BLUE BOX

4 PREVENTIVE ACTION AND WASTE MANAGEMENT

COLLECTION STATIONS: TOOLS FOR COLLECTING PLASTIC WASTE

A PRODUCT DEVELOPED WITHIN THE FRAMEWORK OF:

PROMAR Prevención de Residuos Marinos

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Collection Stations: Tools for collecting plastic waste
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ABOUT THE PROMAR PROJECT

The PROMAR project - Prevention of Marine Litter in the Caribbean Sea aims to reduce the flow of plastic waste (mainly plastic packaging and single-use plastics) that reaches the Caribbean Sea, promoting Circular Economy solutions in the Dominican Republic, Costa Rica and Colombia. The project is funded by the German Federal Ministry for the Environment, Nature Protection, Nuclear Safety and Consumer Protection (BMUV) and led by the German organization adelphi.

Within the framework of the project, the PROMAR BlueBox was created, a compilation of various tools, guidelines, tutorials and materials that will help you apply circular economy solutions to reduce marine waste in your municipality. This Collection Stations tool, that you will find on the next pages is part of the PROMAR BlueBox.

The objective of the tool is to provide a technical framework on different facilities for the formal collection of solid plastic waste in communities, companies, schools and other institutions to minimize, separate and collect recyclable waste. The tool covers each stage of installation, maintenance and use of fixed and mobile facilities, providing case studies as examples of success.

This guide is intended for municipalities, environmental groups, NGOs, community organizations, private companies, and the general public interested in ocean conservation. With the publication of the tools, we hope to encourage their use in coastal communities and thereby contribute to the reduction of terrestrial waste flows that reach marine environments.

CONTENT

INTRODUCTION

One of the biggest problems modern societies face is the management of domestic, industrial, commercial and maritime waste. The problem is especially critical in many municipalities in the Caribbean region due to the lack of economic resources to develop and implement effective local solutions. Additionally, public cleaning services often face budget constraints, misallocation of funds, and inadequate resource management, which adversely impacts their ability to provide effective cleaning services within municipalities.

The collection stations are presented as a technological solution that allows plastic waste to be collected in special stations designed for separation at source, facilitating recycling.

The main benefits of collection stations are:

- Awareness of communities, companies, schools and institutions to minimize, separate and collect recyclable waste,
- Significant reduction in the amount of waste,
- Promotes the recovery and recycling of materials,
- Promote a circular economy,
- Avoid informal dumps and reduce the cost of final disposal,
- Strengthens the capacity to integrate innovative technologies in municipalities in the fight against pollution,
- Protection of land, bodies of water and natural resources as critical habitats,
- Promotes general cleanliness and public health in municipalities,
- Increases the possibilities of waste recovery.

This guide for installing collection stations is structured to cover a range of topics, starting with an overview of the basic structures for collection stations and installation techniques. It then delves into technical details and includes case studies of PROMAR pilots in the Dominican Republic.

1. TECHNICAL DESCRIPTION

1.1. COLLECTION SYSTEMS

Figure 1. Poor maintenance of waste container.*

The effective and professional collection of solid waste is essential to achieve clean, healthy and competitive cities and municipalities. This tool encourages municipalities to support the management of solid waste containing recyclable materials with well-designed and managed collection stations.

The term collection includes not only the collection of solid waste from various origins, but also the transportation of this waste to the place where the collection vehicles are emptied. Unloading of the collection vehicle is also considered part of the collection operation. While the activities associated with transportation and unloading are similar for most collection systems, the collection of solid waste will vary depending on the characteristics of the facilities, activities or locations where the waste is generated, and the methods used for on-site storage of the accumulated waste between collections.

*Source: CANVA Design Tool **Source: Solid Waste Management, INET gtz/giz, Buenos Aires, 2003

1.2. SEPARATION AT ORIGIN

Materials that have been separated at source have to be grouped before they can be recycled. Currently, the most commonly used methods for collecting these materials include collecting them in color-coded buckets in front of homes. The collection of waste from homes or buildings (door-to-door services) consists of delivering the waste to the municipal collection service from the home or business in bags, small containers or bales according to the weekly calendar defined by area and at the stipulated time.

Another option represents a curbside pickup system. The curbside collection method consists of depositing waste from homes and businesses directly on the sidewalks. Users are responsible for disposing of their waste in appropriate bags and containers to prevent its release into the environment. Recyclables separated at origin are collected separately in their bags. Because residents and businesses do not have to transport recyclables beyond the curb, these programs typically have a much higher participation rate than programs where recyclables must be taken to separate collection centers.

Sidewalk programs vary greatly from community to community. Some programs require residents to separate several different materials; for example: newspapers, plastics, glass, metals that are then stored in their own containers and collected separately. Other programs use only one container to store unsorted recyclables or two containers, one for paper and the other for heavy recyclables, such as glass, aluminum and tin cans. As specified above, although they tend to have more participation, they require a prior awareness process to ensure that users dispose of the waste safely to avoid its release, complying with the stipulated dates and times, as well as with the proper separation of waste.

Figure 2. Waste classification containers*

*Fuente: Adobe Stock, Pictulandra

The method used to collect waste separated at source directly affects the design and shape of the separation and processing facilities.* Collection can take place at voluntary collection points, where recoverable waste is received from users, or at depots that purchase recoverable waste from users. Waste exchange deposits usually have a higher participation because they imply a direct profit for users.**

Figure 3. Containers in different colors and tokens.***

PAY ATTENTION!

There are many projects in which recycling does not work as it should, so it is essential to plan well before modifying or creating a new management system.

It must be expressed very clearly that one of the main challenges and criteria is that there is a realistic subsequent recycling option/possibility. There are too many projects where recycling does not work properly, separated fractions accumulate and the project can fail, causing frustration for all parties involved. To avoid this frustration, it is necessary to explore and establish the possibility of recycling in advance.

Strategies may be to establish agreements with municipalities, incorporating existing collection centers and commercial companies that already separate and recycle or export recyclable materials. The entire process has to function as a logistics chain including large quantity storage services and transportation.

*Source: Solid Waste Management, INET gtz/giz, Buenos Aires, 2003

**Source: Conference "It's Time to REThink", Returnable Packaging Systems, M. Dugan, Prof. Dr. F. Schindler 2022, https://www.sica.int/documentos/presentacion-sistemas-retornables-de- packaging-experiences-from-germany-and-a-new-activity-in-the-european-union-mrs-melike-dugan-and-mr-prof-dr-florian-schindler-event-it's-time-for- rethink-03-24-2022_1_129711.html

***Source: Prof. Dr. F. Schindler, Roatán, Honduras 2022

1.3. COLLECTION POINTS AND CONTAINERS

COLLECTION POINTS

Logistics and educational centers for the collection and classification of waste, as well as raising public awareness about proper disposal.

For the collection points, the designs and capacities of the containers (bins) to separate the waste depend on the characteristics of the solid waste to be collected and the space available to place the collection bins. In general, it is recommended to clearly indicate what type of waste is collected in which bin. What makes it easier for the user to correctly identify the bin suitable for their waste is a color code and a descriptive sheet that already exist in many countries.

COLLECTION CONTAINERS

Strategic places for separating waste from its disposal, within direct reach of the community.

They can be both fixed and mobile facilities with collection containers located in strategic locations, intended to selectively receive waste delivered by the population, with the purpose of preventing waste from ending up contaminating our environment. Municipality's collection centers are normally intended for multiple fractions of waste including various types of waste such as glass, paper and are staffed and open to the general public.

Figure 4. Collection center of the Municipal Waste Corporation in Berlin (BSR), Germany (Prof. Dr. F. Schindler 2023)

1.4. COLLECTION POINTS

Depending on the volumes of waste generated, including different fractions of recyclable materials (paper, plastics, glass, among others), the use of bins of different sizes can be considered to reduce handling time, facilitating effective management. Whether in individual homes or shopping centers, containers should be stored in an enclosed area with easy access to remove the collected waste. The containers must be able to be covered and identified to separate waste from its generation.

Figure 5. Containers in different colors and cards with explanations (Ref. Prof. Dr. F. Schindler, Playa de Carmen, Mexico 2022)

For the separation of waste, the use of professional containers is recommended; they are industrially produced for these purposes, or individually designed and produced, ensuring the characteristics of stability, durability and practicability. The advantage of container systems is their flexibility: containers are available in many different sizes and shapes for collection.

For small containers from 60 to 240 Liters, two wheels are recommended and for larger containers from 660 to 1100 Liters, 4 wheels or rollers are recommended to move the containers on platforms and/or ramps. If portable containers or loading aids cannot be provided the collection station containers/bins must be light enough to be picked manually by a single picker. To avoid personal injury to pickers from handling containers when they are full, the volume of a loaded container must be limited.

