



**CASE STUDY —** Samaná Province, Dominican Republic

# A model for waste site remediation to reduce climate impacts and ocean plastic pollution

## Case in Brief

Until recently, most of the over 11,000 metric tons of daily waste generated in the Dominican Republic (DR) has been discarded in informal and open dumpsites due to limited landfill sites and management capacity—this leads to the contamination of waterways from unlined disposal areas; polluting the air from gases emanating from the waste; and creating spontaneous combustion fires from the buildup of methane. In the DR, Clean Cities, Blue Ocean provides technical assistance to the national government’s strategic programs unit to stop the environmental damage from these open dumpsites.

Since 2021, with USAID’s support, the DR has remediated two of the four dumps in Samaná Province on the north coast of the Dominican Republic, which will eventually be closed and serve as transfer stations once the Province’s new regional sanitary landfill is developed (with additional technical assistance from Clean Cities, Blue Ocean). These efforts have resulted in the safe management of more than 357,000 metric tons of waste—including over 47,000 metric tons of plastic, the equivalent of five billion plastic bottles—from the two dumpsites in Samaná Province. The improvements have reduced plastics leakage and greenhouse gas emissions, positively impacted community health, and enhanced conditions for the workers who sort and manage waste on site.

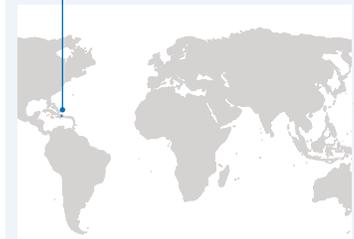
This solid waste management model is expected to be replicated across the country’s hundreds of legacy open dumpsites and introduced nationally as part of a new approach to solid waste management planning that will reimagine the way waste is managed in the DR.

### Dominican Republic

Samaná Province

Las Terrenas

Santa Bárbara de Samaná



### Dominican Republic At a Glance

**240**

informal and open dumpsites  
across the country

**25%**

of households without regular  
waste collection services



Photo: Jon Angin/  
Clean Cities, Blue Ocean

## Background

The DR generates over 11,000 metric tons of waste daily, of which more than 2,000 metric tons are plastic<sup>1</sup>—the equivalent of over 200 million plastic bottles. Over the last decade, up to 95 percent of this waste has been discarded in informal and open dumpsites that raise serious environmental and human health concerns: including, environmental degradation due to improperly contained plastics and other waste; water contamination from unlined disposal areas; air pollution and climate impacts from gases that emanate from the waste, such as methane; and spontaneous landfill fires from the buildup of methane gas. Plastic waste leaking from dumpsites has impacted the island's biodiversity, threatening wildlife and the region's burgeoning tourism sector—and leaks into the ocean where it becomes a global problem.

Until recently, Samaná Province had four official dumps (and many informal dumping locations) situated precariously close to its delicate ecosystems, coastal communities, and town centers. It's estimated that 130 metric tons of waste per day move through the Province's four dumpsites. Plastics and other waste enter Samaná Bay—a globally vital whale breeding ground, primary fishing and shrimping area, and a key tourist draw. Significant portions of Samaná Bay's mangrove forests—essential in the life cycle of tropical fish and critical to sequestering greenhouse gases—suffered, believed to be due in part to toxic leachate (contaminated liquid generated from decomposing waste and water—from rain, surface water, or the water table coming into contact with waste in the open dumps).<sup>2</sup> Communities living near the dumps have been exposed to water contamination due to leachate, as well as toxic fumes emanating from open waste burning and odors from decomposing organic waste.

“Now the ocean smells of [burning] plastic, it doesn't smell of vegetation. In the morning when I go fishing, in the water you can see ashes that appear to come from the dump.”

— Sánchez resident, 62,  
before dump remediation

1 Proyectos Estratégicos y Especiales (PROPEEP), <https://propeep.gob.do/transparencia/programas-y-proyectos/eco5rd/>.  
2 CCBO work plan, Jon Angin pers comm.

## Our Approach

USAID's Clean Cities, Blue Ocean program provides technical guidance to the national government to remediate and close open dumps across the country and to design and develop new sanitary landfills and related infrastructure that securely and sustainably manages the country's waste.

