



Best Practices in Integrated Water and Wastewater Management in Guatemala



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Change Processes in Integrated Water and Wastewater Management

Territorial governance with a watershed approach in Guatemala



Figure 1: Quetzaltenango Valley, Guatemala. ©GIZ/ Sharon van Tuylen.

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Background

The GEF CReW+ is a collaborative project funded by the Global Environment Facility (GEF / GEF) that is being implemented jointly 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 builds on the successful previous phase called "The Caribbean Regional Fund for Wastewater Management (CReW)" (2011-2017). CReW+ is being implemented by GIZ, the Organization of American States (OAS), and the Cartagena Convention Secretariat (UCR/CAR) on behalf of the IDB and UNEP respectively.

The Global Environment Facility (GEF) has provided \$22 million in grants and financial resources and mobilized nearly \$120 billion in co-financing for more than 5,200 projects and programmes. The 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, as well as civil society, international organizations, the private sector, and partners.

In Guatemala, the Ministry of Environment and Natural Resources (MARN), through the Vice Ministry of Water and the Division of Watersheds and Water Resources (DRHyC), is implementing a series of processes to promote the sustainable management and protection of watersheds. The Law for the Protection and Improvement of the Environment (Article 15, paragraph f), establishes the obligation to promote the rational use and integrated management of watersheds, springs, and water supply sources, with which, since 2018, Guatemala has prioritized the micro-watersheds in the Motagua River basin.

The Motagua watershed has strong environmental impacts derived from inadequate practices and low regulatory control of activities such as coffee and banana plantations, parcels, colonies, high-impact urbanizations or subdivisions, and commercial and industrial activities. The watershed has low levels of water and sanitation coverage, with small and dispersed communities that do not have the technical and economic capacity to cope with the growing pressure on water resources and the deterioration of water quality. Under these conditions, integrated water resources management is essential. From the regulatory point of view, the Vice-Ministry of Water has a draft Policy for Integrated Water Resource Management, as an instrument to regulate and organize the interventions that the different actors carry out in the micro-watersheds. In terms of water pollution control, compliance with the Regulation on Wastewater Discharge and Reuse, and Sludge Disposal (Governmental Agreement No. 236-2006) requires special attention, given the high levels of contamination reported in affected watersheds.

The background information on the watershed is sufficient. Currently, the "Integrated Environmental Management Project for the Motagua River Basin", under the responsibility of the United Nations Development Programme (UNDP), covers an area of 17,990.8 km² (84% in Guatemala and 16% in Honduras), with 4,339,748 inhabitants (95% Guatemalans and 5% Hondurans), and includes a detailed diagnosis at the sub-basin level, identifying current management practices and defining strategies and programmes mainly focused on pollution control and its impact on water resources. This programme focuses mainly on solid waste pollution control.

On the other hand, the "Programme for the Adaptation of Rural Development to Climate Change -- ADAPTATE", under the responsibility of MARN and financed by the German Federal Ministry for Economic Cooperation and Development (BMZ) and executed by the German Development Cooperation (GIZ), focuses on the integrated management of the Motagua River basin (upper, middle and lower part), seeking an integration of the different partners at the local government, private and academic sectors, and civil society levels. In addition, the GIZ's global [Sanitation for Millions](#) programme, through the [GEF CReW+ Project](#), seeks to coordinate actions with these programmes to achieve synergies and complementarity of technical and financial resources.

This document systematizes the information on the activities carried out in Guatemala by GIZ, which seeks to support the process of change towards adequate wastewater management through integrated watershed management in the country and capacity building to strengthen the actors involved, to contribute to integrated sanitation that adds to regional actions to achieve a clean and healthy Caribbean.

The challenge

The deterioration of water quality is a major problem in the country, because of its effects on public health, aquatic ecosystems, and

economic activities. If this trend continues, its climate vulnerability will be greater (Guatemala is included among the 20 countries most vulnerable to climate change, according to the global climate risk index reported by Germanwatch (2021)), since extreme weather events can contribute to further increase loads of sediments, nutrients, and pollutants in the water. This affects freshwater ecosystems and consequently freshwater availability for human consumption.

Regarding water pollution in Guatemala, it is a general problem, since according to the Ranking of Municipal Management (Segeplan, 2018) of the 340 municipalities in the country, only 50 municipalities (15%) reached the compliance level of the high categories, and 290 municipalities (85% of the total), were in the low levels of compliance.