An important factor for the logistics of the collection system is the frequency of collection. Container systems have the advantage of only needing one truck and one driver to complete the collection cycle, with each loaded truck requiring a round trip to the unloading site (or other transfer point). Therefore, container size and maximizing truck volume utilization are of great economic importance. Even more, when easily compressible waste must be collected and transported over long distances, the economic advantages of compaction in collection trucks are clear. That is why the use of mechanized trucks with compactors has increased in recent years. When mechanized collection systems are used, the container used for on-site storage of waste is an integral part of the collection system.

1.5. MANAGEMENT OF COLLECTION STATIONS

Figure 6. Azul Ozama Station, Santo Domingo.*

For the planning of collection stations for recyclable materials at source ("in situ"), it must be considered that storage involves microbiological decomposition (if there are organic components in the recyclables), fluid absorption (if there are liquids between the waste) and the contamination of the other components of the waste if the waste is not properly separated at source.

Microbiological decomposition occurs when organic residues are present in the composition of waste received. Waste begins to decompose until it reaches the state of putrefaction, which results in the growth of bacteria, larvae and fungi. To prevent waste from reaching this state without treatment and contaminating other recoverable waste, it is advisable to carry out the entire management process and transport the waste to its final destination quickly (less than a week).

The absorption of liquids occurs with organic waste or with containers that contain remains of liquids (drink, water, sauce). In these cases, waste such as paper and cardboard absorbs this moisture and becomes contaminated, making its revaluation impossible. To avoid moisture in the waste and prevent the contamination that this implies, it is recommended to use airtight, waterproof collection containers (closed with lids) to avoid exposure to rain. Additionally, it is important to avoid contamination of different waste by separating them from their place of origin. The storage of unseparated waste generates the contamination of recoverable waste with other waste such as liquids, organics, cooking or motor oils, household cleaning chemicals and/or other chemicals such as solvents or paints. This cross contamination reduces the value of waste that is recyclable, making it crucial to separate non-recyclable waste, including organic waste, from recyclable waste. For organics, a separate process is recommended for organic waste, such as controlled degradation through composting or a biogas plant.

*Source: Parley, 2023

2. CASE STUDIES - GENERALITIES

DOMINICAN REPUBLIC

The Dominican Republic is a country located in the Caribbean, characterized by its vulnerability to hydrometeorological events such as hurricanes and tropical storms. In addition, it is considered a developing country and has an annual generation of approximately 88,000 tons of plastic waste. Regarding waste management, the country lacks an effective public classification and recycling system, with only some small companies carrying out these practices, but in a limited and inequitable manner, leaving many low-income people outside the system.

The environmental legal framework of the Dominican Republic includes the General Law on the Environment and Natural Resources, also known as Law 64-00, which establishes general regulations for the protection of the environment. This law aims to regulate the management of solid waste and promote sustainable practices. In addition, there is the Solid Waste Management Law (Law 225-20), which establishes specific guidelines for the proper management of waste in the country.

However, despite having these laws, clear regulations or instruments have not yet been implemented that allow their effective application. This has led to an inefficient waste collection system and a lack of adequate infrastructure for its treatment and final disposal. As a result, much of the waste ends up in open landfills, which generates soil and water pollution problems and negatively affects natural resources.

Furthermore, the sewage system in the country is inefficient and saturated due to the large number of people and urban infrastructure in major urban centers. This implies that, sometimes, solid waste ends up in bodies of water and causes the contamination of large bodies of water, especially the oceans.

Below are some of the laws that make up the legal framework for the management of waste and natural resources in the Dominican Republic.

NATIONAL STANDARDS	YEAR	DESCRIPTION
Constitution of the Dominican Republic	2015	It mandates the preservation and protection of the environment and natural resources and grants the right to sustainable use of the environment and natural resources.
Law no. 225-20 General Comprehensive Management and Co-processing of Solid Waste	2020	The objective of this law is to establish a legal regime for comprehensive management that promotes reduction, reuse, recycling, use and recovery, guaranteeing the population's right to a healthy environment.
Environment and Natural Resources Law No. 64-00	2000	Protection of natural resources, reversal of losses due to inappropriate use of the environment and natural resources.
Protected Areas and Biodiversity Law No. 202-04	2004	Environmental authorizations and technical standards approved by the Ministry of Environment and Natural Resources for the protection of air quality, water evacuation, forest management, solid waste management, toxic waste management, noise control, water quality and labeling of hazardous substances.

3. CASE STUDY: BLUE POINTS, SANTO DOMINGO

3.1. NATIONAL AND LOCAL CONTEXT

The objective of this technical chapter is to present and analyze the concept of Collection Points, so called “Blue Points” - Puntos Azules in Spanish in the Dominican Republic. The Blue Points are an innovative strategy for solid waste management in Greater Santo Domingo. They are spaces designed for the interception of plastic waste in different educational and cultural institutions and communities in the region. They consist of collection containers ideally designed for these purposes.

In response to the current challenges in waste management and the growing problem of single-use plastic, this pilot project has been developed with the purpose of promoting a culture of recycling and environmental awareness in the community. Through strategic alliances with entities such as the Babeque School, the Cultural Center of Spain and the Don Bosco Educational Plaza, the first Blue Points have been implemented in strategic locations within Greater Santo Domingo. The selection of these locations is based on criteria such as plastic generation, accessibility and the space available for the installation of the containers.

In addition to functioning as plastic waste interception points, the Blue Points have become an educational and awareness-raising platform, involving students, teachers, parents and administrative staff in activities and training related to responsible waste management. Although the project is in its initial stages, promising results have already been obtained. In just a short period of time, more than 231 kg of plastic have been intercepted at the Blue Points located at the Cultural Center of Spain and the Babeque School. In addition, more than 50 trainings have been carried out, impacting around 500 people and turning 20 participants into guardians of the "Marea Montesinos" program. As the project progresses, there are significant opportunities for expansion and improvement, including expanding the type of materials collected, expanding the Blue Points to other communities and sectors, and interconnecting them with the existing Blue Stations to optimize collection and recycling logistics.

GREATER SANTO DOMINGO

Greater Santo Domingo, made up of the National District and the municipalities of Santo Domingo East, Santo Domingo Oeste and Santo Domingo Norte, faces a growing problem related to the excessive use of single-use plastic items. This trend has led to an alarming increase in the generation of plastic waste in the city.

Furthermore, it has been observed that young people and children tend to take the use of plastic for granted, without being aware of the damage that this material causes to the environment. This lack of awareness and knowledge about the negative effects of plastic is worrying, as it contributes to perpetuating unsustainable practices in waste management.

In the context of Greater Santo Domingo, where population growth has been accelerated and infrastructure capacity for solid waste management is limited, significant challenges arise. The Duquesa Landfill, the main waste disposal site in the area, has been the subject of concern due to its condition as a non-sanitary open-air landfill, without geomembrane/geotextiles to make it impermeable to subsoils, generating health problems and environmental pollution.

In this scenario, it is essential to address the proper management of solid waste in Greater Santo Domingo. It is necessary to promote environmental education and community awareness, especially in the most vulnerable areas, to promote sustainable waste management practices. Likewise, innovative and collaborative solutions must be sought to reduce the use of single-use plastics and promote the separation and recycling of waste.

This chapter offers a perspective on the project implemented in the Villa Duarte neighborhood, where significant progress has been made in waste management and community awareness. Through the analysis of this case study, we seek to provide an example of good practices and highlight the existing opportunities to address the problem of plastic waste in Greater Santo Domingo. In addition, possible avenues for expansion and collaboration with other institutions are explored to promote similar initiatives in different areas of the city and the country.

Ultimately, it is hoped that this document will serve as a source of inspiration and motivation for those interested in promoting positive change in solid waste management, particularly in relation to the responsible use of plastics and the implementation of community awareness projects. The transformation towards a more sustainable and environmentally conscious society is possible if we join forces and work together in the search for innovative and effective solutions.

3.2. PUTTING TOGETHER THE PILOT PROPOSAL

UNDERSTANDING THE LOCAL REALITY

During the development of the “Blue Points” pilot, we were able to observe the current situation of the use of plastics in public places, especially those frequented by young people and children. It is evident that there is a general tendency to use disposable plastic products in establishments where food and drink are sold.

