

# The Gendered Dimensions of Open Waste Burning:

*A case study of Samaná Province, Dominican Republic, and  
USAID's Clean Cities, Blue Ocean program*



Photo credit: Orlando Barriá

## WHITE PAPER

Delila Khaled

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For more information please contact: Delila Khaled, Principal, ImpaXus at [delila@impaxusllc.com](mailto:delila@impaxusllc.com).

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## Executive Summary

Open waste burning (OWB) is a prevalent waste management practice across low- and middle-income countries (LMICs) that exacerbates climate change and poses a grave threat to human health and the environment. Nevertheless, data on OWB are limited and analyses of the gendered dimensions of the practice negligible. Though research on gender and waste management has increased in recent years, it gives little consideration to open burning. Addressing this gender blind spot is critical to inform prevention efforts given the prevalence of OWB in both household waste management and the informal waste sector – two domains where women play a significant role.

This white paper aims to increase understanding and awareness of the gendered dimensions of OWB to inform future research, policymaking, and programs aimed at ending this hazardous practice. Given the dearth of data and literature on gender and OWB, the paper includes a case study of Samaná Province, Dominican Republic, drawing on formative research conducted by the United States Agency for International Development’s (USAID) Clean Cities, Blue Ocean (CCBO) program. CCBO is USAID’s global flagship program to address ocean plastic pollution by improving solid waste management (SWM) systems and practices. While prior studies have established that inadequate SWM services are a key driver of OWB, other socioeconomic factors also contribute to this dangerous practice, including social values, cultural norms, environmental threats, and livelihoods, all of which carry gendered implications that have received little attention in academic and formative research.

Following is a summary of the key findings from this study:

1. Open burning and dumping are common waste management practices across Samaná in communities with inadequate waste collection services. Bathroom and yard waste — both containing plastic waste — are co-mingled and burned regularly at the household level.
2. Modesty and privacy are the main drivers for burning bathroom waste. Though the concern is shared by men and women, consideration for women’s modesty and privacy is the underlying driver.
3. OWB poses disproportionate health risks to women, children, the elderly, and those with pre-existing respiratory conditions, affecting reproductive health, cognitive development, and increasing the risk of birth defects, cancer, heart disease, and more. This, in turn, increases women’s unpaid care burden.
4. The perceived benefits of OWB, shared by men and women, can serve as an incentive to continue the practice:
  - a. OWB may be viewed as a risk mitigation strategy to reduce waste accumulation and the associated threat of vector-borne diseases, particularly in underserved and low-income communities.
  - b. In the absence of adequate waste collection and recycling systems, some burn plastic waste to prevent accumulation and leakage into the environment. This is driven further by widespread awareness and visibility of the plastic pollution crisis and a strong desire to protect the environment and associated livelihoods (e.g., beach tourism and fishing).

5. Gendered divisions of labor around household waste management in Samaná are both rigid and fluid. Although women and men do not consider waste disposal a gendered responsibility, women primarily take on this task. (See finding 6, below.) Anecdotal evidence suggests that women may routinely burn the small quantities of waste compiled as part of routine household cleanup, while men handle the burning of larger volumes of yard waste. Boys and girls may assist with domestic OWB as part of their household chores. Further research is needed to confirm the prevalence of these practices and determine the extent to which incidental plastic waste is burned.
6. Challenging common assumptions about gendered divisions of labor in household waste management globally, men and women in Samaná share responsibility for domestic waste disposal based on practicality rather than gender. Nevertheless, due to their greater presence in the home, women disproportionately bear the burden of waste disposal, thereby increasing their time poverty and exposure to environmental and health risks.
7. The availability of sex-disaggregated data on OWB and gender analyses of the practice are virtually nonexistent. This gap contributes to a poor understanding of the intersecting social, cultural, and economic factors influencing how men, women, boys, girls, the informal sector, and other vulnerable groups engage in and are impacted by the practice.

Following an analysis of the health, environmental, and socioeconomic risks of OWB for women and girls, the paper offers practical recommendations for donors, policymakers, and practitioners aiming to take gender-responsive actions to end this harmful practice. Briefly, these recommendations include:

- Mandating gender and social inclusion analyses and the collection of sex-disaggregated data on OWB in solid waste management (SWM) studies and activities.
- Including domestic OWB in national emissions inventories.
- Enabling women's participation in waste management decision-making.
- Providing economic incentives for women-led waste enterprises to address gaps in waste circularity.
- Designing waste management infrastructure and collection services to meet the needs of both men and women.
- Leveraging technological solutions to engage women and communities, along with local governments, in OWB monitoring and education, thereby enhancing awareness, transparency, and accountability.
- Ensuring OWB awareness and education campaigns promote shared responsibility in household waste management while addressing the gender- and age-differentiated risks of OWB.
- Identifying strategic entry points to integrate OWB prevention with a gender lens into existing and future programs and policies, adopting a cross-sector approach to maximize resources, increase impact, and break knowledge silos.

# 1. Introduction

Despite its catastrophic impact on health, climate, and the economies of low- and middle-income countries (LMICs), open waste burning (OWB) has not been addressed in climate change negotiations and is conspicuously absent from donor interventions aimed at improving solid waste management (SWM), not to mention national and global health agendas. This stems partly from the fact that waste management, in general, has been historically neglected by both development and climate actors – garnering a mere 0.3% of foreign aid (Practical Action, 2021). While limited data exist around OWB, research on the topic has been trending upward in recent years. Nevertheless, little attention, if any, has been paid to understanding the gendered dimensions of open burning. Such data and analysis are needed to improve SWM systems, policies, and social and behavior change strategies aimed at ending the practice. Addressing this gender blind spot is critical to inform mitigation efforts given the documented association between OWB and both household waste management and the informal waste sector – two domains where women play a significant role.

This white paper examines the understudied relationship between gender and open waste burning. Based on a literature review and an exploratory case study of Samaná Province, Dominican Republic (DR), it analyzes the primary drivers of OWB and the divisions of labor relating to this practice through a gender lens. (See appendix 8.4 for sources referenced). Finally, the paper offers practical recommendations for practitioners and policymakers to take gender-responsive actions to end OWB.

The Samaná case study focuses on the Clean Cities, Blue Ocean<sup>1</sup> program—USAID’s flagship program to address ocean plastic pollution under the Save our Seas Initiative. CCBO works to reduce plastic pollution at its source, working closely with local governments and communities to improve municipal solid waste (MSW) management and build local circular economies. To inform the design of its social and behavior change communication (SBCC) strategy for Samaná Province, CCBO worked with local partners to conduct household ethnographic interviews, followed by focus groups discussions, and then Trials of Improved Practices (TIPs). TIPs is an iterative research technique in which a small sample of a population is asked to select and try a new or modified behavior for a brief period to identify what solutions or policies should be promoted. The research team used TIPs to test households’ willingness to adopt alternate behaviors for domestic waste management, including refraining from open burning. Given the dearth of data on OWB, especially at the intersection with gender, CCBO’s formative research in Samaná offers invaluable information to this study. To gain further insight into CCBO’s findings, the author conducted in-depth interviews with six local and international experts from the research team.<sup>2</sup> (See Appendix 8.2 for details on CCBO’s research approach, and Appendix 8.3 for a list of interviewees.)

## *Limitations*

Several constraints were faced in carrying out this work, which must be considered when extrapolating findings beyond the context of Samaná. Foremost of these is the absence of gender-informed analysis and sex-disaggregated data on OWB in the existing literature — a key impetus behind the case study. Systematic reviews of OWB as well as location-specific case studies rarely capture sex-disaggregated data or apply a gender lens, even in research focusing on domestic OWB or the informal sector.

Additionally, the availability of published information on OWB and SWM in Samaná Province is sparse (USAID, 2023). This case study thus focuses primarily on domestic open burning of household waste, with limited analysis at the informal sector and municipal levels, given the availability of data and the focus of CCBO's OWB-related research.