To support the DR in establishing a national solid waste management model that includes a transition from informal and open dumps to regional sanitary landfills, Clean Cities, Blue Ocean provides tailored technical guidance to PROPEEP and is enhancing its capacity in key technical areas. Beginning in Samaná Province, PROPEEP is phasing out legacy open dumpsites (such as in Las Terrenas and Santa Bárbara de Samaná), which will instead be used as waste transfer stations to send the waste to a new sanitary landfill where recyclable materials can be separated and cleaned. Clean Cities, Blue Ocean is working to promote segregation at source and collection, especially plastics, so that they can be recovered from the other waste prior to reaching landfills. Closing and remediating open dumpsites as new transfer stations addresses significant leakage points in Samaná's solid waste management system. Creating aggregation and sorting locations outside landfill areas with trained personnel—who previously gathered recyclables from the open dumps—will support equity and safety as well as increase public awareness and social responsibility around solid waste management.

CCBO's technical assistance has supported the DR to:



### Safely close open dumpsites.

Landfill engineers have introduced the concept of dedicated “cells” to hold the legacy waste without further environmental damage, as well as proper grading and compaction techniques, including the use of six to twelve inches of soil cover material. This cover material not only prevents the migration of waste into adjacent waterways, but drastically reduces combustion fires, odors, and fugitive methane emissions from escaping into the environment. Using these new waste management techniques, the sites will continue to receive local waste with significantly reduced environmental impact until the Province's sanitary landfill opens.



### Manage methane to mitigate climate impacts.

An emissions control system was installed at each site to decrease, capture, and use methane as a clean energy source. Landfills are major sources of methane emissions, as decomposing organic waste generates methane—an explosive greenhouse gas 25+ times more powerful than carbon dioxide at trapping heat in the atmosphere. The system's chimneys are now able to vent flammable gases,

## Project Partners

### Directorate General for Strategic and Special Projects of the Presidency (PROPEEP)

Clean Cities, Blue Ocean partners with PROPEEP to implement the DR's solid waste management plans to remediate open air dumps and build waste transfer stations across the country—to enable replication and scaling. By Presidential Decree 62-21, PROPEEP was instructed to intervene at eight open air dumps—which included Las Terrenas and Samaná—for remediation and construction of scale houses and transfer stations making it a priority to translate the new General Law of Integral Management and Co-processing of Solid Waste (Law 225-20), passed in July 2020, into action to effectively address persistent waste issues in the country. As of October 2022, Clean Cities, Blue Ocean and PROPEEP mobilized over \$3.95 million in public investment for improved local solid waste management in Samaná Province.

### Ministry of the Environment

The Ministry facilitates implementation of the new Law 225-20 to reduce and manage waste across the country. This law created momentum for radical changes in the waste management system and provided a framework for remediation and closure of legacy sites. Clean Cities, Blue Ocean's partnership with the national government has unlocked funding and the ability to scale the remediation work nationally.

preventing methane buildup, which may soon be captured and converted into energy to power the site's operational buildings. By reducing and controlling Samaná's methane gas emissions in the remediated dumpsites, USAID estimates that 62.4 million pounds of CO<sub>2</sub>e have been captured and destroyed to date—roughly equivalent to the annual emissions of burning 31.2 million pounds of coal or 3.2 million gallons of gasoline.



### **Prevent leakage of toxic leachate that harms biodiversity.**

The construction of stormwater and leachate management systems in remediated dumpsites ensure the sites prevent toxic leachate and stormwater from leaking into local waterways.



### **Establish a data-driven waste management system.**

The installation of truck scales at the sites allows weighing of the daily incoming waste, enabling Samaná to have accurate information on provincial waste volumes. Such data can be used to inform the design of the new regional sanitary landfill as well as provide long-term monitoring capability at the legacy sites. Previously, waste volumes were estimated and not systematically tracked. Once the dumpsites assume their new role as transfer stations, the scales will enable operation managers to make data-driven decisions and prepare properly for transfers. With Clean Cities, Blue Ocean's design and technical guidance, transfer stations and scale houses will soon be operational at the Las Terrenas and Samaná dumpsites—complete with truck scales, administrative offices, and amenities for workers.



