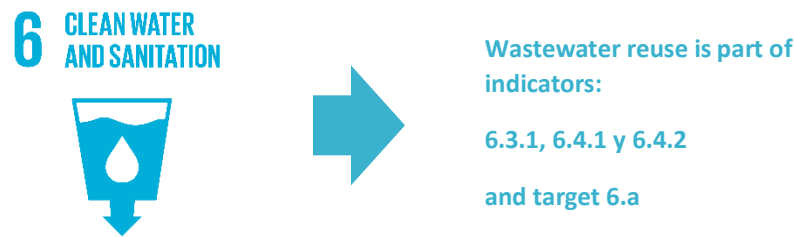


Figure 2: The GEF CReW+ project collaborates with the Dominican Republic in advancing the achievement of the Sustainable Development Goals. Specifically, with target 6a and indicators 6.3.1, 6.4.1, and 6.4.2.

CReW+ Approach

Our strategy

The The GEF CReW+ is a collaborative project funded by the Global Environment Facility (GEF) being jointly implemented by the Inter-American Development Bank (IDB) and the United Nations Environment Programme (UNEP) in 18 countries of the Wider Caribbean Region (WCR). This innovative project is built upon the successful previous phase called "Caribbean Regional Fund for Wastewater Management (CReW)" (2011-2017). CReW+ is being executed by Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH, the Organization of American States (OAS), and the Secretariat of the Cartagena Convention (UCR/CAR) on behalf of IDB and UNEP, respectively.

The Global Environment Facility (GEF) has provided \$22 million in grant funding and financial resources and mobilized around \$120 billion in co-financing for over 5,200 projects and programs. GEF is the largest trust fund focused on enabling developing countries to invest in nature and supports the implementation of international conventions on biodiversity, climate change, chemicals, and desertification. It brings together 184 governments, in addition to civil society, international organizations, private sector, and partners.

The GEF CReW+ project, under the leadership of GIZ in consultation with the Ministry of Environment and Natural Resources of the Dominican Republic and the National Institute of Drinking Water and Sewerage, has devised a two-phase strategy to address wastewater reuse.

First, in June 2021, CReW+ commissioned the study "Analysis of the Legal and Regulatory Framework Related to Water Resources Management and Water and Sanitation in the Dominican Republic for the Updating of the Regulation for the Control of Wastewater Discharges" through GIZ.

This study analyzed the existing regulations in the country regarding wastewater discharge and the relevant legal framework to assess: 1) the need for updating these regulations, 2) the areas that should be focused on in this update, and 3) whether specific provisions for wastewater reuse should be incorporated into the regulations, and if so, establish an initial baseline for regulations regarding reuse.

The methodology for the study included a participatory process, with interviews with key stakeholders from the main government institutions related to the Water and Sanitation sector (listed in a table below) and two workshops. This helped raise awareness about reuse and the need to integrate parameters for safe reuse into water quality standards. The study also included a thorough review of national and international literature and a comparative assessment with similar regulations in the Central American region.

After analyzing the Dominican regulations and their counterparts in the region, the study concluded that the Ministry of Environment and Natural Resources should focus on a short-term review and update of the country's wastewater discharge control regulations. The results of interviews and consultations conducted by the consulting team indicated that the regulation should be revised to incorporate sludge management and requirements for wastewater reuse, which were identified as significant gaps.

Participants in the process identified economic and population growth, as well as climate change due to global warming, as the fundamental reasons to prioritize wastewater reuse in the Dominican Republic as a tool for integrated and sustainable water resources management in the country.

The study found that currently, the majority of wastewater reuse in the Dominican Republic, in terms of water volume used, is unplanned reuse for agricultural purposes. This implies a lack of monitoring regarding water quality, health protection, and environmental protection. There is also planned reuse included in some environmental permits in the industrial and tourism sectors. Although it is more organized, there are no monitoring mechanisms (beyond Environmental Compliance Reports -ICAs-) or information databases that allow the integration of the practice into water resources management policies.

The second phase involved the review of the wastewater discharge regulations to incorporate parameters for wastewater reuse and provisions for sludge management and wastewater treatment. Once again, the methodology ensured broad stakeholder participation. With the support of the GEF CReW+ Project, through GIZ, the Ministry of Environment and Natural Resources of the Dominican Republic convened a Technical Committee with representatives from key institutions involved in water resources and water and sanitation management in the country.