## 2. Open waste burning: A global threat to human health and the environment

There is a distinct lack of awareness of the negative impacts of open waste burning at the individual, community, and governmental levels. Despite existing legislation against open burning in many countries, the practice continues, particularly in LMICs where waste management infrastructure is inadequate (Pathak *et al.*, 2023). Experts estimate that between 40% to 65% of total MSW in LMICs is openly burned, causing air, land, and water pollution, and posing grave risks to human health (Christian *et al.*, 2010, Velis and Cook, 2021, Wiedinmyer *et al.*, 2014). Inadequate municipal waste management has become an increasingly pressing issue across LMICs, where under-resourced systems cannot keep pace with population growth and changes in consumption patterns. Globally, some 2.7 billion people lack access to waste collection (UNEP, n.d. -b). At the household level, many resort to open dumping and open burning as their primary means of waste disposal. A systemic review of domestic open burning found that the resulting emissions are disproportionately higher in low-income areas, increasing health risks for nearby populations where it is a daily routine. The prevalence of open spaces in suburban and peripheral regions was found to facilitate OWB, perpetuating environmental degradation and health disparities. Though often associated with rural practices, in cities like Mumbai, India, OWB contributes to approximately 20% of air pollution, highlighting its substantial impact in urban environments (Ramadan *et al.*, 2022).

The open burning of MSW emits harmful pollutants, including fine particulate matter (PM<sub>2.5</sub>) and black carbon (BC), which significantly diminishes urban air quality (Krecl *et al.*, 2021). These pollutants, such as polychlorinated dibenzo dioxins, polychlorinated dibenzo furans, and polyaromatic hydrocarbons, pose severe health risks to vulnerable populations, particularly young children and older adults with respiratory conditions. Exposure to these pollutants has been linked to cancer, liver problems, immune system disorders, and developmental complications (International Waste Platform, n.d.). Kodros *et al.* (2016) estimated that 270,000 premature adult mortalities per year occurred due to chronic exposure to PM<sub>2.5</sub> from domestic open waste burning.

Open waste burning is used not only to prevent waste accumulation but also to mitigate associated environmental health hazards. Insufficient and improper SWM threatens public health by fostering disease outbreaks such as worm infections, diarrhea, cholera, and food poisoning through the breeding of biological vectors including insects and rodents (Gutberlet and Uddin, 2017). Despite the well-documented health risks, research and interventions to end the practice remain limited, leaving approximately 11 million informal waste pickers, many of whom are women, at risk due to their proximity to waste and lack of protective equipment. Informal waste pickers exposed to OWB inhale volatile organic compounds (VOCs) that greatly endanger their health (Velis and Cook, 2021).

Open waste burning also presents grave consequences for the environment. It releases a variety of greenhouse gases (GHGs) into the atmosphere – including methane, nitrous oxide, and carbon dioxide – as well as toxic pollutants that intensify climate change. Research shows that BC emissions from OWB have a significant impact on climate change, amounting to between 2% to 10% of global carbon dioxide equivalent emissions (CO<sub>2</sub>Eq) (Wilson *et al.*, 2019). Black carbon, a short-lived climate pollutant (SLCP) with a global warming potential 900 times stronger than CO<sub>2</sub> over a 100-year horizon, absorbs sunlight and heats the atmosphere, exacerbating global warming (Bond *et al.*, 2013). A study in Mexico found that the CO<sub>2</sub>Eq from BC emitted by uncontrolled backyard burning is significantly higher than the methane emissions from biodegradable waste at official dump sites, making it a significant contributor to climate change in the country (Reyna-Bensusan *et al.*, 2018). The toxic ash from open burning also contaminates soil, pollutes groundwater, and disrupts the food chain. Women and the poor already suffer disproportionately from the effects of climate change in LMICs; OWB may be exacerbating these inequities by increasing their water and food insecurity, as well as exposure to extreme heat, an issue that demands urgent study.

With plastics accounting for a significant portion of municipal solid waste — estimated between 40% to 65% in LMICs—the burning of plastics is a critical but underappreciated contributor to climate change and presents dire consequences for human health (Velis and Cook, 2021). Plastics are especially problematic when burned, releasing a potent cocktail of toxic pollutants and significant quantities of GHGs, such as BC. These emissions contribute significantly to air pollution and pose severe health risks, including heart disease, respiratory issues, neurological disorders, and cancer (*Ibid.*). A global review of plastics burning found that campaigns aimed at raising awareness about plastic pollution often inadvertently led to increased plastics burning as individuals seek to manage plastic waste without adequate disposal options (Pathak *et al.*, 2024).

### 3. Why we need a gendered understanding of OWB

A substantive body of evidence has established that gender equality and environmental goals are not only inextricable but mutually reinforcing (OECD, 2020). Moreover, climate action that recognizes women’s knowledge of resource management and their potential to effect long-term change has been found to be more just *and* more successful (ADB, 2014). Nevertheless, gender data related to climate, environment, and resources are not systematically collected (Glemarec *et al.*, 2016). This lack of data is particularly pronounced in the context of gender and solid waste management, thereby hampering informed policymaking, planning, and interventions (Aidis and Khaled, 2019).

Recognizing and supporting women's roles in SWM can enhance waste management practices, improve recycling rates, and help to reduce OWB, leading to better environmental and health outcomes. In many LMICs, women often assume the task of managing household waste as part of domestic cleaning chores. They sometimes share this task with children, especially girls. Women also play a key role in the informal waste sector, where they face gendered and systemic barriers that often relegate them to the lowest levels of the SWM value chain where they operate as waste pickers, sorters of recyclables, and micro-



entrepreneurs (e.g., operating out of their homes or small shops). This work exposes women to severe environmental and health risks, including hazardous substances and toxic fumes.

Waste management is fundamentally about people and behaviors, not just emissions and waste flows, and is thus deeply influenced by cultural and socioeconomic dynamics. A gendered understanding of OWB is essential to develop effective strategies that decrease waste burning in localized contexts and address the roles, needs, resources, and risks faced by all genders. As with SWM in general, rigorous research and gender analysis are lacking to identify the patterns and variations in how gender intersects with OWB across cultures and countries. Applying a gender lens in SWM research, policy, and practice is needed to recognize and respond to the diverse needs, roles, constraints, and opportunities for everyone, including vulnerable groups.

“It is with women that you have to work, men do things, but women mostly take on everything. We are aware of everything, and more with these things [household waste]. And since the man walks in the street working and [the woman] is in the house mostly, [the woman] has more control of the garbage and tells whoever comes to throw garbage, do not throw it there! Be careful with littering! Then when you go out and say that, another woman [comes out] and says the same and the other comes, and says look, don't throw it away, she's telling you not to throw it away, so people don't dare to make a mess.”

Sánchez woman (USAID, 2023)

As OWB gains attention among donors, practitioners, and policymakers, understanding the needs and roles of both women and men is crucial for devising effective SWM solutions and SBCC strategies that lead to sustainable behavior change. Gender-responsive interventions can better address the unique needs and circumstances of different groups, ensuring that messages resonate, and solutions are actionable. Women are key to adopting and spreading new waste management practices. SBCC strategies that engage women and leverage their influence within households and communities are likely to be more impactful. Moreover, inclusive approaches involving all genders in waste management education can break down traditional roles and encourage collective responsibility, leading to greater gender equity and more effective and lasting environmental improvements.

It is important to underscore that a gendered understanding of waste does not benefit women solely, but society overall. Adopting a gender lens helps identify the diverse experiences, behaviors, roles, and needs of all genders across intersecting socioeconomic variables to ensure that SWM strategies are inclusive, equitable, and sustainable. To assess gender-differentiated risks and impacts of OWB, it is vital to consider factors such as income and employment status, location (e.g., rural or urban), age, and marital status, among others. Collecting sex-disaggregated data and gender statistics are crucial not only for gender analysis but also for setting project baselines related to people and environments, including

climate change. Without integrating gender considerations, the policies and programs designed to improve SWM and end open waste burning will fall short of achieving and sustaining the necessary systemic and societal transformation. Worst yet, they could even lead to unforeseen, counter-productive impacts that exacerbate gender inequality and open burning.