In particular, within schools, we have verified the large amount of single-use plastics that are generated, motivated by their practicability and low cost. Unfortunately, in many cases, the lack of knowledge about the adverse effects of these materials contributes to the increase in their use, despite the fact that for many uses there are alternatives:

- reusable bottles ("thermos" made of plastic or metal)
- reusable plastic or metal lunch boxes
- reusable bags

Unfortunately, the lack of comprehensive environmental education, which includes plastic pollution, alternatives to plastic, the classification of solid waste and its correct disposal, is not an official part of the educational curriculum in the Dominican Republic. This lack of education contributes to the indiscriminate use of plastics and the lack of awareness about the negative environmental impacts this generates.

Figure 7. Compactor in a school zone in Roatán Honduras 2022 F. Schindler

Decision to make!

Each project of this type must define the materials it receives or collects. This is a crucial aspect that has implications in all stages, such as the design of the containers, logistical definitions, the identification of allies for the purchase or transformation of materials, and the costs of the system. The decision made for the pilots and its justification must be explained.

In our case, the decision was to start receiving only PET due to its established value chain (through Estación Azul, Cilpen and Parley Global). However, we are evaluating the possibility of receiving other materials, such as different types of plastic, paper and cardboard, among others. The inclusion of other materials can influence the potential costs and income, and thus the financial sustainability of the system, depending on the market and their respective value chains.

IDENTIFICATION OF GOOD PRACTICES

- Green Love Clean Points: These intermediary points collect classified materials for their correct final disposal through recycling. The segregated materials are delivered to different recycling plants, where they are used as raw materials to produce new products. This initiative serves as a reference for us to establish efficient waste classification and disposal practices.
- Parley operations in other countries: We observe and analyze Parley operations in different countries, with special attention to Parley Maldives operations. Parley focuses on beach and ocean cleanups, as well as raising awareness about the problem of marine pollution. We study their approach to community awareness and support in waste collection and classification to incorporate similar elements into our strategy.
- Through the analysis of these practices and initiatives, we were able to learn and understand the operation of key features, such as selective collection, door-to-door collection, sorting from the source, accompaniment and community awareness.

3.3. BASELINE SURVEY

WASTE FLOW ANALYSIS

Within the framework of the project "Prevention of Marine Litter in the Caribbean Sea (PROMAR)", Parley for the Oceans carried out a flow analysis of plastic waste (“Material Flow Analysis” = MFA) in the Municipality of Santo Domingo East, as part of the activities to quantify the waste that reaches the Caribbean Sea and know its composition. (Check out the respective tool in the BlueBox!) This baseline survey is optional for the Blue Point installation. The results of this analysis in the Municipality of Santo Domingo East revealed that around 72,738 tons of plastic waste are generated in the municipality per year. Of this amount, approximately 13,771 tons of plastics are not collected, which represents a significant challenge for the comprehensive management of solid waste. In addition, it was identified that around 8,285 tons of plastics end up in bodies of water, which highlights the importance of addressing the problem of marine waste.

It is important to keep in mind that during the analysis, the lack of sufficient and updated information on comprehensive waste management in the municipality was identified as one of the biggest challenges. To seek more effective solutions and carry out similar studies in the future, it is necessary to collect, disseminate and socialize data on waste generation and the amount of waste recovered.

This information will be key to more efficient and sustainable waste management in the municipality.

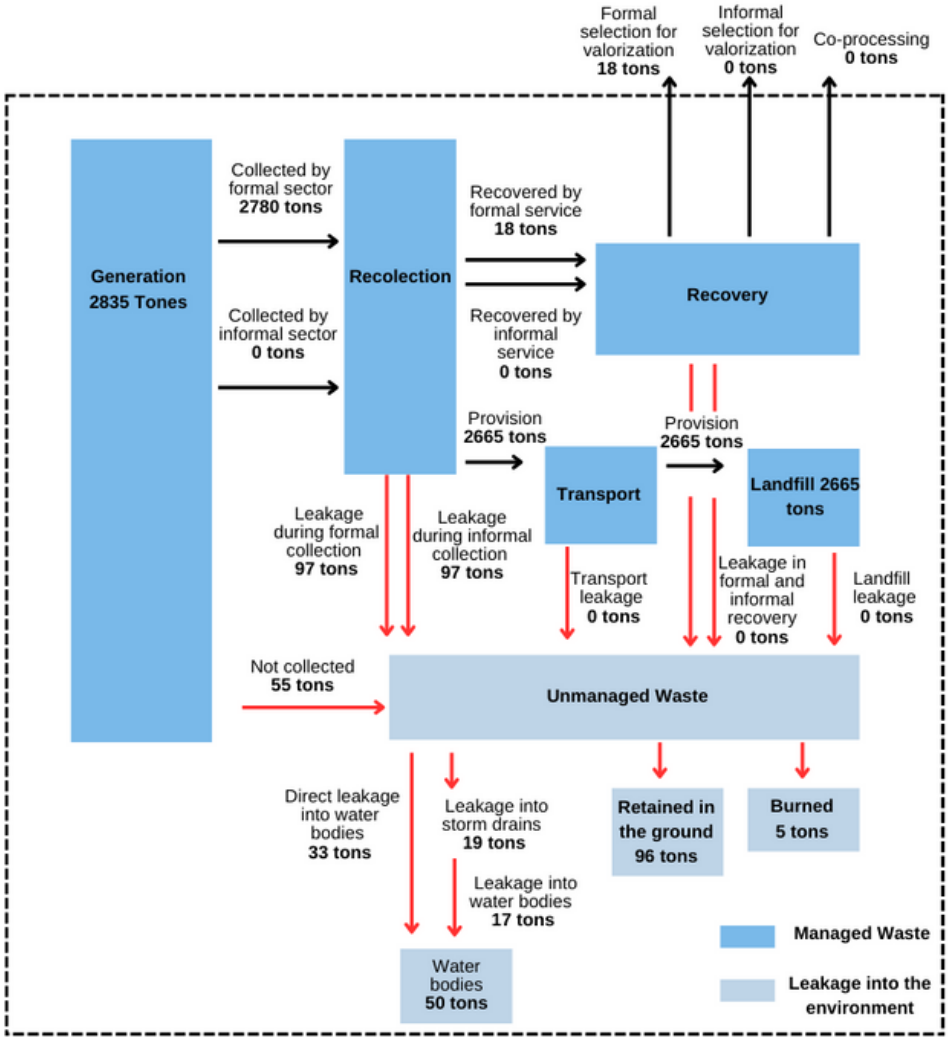

Figure 8. SDE waste flow analysis, Parley

SUPPLEMENTARY DATA COLLECTION

An analysis of complementary data was carried out to obtain additional information and enrich knowledge about the waste situation in the Municipality of Santo Domingo East. These analyzes included information searches, interviews with relevant actors, such as Mayor Manuel Jiménez, as well as other important people involved in waste management. Analysis of data provided by the National Statistics Office and international agencies, such as UN-Habitat, was also used.

These actions made it possible to identify specific needs, local realities and the type of waste produced in the municipality. Through the interviews, a deeper insight into the policies, strategies and challenges related to waste management in the area was obtained. Likewise, data collected from official sources and international organizations provided a solid basis for understanding the magnitude of the problem and establishing comparisons with international standards.

3.4. LOCATION SELECTION

EVALUATION CRITERIA FOR STUDY AREA

Selecting the right locations was another crucial factor. We carried out an exhaustive study of the action areas, considering factors such as the volume of waste generated, accessibility, population density and the specific needs present. We focused on identifying those areas that faced the greatest challenges in waste management and where our intervention could have a significant impact. Likewise, we take into account the availability of appropriate physical spaces for the installation of the Blue Points.

Regarding containers, we rely on experience and best practices in waste management. We select resistant containers, of adequate capacity and designed specifically for the separation and collection of plastics. Additionally, we ensured that the containers were visually appealing and easily identifiable to encourage community participation and use. We also considered the strategic location of the containers, placing them at key points within the area respectively within the institution to maximize their accessibility and use by participants.

LOCATION BLUE POINTS

SELECTION CRITERIA FOR SCHOOLS PARTICIPATING IN THE PILOT:

- **Potential for high quantities of recyclables to recover**
- **Will of the school administration (agility to execute the necessary administrative process)**
- **Availability of physical space to locate the containers with access for the vehicle to transport recyclables**
- **Ongoing awareness activities that can be leveraged**
- **Logistics (proximity to the place where the materials are taken, in our case the Blue Station)**

The selection of locations for the Blue Points was made carefully, taking into account various factors that were fundamental to the success of the project. One of the main reasons for choosing these locations was the amount of plastic produced in each location. We carried out an exhaustive analysis of the available data on waste generation in different areas of Greater Santo Domingo. We identified those sectors in which a considerable production of single-use plastics was observed, such as food and beverage containers. This includes places such as schools or institutions with large numbers of students, where the collection of significant quantities of plastics is anticipated.