### **Improve work environments for the informal waste sector.**

USAID commissioned research on the roles and challenges of informal waste collectors (particularly women) in the waste value chain to inform an inclusive strategy for the DR's solid waste management sector. Clean Cities, Blue Ocean provides technical guidance on safety protocols and equipment to improve the livelihoods and safety of the site's waste workers—who previously gathered recyclable waste out of the open dumpsites, traversing through mounds of waste and often amid active combustion fires. Now, informal waste collectors who work at the remediated site can access recyclables in a dedicated sorting area before it is transported to a waste disposal area. Their work is safer, cleaner, and more efficient as a result of the remediation. Workers also received personal protective equipment and now have access to men and women's restrooms and showers at the site.

## **Project Partners**

*(continued)*

### **Sostenibilidad 3Rs**

Sostenibilidad 3Rs Foundation, a subcontractor on the Clean Cities, Blue Ocean program, is a local environmental advocacy organization that partners with other private and public organizations to implement the new solid waste management law.

### **Samaná Tourism Cluster<sup>3</sup>**

The Tourism Cluster is an apolitical, non-profit organization that brings together public and private institutions in the province to increase collaboration and facilitate best practices in the tourism sector. The Tourism Cluster played a significant role in establishing Samaná Province as a pilot site for PROPEEP's Eco5RD project to leverage the province's tourism objectives.

### **The Center for the Conservation and Eco-Development of Samaná Bay and its Surroundings (CEBSE) Consortium**

Clean Cities, Blue Ocean commissioned a consortium led by CEBSE to conduct an ethnographic study to inform the program's complementary social and behavior change initiatives as well as to gain further insights into women's roles in the waste value chain in Samaná.

<sup>3</sup> USAID introduced the Tourism Cluster model across the Dominican Republic in 2003.

## Impact

With Clean Cities, Blue Ocean’s technical assistance, the DR has remediated two open dumps in Samaná Province and is working to develop a sanitary regional landfill—and this approach is being expanded to other sites across the country. As a result, many more people will have improved health, quality of life, and economic opportunities; and the environment, particularly the ocean, will be better protected from pollution and climate impacts.

Samaná Province is already seeing numerous impacts from the remediations. With USAID’s assistance:

- **Secured nearly 400,000 metric tons of waste (including over 47,000 metric tons of plastic—the equivalent of five billion plastic bottles)**

PROPEEP has prevented and secured a significant amount of waste from entering Samaná’s drainage canals, rivers, and streams—and ultimately the ocean. Approximately 25,000 metric tons of waste, including 4,000 metric tons of plastic, is expected to be aggregated and secured from leaking into the environment on a quarterly basis until the new sanitary landfill is opened and the transition to transfer stations. Further impacts are expected as this model is replicated across the country’s hundreds of legacy open dumpsites.

## By the Numbers

357,000

metric tons of **waste secured so far**, including over 47,000 metric tons of plastic<sup>4</sup>

25,000

metric tons of waste **projected to be secured** every quarter

85,000

people with **improved solid waste management services** and reduced air and water pollution



“Every time we implement, we improve. We are replicating, duplicating this [approach] not only here in Las Terrenas, but in all the 13 landfills that we are working [to remediate]. I believe that in the years to come, we’ll be able to work across more landfills and all of this will grow.”

– Emmanuel Pepin  
Environmental Engineer,  
PROPEEP

- Captured more than 62.4 million pounds of CO<sup>2</sup>e**

By reducing and controlling Samaná’s methane gas emissions in the remediated dumpsites, the project is enabling the Province to further limit its impact on climate change. USAID estimates that the amount of CO<sup>2</sup>e captured and destroyed to date is roughly equivalent to the annual emissions of burning 31.2 million pounds of coal or 3.2 million gallons of gasoline.

- Improved health and environmental conditions for over 85,000 people**

Without the two open dumpsites, waste-related air and water pollution in Samaná is significantly improved, resulting in a better quality of life and reduced risk of disease. In the recent study in Las Terrenas led by USAID grantee, CEBSE, community members reported their satisfaction with the ongoing remediation efforts, noting relief from toxic fumes that emanated from the dump due to waste fires.