## 4. Case study: Samaná Province, Dominican Republic

### 4.1 Clean Cities, Blue Ocean

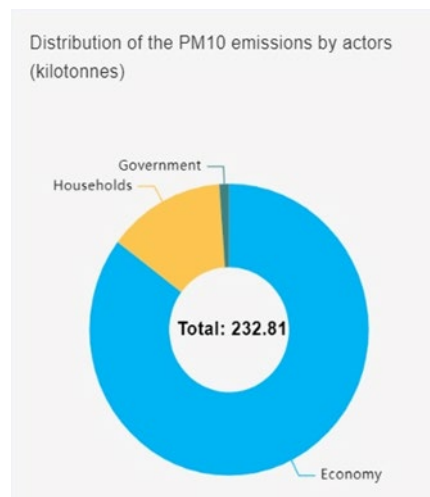
Since 2020, [Clean Cities, Blue Ocean](#)—USAID’s flagship program to address ocean plastic pollution—has been supporting the Dominican government to improve waste management in Samaná Province. This work includes remediating open dump sites and building local, sustainable recycling systems backed by informal waste collectors (IWCs) and entrepreneurs with a focus on women’s economic empowerment. Given the absence of published data to inform the design of its social and behavior change communication (SBCC) strategy for the province, CCBO conducted in-depth, qualitative research of Samaná’s waste value chain, household waste practices, and communities’ feelings and ideas about waste. This formative research included in-depth interviews, focus group discussions (FGDs), and household surveys carried out in six cities across three municipalities: Las Terrenas, Sanchez, and Samaná. Researchers balanced the participant demographics to include gender, religion, age, and educational diversity. Within each city, and to some degree in outlying districts, the research team selected neighborhoods to ensure that all income levels and sectors of the community were included. The research began with a household study comprising 208 ethnographic interviews, followed by nine FGDs in six cities across three municipalities to explore themes and questions that arose during the interviews. Open-ended interviews were also conducted with nine female and eight male IWCs. Drawing on interview findings, the research team then conducted Trials of Improved Practices (TIPs) with 26 households to test alternate waste management behaviors, including refraining from OWB (USAID, 2023). (See Appendix 8.2 for details of CCBO’s research approach, and participant demographics.)

### 4.2 Country context: municipal solid waste management in the DR

The DR faces significant challenges in municipal solid waste management (MSWM), particularly in high-poverty communities where systems are fragmented and inadequate (Turner *et al.*, 2021). With a child mortality rate of 32.4 per 1,000 live births, and 24% of the population living below the poverty line, the country’s waste management inefficiencies pose severe public health risks (UN IGME<sup>3</sup>; World Bank). In many places, access to garbage collection services can be sporadic and recycling options are limited. Consequently, much of the country’s waste ends up in one of more than 350 open dump sites, with improvised dump sites common near populated areas. In lower-income areas, waste often accumulates on roads, empty lots, and in bodies of water, exacerbating health hazards for residents. In July 2018, Santo Domingo’s beaches made international headlines when over 60 tons of garbage washed ashore, highlighting the severity of the waste crisis (Karasz, 2018).

Though 85.2% of households utilize MSWM services, there is a stark disparity between urban (91.5%) and rural (58.1%) areas, with rural households more likely to resort to open burning or dumping (ONE, 2019). Local experts estimate that of the 5.1 million tons of waste per year sent to landfills in the DR, at least 50% may end up being openly burned (Silver, 2021). Open waste burning is a significant source of particulate matter (PM10), alongside dust from unpaved roads and agricultural activities, and contributes substantially to air pollution (MoENR, 2020). Household waste comprises the majority of

MSW, and experts estimate it may produce double the emissions of the industrial sector (Pimentel, 2021). Organic matter constitutes 60% of waste, with the remainder comprised of cardboard (10%), paper, plastic, and glass (6%), metals (4%), with 8% of materials unidentified (UNEP, n.d. – a, Wolf *et al.*, 2018). According to the first SLCP assessment in the DR, the waste sector is the second-largest source of methane emissions after agriculture, with solid waste in landfills being the largest methane source. Notably, waste burning is also among the major sources of black carbon emissions, alongside residential combustion, industry, and transport (CCAC, 2021).



Source: UNEP (n.d. -a)

In recent years, waste fires have been a problematic and political hot button issue in the DR, most infamously highlighted by the Duquesa landfill fire in 2020, which raged for 30 days with devastating effects across the capital city. This led to an increased commitment from the national government to address waste challenges, including dump site remediation efforts such as those led by CCBO in the municipalities of Samaná and Las Terrenas. The new national SWM law – the 2020 General Law 225-20 on Comprehensive Management and Co-processing of Solid Waste – also has been lauded as a sign of renewed commitment on the part of the government to tackle the nation’s waste crisis, aiming to reduce waste generation and establish an integrated management system. The law clearly prohibits open waste burning, though the practice was already banned under the 2003 Environmental Standard on Air Quality. Despite such advancements, effective MSWM remains a significant challenge due to limited enforcement capabilities and insufficient municipal resources, and OWB is commonplace.

### 4.3 Open waste burning in Samaná Province

In recent decades, the province of Samaná (also the name for the peninsula and capital city) has faced significant waste management challenges, impacting both its environment and local communities. Massive amounts of trash – most notably, plastics – wash into ravines, streets, streams, and rivers, and eventually leak into Samaná Bay and the Atlantic Ocean. The peninsula’s rich biodiversity and once-pristine beaches have been significantly affected, undermining crucial economic sectors such as tourism, fishing, and shrimping. The waste crisis has been exacerbated by changes in consumption patterns driven by the introduction of more packaged goods, a growing middle class, and an expanding formal workforce, all of which strain inadequate waste management systems and contribute to widespread open dumping and burning (USAID, 2023). Residents who live near disposal sites are exposed to smoke and toxic fumes, unpleasant odors from decomposing organic matter, and the risk of water contamination from leachate and stormwater.

“People have been burning on this island for as long as it has existed.”  
Local expert, DR

Each of Samaná's three municipalities has a final waste disposal site (or open dump site). The Samaná dump site is situated notably close to the city center, and the one in Las Terrenas is located near residential communities (see Figure 1, Appendix 8.2). While data on the prevalence of OWB in Samaná does not exist, across the communities surveyed by CCBO, residents complained about noxious odors



*A waste fire smolders at an open dump site in Samaná Province, DR. Photo credit: Mark Donahue, CCBO*

and smoke both from dump site fires, as well as neighbors who openly burn their waste. The organized collection of residential waste falls largely under municipal responsibility, but CCBO's initial SWM assessment revealed significant variations in waste collection across the province, with limited recycling or material recovery. Domestic open burning is a common and long-standing waste management practice in the region, especially in outlying districts where waste collection is less consistent and peri-urban areas where narrow streets hinder access by trucks and SWM infrastructure is scarce. CCBO estimates that approximately 50 IWCs – at least half of whom are women – operate at Samaná's municipal dump sites. However, there is insufficient data to determine the involvement of male and female IWCs in open burning, or their level of exposure to waste fires. Anecdotal reports indicate that waste fires were not uncommon prior to CCBO's remediation efforts in Samaná and Las Terrenas, and that they may continue in the more isolated Sanchez dump site that is yet to undergo remediation.

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#### 4.4 Gender and waste in the unique landscape of Samaná

Across the DR, *machismo* culture contributes to a highly gendered division of labor prevalent in the public, private, and informal sectors. Women (aged 15 and over) spend 4.41 times as many hours as men on unpaid domestic and care work. Furthermore, men spend twice as much time on remunerated work than women; while women spend 3.25 times as many hours on non-remunerated work than men (ONE, 2016).<sup>4</sup> That said, women's participation in the labor force rose to 54% as of 2021 (World Bank, 2021).