Currently, contamination of surface water and shallow groundwater is prevalent. Of all the water used in the country, about 1540 million m³ of wastewater is generated annually. Sewage treatment is minimal, only about 5% of wastewater is treated (SEGEPLAN 2007 cited by IANAS [2012]).

In urban areas, 164 treatment plants are operating, from 81 municipalities (24%). Tertiary wastewater treatment is performed only in 21 treatment plants from 17 urban area municipalities (Segeplan, 2018). Only 286 municipalities have sewerage services and there are no programmes to monitor the quality of collected wastewater (Segeplan, 2006).

According to data provided by the Ministry of Health, diarrheal diseases are the second cause of morbidity and the second cause of mortality in the country, second only to respiratory infections.

Despite the existence of a regulation (Governmental Agreement 236-2006, Regulation of Wastewater Discharge and Re-use and Sludge Disposal) that regulates and requires compliance with certain effluent quality standards for discharge into water bodies, its implementation and compliance have suffered a series of delays and extensions.

The Motagua River Basin has strong environmental impacts derived from inadequate practices and low regulatory control of activities such as coffee and banana plantations, parcels, colonies, urbanizations or high-impact subdivisions, and commercial and industrial activities. The watershed has very low levels of water and sanitation coverage, with small and dispersed communities that do not have the technical and economic capacity to cope with the growing pressure on water resources and the deterioration of water quality. Under these conditions, integrated water resource management is essential.

Relevance for development

By valuing water as a scarce good, the concept of IWRM applied within the framework of the GEF CReW+ project in Guatemala is based on supporting institutional development and its governance capacities to face the challenges of the water and sanitation sector, through instruments that promote good practices for this sector's integrated management.

In this way, the *Guide for the development of management, protection, and conservation plans for watersheds, sub-basins, and micro-basins of the Republic of Guatemala* was generated, which contributes directly to the achievement of Sustainable Development Goals -SDG-:

Goal 6 "Ensure availability and sustainable management of water and sanitation for all" (especially SDGs 6.2 and 6.3),

Goal 3 "Ensure healthy lives and promote well-being for all at all ages", and

Goal 15 "Sustainably manage forests, combat desertification, halt and reverse land degradation, halt biodiversity loss", listed in order of priority for water management and care, people's health, and ecosystems. The allocation of an environmental flow in water planning allows the maintenance of ecosystems that in turn provide a variety of goods and services to populations.

Additionally, the use of the guide will indirectly impact other SDGs including, among others:

Goal 11 Sustainable Cities and Communities, dependent on adequate water supply and responsible for wastewater generation and treatment.

Goal 13 Climate Action, considering that water is a key resource in climate change adaptation and mitigation.

Goal 14 Submarine Life, in line with the watershed-to-coast concept, where good management ensures that the impact of land-based activities on the marine-coastal environment from river mouths is reduced.

Other activities relevant to development are materialized in:

- To provide the governing body with tools for orderly planning of basins for the improvement and recovery of water resources.
- Facilitate the consolidation of inter-institutional alliances between the public and private sectors and other international cooperation projects.
- Train and accompany technical personnel in the territory to strengthen their skills in integrated water resources management -IWRM- and adequate watershed management.
- Add to the national strategy to clean up the Motagua River to reduce the impacts of pollution on both the river and the Caribbean Sea.

The CReW+ approach

Change processes supported by CReW+

The MARN, aware of the current environmental problems exacerbated by the effects of climate change, as well as the vulnerability of the majority of the population and the low resilience to the variety of phenomena such as hurricanes, heavy rains, tropical storms, droughts, and frosts, which are increasingly recurrent and affect the quality of livelihoods of the population; requests the CReW+ project to update the Guide for the Development of Microbasin Management Plans generated in 2009 with the support of the International Union for Conservation of Nature (IUCN). From then, despite not being formally established in national legislation, this Guide has favored the development of watershed management platforms, through the development of planning instruments at the micro-watershed level. Since the country's context has changed, the readjustment of this document was necessary to provide managers and local stakeholders with a practical tool that strengthens the IWRM approach, under the current national situation. This update should also seek to strengthen governance aspects to facilitate the equitable participation of all stakeholders and sectors in the use and management of water resources, as well as in decision-making. It should also be harmonized with the most recent national strategic and planning instruments, contribute to the fulfillment of international commitments, and incorporate cross-cutting issues, particularly climate change.¹