These areas became strategic points to install our containers and provide concrete solutions for the proper management of this waste. Accessibility was also a key criterion in selecting the locations. We looked for places that are easy to access both for residents of the area and for our collection team. We considered proximity to main roads and the availability of public transportation, ensuring that program participants could easily access the Blue Points to deliver their plastic waste.

We needed to guarantee that our trucks will be able to pick up the bags once they are full. Additionally, we considered the space available and necessary to locate appropriately sized containers. The Blue Points required containers of specific dimensions, in our case the containers designed for the pilots had a length of 86 inches and a height of 43 inches (2.18 m x 1.00 m respectively). It is important to highlight that these containers had to be placed in spaces that did not hinder pedestrian or vehicular traffic, ensuring proper layout and operation of the system.

Another determining factor in the choice of locations was the ability to have adequate spaces and committed people to hold workshops, talks and raise awareness for the members of the institution, for example, the students. We recognized the importance of education and awareness as key tools to reduce the generation of single-use plastics and improve waste management. Therefore, we selected places that allowed us to carry out these activities, involving the institution's community and promoting behavioral changes towards more sustainable practices.

3.5. INFRASTRUCTURE

INFRASTRUCTURE REQUEST AND ALTERNATIVES

Figure 9. Blue Point installed at Babeque 2023 secondary school, Santo Domingo.*

To meet our specific needs, we choose to design and create our own containers with specific dimensions and features. These containers were designed to hold two bags of plastic waste (for two types of materials) and were manufactured using plastic wood raw material, which is produced from recycled plastic.

As we implemented the project, we realized the importance of adjusting to the design of the containers to improve their functionality. For example, initially the containers had the discharge opening at the back, which made it difficult to access and remove the bags once they were full. To solve this problem, we decided to modify the design and place the discharge doors on the front, thus facilitating the process of emptying the bags without having to move the entire container.

*Source: Parley 2023

In addition, we identified the need to provide the containers with wheels to facilitate their mobilization. This was especially useful for sanitation and cleaning the places where the containers were located, since they could be moved more practically and efficiently.

We also implemented visual changes to the container design. We added a header poster at the top, which serves as the container identifier. Likewise, we placed posters on the front of the containers with clear instructions and the specific materials that must be deposited in each container, thus facilitating the correct classification of waste by the participants.

Figure 10. “Blue Point” installed at Babeque 2023 secondary school, Santo Domingo

*Source: Parley 2023

3.6. IDENTIFICATION OF ALLIES

CENTRAL GOVERNMENT AND INTERNATIONAL COOPERATION

Regarding strategic alliances, we focus on establishing collaborations with various institutions and relevant actors. We conducted extensive research to identify local organizations, businesses, and government entities that had similar interests and goals in properly managing waste and reducing plastic pollution. Establishing these partnerships gave us the opportunity to access resources, expertise and support networks, which significantly strengthened project implementation.

One of the key alliances is with a German government cooperation project, the PROMAR project, of which we are implementing partners in the Dominican Republic. PROMAR is financially supported by the German Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV). This alliance has given us access to technical resources, specialized knowledge and financial support for the implementation of our activities. German cooperation has been a key partner in our effort to address the problem of plastic pollution in the Dominican Republic. The pilot projects are part of the PROMAR project and are executed by Parley as a regional partner in the Dominican Republic.

In addition, we have had the support of the Ministry of Environment and Natural Resources of the Dominican Republic. This partnership is vitally important, as central government support and involvement is crucial to ensuring the long-term success and sustainability of the project. The Ministry of the Environment has provided guidance, technical advice and institutional support, which has strengthened our work in proper waste management and environmental awareness. These strategic alliances with the German Cooperation and the Ministry of the Environment have allowed us to take advantage of complementary resources and knowledge, as well as establish links with key actors in promoting environmental protection and reducing plastic pollution. Collaboration with these institutions has been essential to expand the scope and impact of our project, as well as to ensure its long-term sustainability.

LOCAL INSTITUTIONS

In addition to our strategic alliances with the German Cooperation and the Ministry of the Environment, we have also established important collaborations with local institutions that have become fundamental implementing allies for the Blue Points pilot. Among them, the Babeque School, the Cultural Center of Spain and the Don Bosco Educational Plaza stand out. In these institutions we managed to implement the Blue Points through a process of defining conditions and agreements.

Colegio Babeque, located in a middle-class area in Greater Santo Domingo, has given us its support by opening the doors of its institution to us. Their commitment to education and environmental awareness has been key to promoting the participation of students and their families in the project. Through educational activities and the incorporation of sustainable practices at school, we have managed to raise awareness in the school community about the problem of plastic pollution and encourage the adoption of more responsible habits.

The Cultural Center of Spain, located in the National District, has been a strategic ally in dissemination and promotion, in addition to being a meeting point for the community, where we have been able to raise awareness and promote behavioral changes in relation to with the use of plastic.

The Don Bosco Educational Plaza, located in Santo Domingo East, has been another key ally in our project. This educational institution has provided its support by allowing us to carry out environmental awareness and education activities with students. Through workshops, talks and recreational activities, we have managed to transmit knowledge about plastic pollution and promote the adoption of sustainable practices in this community thanks to its Artesanias Ecoplast project.

The diversity of our implementing partners has allowed us to cover different geographic areas and socioeconomic strata in Greater Santo Domingo. Thanks to your support and collaboration, we have been able to reach a wide variety of people and communities, promoting environmental awareness and the adoption of concrete actions to reduce plastic pollution.

3.7. RESULTS

Since the launch of the first Blue Point, we have managed to obtain significant results in a short period of time. In collaboration with the Cultural Center of Spain and the Babeque School, we have intercepted a total of 231 kg of plastic. This figure demonstrates the positive impact we have achieved by diverting a considerable amount of plastic from landfills and the environment.

In addition to the collection of plastic waste, we have carried out a total of 50 trainings in the three centers involved, reaching approximately 500 people. These trainings focused on raising awareness about the negative effects of single-use plastic and promoting sustainable practices in the public's own consumption habits and in waste management, for example, the correct separation of recyclables. As a result of these trainings, we have managed to convert 20 individuals into Guardians of the Marea Montesinos Program. This special program is being implemented in the Montesinos sector of the Colonial Zone and has emerged as an additional pilot project that feeds the Blue Points. The Guardians of the Marea Montesinos Program play a crucial role with their activities in promoting recycling and raising awareness in their community, as a target group, acting as leaders and agents of change through the collection stations.

We have developed an additional initiative called "Blue Business". This project focuses on engaging local business owners in adopting sustainable practices, like changing packaging and packaging products to more environmentally friendly options, such as paper, boxes made from sugarcane bagasse. These businesses also participate in the collection of plastic waste, with the installation of containers (bins/buckets) for plastics in their facilities, which are then delivered to the Cultural Center of Spain. Overall, we are proud of the results achieved so far.

Although the Blue Points project is in an early stage, we have managed to intercept a significant amount of plastic and have impacted a large number of people through training and community programs. These achievements motivate us to continue working on the expansion of the Blue Points and to explore new opportunities to promote sustainable practices in the management of plastic waste in the Greater Santo Domingo region.

3.8. CHALLENGES & OPPORTUNITIES

CHALLENGES

Throughout the implementation of the “Blue Points”, we have faced various challenges that have required adaptation and search for solutions. One of the significant challenges has been the location of two of our points within school facilities. Due to the opening close to the end of the school year, we have faced limitations in carrying out planned activities.

However, we are aware of this situation and are working on planning activities for the next school year, thus ensuring greater student participation and engagement. The plastics collected are: Beverage bottles, shampoo containers, plastic gallons, cleaning containers. In addition to the technical recycling triangles with numbers 1, 2 and 5 (see photo of Blue Points).

Figure 11. Photo of the explanation of the “Blue Points” cubes

Another major challenge has been the fact that we are currently only collecting plastic waste, at the Blue Points. This has limited our ability to recycle other types of waste generated by program participants, resulting in the final disposal of that waste in conventional landfills. To improve the pilot, we are evaluating options to expand the value chain to encompass the collection and recycling of other materials such as metal, paper and glass. This will give us the opportunity to further optimize waste management and strengthen the recycling chain in our community. Generating income from its sales would allow us to further improve the project.