In Samaná Province, gender roles are shaped by the region's unique and complex history. The area is home to descendants from various countries including Spain, parts of Africa, other Caribbean countries like Haiti, as well as African Americans who resettled in Samaná in the 1820s. This diverse ancestry creates a division of labor among women and men that is both rigid and fluid. While it is uncommon to see men cooking, cleaning, or caring for children at home, their involvement in household chores has increased. Gendered divisions of labor can be observed across specific activities and tools. Labor intensive activities such as cutting grass and branches in the yard, typically done with a machete, are considered a man's task, whether performed by a husband, father, brother, son, or hired help. Conversely, sweeping with a broom (whether around the home, patio, or yard) is viewed as a woman's responsibility (USAID, 2023).

As part of cleanup efforts around the home and yard, evidence suggests that both women and men are involved in burning household waste; however, further research is required to gauge the gendered dimensions of this practice (as discussed below). Both men and women surveyed by CCBO recognized that open waste burning is a health hazard. During FGDs, participants in all locations consistently complained about their neighbors burning trash. Likewise, “everyone – women and men – complains about being bothered by smoke from burning at dumps (*Ibid.*)” CCBO found that men were as likely as women to express environmental concerns and feelings of frustration or sadness when discussing the impact of waste on ecosystems. CCBO’s Trials of Improved Practices showed that there was a high level of willingness among both women and men to adopt alternate SWM behaviors – notably, to refrain from open burning, to separate plastic waste from piled patio leaves, as well as separating bathroom waste in bags. Of the 26 households that agreed to participate in the TIPs, only four did not complete the trial process. Those that did not maintain the alternate behaviors indicated that they had no other options for sufficiently addressing all their domestic waste management needs – namely, disposal of bathroom and yard waste (*Ibid.*).

“...there is a neighbor who burns things. It is close to me, and my daughter gets congested with the smoke.”

Arroyo Barril woman (USAID, 2023)

At the sector level, CCBO found that the commercialization of waste in Samaná and across the DR is highly gendered due to structural and cultural factors that impede women’s involvement and advancement. As a result, women are relatively absent across the SWM value chain, working almost exclusively as IWCs at dump sites. Akin to their counterparts in many LMICs, they lack access to high-value waste streams, equipment, vehicles, financing, and markets needed to collect, transport, process, and sell recyclables. In addition to the severe health risks they share with male IWCs, women IWCs face the threat of sexual harassment and gender-based violence (*Ibid.*; Aidis and Khaled, 2019).

## 5. Case study analysis and insights

### 5.1 Drivers of open waste burning

#### ***Domestic burning of household waste***

Open burning is widely practiced across Samaná Province. During more than 150 household interviews across the province, the CCBO research team found that households separate and burn yard waste and bathroom waste with “alarming regularity (USAID, 2023).” At the household and community levels, OWB may be considered the only option for managing certain types of waste, and even beneficial for human health and the environment – be that real or perceived. It is important to note there are no regular municipal collection services for yard waste in Samaná, and less than 20% of households and buildings in the DR are connected to a sewer system (Pimental, 2021).

Households without reliable and frequent access to waste collection services are more likely to resort to OWB. Household study respondents in many communities noted that municipal collection was generally

reliable; however, in many areas, garbage trucks do not run on a fixed schedule or operate along narrow streets, and dumpsters are not conveniently accessible. Households in outlying districts described waste collection as “chaotic” in terms of frequency and consistency of pickups. Many households thus depend on informal waste collection, which can lead to further problems around proper waste disposal – namely, open dumping and burning (USAID, 2023).

Household interviews revealed a “strong adherence” to preserve modesty, privacy, and hygiene as key reasons for burning bathroom waste. Researchers found that most people do not want their hygiene products and fecal material exposed to public view – either by dogs who might tear bags of waste left on the street for collection, or by IWCs who open trash bags at dumps searching for recyclables. Trials of Improved Practices demonstrated that, “almost everyone burns the contents of their bathroom waste container [and] relatively few people chose to stop this burning and add the bathroom waste container content to their residual waste. If this waste could be guaranteed to be kept private (i.e., inaccessible to dogs and IWCs), more people might be willing to stop burning (USAID, 2021).”

While modesty, privacy, and hygiene concerns are shared by men and women, many of the experts interviewed indicated that consideration for women’s modesty and privacy are the underlying drivers for burning bathroom waste, spurred by local cultural norms. During CCBO’s focus group discussions, participants discussed sensitive topics around toilet paper and fecal matter, but gender-sensitive waste such as feminine hygiene products were conspicuously ignored, and diapers were mentioned only once. (It is worth noting that all FGDs were mixed gender). Further investigation is required to unpack the gendered dimensions of this OWB driver, paying due attention to the presence of plastics in bathroom waste content. Sanitary pads and diapers, for example, can use synthetic plastic fibers to improve absorption, some of which release volatile organic compounds and endocrine-disrupting chemicals, potentially posing risks to women and children who use them (Woeller *et al.*, 2015, Kounang, 2021, Ishii *et al.*, 2014) as well as burn them. One of the experts interviewed for this study remarked that women’s hygiene needs are often overlooked in SWM development activities globally. This is notably problematic for households that lack both adequate sanitation and SWM infrastructure. The burning of plastic bags commonly used to collect bathroom waste poses an additional health risk that should be factored into SWM and health risk assessments.

Throughout Samaná’s rural and peri-urban areas, households burn yard waste to reduce the buildup of leaves, branches, and litter around their homes. This is a fairly common practice as part of routine household upkeep and yard maintenance, given that municipalities typically do not collect yard waste.<sup>5</sup> A perceived secondary benefit of burning yard waste is to deter mosquitoes and other pests (e.g., mice), which thrive in the heavy rainfall and high humidity characteristic of the DR and contribute to vector-borne diseases (USAID, 2023). This is consistent with findings from the limited number of recent SWM-related studies in the DR. One study conducted in the municipality of Consuelo found that the main environmental health hazards prioritized by parents of young children include air pollution from trash burning, poor sanitation, and health effects of trash accumulation. These hazards

“Regarding the burning of trash, I’ll have to burn again because there are too many branches and that generates a lot of mosquitoes.”

Las Terrenas man (USAID, 2023)

were associated with respiratory illnesses, diarrheal diseases and vector-borne diseases (Turner *et al.*, 2021). Another study by the municipality of Jarabacoa demonstrated that its open dumps caused the proliferation of insects such as mosquitoes, which transmit dengue,<sup>6</sup> chikungunya, Zika, and West Nile viruses as well as lymphatic filariae (de Prada *et al.*, 2018). A gender analysis of the 2016 Zika outbreak conducted in four provinces of the DR found that lower income and rural households are especially vulnerable to environmental health risks, particularly young children, pregnant women and the elderly. Of the households surveyed, 49% reported they had no access to waste collection services and another 51% had access only weekly or less frequently. More than 40% of households had an open dump within 100 meters. Women reported that improving household hygiene in the absence of adequate sanitation and waste collection was a primary coping strategy against the threat of mosquito-borne diseases (Cepeda *et al.*, 2017).

CCBO research and expert interviews also indicated that it is not uncommon for households to sweep up and burn incidental plastic waste – such as plastic bottles and packaging – along with leaves and debris from their patios and yards. This aligns with findings from a recent global study of plastics burning, which found that the open burning of mixed wastes that

contain plastics is a widespread practice across LMICS (Pathak *et al.*, 2024). CCBO’s Trials of Improved Practices demonstrated that both men and women share a high level of willingness to segregate their waste, rooted in prior practices and a strong concern for the environment and plastic pollution; however, respondents stressed that they lack alternatives for dealing with plastic waste. Some people thus resort to burning plastics and other waste to prevent littering and protect the environment.