Based on the above and with the creation of the Vice-Ministry of Water, MARN proposed that instead of updating the existing Guide, a new one should be developed that would include, in addition to management, the protection and conservation of watersheds, sub-watersheds, and micro-watersheds, based on Governmental Agreement 19-2021. The purpose of this Agreement is to promote the protection and conservation of the watersheds of the Republic of Guatemala, through a continuous process that allows for the preparation and/or updating of watershed diagnoses as a basis for the implementation of natural resource management plans focused on solving environmental degradation problems. The new Guide considers different entities' past and existing experiences in the country and provides local, municipal, departmental, and national managers and stakeholders with a practical tool to strengthen the IWRM approach.

¹ The DRHyC is responsible for prioritizing micro-watershed interventions, strengthening technical capacities in their management, and providing advice to the Municipal Environmental Management Units, Forestry Offices, and Municipal Planning Directorates in the preparation of Integrated Micro-watershed Management Plans - PLADIM

The CReW+ project in Guatemala focused particularly on promoting the generation of guidelines and standards for IWRM and the development of management and implementation capacities. Although the project's area of intervention was initially defined for the Motagua River basin, the institutionalization of the products generated was sought, so that they would be scalable and of national utility and application.

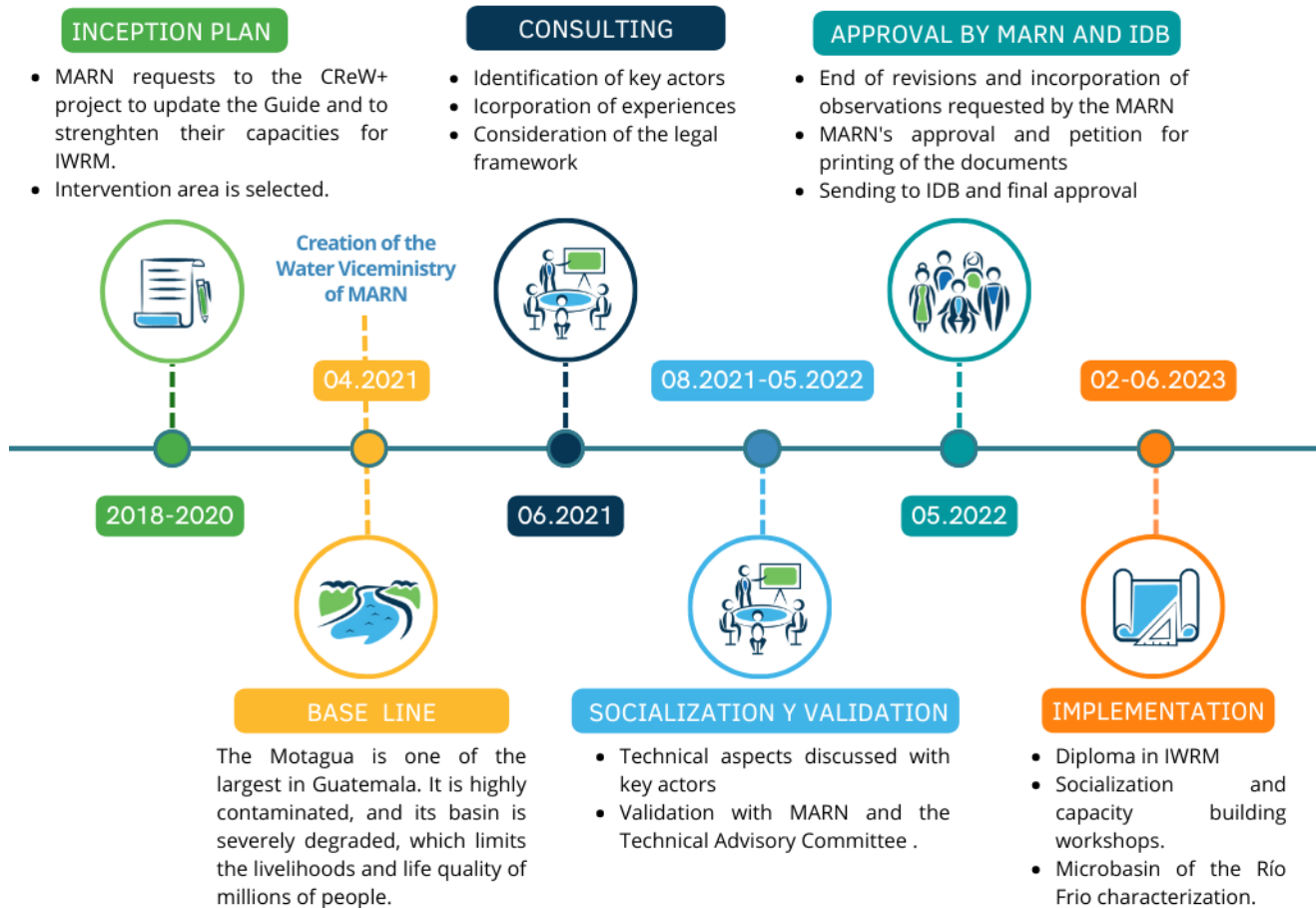


Figure 2: Process of activities developed by GIZ through its Sanitation for Millions programme for the CReW+ project. ©GIZ/Sharon van Tuylen

The actions carried out in Guatemala by GIZ through its global programme Sanitation for Millions, within the framework of the CReW+ programme, consisted of activities within two components: Component 1. Analysis of the existing policy framework, legislations, guidelines, and standards in support of integrated water and wastewater management, and recommendations for management improvements; and Component 3. Technological innovations in integrated water and sanitation management at the rural level.

Component 1. Analysis of existing policy framework, legislation, guidelines, and standards in support of integrated water and wastewater management, and recommendations for management improvements:

- + Strengthen the IWRM approach through the creation of the Guide for the elaboration of management, protection, and conservation plans for basins, sub-basins, and micro-basins in the Republic of Guatemala, which includes a toolbox for the preparation of comprehensive diagnoses and management plans, guidelines for the creation of micro-basin committees, and training, knowledge, and dissemination material.

The following activities were carried out to generate the Guide, divided into three stages: Stage I: Determination of baseline and identification of relevant aspects to be modified

- + A review of territorial gaps and adjustments was conducted, addressing the municipal role and existing instruments.