Since the Blue Points are in the very early stages of implementation, we are in a constant process of improvement. As the project progresses, new alliances and collaborations with institutions, companies and government agencies are being analyzed to overcome these limitations and achieve comprehensive waste management in the region. Through feedback from participants, constant evaluation and the search for innovative solutions, we seek to overcome obstacles and achieve an even greater impact on waste management and environmental awareness in Greater Santo Domingo.

OPPORTUNITIES

In developing the Blue Points, we have identified several opportunities that will allow us to expand our impact and improve the efficiency of our program. Below, we will highlight some of these opportunities:

Expansion of the type of materials to be collected: Currently we focus on the collection of plastic waste at the Blue Points. However, there is a clear opportunity to expand the variety of materials we collect. This includes the incorporation of other recyclable materials such as metal, paper and glass. By expanding the types of materials accepted, we will be able to maximize the amount of recoverable waste we intercept and further increase the recycling chain.

Expansion of Blue Points: As the pilot project continues and consolidates, the opportunity arises to expand the number of Blue Points in Greater Santo Domingo. This involves identifying new strategic locations in different communities and sectors, taking into account waste generation and accessibility. By increasing the number of Blue Points, we will expand our coverage and reach, involving more households, educational and cultural institutions in responsible waste management.

Interconnection between Blue Points and Blue Stations: A key opportunity is to establish an interconnection between Blue Points and existing Blue Stations. This involves establishing efficient logistics so that the bags collected at the Blue Points are collected by the tricycles and transported to the nearest Blue Station. This integration will allow more fluid waste management, optimizing the collection, classification and recycling processes. It is worth mentioning that both the Blue Points and the Blue Stations could operate independently, providing flexibility and adaptability to our operations.

These opportunities will allow us to strengthen and expand our program, maximizing the positive impact on waste management and environmental education in Greater Santo Domingo. We are committed to pursuing strategic partnerships, improving logistics processes, and providing greater community engagement to make the most of these opportunities and create sustainable change in our region.

3.9. CONCLUSION

Since the launch of the first Blue Point, we have managed to obtain significant results in a short period of time. In collaboration with the Cultural Center of Spain and the Babeque School, we have intercepted a total of 231 kg of plastic. This figure demonstrates the positive impact we have achieved by diverting a considerable amount of plastic from landfills and the environment.

With training in the centers involved, we raised more than 500 people's awareness about sustainable practices in waste management.
Of those trained, 20 individuals became "Guardians of the Marea Montesinos Program." These Guardians are agents of change and play a crucial role in promoting recycling and raising awareness among their target group.

4. CASE STUDY: COLLECTION CONTAINER - ESTACIÓN AZUL, SANTO DOMINGO

4.1. BLUE STATION FRAMEWORK

In a world where proper waste management and environmental protection have become urgent priorities, it is crucial to have tangible examples of successful implementation of sustainable projects in our communities. This document offers an inspiring and practical case study: the implementation of the Blue Station (spanish: Estación Azul) project in the Villa Duarte neighborhood, Santo Domingo, Dominican Republic. Through this project, significant challenges related to waste management, community awareness and the promotion of sustainable practices were addressed.

Throughout this paper, we explore the comprehensive approach used to address these challenges and the results obtained. However, beyond simply providing a detailed description of the actions undertaken, this document is presented as a tool and a source of inspiration and learning for those interested in undertaking similar projects. Through the analysis of the implemented communication strategy, the community awareness plan, the collaboration with key actors and the creation of a distinctive visual identity, it is highlighted how the synergy of these actions has been fundamental to the success of the Estación Azul project.

As we progress through this document, the details of the strategy used to engage the community and encourage their active participation will be revealed, as well as the lessons learned during the process. In addition, complementary actions will be explored, such as collaboration with local institutions, data analysis and obtaining permits necessary for the implementation of the project. All of this is presented as a tool or practical guide that invites the reader to reflect and adapt these strategies to their specific context, recognizing that each project has its own particularities, but can serve as an example of good practices with this successful experience.

SANTO DOMINGO EAST

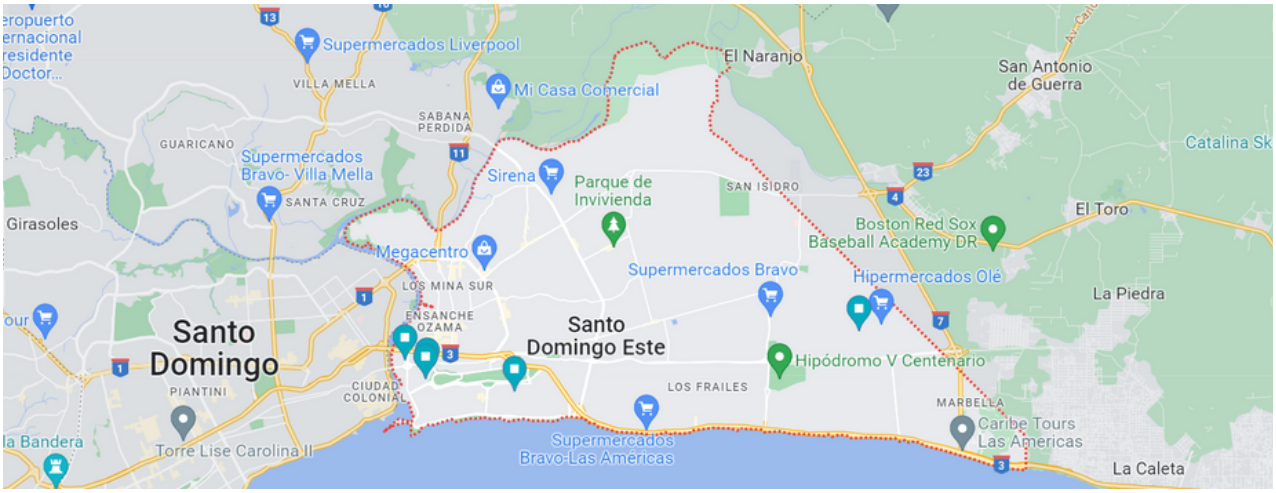

Figure 12. Map of Santo Domingo East, Google Maps

Santo Domingo East is one of the municipalities that make up Greater Santo Domingo, in the Dominican Republic. Historically, this area has faced great challenges in terms of solid waste management, being one of the municipalities with the worst waste management and with a high number of improvised landfills. This situation has worsened in recent years, evidencing the great systemic problem we face.

During the COVID-19 pandemic, a significant worsening was observed in waste management in Santo Domingo East. The accumulation of garbage in the streets and the lack of adequate collection became an obvious problem, affecting the quality of life of residents and generating health risks. This revealed the structural and operational deficiencies in the management of solid waste in the municipality.

The solid waste transfer site, which should function as a transition point between collection and final transportation of waste, is located almost inside the Ozama River. This inappropriate location represents a serious risk of contamination for the river and its ecosystems, in addition to being a contributing factor to the obsolescence and inefficiency of the transfer site.

In addition to physical and operational problems, corruption and institutional mismanagement have affected waste management in Santo Domingo East. For years, cases of corruption in the allocation of contracts and the lack of transparency in the selection processes of companies in charge of waste collection and disposal have been reported. This situation has created an environment conducive to impunity and has hindered efforts to improve solid waste management in the municipality.

4.3. PUTTING TOGETHER THE PILOT PROPOSAL

IDENTIFICATION OF GOOD PRACTICES

To identify good practices and antecedents that would serve as a reference for our project, we carried out an exhaustive investigation of various successful initiatives. Some of the practices that we consulted and that gave us valuable learning were the following:

Green Neighbor Project: This project consists of a network for the collection of recyclables, such as paper, cardboard and plastics, coordinated by 3Rs Sustainability. The initiative seeks to insert informal collectors, who find their livelihood in the marketing of recyclables. We are inspired by this proposal to integrate local actors in our collection and recycling work.

Green Love Clean Points: This initiative works as an intermediary and is responsible for collecting classified materials for their correct final disposal through recycling. The segregated and consolidated materials are delivered to different recycling plants, where they are used as raw materials to produce new products. This experience served as a reference for us to establish efficient waste classification and disposal practices.

Reciveci: This Ecuadorian startup offers services aimed at increasing the amount of recyclable waste recovered by grassroots recyclers. Its services include waste recovery, advice to companies within the framework of Extended Producer Responsibility, institutional recycling and educational campaigns, among others. We are inspired by their comprehensive approach and their ability to involve different actors in the recycling process.