Ultimately, CCBO’s behavior change trials demonstrated that refraining from burning waste was unpopular among men and women, mostly because the SWM system is unable to address their underlying reasons for domestic burning.

### ***OWB by the informal sector and municipal waste workers***

CCBO researchers found that complaints of smoke and lingering fog from burning at the dumps were made consistently in each city (USAID, 2023). While there are no quantitative data regarding the prevalence of OWB by informal and/or municipal waste workers, anecdotal reports suggest that it is not an uncommon practice. There is no evidence to indicate women’s involvement in OWB at this level. Some of the experts interviewed noted that women IWCs have no motive to burn waste given their highly constrained role in the SWM value chain; and one highlighted the fact that women IWCs may even be disincentivized to openly burn because this could jeopardize the types of waste women seek to recycle (e.g., paper, discarded hotel soaps, etc.).

“Sincerely, not only the garbage in the house has to be eliminated, many people send (people carrying garbage for others) to dump garbage on the beach, and when they leave it, you have to take care of it. The plastics are burned, all the garbage bags that they throw away must be burned... The truck only goes through the main street. It does not come down here.”

Sánchez man (USAID, 2023)



*Motoconchero, Samaná Province, DR.  
Photo credit: CCBO*

At the level of waste collection and transportation, open dumping is not uncommon, but further research is required to determine the prevalence of uncontrolled burning. Household survey respondents and experts interviewed shared that *motoconcheros* (young men who operate motorcycles for hire mainly to transport passengers, but also to run errands, including collecting and disposing of residential waste) and municipal waste collectors may be diverting waste from final disposal sites and dumping or burning it. CCBO's research suggests that this could be to avoid the time, effort, and/or costs associated with transportation. Evidence suggests that a combination of other factors also may be at play. This includes controlling the proliferation of pests to prevent disease, controlling waste volumes, and minimizing litter to protect the environment.

Several experts interviewed for this study noted that prior to CCBO's dump site remediation efforts, municipal waste workers burned waste to prevent accumulation and the spread of disease (e.g., by burning dead animals). In Samaná, one expert recounted that prior to remediation, municipal workers burned waste to control the problematically high number of flies at the open dump site, given its location uphill from the nearby city and in response to complaints from residents. Another expert noted that many men who work in fishing and tourism also work part-time as *motoconcheros* to subsidize their income. Given their heightened exposure to the effects of waste pollution on their primary source of livelihood, those who collect household waste (which notably contains plastics) may be burning it because they consider it a better alternative than open dumping, which directly threatens their livelihoods. This requires further investigation. Survey respondents also reported that men who work informally selling items to tourists along Samaná's beaches were seen burning waste. Given the excessive amount of waste that is openly dumped on beaches and discarded by tourists (much of which is plastic), these men use burning as a method of cleanup to keep the beaches attractive to tourists. These observations suggest a socioeconomic incentive to openly burn waste when it is perceived to be the best option for protecting the environment and livelihoods.



*Plastic waste washes up on the beach in the touristic town of Las Terrenas, Samaná Province. Photo credit: iStock.com/ukayacan*

## 5.2 Divisions of labor

### ***Domestic burning of household waste***

Perhaps the most notable finding in CCBO's study of household waste management in Samaná is what is not gendered. Contrary to widely held assumptions about women's role in household waste



management, CCBO found that waste disposal in Samaná is not considered a woman's responsibility. The men and women surveyed indicated that there is no strict gendered division of labor and that whoever is available takes on the task. This was considered a pragmatic approach to waste disposal given that collection is not necessarily consistent or reliable, leaving it curbside is not desirable, and local employment patterns are in flux. Researchers found that when it is not a time-sensitive activity, waste disposal is a household task that is shared across genders and generations (USAID, 2023).

Despite this inclusive approach, the men and women surveyed indicated clearly that women most often undertake the task of disposal on account of their availability and predominant presence in the home (*Ibid.*). Globally, women's disproportionate presence in the home is indicative of the often invisible gender inequalities tied to women's domestic work and time poverty burden. Regardless of people's perceptions, women's disproportionate role in household waste management increases their time poverty, constraining women's ability to engage in other productive spheres. Further research is required to determine whether women's disproportionate role in domestic waste disposal extends to open burning. Evidence of this kind is important to effectively assess the health risks and socioeconomic costs of OWB, especially given the gender- and age-related health vulnerabilities of women and girls.

As mentioned previously, CCBO found that it was common for households to sweep up and burn incidental plastic waste along with leaves and debris from their patios and yards. Anecdotal evidence indicates that women – who assume the gendered responsibility of sweeping – also engage in burning the small amounts of swept up debris as part of routine cleaning chores. Meanwhile, men are more likely involved in the periodic burning of bulkier, larger volumes of yard waste (such as branches and bushes) requiring greater physical effort and the use of machetes for chopping. Several experts noted that young girls and boys sometimes support their parents with household upkeep, and thus may participate or be present alongside their parent(s) when burning residential waste, directly exposing them to toxic fumes and ash. Further research is required to understand these important nuances in the division of labor around domestic burning. That said, evidence from Samaná clearly indicates that women's involvement in OWB at the household level is not uncommon.

CCBO researchers concluded that segregation of kitchen waste is one of the few gendered waste behaviors at the household level. Dominican women native to Samaná are responsible for organic kitchen waste (fruit and vegetable peelings, etc.), which they put in a bucket and leave out for those who own pigs or pig farms to collect. Further research is required to understand the contribution of women in this area and opportunities to scale efforts through entrepreneurship.

### ***OWB by the informal sector and municipal waste workers***

As noted above, beyond the female IWCs at municipal dump sites, waste management is undertaken exclusively by men. While most of the households surveyed by CCBO reported not paying for regular trash collection, exceptions to this were observed throughout the province. Some respondents reported paying municipal workers for "unusual" pickups including bulky items. A more common alternative is to pay a small fee (less than US\$1.00) to a *motoconchero* to take away the trash, dump it into a pit or a river, or burn it (USAID, 2023). Further research is required to determine the prevalence of OWB in this case, as well as gender-related issues around decision-making, willingness to pay, among others.

Domestically and in the informal recycling sector, the division of labor around OWB and the roles of women compared with men remains cryptic. Understanding who takes on the task of burning, why, what they burn, and how frequently, has critical implications for devising effective SWM solutions and SBCC strategies, and to properly assess and address health risks. The void of gender analysis and sex-disaggregated data in this regard is glaring.

### 5.3 OWB impacts and risks for women and girls

In addition to findings from CCBO's research and the expert interviews, this paper draws on the growing body of knowledge around gender and SWM globally, and the robust evidence and best practices in support of women's economic empowerment and gender equality. Through this lens, analysis suggests that women and girls who are exposed to open waste burning face several disproportionate risks tied to their gender roles in society and/or their increased vulnerability to environmental hazards. This includes women and girls exposed to OWB during domestic burning and waste disposal, women IWCs working at dump sites, as well as family members of IWCs and low-income households residing in proximity to dump sites. Below is a brief overview of potential OWB gender impacts and risks to consider:

#### A. HEALTH RISKS

- **Exposure to toxic emissions:** Women and children, especially girls, in many LMICs are often tasked with managing household waste. In low-income communities that lack adequate waste infrastructure and services, their proximity to waste burning sites exposes them to toxic air and chemical pollutants, including black carbon, dioxins, and furans. Children living near these dump sites have been found to ingest and inhale these toxic substances (Mebratu and Mbandi, 2022). Exposure to such pollutants can lead to reproductive health problems, including infertility, low birth weight, premature death, and cognitive developmental problems in children, as well as respiratory and cardiovascular diseases, and cancer. Young children and older adults with preexisting respiratory conditions such as asthma and chronic obstructive pulmonary disease (COPD) are the most vulnerable to the immediate adverse health impacts of open-air burning (*Ibid.*; International Waste Platform, n.d.).