- + Key information providers were identified to carry out a participatory consultation process to fill information gaps. In addition, a compilation of information on previous experiences was carried out and practical aspects of existing projects (lessons learned) were included.

It is worth mentioning that during this stage, the Vice-Ministry of Water was created within MARN, and Governmental Agreement 19-2021 was issued, which mandates the promotion of watershed protection and conservation in the Republic of Guatemala. Article 7 of the Agreement establishes that the watershed protection and conservation plan will be the strategic instrument, so the Guide was prepared following this regulation.

These actions, together with other existing laws and policies identified, provided legal support to reinforce the adoption of the Guide by the governing body, in addition to consolidating its use and application.

Stage II: Technical construction of the Guide

- + At the national level, interviews were conducted with personnel from government agencies involved in natural resources, watersheds, and climate change issues, as well as with specialists from international cooperation agencies and national and international NGOs involved in these issues. At the municipal and departmental level, representatives of municipal offices related to water and forests, personnel from government agencies, national and international NGOs, international cooperation agencies, and university centers of the University of San Carlos of Guatemala were interviewed. At the community level, focus groups were conducted with micro-watershed committees to learn about water governance and the implementation of micro-watershed, sub-watershed, and watershed management plans.
- + Taking into consideration the baseline and compilation of experiences, a first draft of the document was formulated, and discussions were organized and led internally within MARN and externally with key stakeholders on the technical and functional aspects of the Guide and its components, for its improvement. As a result of this feedback process, inputs were incorporated, and a final version was obtained ready for a consultative process.

Stage III: Guide consultation and socialization process

- + Process of circulating the Guide and receiving feedback. This was carried out through virtual presentations and consultation workshops, as well as face-to-face meetings and visits to identified stakeholders for further feedback on the document. In addition, the consultative process for the updated Guide involved the efforts of different entities such as the IUCN, the World Wide Fund for Nature (WWF), the Ministry of Agriculture, Livestock and Food (MAGA), as well as other international cooperation agencies, non-governmental organizations, universities, local governments, and communities, which participated in the consultation and validation processes.
- + Subsequently, feedback was incorporated, and the final draft was prepared. This document was presented to the Technical Advisory Committee (TAC)² of MARN for analysis and validation.
- + Finally, once the TAC's observations were incorporated, a series of meetings was held with MARN to review and approve the Guide, and the final version was delivered to the Watershed Division. The document was approved by MARN on May 10, 2022.