The Technical Committee agreed on the main parameters that need to be regulated for safe reuse for specific purposes and detailed parameters for the following uses:

1. Urban reuse: Irrigation of areas with people's access (green areas, golf courses, parks, sports facilities, and cemeteries), car washing, toilets, fire extinguishing, and other uses with similar water access or exposure.
2. Restricted access irrigation: Lawn cultivation, forestry, and other areas where public access is prohibited or restricted.
3. Agricultural reuse in food crops that are processed before sale: Irrigation of crops that, before being sold to the public, have undergone the necessary physical or chemical processing for the destruction of potential pathogens they may contain.
4. Agricultural reuse in non-food crops: Irrigation of flat pastures, forages, fiber and seed crops, and other non-food crops.
5. Recreational reuse: Reuse in artificial bodies of water where there may be occasional contact (fishing, canoeing, and boating).
6. Landscape reuse: Aesthetic uses where contact with the public is not allowed, and this prohibition is clearly labeled.
7. Construction reuse: Soil compaction, dust control, material washing, concrete production.

Institutions in the Technical Committee

1. Ministry of Environment and Natural Resources
2. Ministry of Health
3. Ministry of Agriculture
4. National Institute of Hydraulic Resources
5. National Institute of Potable Water and Sewage
6. Potable Water and Sewage Corporation of Santo Domingo
7. Potable Water and Sewage Corporation of Santiago
8. Dominican Institute for Quality Assurance
9. Dominican Federation of Municipalities
10. Academic Expert

The use of wastewater for agricultural production of raw food products was discussed, but no consensus was reached, making it a pending issue for the Ministry to decide at a later date.

Furthermore, during the second part of the intervention, other water quality standards and legal documents were reviewed to identify aspects that need to align with the new regulation.

The approach of the GEF CReW+ Project has helped the Dominican Republic to have, for the first time, normative parameters to ensure safe and proper reuse of wastewater incorporated into the discharge standards. The participatory nature of the process helped promote technical and institutional dialogue that will continue during the public consultation process for the regulation. This

helps raise awareness of the need to establish a comprehensive policy that incorporates reuse into the set of strategies for the sustainable use of water resources in the country.

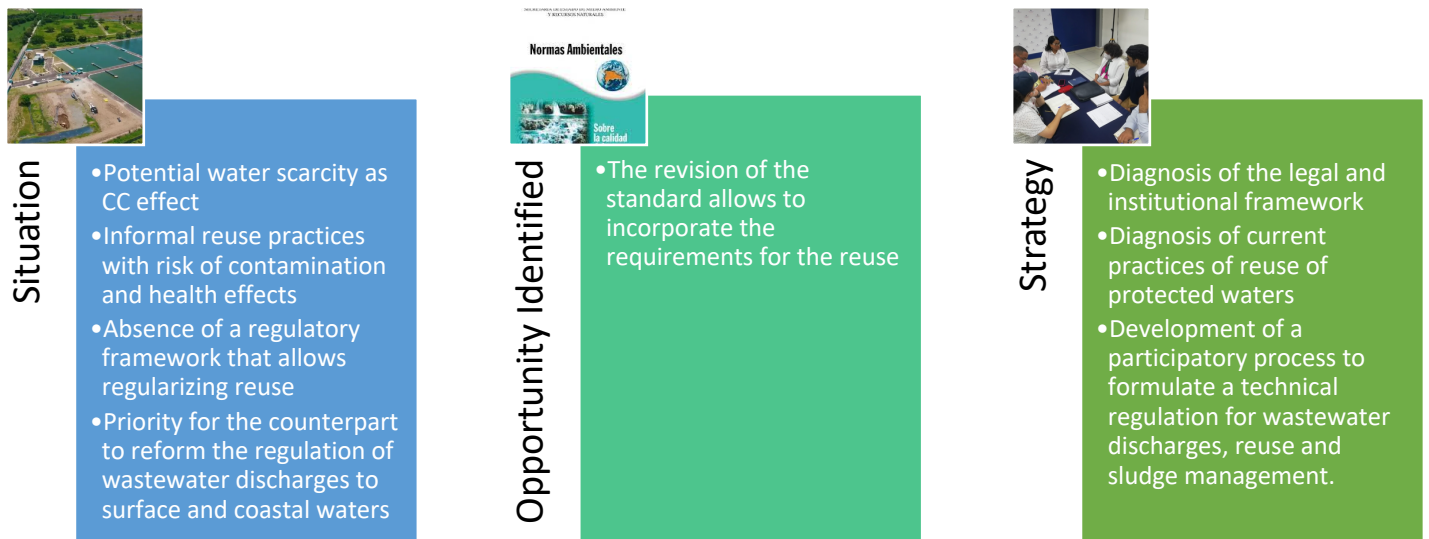


Figure 3: Process diagram (current situation, identified opportunity, and strategy) for the development of the Regulation for the Control of Wastewater Discharges.