#### B. ECONOMIC AND SOCIAL RISKS

- **Livelihood vulnerability:** Women who work in the informal recycling sector are among the most economically vulnerable members of society. Open burning of waste can reduce the recyclability of the materials they collect and sell, jeopardizing their livelihoods and exacerbating poverty.<sup>7</sup>
- **Increased workload and time poverty burden:** Women and girls who bear the responsibility of managing waste in communities without access to adequate MSW management systems bear the burden of increased domestic workloads. This reduces their time for education, income-generating activities, leisure, and personal care. In other words, household waste management (including OWB) can contribute to women's time poverty burden, perpetuating gender inequalities and limiting their opportunities for economic and personal advancement.
- **Increased unpaid care burden:** The overall health impact on communities due to open waste burning affects women disproportionately as they often care for sick family members, thus increasing their unpaid care burden in addition to their emotional and physical stress.

#### C. ENVIRONMENTAL RISKS

- **Water and food insecurity:** The pollutants from OWB can contaminate local water sources and soil, affecting agricultural production and water quality. As a result, women and girls who are

responsible for fetching water and managing household food production can face increased difficulty in securing clean water and food. This includes traveling farther distances, which can increase vulnerability to sexual harassment and gender-based violence.

Addressing these threats requires gender-inclusive policies and programs that recognize the primary and secondary impacts of OWB on women, children, the elderly, and informal recyclers.

## 6. Conclusion

The intersection of gender and open waste burning is a nascent field of study suffering chronic data deficiencies symptomatic of the gender-waste-environment nexus. The case of Samaná demonstrates how OWB is driven by both inadequate SWM systems and socioeconomic factors wherein gender plays a nuanced yet poorly understood role. Both women and men – and to some extent, possibly girls and boys – are involved in domestic OWB in Samaná, which entails burning of bathroom waste together with yard waste and incidental plastic waste. However, further research is required to clearly discern who is burning which type of waste, why, and how frequently.

While men and women share concerns over hygiene, privacy, and modesty when it comes to bathroom waste burning, anecdotal evidence suggests these concerns pertain to women’s modesty and privacy, demanding further study of gender-differentiated waste management needs. Anecdotal evidence also suggests that women may be more involved in routine burning of small waste piles as part of day-to-day cleaning – that is, debris swept up from the patio and garden, including leaves and plastic litter – while men are likely involved in periodic burning of larger volumes of yard waste (branches and brush).

Challenging commonly held assumptions around women’s role in household waste management, CCBO found that waste disposal is deemed a non-gendered task in Samaná. Nevertheless, women disproportionately take on this activity. Further research is required to determine to what extent this task includes OWB, given the serious implications for women’s reproductive health and time poverty burden. OWB presents disproportionate health risks and socioeconomic impacts for women globally that beg further investigation. In communities where OWB is problematic, its adverse health impacts on residents may translate to an increased care burden for women who typically attend to sick household members. In addition, women and girls may face greater water and food insecurity in communities where OWB is contaminating local water sources and agricultural lands, including the increased risk of gender-based violence as they are forced to travel farther to secure clean water and food.

Though men and women across Samaná expressed serious concern over the impacts of OWB by neighbors and at dump sites, and demonstrated a willingness to end the practice, the absence of adequate waste collection is their primary obstacle to doing so. Furthermore, the perceived benefits of OWB – such as reducing the risk of vector-borne diseases and preventing plastic pollution from open dumping – serve as incentives to maintain the practice and may even lead to increased burning in communities vulnerable to the threat of vector-borne outbreaks or for those whose livelihoods are negatively affected by plastic pollution. Future socioeconomic and gender analyses of OWB must therefore look beyond households and the informal recycling sector to include other informal sectors

that engage in the practice. Despite the detrimental implications for IWCs and municipal waste workers, no data are available on their involvement in OWB in Samaná or elsewhere in the DR. Future research in this area should examine gender-differentiated drivers and divisions of labor around OWB among IWCs and how this relates to gendered variables across the SWM value chain.

## 7. Recommendations

Ending OWB requires people-centered, gender-informed strategies to address both the systemic and socioeconomic drivers and impacts of the practice in LMICs. Doing so successfully demands an integrated approach employing a gender and social equity lens to ensure the needs, roles, resources, constraints, and potential of all members of society – especially the most vulnerable and underserved – are considered. The following are practical recommendations and actionable strategies for practitioners and policymakers seeking to take gender-responsive actions to end OWB:

### A. GENDER-INCLUSIVE PLANNING AND POLICYMAKING

Integrate a gender and social inclusion lens in OWB-related research, policies, and planning to ensure gender differences and needs are recognized, including:

1. **Mandate the collection of sex-disaggregated data and gender statistics** on SWM and OWB in relevant surveys and assessments.
2. **Include domestic open waste burning in national emissions inventories and assessments of SLCPs.** In the DR and across LMICs, this is important to accurately quantify the environmental and socioeconomic costs of domestic OWB, and thereby advocate that resources be allocated where they are needed most.
3. **Build local institutional capacity to conduct gender analysis.** Appoint, train, and mentor a gender focal point within municipal waste management units and/or other relevant local entities.
4. **Enable the equitable participation of women** in SWM and OWB policy planning and decision-making processes, prioritizing the voices of those most affected.
5. **Provide economic incentives to recycling and waste enterprises – formal and informal – as well as special incentives to women-owned businesses** that address high-impact open burning waste streams and contribute to a more circular economy.

### B. GENDER-INCLUSIVE PROGRAMMING, MONITORING, AND EVALUATION

1. **Integrate gender and social inclusion (GESI) analyses in OWB assessments and SWM programs.**
  - Ensure activities consider the differential risks, behaviors, needs, and implications for women, men, girls, and boys – including pregnant women, the elderly, the informal sector, and marginalized groups.
  - Use the data to map access to waste collection services disaggregated by gender and income to determine where improvements are most needed.
  - Bridge knowledge gaps by pairing gender and SWM experts.

#### *INTEGRATING GESI ANALYSIS*

GESI analysis should not be a standalone, check-box exercise. The insights gained must be integrated throughout the project lifecycle, guiding implementation of gender-responsive activities based on clear recommendations arising from the analysis.

2. **Actively consult and engage women in the design, implementation, and monitoring of OWB strategies** including infrastructure and service delivery improvements and SBCC campaigns.
  - Ensure safe and equitable gender representation and participation among all stakeholders.
  - **Create safe spaces for women** to express their views and concerns about waste management and OWB. (The Samaná case study reminds practitioners of the importance of creating forums where women are comfortable to discuss sensitive issues around hygiene and modesty.)

Ensure women’s needs and experiences inform the design and timely adjustment of activities.
3. **Leverage strategic entry-points for integrating OWB prevention with a gender lens.** Adopt a cross-sector approach to maximize resources and impact, as well as break knowledge silos<sup>8</sup>. Novel approaches may include:
  - Address domestic OWB in health projects focused on mitigating household air pollution and the effects of cooking fuels.
  - Include the burning of bathroom waste in SBCC campaigns focused on improving household and community sanitation. (See text box.)
  - Integrate OWB and plastics burning into SWM programs, policies, and research, especially those focused on reducing plastic pollution.
4. **Establish gender-sensitive monitoring, evaluation, and learning systems** to track and assess the qualitative and quantitative impacts of interventions for men and women. This includes gender-specific indicators and targets. Use the data to refine and improve strategies over time.

**PROMOTING OPEN BURNING FREE COMMUNITIES IN INDIA**

Engineering X grantee, the Administrative College of India, developed the country’s first Open Burning Free campaign, which it integrated with its Open Defecation Free initiative to raise awareness of the adverse impacts of OWB among decision-makers and citizens and improve MSWM systems.