Parley operations in other countries: We observe and analyze Parley operations in different countries, with special attention to the Parley Maldives operations. Parley focuses on beach and ocean cleanups, as well as raising awareness about the problem of marine pollution. We study their approach to community awareness and support in waste collection and classification to incorporate similar elements into our strategy. Through the analysis of these practices and initiatives, we were able to learn and understand the operation of key features, such as selective collection, door-to-door collection, sorting from the source, accompaniment and community awareness. These elements allowed us to form the pillars of our project and adapt the best practices to our local reality in Santo Domingo East.

UNDERSTANDING THE LOCAL REALITY

To understand the local reality and address the challenges of solid waste management in Santo Domingo East, we actively engage in the collection of information through various sources. Initially, we became aware of the serious problem through news, posts on social media and the testimonies of people in the community. These communication channels gave us a clear view of the magnitude of the challenge facing the area and the entire country in terms of solid waste management.

We conducted field investigations to gain a better understanding. We employed tools like surveys, heat maps, and analyzed existing waste collection routes and schedules. Additionally, we used a waste flow diagram, which helped us identify systemic issues leading to waste ending up in the Duquesa landfill. One of the main conclusions was that the lack of territorial planning generated inaccessibility during many collection times, since the narrow and poorly passable streets make it difficult for collection trucks to access people's homes. As a result, many families were forced to travel long distances to deposit their waste in places where trucks could access, or they resorted to the creation of improvised landfills or even threw the waste directly into the Ozama River, which in turn flows into the sea.

This panorama showed the existence of a series of interrelated factors that contribute to the problem. The inconstant movements of the collection trucks, the large accumulation of garbage, the inefficiency of the drainage and sewage systems, added to the hydrometeorological stress to which we are geographically exposed, resulted in periodic floods that carried the waste towards the rivers and later to the sea.

AGREEING ON ESSENTIAL ELEMENTS

We understood that the essential elements for the implementation are:

Location: We carry out an exhaustive study to select a strategic location that would cover areas near the Ozama River, more specifically in the “Parqueo del Bar de Chencha”. We consider accessibility, population density and the existence of specific problems related to waste disposal in the area.

Financing: We identify the importance of securing the financial resources necessary for the implementation and operation of the project.

Permits and regulations: We recognize the need to obtain the corresponding permits and authorizations from the competent authorities. We become familiar with environmental legislation and local regulations related to solid waste management. We established contacts with the relevant institutions and ensured that all legal requirements for the execution of the project were met.

Infrastructure: We analyze the infrastructure needs required for the collection, classification and proper disposal of solid waste. We consider the installation of collection stations, containers, separation and storage equipment, as well as the implementation of efficient management and monitoring systems.

Strategic alliances: We recognize the importance of establishing alliances with different actors, such as community organizations, government institutions, private companies and NGOs, to strengthen our implementation capacity and maximize the impact of the project. We establish collaborations with entities that shared our objectives and values, allowing us to access resources, knowledge and support networks.

Team provision: We identify the need to have a trained and committed team to carry out operational and awareness tasks. We carry out a personnel selection and hiring process, prioritizing the hiring of local residents who knew the realities and challenges of the community. Likewise, we provide training and continuous education to ensure efficient and effective performance.

4.4. IDENTIFICATION OF ALLIES AND ACTORS

VALIDATION OF LOCAL ACTORS

Alliances are fundamental in the development and success of any program, especially those for solid waste collection. In our case, the strategic alliances we established played a crucial role in allowing us to get closer to the community and improve the bureaucratic flow. These alliances provided us with several important benefits.

First, validation and support from local government were critical to obtaining the support needed to pilot the program. By having the support of a public actor, we were able to streamline the permit and authorization processes necessary to implement the planned actions. This reduced bureaucracy and administrative obstacles, allowing us to move forward more efficiently and quickly.

In addition, alliances with the local government allowed us to establish direct links with the community through neighborhood associations, churches, schools and other local institutions. These alliances gave us the opportunity to listen to the needs and concerns of the community, as well as to build trust and promote citizen participation. Through these interactions, we were able to obtain valuable information about the local situation, identify the most appropriate areas to implement the pilot program, and determine strategic locations to place collection stations.

Having government partnerships not only made the implementation of the project easier, but also made it more effective in terms of results and long-term sustainability. Collaborating with local government allowed us to access resources, knowledge and capabilities that are critical to the success of the program. In addition, coordination with local authorities gave us a more comprehensive vision of the challenges and opportunities related to solid waste management.

APPROACH WITH THE MUNICIPALITY

AGREEMENT WITH ASDE: On April 22, 2022, Parley and the Santo Domingo East City Council signed an agreement for the launch of the Ozama blue station pilot, with a validity of one year and with the objective of carrying out a pilot project of Estación Azul to prevent marine pollution through the collection and storage of recoverable solid waste. Both parties commit to collaborating in the implementation of the Parley A.I.R (Avoid, Intercept, Redesign) strategy and the PROMAR project in the municipality. Parley Dominican Republic S.R.L. assumes key responsibilities, such as establishing the pilot project in different sectors, installing the infrastructure of the temporary collection center (SDE-CC1) in the "Parqueo del Bar de Chencha" and designing municipal awareness and education strategies. In addition, they are committed to leading the sensitization of community actors and providing periodic reports on their operation. For its part, the Santo Domingo East City Council is committed to facilitate the use of public space, granting the necessary permits and adapting the land for the project's infrastructure. They will also collaborate in raising awareness among beneficiary communities, guaranteeing the security of the temporary collection center and adopting the Parley A.I.R strategy in municipal waste management.

RSU RIO OZAMA ALLIANCE: It was carried out on July 6, 2022 between Parley for the Oceans together with the Santo Domingo East City Council, the United Nations Development Program (UNDP) and the CODESSD Verde Women's NETWORK to implement the Comprehensive Management Plan for Urban Solid Waste (MSW) on the banks of the Ozama River. This initiative seeks to rationally and effectively manage the waste generated by the communities settled in the area, protecting the waters and biodiversity of the river, and preventing waste from reaching the coast of the Caribbean Sea. The objective of this alliance is to promote community management of solid waste, with the active participation of the community and the leadership of the municipal government. We have worked together for more than a year to identify problems, articulate collective actions and develop innovative solutions that improve people's quality of life. The approach includes both the logistical aspect of waste collection and citizen awareness and education on the proper disposal and classification of waste. Parley for the Oceans, through the Project for the Prevention of Marine Litter in the Caribbean Sea (PROMAR), will focus on its impact area, which ranges from the Matías Ramón Mella bridge to the Oxígeno neighborhood. Their work will consist of systematically collecting plastic waste generated in homes and businesses, in order to prevent the generation of marine litter. It also contemplates the participation of UNDP, CODESSD and other community organizations in different areas of action, ranging from improving collection routes to training community leaders in appropriate waste management practices.

4.5. BASELINE SURVEY

WASTE FLOW ANALYSIS

Within the framework of the project "Prevention of Marine Litter in the Caribbean Sea (PROMAR)", at Parley for the Oceans we carry out a flow analysis of plastic waste (“Material Flow Analysis” = MFA) in the Municipality of Santo Domingo East, as part of the activities to quantify the waste that reaches the Caribbean Sea and know its composition. This baseline is optional for the installation of “Blue Points”. The results of this analysis in the Municipality of Santo Domingo East revealed that around 72,738 tons of plastic waste are generated in the municipality per year. Of this amount, approximately 13,771 tons of plastics are not collected, which represents a significant challenge for the comprehensive management of solid waste. In addition, it was identified that around 8,285 tons of plastics end up in bodies of water, which highlights the importance of addressing the problem of marine waste.

It is important to keep in mind that during the analysis, the lack of sufficient and updated information on comprehensive waste management in the municipality was identified as one of the biggest challenges. To seek more effective solutions and carry out similar studies in the future, it is necessary to collect, disseminate and socialize data on waste generation and the amount of waste recovered. This information will be key to more efficient and sustainable waste management in the municipality.

