



# DIOTIN Solution for Gabon's Water Crisis

## What is DIOTIN?

DIOTIN is a stabilized chlorine dioxide-based liquid concentrate used for advanced disinfection and purification of water systems. Unlike traditional chlorination agents, DIOTIN is highly effective even in small dosages (10 mL per 1,000 liters), with long shelf life (up to 24 months) and remote monitoring capabilities. It neutralizes bacteria, viruses, fungi, biofilms, and heavy metals like lead and mercury. This makes it suitable for municipal water, surface water bodies, and sewage treatment plants.

## The Water Crisis in Gabon

Despite Gabon's rich natural water resources, including the Ogooué River, urban estuaries, and rain-fed lakes, the country suffers from significant water safety issues due to pollution, inadequate infrastructure, and untreated waste discharge. Libreville, Port-Gentil, and other cities frequently face intermittent supply, microbial contamination (e.g., E. coli, Salmonella), biofilm accumulation in pipes, and inadequate sewage treatment systems. Moreover, runoff from industrial, mining, and urban activities introduces heavy metals and chemical pollutants into rivers and lakes.

## How DIOTIN Solves Gabon's Water Challenges

DIOTIN can be applied strategically across Gabon's entire water cycle:

- In municipal plants, it ensures pathogen inactivation even during low-pressure events.
- In rivers and estuaries, it disinfects water near urban discharge zones and recreational areas.
- In lakes, it clarifies turbid water and removes biofilm and heavy metals.
- In sewage and reuse systems, it reduces microbial load, stabilizes sludge, and enhances reuse safety.
- Remote dosing systems minimize the need for frequent site visits, ideal for Gabon's dispersed communities.

## National Water Volume and DIOTIN Dosage Requirements

The following table outlines the estimated annual volumes of water requiring treatment across sectors:

Sector	Annual Volume (million m <sup>3</sup> )
Municipal water systems	200.0
Rivers (all major + tributaries)	4.8
Urban rivers & streams	75.0
Lakes & estuaries (national)	6000.0
Sewage & wastewater	130.0

Based on DIOTIN's dosage rate of 10 mL per 1,000 liters and a price of \$15 per liter:

- Total DIOTIN required: 64,098,000 liters
- Total estimated cost: \$961,470,000 USD

## Implementation Plan & Strategic Value

To implement DIOTIN across Gabon effectively, a phased plan is recommended:

1. Pilot programs in Libreville and Port-Gentil's municipal and river systems.
2. Nationwide training and remote monitoring setup.
3. Integration with existing infrastructure upgrades (e.g., pressure zones, pipe replacements).
4. Environmental and health monitoring to validate long-term safety.

DIOTIN provides a scalable, resilient, and environmentally friendly tool for improving Gabon's water quality, reducing disease risk, and enhancing climate resilience in water and sanitation systems.



## Detailed Cost Analysis by Sector

Below is a detailed breakdown of the DIOTIN volume required and cost for each water sector in Gabon:

Sector	Annual Volume (million m <sup>3</sup> )	DIOTIN Required (liters)	Cost (USD)
Municipal water systems	200.0	2,000,000	\$30,000,000
Rivers (all major + tributaries)	4.8	48,000	\$720,000
Urban rivers & streams	75.0	750,000	\$11,250,000
Lakes & estuaries (national)	6,000.0	60,000,000	\$900,000,000
Sewage & wastewater	130.0	1,300,000	\$19,500,000
<b>TOTAL</b>	<b>6,409.8</b>	<b>64,098,000</b>	<b>\$961,470,000</b>

## Carbon Credit Potential from DIOTIN Water Treatment in Gabon

### What Are Carbon Credits?

Carbon credits are tradable certificates that represent the removal or avoidance of one metric ton of carbon dioxide equivalent (CO<sub>2</sub>e) from the atmosphere. Organizations that reduce emissions beyond regulated limits or remove carbon through verified methods—such as water sanitation, afforestation, or clean energy—can earn credits. These credits can then be sold on voluntary or compliance markets to companies seeking to offset their carbon footprint.

### 2030 Agenda and the Growing Carbon Credit Market

Under the Paris Agreement and SDG 6 and 13 of the UN 2030 Agenda, countries are incentivized to reduce greenhouse gas emissions and improve access to clean water. Carbon markets are central to achieving these goals. As nations approach 2030 targets, the value of verified carbon credits is expected to surge due to supply constraints and growing demand from ESG-driven corporations and governments.

Currently, voluntary carbon credits trade between \$100–\$400 per ton CO<sub>2</sub>e, with high-quality, water-related offsets fetching premium prices. Forecasts suggest that prices could rise to \$700 or more per ton by 2030, especially for verifiable, multi-benefit credits that also improve health, sanitation, and biodiversity.

### How DIOTIN Enables Carbon Credit Generation

DIOTIN enables large-scale environmental impact through water system rehabilitation and disinfection across Gabon. It eliminates the need for traditional boiling using wood or coal, and it stabilizes water ecosystems, improving oxygenation and microbial cycling. These activities qualify for carbon credit generation under international methodologies such as Gold Standard or Verra’s VCS program.

### Estimated Carbon Credit Impact from DIOTIN Deployment

Impact Category	CO <sub>2</sub> e Offset (tons)	Credit Price (\$/ton)	Value (USD)
Avoided Emissions (waste, fuel)	6,409,800	\$300	\$1,922,940,000
CO <sub>2</sub> Absorption (river & lake restoration)	300,240	\$300	\$90,072,000
<b>TOTAL</b>	<b>6,710,040</b>	<b>\$300</b>	<b>\$2,013,012,000</b>



## Conclusion

This project presents a national-scale deployment of DIOTIN, a stabilized chlorine dioxide-based water treatment solution, across Gabon's municipal, surface, and wastewater systems. The initiative addresses Gabon's critical water contamination issues while simultaneously unlocking carbon credit revenue streams through emissions reductions and ecological restoration.

Despite its rich natural resources, Gabon faces significant challenges in providing safe, clean water.

Key issues include:

- Microbial contamination (E. coli, Salmonella, Klebsiella) in urban water supplies
- Inadequate sewage treatment and widespread open discharge
- Industrial and mining runoff polluting rivers and lakes
- Heavy metal accumulation (lead, mercury) in coastal estuaries
- Rural populations relying on unsustainable methods like wood or coal burning to sterilize water

## The DIOTIN Solution

DIOTIN offers a modern, scalable, and environmentally friendly solution. Its features include:

- Rapid elimination of pathogens, biofilms, and viruses
- Heavy metal removal from polluted surface waters
- Long shelf life and remote monitoring for rural/urban use
- Dosing rate of just 10 mL per 1,000 liters, minimizing chemical usage
- Displacement of traditional water sterilization methods (boiling), directly reducing fuel-based emissions

Targeted Treatment Areas:

- Urban and rural municipal water systems
- Ogooué, M'Passa, and hundreds of smaller rivers and streams
- Lakes, estuaries, and mangrove zones
- Open sewage lagoons and wastewater reuse projects

This project qualifies for voluntary carbon credits under recognized international standards, due to its dual impact on:

- Emission reductions (fuel, methane, chemicals)
- Ecological restoration (aerated rivers, clean lakes)

This project represents a transformational opportunity for Gabon. By treating over 6.4 billion cubic meters of water annually using DIOTIN, Gabon can drastically improve public health, restore natural ecosystems, reduce carbon emissions, and generate over \$2 billion in carbon credit value.