### C. OWB AWARENESS AND EDUCATION

Implement gender-sensitive SBCC and awareness campaigns *in tandem* with SWM improvement plans. Efforts to change behaviors around OWB will be unsustainable and/or unsuccessful without addressing the systemic deficiencies in SWM and the key drivers of OWB among women and men.

1. Promote safe and sustainable waste management practices that **recognize gender differences and encourage shared responsibility** among women and men.
2. **Provide gender- and age-specific information** on health risks from OWB exposure in SBCC campaigns relating to SWM and plastics pollution, as well as household sanitation and cooking fuels.
3. **Include all stakeholders** – municipality, households, informal sector, and enterprises, as well as schools – to ensure youth inclusion. Special attention should be paid to including women and members of the informal recycling sector, as well as other informal sector actors that practice and/or are exposed to OWB (e.g., motoconcheros, individuals involved in beach tourism).
4. **At the household level, provide information and demonstrations on alternate waste behaviors**, such as composting and segregation at source, taking into consideration local gender norms and opportunities to bolster gender equity.
5. **Engage local leaders, including women leaders**, to disseminate information and drive behavior change. Use educational materials accessible to both genders and leverage community influence to promote gender equality in waste management.

### D. GENDER-RESPONSIVE WASTE INFRASTRUCTURE AND COLLECTION SERVICES

1. **Provide gender-responsive waste collection services:** Design waste collection systems that consider the needs of women, e.g., ensuring privacy, accessibility, safety, and convenience.

2. **Develop gender-responsive waste disposal infrastructure:** Invest in community waste management infrastructure and services including recycling centers, composting facilities, and secure dumpsters that are safe, accessible, and convenient for women and men, and that generate economic opportunities for informal sector integration and women's entrepreneurship.
  - In Samaná, for example, CCBO experts suggested a municipal pilot using compacting bin technology, where bathroom and other waste could be immediately compacted, thus preventing retrieval by IWCs or exposure by stray dogs.
3. **Incentivize women's entrepreneurship in OWB-related high-impact waste streams.** Build on current and/or prior norms that support the 3Rs to develop and scale local circular economy solutions that mitigate OWB, with a focus on women and the IRS. For example, in Samaná, explore the creation of women-led community-based enterprises and/or cooperatives to aggregate and sell plastic recyclables to aggregators.

## E. GENDER-RESPONSIVE TECHNOLOGICAL SOLUTIONS

1. Leverage the use of **affordable, appropriate, gender-inclusive technologies** to engage all stakeholders in monitoring SWM services and OWB incidents, and as an SBCC tool to educate and raise awareness among stakeholders (see text box). This can help to build mutual trust, transparency, and accountability among citizens, the informal recycling sector, and municipalities. Used correctly, digital platforms can also offer a **safe space and time-efficient method for women's participation**. Solutions include:
  - Use common digital applications and communications platforms to enable citizens, enterprises, and municipalities to monitor, document, and report incidents of open waste burning to municipal authorities to act. Enabling feedback loops can strengthen accountability and motivate citizens, IWCs, and municipalities to take action to end OWB. Such tools can also help to fill critical data gaps on OWB locally.
  - Employ GPS tools to monitor municipal waste collection to (1) improve timeliness and coverage of waste collection services; and (2) ensure that trucks are following collection routes and not openly dumping (and possibly burning) waste *en route* to landfills.

## F. COLLABORATION

1. **Strengthen intergovernmental cooperation and capacity to address gender and OWB/SWM.** Support greater collaboration on OWB and SWM between national and municipal government entities and involve relevant government entities focusing on women and youth.
2. **Establish cross-sectoral OWB working groups (WGs)** – for example, health, SWM, and WASH – to conduct gender-informed research and to establish gender-inclusive targets, policies, and programming that address OWB at the household and informal sector levels. WGs should include gender and social inclusion experts specializing in the relevant sectors.
3. **Share learnings on the gendered dimensions of OWB across local and international institutions (donors, NGOs, academia) and sectors** through knowledge platforms, international conferences, online forums, and joint research to build the evidence base, raise awareness, and advocate for gender-inclusive solutions to end open waste burning.

## 8. Appendices

### 8.1 Terms and definitions

**Gender:** Different from biological sex (male/female), gender is a sociocultural construct that defines, describes, and characterizes the roles, behaviors, and activities expected and deemed acceptable for men, women, and other genders, influencing their interactions. Typically viewed on a feminine-masculine spectrum, gender affects power dynamics between individuals and groups. It is shaped by social, cultural, political, and economic values and structures, making gender roles and relationships dynamic, subject to change over time, and highly variable across and within cultures ([IUCN, 2021](#)).

**Gender analysis:** A form of socioeconomic and sociocultural analysis that aims to identify, understand, and describe gender dynamics regarding roles and norms within a specific context and among various social groups (such as those based on class, age, disability, ethnicity, race, sexuality, etc.). It examines how these dynamics influence access to resources, services, opportunities, and benefits for women and men; the mechanisms that sustain these dynamics (like cultural norms, beliefs, and institutional systems); and the ways in which women and men challenge and transform existing inequalities. This analysis helps explore the effects of gender roles and norms on individuals' lives at different levels, from the micro (family, community, project interventions), to the meso (service delivery systems, institutions, local government), and the macro (national policies, laws, development planning) levels (*Ibid.*).

**Gender lens:** Takes the existing differences between women and men into account when analyzing a situation or when developing specific approaches or programs ([UNESCWA](#)).

**Motoconcho:** A motoconcho is a motorcycle used for hire, primarily for transportation. Sometimes there may be cart welded to the frame of the motorcycle. Motoconcho refers to both the driver, the motorcycle, and the activity.

**Motoconchero:** Often referred to simply as motoconchos, motoconcheros are exclusively young men who operate motorcycles for hire. They transport passengers, but also may be hired for errands, including collecting household waste for a small fee (~RD\$50 = >US\$1.00).

**Time poverty burden** refers to the condition where individuals, particularly women, are constrained by excessive unpaid domestic and care work, leaving them with insufficient time for rest, leisure, education, or paid employment. This phenomenon exacerbates economic and social inequalities by limiting opportunities for personal and professional development.

**Unpaid care work:** All unpaid services provided by individuals within a household or community for the benefit of its members, including care of persons and domestic work. Common examples include cooking, cleaning, collecting water and fuel, and looking after children, older persons, and persons with illness or disabilities. Women and girls have disproportionate responsibility for unpaid care and domestic work; globally they spend three times as much time on this work as do men and boys. Unpaid care work is one of the main barriers preventing women from moving into paid employment and better quality jobs. ([UN Women, 2022](#))

## 8.2 CCBO research methods and scope

One of the key objectives of CCBO has been to develop a comprehensive social and behavior change (SBC) strategy in Samaná Province to improve SWM and address the waste pollution crisis, with a focus on plastic waste and empowerment of women and the informal sector. However, there was little information published and available on Samaná's waste value chain, household waste practices, and communities' feelings and ideas about waste. Therefore, to inform design of the program's SBC strategy and gain further insights on women's role in the SWM value chain in Samaná Province, CCBO undertook formative qualitative research including in-depth interviews, focus group discussions, and household interviews.<sup>1</sup> The research explored peoples' perceptions of trash; existing and historical 3R (reduce, reuse, recycle) practices and SWM; understanding regarding what should be done with the trash; views on the economic and social costs of litter; and potential and practical solutions to the waste crisis.

### Case study area: Samaná Province, Dominican Republic

Samaná—the name of the peninsula, province, and capital city—is part of the Northeast Region of the DR and has an area of 844.99 km<sup>2</sup>. It is the seventh largest province in the Republic and home to seven protected areas. It limits to the north and east with the Atlantic Ocean, to the south with the Bay of Samaná—a globally vital whale breeding ground, primary fishing, and shrimping area—and part of the Monte Plata and Hato Mayor provinces, and to the west with the María Trinidad Sánchez and Duarte provinces.