- Developed markets for the recycled plastic bottles and other materials**

Complementary improvements are being made throughout the Province’s solid waste management system, including Clean Cities, Blue Ocean-supported community plastic bottle collection points, as well as a budding plastic recovery business—Reciclajes Bahía (Recycling Bay)—which recovers plastics from Las Terrenas’s resorts and restaurants and sells them to Cilpen Global, the country’s first Material Recovery Facility. Clean Cities, Blue Ocean also assisted in the implementation of a pilot, with support from the U.S. Environmental Protection Agency and Battelle Memorial Institute, to provide training and tools for waste pickers at the Samaná landfill to segregate, compact, and shred plastic waste—to also sell to Cilpen Global. Prior to USAID’s interventions in Samaná Province plastic bottles were not being recuperated for recycling and they were sent to landfills, and in many cases washed to the sea. As of October 2022, over 40 metric tons of plastic bottles and other materials have been recycled and diverted.



### Milestones to Date

#### JULY 2020

Passage of national solid waste management Law 225-20

#### FEBRUARY 2021

Remediation begins at the Samaná, Las Terrenas open dump sites

#### MAY 2022

Completion of transfer stations and scale houses

#### JUNE 2022

Inauguration of sites

<sup>5</sup> Photo taken in July 2022

## Key Lessons

Working together, USAID and its partners have developed an impactful project whose key takeaways include the importance of partnering strategically to make the most of political momentum, leveraging the interests of the private sector and the tourism economy, and ensuring that waste workers are considered in remediation plans.

### Secure political buy-in to enable replication and scalability

USAID's partnership with PROPEEP enabled opportunities for replication and scaling that would not be possible without the support of a national government agency. Enactment of the new Law 225-20 created momentum for radical changes in the solid waste management system and has provided a framework for remediation and the closure of legacy sites. This law created the Public Private Trust for the Comprehensive Management of Solid Waste and as of March 2021 all public and private organizations and individuals are paying a contribution for solid waste management to the National Treasury. Through the Sostenibilidad 3Rs Foundation, Clean Cities, Blue Ocean identified national and international stakeholders across both the private and public sectors in the DR with whom it could partner to support implementation of the new law.

### Leverage vested stakeholder interests

In the DR, tourism plays a key role in the economy and stakeholders in well-known destinations such as Punta Cana and Santo Domingo had a vested interest in the remediation work being successful. For example, the Samaná Tourism Cluster aims to add Samaná Province to the country's list of major tourist destinations, an effort which necessitates addressing the region's waste management challenges. Based on this mutual interest, Clean Cities, Blue Ocean and the Tourism Cluster quickly established a partnership which granted program access to the Tourism Cluster's wide network of stakeholders both in Samaná and across the country, including facilitating Clean Cities, Blue Ocean's introduction to PROPEEP.

### Ensure waste workers are considered in remediation plans

When remediating or closing unsanitary landfills or dumpsites, it is critical to anticipate and address the challenges of informal waste pickers who rely on these sites for their income. Provisional plans should be developed ahead of remediation to establish how changes will be communicated to informal waste collectors, establish temporary work areas, and integrate the informal sector into the planned final sites. Without such plans, these already marginalized groups of people are at risk of not only losing their livelihoods but also dropping out of vital recycling jobs.



## Related Resources

### FACT SHEET

[Addressing Climate Change Through Circularity and Improved Solid Waste Management](#)

### VIRTUAL TRAINING

[Managing Open Dumpsites](#)

[Siting and Designing Sanitary Landfills](#)

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**Cover Photo:** Aerial view of the Samaná open dump site, with partial remediation and coverage of the legacy waste, and a completed administrative building and truck scale—to support the site's future role as a transfer station. *Photo: Cesar Leon/Clean Cities, Blue Ocean*

**Above:** Members of Clean Cities, Blue Ocean's Peru country office visit the Samaná site to learn from the remediation process and future site plans. The DR's model has served as a valuable example to countries across the world that face similar challenges. *Photo: Melinda Donnelly/Clean Cities, Blue Ocean*