Although the GEF CReW+ project's only goal in Guatemala was to generate the Guide, there was a need for follow-up to reinforce its appropriation and implementation. For this reason, together with the MARN Watershed Division, socialization and training workshops were organized for the institution's technical staff on the use and application of the

² The TAC is a technical body created by Governmental Agreement 19-2021, whose function is to provide technical and scientific support to anyone who voluntarily participates in the evaluation, control, and monitoring of watershed protection and conservation.

Guide, so that they can implement related activities in their territories of action and at the same time train other local partners and stakeholders. These actions were linked to the implementation of Component 3 activities.

Component 3. Technological innovations for integrated water and sanitation management at the rural level: In this case, MARN expressed the need for CReW+ to focus on:

- + Strengthen the technical capacities of the technical staff of MARN, the prioritized municipalities, and other government agencies and stakeholders for the development of management, protection, and conservation plans for watersheds, sub-watersheds, and micro-watersheds and their implementation.

For the development of these activities, sub-activities were established, and distributed in three stages:

Stage I: Diagnosis and selection process of micro-watersheds

- + In conjunction with MARN, a process of prioritization of the micro-watersheds within the Motagua River basin was carried out, using secondary information and experience from the ADAPTATE III project implemented by GIZ.

Seven micro-watersheds were prioritized:

In the <u>upper part of the</u> basin:	– The Frio River in the department of Guatemala, municipality of San Raymundo.
In the <u>middle part of the</u> basin:	– Sanarate, Morazán, and Guastatoya rivers in the department of El Progreso, municipalities of Sanarate, Morazán, and Guastatoya.
In the <u>lower middle part of the</u> basin:	– Río Lato in the department of El Progreso, municipality of San Agustín Acasaguastlán. – Guijo and Tambor rivers in the department of Zacapa, municipalities of Cabañas and Usulután.

Stage II: Development of a training plan

- + Through a participatory and collaborative process, a training and strengthening plan was developed (using the Guide generated). For this purpose, a tool was designed to evaluate knowledge and learning desires on integrated water resource management and watershed management. The tool was applied to the technical staff of the prioritized municipalities and made it possible to diagnose their training needs. As a result, a training content proposal was developed and validated by the Watershed Directorate and the Training and Social Participation Directorate of MARN.
- + After a process of analysis of the scalability and potential of the Guide, it was decided to design an online diploma course to broaden its scope. Thus, it was decided to install on the platform of the Ministry of Environment and Natural Resources the "Diploma in integrated water resources management with emphasis on the development of micro basin management plans - PLAMIM", focused on capacity building in integrated water resource management and the application of the Guide (developed in C1). This course was designed as a self-paced Massive Open Online Course to be permanently available and open to all interested persons, thus ensuring the sustainability of the product beyond the end of the project. It is worth mentioning that this is the first course available on the MARN platform with these characteristics.
- + In addition, a toolbox was designed to accompany the training process and the use of the Guide. This toolbox contains a study manual for the diploma course, a manual for the development of participatory workshops, a

manual of technical tools for the development of micro-watershed management plans following the Guide, and a booklet of templates of the activities considered in both manuals, the technical tools manual and the workshop manual.

Stage III: Execution of training and accompaniment in the implementation of activities

- + Execution of the strengthening plan with the municipalities of the selected micro-watersheds. In addition to the virtual diploma course in IWRM with emphasis on micro-watershed management plans, two face-to-face workshops were held with the technical staff of the municipalities of the prioritized micro-watersheds to strengthen knowledge under the needs identified in the diagnosis and for the use of the Guide and the preparation of plans.

Finally, in Stage III, socialization and training workshops were held for the technical staff of the seven municipalities prioritized under the project, as well as for MARN technicians on the use and application of the toolbox.

The purpose of this stage was to provide advice to technical personnel for the preparation of micro-watershed management plans from a training perspective for self-management.

- + Five socialization and training workshops were held at the national level with the participation of technical staff from the seven municipalities prioritized under the project, as well as technicians from MARN and other government agencies such as MAGA, the General Secretariat of Planning -SEGEPLAN-, the National Forest Institute -INAB- and the National Council of Protected Areas -CONAP-, in addition to some key MARN partners from NGOs (Water for people, HELVETAS, Tikonel) and technical staff from the EbA LAC programme (IUCN-GIZ-CATIE) for the use and application of the Guide and the toolbox, so that they can implement the related activities in their territories of action and at the same time they can also train other local partners and stakeholders.
- + Accompaniment in the implementation of selected activities of the training course to develop some phases of the Management Plans. Support was provided to the Municipality of San Raymundo to prepare the technical and social characterization of the water quality of the Río Frío micro-watershed.