Lessons Learned

What not to do:

- *Underestimating the amount of time required to develop a participatory process.* As indicated, in the Dominican Republic, the institutional and legal framework for water management is fragmented. In the case of wastewater reuse, sectors such as agriculture, tourism, and industry also need to be involved. In the design of the participatory process, the time needed to engage various stakeholders and build the necessary levels of trust for reaching consensus should be considered. Additionally, in some cases, when dealing with highly technical issues, it is necessary to build a common knowledge base and language that facilitates effective dialogue.
- *Assuming that data will be readily available.* During the diagnostic phase, it is often assumed that data on wastewater quantities produced and treated, volumes used by different user types, water quality of discharges, etc., will be readily available. Unfortunately, in our countries, we often lack monitoring and data recording systems, or the existing data is not aggregated or easily accessible. It is important to be flexible and gather information through interviews, workshops, or secondary sources.
- *Proposing regulations that cannot be enforced under local conditions.* It is easy to fall into the trap of seeking a perfect regulation that mirrors those of more advanced countries in the field. However, this can lead to a situation where regulators become frustrated due to the lack of mechanisms for monitoring and ensuring compliance, while regulated entities feel burdened by costly or technically unfeasible requirements in their reality. To avoid the aforementioned problem, broad participatory processes involving different institutions should be conducted to develop a consolidated legal instrument.

What worked:

- Ensure that the project support responds to the needs of the counterpart. Sometimes projects develop actions and strategies without the participation of the country. This often leads to results that are not applicable or do not reflect local priorities. When support aligns with local priorities, there is greater enthusiasm and it becomes easier to engage stakeholders. It also enhances sustainability after project completion.
- Promote participation and encourage dialogue between institutions and private actors. Wastewater reuse has significant economic implications for the private sector. Their involvement in the diagnosis and definition of regulations facilitates faster approval and better reception for implementation.
- Involve key informants. The diagnosis relied on identifying key actors with relevant information.
- Have a clear understanding of the country's legal and institutional framework as a starting point. When dealing with processes that involve modifying existing regulations, it is crucial to begin with a clear understanding of the legal and institutional framework. This also facilitates mapping of actors and the involvement of key stakeholders.
- Benchmark with regional/comparable regulations. This is considered a good practice for several reasons. Firstly, environmental regulations directly impact competitiveness, so if regulators are establishing stricter standards than other countries, it should be a conscious decision with a clear understanding of potential implications. Secondly, being aware of regional norms provides a starting point for what can be achieved in similar contexts.

Sustainability and improvements

The formal outcome of this strategy is a draft normative document. **However, more importantly, it has fostered dialogue among the relevant institutions and raised awareness of wastewater reuse as a key component of a comprehensive water resource management strategy.**

The sustainability of the results is based on the fact that the GEF CReW+ Project, under the leadership of GIZ, worked closely with the institutions of the Dominican Republic to ensure their commitment to completing the regulation approval process, which will include a broader public consultation. Additionally, the participation of the Technical Committee provides extensive support and ensures that other institutions are also involved in advancing the process.

This experience represents an initial step for the Dominican Republic to develop policies and programs that promote the safe reuse of wastewater, capacity-building for monitoring, and the enforcement of regulations. The methodology and lessons learned from this process can be applied to other countries with similar regulatory frameworks to the Dominican Republic.

Furthermore, this experience has identified additional aspects that need to be addressed by the Ministry of Environment and Natural Resources of the Dominican Republic, such as improving monitoring and tracking capabilities, enhancing information capture systems, and implementing monitoring mechanisms to generate a database on wastewater discharges from companies, facilities, and projects with environmental permits.

To ensure safe reuse, an educational campaign should also be conducted targeting the agricultural sector in the Dominican Republic, which should be coordinated between the Ministries of Environment and Agriculture. Establishing inter-institutional partnerships, including collaborations with universities to facilitate capacity-building in water quality monitoring and treatment processes, would also be beneficial.

Lastly, it is recommended to evaluate the adoption of ISO 30500 and ISO 24521 standards for non-sewered sanitation systems, as the Dominican Republic has less than 20% of its population covered by sewerage systems, according to official estimates, but over 80% of the population has access to toilets. This results in a high percentage of untreated wastewater discharged or directed to septic tanks that do not comply with appropriate technical standards.

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