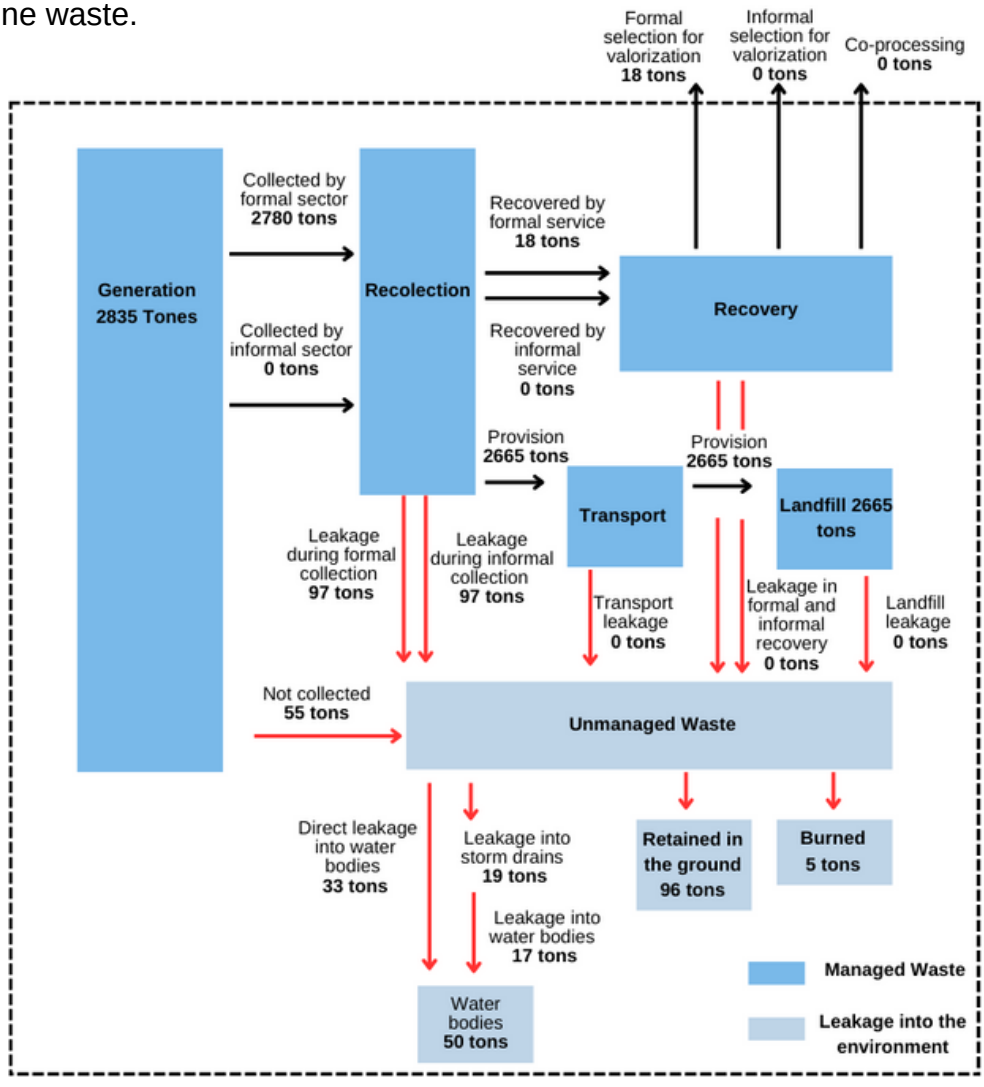

Figure 13. SDE waste flow analysis, Parley

SUPPLEMENTARY DATA COLLECTION

An analysis of complementary data was carried out to obtain additional information and enrich knowledge about the waste situation in the Municipality of Santo Domingo East. These analyzes included information searches, interviews with relevant actors, such as Mayor Manuel Jiménez, as well as other important people involved in waste management. Analysis of data provided by the National Statistics Office and international agencies, such as UN-Habitat, was also used.

These actions made it possible to identify specific needs, local realities and the type of waste produced in the municipality. Through the interviews, a deeper insight into the policies, strategies and challenges related to waste management in the area was obtained. Likewise, data collected from official sources and international organizations provided a solid basis for understanding the magnitude of the problem and establishing comparisons with international standards.

The analysis of complementary data was essential to have a more complete and precise approach to the problem of plastic pollution in the Municipality of Santo Domingo East.

4.6. PREPARING THE IMPLEMENTATION

PILOT LOCATION SELECTION

The selection of the Blue Station on the banks of the Ozama River, on the border between the National District and Santo Domingo East, was based on a series of important considerations:

Proximity to the Ozama River: The choice of this town was made taking into account its proximity to the Ozama River. Areas near bodies of water are usually high-risk areas in terms of pollution and inadequate solid waste management. Therefore, this area was identified as one that required prevention, awareness and infrastructure actions to address the problem of urban solid waste management and its impact on the river.

Need for preventive actions: The location on the banks of the Ozama River suggests that this area may be one of the main sources of contamination of the river. The implementation of a blue station in this town would allow for preventive and awareness-raising actions aimed at the local community, with the aim of promoting appropriate waste management practices and reducing the negative impact on the Ozama River.

Importance of adequate infrastructure: Since areas near rivers are often prone to accumulation of waste, it is essential to have adequate infrastructure for waste management. The choice of this town on the banks of the Ozama River would allow evaluating the implementation of specific infrastructure, such as the blue station, to facilitate the selective collection and proper management of solid waste generated in the area.

In summary, the selection of the location of the blue station on the banks of the Ozama River, on the border between the National District and Santo Domingo East, was based on the need to address the inadequate management of solid waste in an area near the river and prone to pollution. The implementation of preventive actions, awareness and adequate infrastructure would contribute to the improvement of urban solid waste management and the protection of the Ozama River.

INFRASTRUCTURE REQUEST AND ALTERNATIVES

The decision to use cargo containers as the structure for our blue station in Ozama was based on several characteristics and advantages that they offered us:

Mobility and ease of assembly: Recycled cargo containers are mobile structures and easy to assemble. This feature allowed us to conveniently place them in the location chosen for the blue station. Furthermore, if necessary, we can mobilize the infrastructure without difficulty, which gives us flexibility in terms of location and adaptation to future needs.

Reuse (Recycling) of old containers: Opting for cargo containers gave us the opportunity to give new life to structures that otherwise could have become waste. This choice is aligned with our approach to sustainability and resource reuse, as we allow old containers to be used as an integral part of the project, providing a practical and creative solution at the same time.

Electrical autonomy through solar panels: The containers selected for the blue Ozama station have solar panels that provide them with electrical autonomy. This means that we can cover all the station's logistical needs, such as lighting and equipment operation, through renewable and sustainable energy. This choice reinforces our commitment to environmental protection and reduces our dependence on traditional energy sources.

PERMIT MANAGEMENT

To carry out the Blue Station project, it is necessary to obtain adequate permits to ensure compliance with established regulations and standards. Some of the necessary permissions are:

Land use permit: Law 225-20 in its regulation for collection centers establishes specific requirements and regulations, including having the necessary permit to obtain authorization to use a specific land for the establishment of the Blue Station. It must be managed and obtained in accordance with current regulations on land use. In the case of the Santo Domingo East City Council, an approximate cost of 33,000 Dominican pesos for one year is estimated to obtain this permit.
Permit for free circulation: In the case of Estación Azul Ozama, which includes the use of tricycles for waste collection, it is necessary to have a permit that allows free circulation and operation on public roads. This permit ensures that tricycles comply with applicable safety requirements and traffic regulations.

It is important to highlight that as part of the agreement with the city council, they were in charge of the management and financial coverage for the issuance of the permits. This indicates that the city council assumed the responsibility and costs associated with obtaining the necessary permits for the Ozama Azul Station project.

COMMUNITY OUTREACH

The selection of the personnel who operates the Blue Station was carried out taking into account various criteria, including:

Residence in the area: Priority was given to hiring people residing in the action area of the Blue Station. This decision was made with the objective of facilitating entry to the neighborhood and encouraging the participation and commitment of the local community in solid waste management. By hiring local workers, a closer bond is established and the sense of belonging to the project is strengthened.
Profile and experience: The profiles and experience of the candidates in the field of solid waste management were taken into account. Priority was given to hiring people with relevant knowledge and skills, such as willingness to collect waste, and willingness to acquire knowledge in recycling. This ensures that the selected staff is trained to carry out their responsibilities effectively and efficiently.

Based on these criteria, 5 people were hired to work at the blue station, who have remained the same since their hiring:

Three collectors: These workers are responsible for collecting solid waste in the assigned area, following established protocols. Their work consists of, using the electric tricycles that we have, going to the relevant areas to collect the waste and transfer it to the logistics center.

A technical supervisor: This person has the responsibility of supervising and coordinating the activities of the collection staff. Responsible for ensuring that established schedules are met, that waste is properly separated, and that a good level of performance is maintained in the work team.

A recycling technician: This worker has specialized knowledge in the area of recycling. Its main function is to supervise the classification and separation process of recyclable materials at the blue station. In addition, it is responsible for providing technical advice and training to collection personnel and the community in general on the importance of recycling and how to carry it out effectively.