Capacity building for implementers provides the necessary tools to be able to organise activities in the territories through management plans, so that the necessary resources can be directed to improve integrated water and wastewater management, from different fields of action.

Lessons learned

1. Things that worked

- + Participatory construction of the document including communities, institutions, and other stakeholders serves to facilitate their validation and implementation.
- + The close involvement and collaboration of the Ministry of the Environment and Natural Resources during the entire process of consultation and formulation of the Guide was fundamental to ensure its appropriation as an instrument of national application and the sustainability of the product generated.
- + The generation of a self-paced online diploma course installed on the MARN platform has been identified as a success for the replication of knowledge since it is available indefinitely to all the people interested in the subject and MARN is partly obliged to include the training within the goals of the institution's annual operational planning, which guarantees its sustainability.

2. Things that did not work well

- + Working with government agencies as the only counterpart on which the entire project depends represents a risk in countries such as Guatemala, where there is political instability and high personnel turnover in

government agencies. It is important that the implementation of an instrument that can be applied nationally can be promoted from open participatory spaces (e.g., NGOs, academia, municipalities, civil society) and be carried out independently of its appropriation by the governing body so that in cases of institutional uncertainty, different actors have access to the instruments and can take them into account in the planning processes with a watershed approach and make budgetary and investment priorities.

- + Involve only the technical part, it is necessary to consider and hold informative meetings with higher levels, who are responsible for decision-making.

Sustainability, upscaling, and downscaling

In search of sustainability, the Guide proposes the creation of organizational structures such as basin technical tables, basin, sub-basin, and micro-basin committees, considering that, in the territories, there are coordination spaces such as those established in the Law on Urban and Rural Development Councils, from which decisions are made and can be scaled up to the national level.

Thus, the guide provides a process that orients and accompanies technicians and entities to guarantee the collaboration of the population in watershed management through the watershed, sub-basin, and micro-basin committees. It was designed to implement participatory processes of local, municipal, departmental, and regional development, in which communities are directly involved through community development councils -Cocode-, municipalities through municipal development councils - Comude-, departments through departmental development councils -Codede- and several departments through regional urban and rural development councils -Coredur-, and other forms of social organization.



Figure 3: Planning meeting with MARN. ©GIZ/Sergio Ramírez.

In addition, the fact that several projects are being implemented with cooperation objectives with Guatemala focused on Water Resources Management, such as the GEF Motagua project, IUCN Volcanoes Project, EbA LAC, ADÁPATE GIZ, among others, contributes to the sustainability of what was generated by CReW+. These projects have expressed their interest in applying the Guide in their territorial intervention processes, for planning with a watershed approach. In addition, the replication and multiplication of the knowledge acquired are guaranteed by involving them in the participatory processes for the formulation of the Guide and in the training for its use, as well as in the Diploma course generated for this purpose.

On the other hand, one of the challenges we face in the application of the Guide is the lack of knowledge, on the part of members of civil society, the private sector, academia, local governments, and basin users, of the costs and benefits derived from integrated water management actions and planning with a basin approach in the territory: the zoning of flood risk and water recharge zones, the protection of wetlands, and the control of surface and groundwater quality, in addition to the challenges to ensure water security under the context of climate change.

It also represents a challenge for SEGEPLAN to generate guidelines for the incorporation of the watershed approach in land use planning instruments at the national level and the inclusion of a typology that allows directing financing from the national public investment system towards the implementation of activities proposed in the watershed management plans.

Finally, there is a clear need to strengthen the institutional framework of the governing body so that it can execute,

accompany, and provide the required assistance to the parties involved in the preparation of the micro-watershed management plans using the Guide and their further implementation.

Published by: Deutsche Gesellschaft für
Internationale Zusammenarbeit (GIZ) GmbH

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Design: Deutsche Gesellschaft für
Internationale Zusammenarbeit (GIZ) GmbH

Date: June 2023

On behalf of: Inter-American Development Bank (IDB)
with funding from the Global Environment Facility
GEF