FIGURE 1. MAP OF SAMANÁ



An estimated 180,000 tourists visit Samaná every year. According to the National Population Census, carried out by the National Statistics Office in 2022, the number of inhabitants in this province is 114,468, of which 57,245 are men and 57,223 are women, of which 49,774 inhabitants reside in urban

<sup>1</sup> The research was conducted by a consortium of local Dominican partners led by Centro para la Conservación y Eco-Desarrollo de la Bahía de Samaná (Center for Conservation and Eco Development of the Samaná Bay (CEBSE)) and supported by an international research expert, under the direction of CCBO's Director of Social and Behavior Change and Gender, Laurie Krieger, PhD. The other consortium members include Foro Ambiental de Samaná (Environmental Forum of Samaná (FAS)) and Ecoservices.



areas and 64,694 in rural areas (ONE, 2023). The province is comprised of three municipalities, Samaná, Sánchez, Las Terrenas, with three municipal districts: El Limón, Arroyo Barril, and Las Galeras.

### Data Collection and Analysis

From 2020 to 2021, the CEBSE team conducted research in six cities across Samaná’s three municipalities. This research included multiple phases, beginning with a household study of waste, examining women’s role in the SWM value chain, including interviewing IWCs and waste aggregators at all levels, holding FGDs, and interviewing businesses. This formative research study consisted, in total, of 208 interviews and nine FGDs – one in each city, an additional FGD in Las Galeras (see below), and two FGDs with informal waste collectors. A summary of the populations engaged in this research is presented in Table 1. Finally, data from this research informed the Trials of Improved Practices (described below).

**TABLE 1: POPULATION SAMPLE**

Study type	Total	Males	Females
<b>Household survey</b>			
	154	57	97
<b>Focus group discussions</b>			
Informal Waste Collectors	16	7	9
Aggregators	11	10	1
Businesses	15	11	4
TIPs (Residents)	26	n/a	n/a
<b>Total</b>	<b>222</b>	<b>85</b>	<b>111</b>

Household interviews were conducted in each city and corresponding district and employed in-depth, open-ended interview schedules—30 in each city and 20 in each district, for a total of 154 interviews. Interviews were conducted over a six-week period and lasted approximately 90 to 120 minutes. Researchers balanced the demography of participants to include males and females as well as religion, age, educational and

socioeconomic diversity. Within each city, and to some degree in outlying districts, the CCBO research team selected a diversity of neighborhoods to ensure that all income levels and sectors of the community were included. For example, in Las Terrenas and Las Galeras, the two locations with significant non-Dominican populations, efforts were made to include expatriate neighborhoods and households. In Samaná and Sánchez, efforts were made to include the range of socioeconomic groups by targeting specific neighborhoods. In general, there was an effort to encourage female participation, and where this was unsuccessful, as in El Limón, additional households were added (four in El Limón) (USAID, 2023). (Table 2 provides sex-disaggregated demographic data for household interviews).

**TABLE 2. DEMOGRAPHIC DATA FOR HOUSEHOLD INTERVIEWS**

City	Total	Female	Male	Age	Religion*			Nationality		Education		
					E	C	O	Dominican	Other	Primary	Secondary	University
Sánchez	30	23	7	25-70	14	12	4	30	0	10	7	13
Arroyo Barril	20	14	6	18-68	3	16	1	20	0	11	7	2
Las Terrenas	30	13	17	18-72	10	8	12	22	8	3	15	9
El Limón	24	8	16	20-60	5	14	1	19	1	2	12	6
Samaná	30	24	6	18-73	7	13	10	30	0	6	14	10
Las Galleras	20	15	5	30-54	2	1	17	13	7	2	7	11

To explore themes and additional questions that arose during household interviews, the research team held seven FGDs – one at each site, plus an additional FGD in Las Galeras to ensure inputs from the local Dominican population, as well as gender balance. (The focus groups were mixed gender, except for Las Galeras, where despite efforts to engage a broad range of community members, only expatriate women attended. The research team subsequently added another FGD in this city to hear from the Dominican community, and in this focus group only Dominican men attended.)

Focus group discussions were also held among IWCs. In total, 24 men and 33 women participated in the FGDs. In addition, open-ended interviews were conducted with eight male and nine female IWCs; eleven local, regional, and national aggregators; seven local authorities; and 15 tourist and local business owners and operators (USAID, 2023).

Finally, building on the in-depth interviews and FGDs, the team then conducted Trials of Improved Practices (TIPs), a method that combines research and implementation to see what behaviors or policies should be promoted. The research team used TIPs to test six to seven alternate waste management behaviors in the three focus municipalities, including refraining from open waste burning.

### **Trials of Improved Practice (TIPs)**

TIPs is a rapid research method used for over 40 years in the health sector to determine what behaviors people are able and willing to adopt for program implementation. This iterative technique involves asking a small sample of a population to try out new or modified behaviors in their daily lives for a short period. For the CCBO DR research, households previously interviewed during qualitative research were asked to try behaviors supporting improved solid waste management (SWM) and recycling. TIPs is always conducted after qualitative research to ensure researchers understand which behaviors are feasible for participants. Researchers then develop a menu of possible environmentally supportive behaviors based on the results.

### 8.3 Expert interviews and consultations

	<b>Name</b>	<b>Position</b>	<b>Organization</b>	<b>Date</b>
1	Daniel Abreu	CCBO Samaná Coordinator	CEBSE	7/24/24
2	Maria Caram	Project Manager and Analyst (women's study)	EcoServices	6/22/24
3	Laurie Krieger, PhD	Social and Behavior Change and Gender Director	CCBO	5/13/24
4	Natividad Pantaleon	Coastal Sustainability Expert	CEBSE	5/21/24
5	Kathleen Skoczen, PhD	Professor and Chair, Department of Anthropology; Social and Behavior Change Consultant	Southern Connecticut State University; Manoff Group	5/28/24
6	Lori Scozzafava	Governance and Capacity Development Director	CCBO	5/16/24

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## 8.5 Endnotes

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<sup>1</sup> Initiated in 2019, CCBO is a USAID program being implemented in Indonesia, the Philippines, Sri Lanka, the Maldives, Vietnam, Fiji, Federated States of Micronesia, Papua New Guinea, Peru, and the Dominican Republic. As a cross-cutting objective, CCBO works to support and enhance the livelihoods of those working in the waste and recycling sectors, particularly women, as well as advance gender equality within the sector and opportunities for women's economic empowerment.

<sup>2</sup> The expert interviews were semi-structured and lasted approximately 1.5 hours. The interview instrument included approximately 17 questions that were primarily open-ended, allowing interviewees to elaborate on themes they felt were relevant to this study.

<sup>3</sup> 2021 estimates by the UN Inter-agency Group for Child Mortality Estimation (UN IGME), including UNICEF, WHO, World Bank, UN DESA Population Division. Available at: [www.childmortality.org](http://www.childmortality.org).

<sup>4</sup> Average weekly hours spent by the population aged 10 and over on different types of work by sex.

<sup>5</sup> One expert interviewed noted that in some places in Samana, municipalities may collect yard waste if it is bagged up; however, this was also perceived to be too much work and burning considered a more efficient solution.

<sup>6</sup> Cases of dengue are rising explosively in Latin America and the Caribbean. More than 4,500 deaths and [9.3 million cases](#) were reported in the first half of 2024, which is double the number of cases the region reported all of 2023.

<sup>7</sup> While the practice of burning e-waste and other materials to extract high-value recyclables (such as copper cables and precious metals) is not uncommon in LMICs, evidence from the DR suggests that women lack access to these higher value recyclables and are unlikely involved in this type of burning at the informal sector level.

<sup>8</sup> These approaches are especially important considering the chronic shortage of resources for municipal SWM in LMICs, the short-term duration of donor interventions, and the lack of cross-sector coordination within and among donors and government actors.