4.7. IMPLEMENTATION

COMMUNICATION STRATEGY

Community awareness

As part of our communication strategy and community awareness plan in Villa Duarte, we have implemented various actions to actively involve residents in our project. To do so, we carefully selected five representative sectors of the neighborhood, two of them being areas with a high degree of vulnerability and visible poverty, while the other three are made up of segments of the middle class population. Before starting collection activities in the neighborhood, we carried out a door-to-door awareness day. During this day, our main objective was to raise awareness in the community and encourage their participation in the project. We informed residents about the purpose of our project and presented the reality that prompted us to undertake this initiative.

Additionally, we are continually monitoring awareness levels in the community. To provide additional educational space, we have enabled a container that has been transformed into a classroom within the Blue Station. This space allows us to carry out workshops and educational activities aimed at promoting practices for the purposes of the project. Through these communication and awareness strategies, we seek to generate a positive and lasting impact in the community of Villa Duarte, fostering greater environmental awareness and promoting the active participation of residents in waste management.

Design and implementation of advertising campaign

As part of our efforts to increase the dissemination of the project, we developed a comprehensive advertising campaign that includes a distinctive logo and a coherent graphic line. The logo is made up of a stylized wave with two fish, symbolizing our connection with the sea and the importance of preserving aquatic resources. In addition, we have created the slogan "I recycle, I am blue", which seeks to convey the message of individual commitment to the cause. To complement the campaign, we have designed posters alluding to the project that are displayed in strategic places in the community, inviting community members to join our initiative. In addition, we have created promotional material such as tote bags, t-shirts, mugs and thermoses personalized with the logo and slogan of the project, which we have distributed among collaborators and participants.

DEVELOPMENT OF BASIC PROCEDURES

The implementation of an effective logistics plan has been fundamental to the success and sustainability of the Estación Azul project.

We installed and equipped the containers with the necessary tools and structures for the reception and storage of plastic waste. We then proceeded to train employees, providing them with both technical information and environmental awareness. We wanted to ensure that they became conscious citizens who not only improve the quality of life of those in their community, but also take action to preserve the health of our oceans and environment.

Additionally, during the implementation process, we focused on designing and planning the mobility needs for waste collection. We established a connection with the national automobile manufacturing company, Andando RD. They were responsible for developing three electric tricycles that we use at the Ozama Blue Station, and we also plan to use them at future blue stations. These electric tricycles allow us to guarantee sustainable and eco-friendly mobility. Unlike combustion engines, electric tricycles do not emit greenhouse gases, which cause climate change. Furthermore, the fact that all tricycle parts are local, encourages development and technology in the country as well as providing local employment and decreasing dependence on imports. Once we had all the components ready to start, we focused on the selected sectors through identification days. Each home was assigned an alphanumeric code within the Blue Station system, using the initials of the sector and the house number.

We established rules to facilitate collection, asking each family to inform us through a telephone line when they were ready to deliver the waste. In this way, we began with the collection, taking place for 4 hours a day, 5 days a week, and that is how it has been until now. After being intercepted in the communities, the collected materials are taken to the Blue Stations, where they are temporarily stored. Subsequently, scheduled pickups are made to transport the materials in trucks to the CILPEN Dominicana facilities. CILPEN Dominicana is responsible for the processing and proper management of plastic waste. They separate, classify and prepare the material for subsequent shipment to Parley Global, which in turn is responsible for receiving and using these materials for the manufacture of sustainable products, thus contributing to the circular economy and the responsible use of resources. The collaboration with CILPEN Dominicana and Parley Global allows us to close the life cycle of plastic waste, transforming it into valuable resources and preventing its accumulation in the environment.

ROUTE DEFINITION

We have established collection routes in five distinctive sectors of the Villa Duarte neighborhood: Simónico, La Francia, Pueblo Nuevo, Calero and El Molino. With the aim of facilitating the participation of neighbors and optimizing collection efficiency, we have implemented a system in which participants inform us when they are ready to deliver their recyclable waste.

Thanks to the collaboration of the community, we can design the daily collection routes according to the participants who are ready in each sector. Our goal is to stop by each home at least once a week, ensuring regular and timely collection of recyclables.

This participatory and route-planning approach allows us to maximize resource utilization and ensure that participants can actively contribute to the project. In addition, by establishing a regular collection frequency, we encourage consistency in the separation and delivery of recyclable materials, thus promoting a culture of sustainable recycling in the homes of each sector. With this strategy of established routes, we achieve greater efficiency in collection and ensure that recyclable materials are properly processed and valued.

4.8. RESULTS, CHALLENGES AND OPPORTUNITIES

RESULTS

Significant results have been obtained at Estación Azul Ozama during its operation of more than a year in the Villa Duarte neighborhood. With the active participation of the community, we have managed to establish five sectors within the neighborhood and have more than 800 households registered.

Thanks to the awareness days and the commitment of the participants, we have managed to raise awareness among communities about the importance of recycling and the need to reduce plastic pollution. This awareness has led to greater participation in the project and the adoption of more sustainable practices in waste management.

One of the most notable achievements is the interception of more than 15 ton loads of plastic, which is equivalent to 8918.7 kg. This intercepted plastic is mainly composed of 82% PET, 17% HDPE and 1% other types. Thanks to these efforts, these materials have been prevented from contaminating bodies of water and the environment, thus contributing to the preservation of the ecosystem and the reduction of marine pollution.

In addition, we have carried out a total of 4,776 collections, with an average of 682 per month, which demonstrates consistency and effectiveness in waste management. These accomplishments are the result of a joint effort between the community, the employees of the Blue Station and our strategic allies.

As part of our growth and expansion, we are in the development phase of another Blue Station in a new location. This expansion demonstrates the positive impact and viability of the project, as well as the possibility of replicating it in other areas of Santo Domingo and the country.

We will continue to work closely with the community and our allies to continue promoting recycling and proper waste management, with the goal of creating a cleaner, more sustainable environment for future generations.

CHALLENGES

In carrying out the implementation of the Blue Station, we are faced with several challenges that we must address effectively. One of the main challenges is the limitation in the reception of materials other than plastic. Currently, we are only receiving plastic at the station, which is due to the need to establish appropriate strategies to guarantee the management and use of other materials once intercepted.

For example, if we want to intercept paper or cardboard, we must find ways to protect these materials from getting wet or damaged during storage and transportation. Likewise, glass requires special attention due to its fragility and weight. We may face difficulties removing glass from some hard-to-reach places due to its weight and the limitations of the motors used for collection.

OPPORTUNITIES

As part of the project we identified several opportunities that could further strengthen and expand the positive impact of the program. One of these opportunities lies in the possibility of receiving other types of recoverable waste, such as metals, paper and glass. By expanding the value chain, not only is resource utilization maximized, but program participants are also given the option to deposit and recycle these additional materials at the station.

In addition, there is the opportunity to establish alliances and collaborations with other institutions to develop organic waste collection points. By implementing composting processes, this waste could be used for the production of compost, a valuable natural fertilizer that could be used in community gardens, urban gardens or in local agriculture. This initiative would not only contribute to the proper management of organic waste, but would also promote sustainable practices in the management of natural resources.

Likewise, an obvious opportunity for the Estación Azul project is its expansion to other areas of Santo Domingo and the country. The success and experience obtained in Villa Duarte could serve as a replicable model to implement similar stations in different communities. These additional opportunities will not only provide direct benefits to the community and the environment, but would also contribute to strengthening the waste value chain, creating local jobs and promoting a stronger and more sustainable circular economy.

4.9. CONCLUSION

The methodology of the Estación Azul project in the Villa Duarte neighborhood has proven to be a useful tool. It represents a good inspiring example of how to effectively address challenges related to waste management and community awareness. The involvement of the community, both in sectors in a state of vulnerability and visible poverty as well as in the middle class, has been key to the success of the project. The initial awareness day made it possible to inform residents about the purpose and benefits of the project, encouraging their active participation and turning them into true actors of change.

Furthermore, collaboration with relevant actors, such as the local council, has facilitated obtaining the necessary permits and has strengthened institutional support for the project. The availability of complementary data and analysis, from sources such as the National Statistics Office and international agencies, has allowed for more informed and effective decision-making.

The communication strategy, supported by a distinctive logo and pop material, has contributed to spreading the message of the "Blue Station" project effectively, reaching a wide audience and raising awareness about the importance of proper waste management.

We hope that this document has been a source of inspiration and learning, providing the necessary tools to address similar challenges in different contexts. By undertaking projects with a community-focused vision and holistic approach, we can make a lasting positive impact on waste management and environmental protection. Together, we can build a cleaner, more sustainable future for future generations.

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