Solutions to plastic pollution with community-based behavior change

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SGP The GEF Small Grants Programme

UNDP

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Acknowledgments:

We would like to acknowledge Marie-Laure Mpeck Nyemeck (UNDP RBA / GEF SGP), Murat Okumah (UNDP HQ), Sulan Chen (UNDP HQ), and Laure Kananura (UNDP / GEF SGP Rwanda) for their time, contributions, and support in the development of this project.

Lastly, thank you to Raianna Grant and Rare team members for their contributions to this report.

Citation:

Bujold, P.M. & Williamson, K. (2025). Solutions to plastic pollution with community-based behavior change. Rare. Arlington, VA. https://rare.org/wp-content/uploads/2025/03/2025-03-solutions-to-plastic-pollution-with-community-based-behavior-change.pdf

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Executive Summary: Community-Based Behavior Change Strategies for Plastic Pollution

Plastic pollution is an urgent and far-reaching crisis that threatens natural systems, wildlife, and human health in every country. In response, nations around the world are currently negotiating a high-level treaty to coordinate plastic-reduction efforts on a global scale (Chen, Sulan et al., 2024). Nevertheless, even if an agreement is reached, no single solution can resolve the crisis alone: addressing plastic pollution will require changes at every stage of production and use, from governments enacting new regulations and businesses transitioning to biodegradable materials, to individual consumers choosing reusable items over single-use products. At the heart of these efforts, individuals and communities will play a uniquely vital role in curbing plastic waste and improving disposal practices. However, for behavior change initiatives to match the scope of the problem, they will have to be guided by robust evidence and best practices.

Historically, many community-based efforts to reduce plastic pollution have relied on conventional tactics like sharing information about plastic's harms or offering financial incentives for using sustainable alternatives (Albarracín et al., 2024; Cinner, 2018). Yet emerging insights from behavioral and social sciences suggest that these methods alone are often insufficient. Emotions, social influences, and even subtle shifts in how choices are presented (i.e., choice architecture) can significantly influence behavior, addressing many shortcomings of traditional approaches. In the context of plastics reduction, social norms, existing habits, and the design of our physical environment all play crucial roles in shaping individual behavior (Heidbreder et al., 2019; Nuojua et al., 2024). And while plastic use is highly context-dependent, only a fraction of interventions have applied behavioral insights and theories about such decisions to address single-use plastic pollution (Mathew et al., 2023).

This report examines current approaches, theories, and interventions for reducing plastic pollution and highlights the untapped potential of behavioral and social insights. By bridging the gap between conventional strategies and these powerful tools, it provides actionable, science-based recommendations for practitioners and policymakers. These insights into decision-making will help expand behavior change toolkits, enabling stakeholders to design targeted interventions tailored to specific plastic pollution challenges and drive meaningful progress toward a more sustainable future.

Key insights from the literature

Our review of over 200 studies and articles reveals that interventions to reduce plastic pollution are most effective when integrating complementary strategies. Specifically, traditional methods like financial incentives and information campaigns, while valuable, are most impactful when combined with strategies rooted in behavioral and social insights. For example:

Social Influences + Rules & Regulations

In many contexts, rules are more formalized versions of social norms, communicating what is considered right or wrong in a given place. You can use this to your advantage by enacting a law and supporting it with shared beliefs and messengers who follow the rules.

Emotional Appeals + Information

Designing informational messaging that incorporates an emotional appeal can be an effective way to motivate behavior change. Combining details about what something is, why someone should care, or how to do something with familiar and personal references.

Choice Architecture + Material Incentives

In some cases, making a behavior easier involves significantly reducing the effort, time, or resources required in addition to changing smaller hassle factors and attention.

In addition to considering the traditional levers, redesigning physical environments to make sustainable choices intuitive, appealing to emotional and social motivators to foster commitment, and crafting policies that align with human decision-making form a robust framework for driving meaningful change.

Accordingly, we organized this report around three categories identified from the literature: **choice architecture and nudges,** which shape decision-making environments; **emotional and social strategies,** which connect behaviors to personal and community values; and **behaviorally-informed incentives and policies,** which provide systemic support for lasting change. Each of these categories is most often associated with specific plastic use scenarios, with key insights detailed below.

Choice Architecture and Nudges

Well-designed choice environments can effectively guide people toward more sustainable plastic behaviors by making desirable actions the easiest or most intuitive options. For instance, stores can default to non-plastic bag choices by requiring customers to request plastic bags explicitly or by not offering them at all. Similarly, placing clearly marked recycling bins in locations that naturally align with people's movements—such as near exits or along frequently traveled paths—encourages proper disposal. Timely prompts, like labels on packaging that highlight recyclability or reminders to bring reusable bags before arriving at checkout, will further nudge individuals toward environmentally friendly decisions with minimal effort.

Physical design features and cues play a critical role in guiding behaviors not only around reducing plastic use but also in ensuring proper disposal practices. For example, visual markers on the floor that guide people to recycling stations, bins with openings shaped to match specific recyclable items, and clear instructions posted at disposal points help minimize contamination and littering via making correct disposal easier. By integrating user-friendly signals throughout the consumption and disposal process—and aligning these cues with existing habits rather than requiring deliberate thought—sustainable decisions can become more intuitive, increasing consistency and reducing reliance on conscious effort.

Emotional and Social Strategies

Beyond structural cues, tapping into social and emotional drivers can make sustainable behaviors feel personally meaningful. Connecting the use of sustainable materials (e.g., reusable bags, metal straws) or proper recycling habits to people's identities, be it personal, social, religious, or pro-environmental values, helps individuals internalize these actions as the 'right thing to do.' Highlighting how many others have already embraced these behaviors can also shift perceived social norms, encouraging more people to follow suit. For example, messaging that emphasizes the growing community of individuals choosing plastic-free options can embolden hesitant consumers.

Showcasing trusted messengers—such as community leaders, respected local figures, or peer groups—using non-plastic products and recycling correctly further reinforces these actions as socially desirable and achievable. These influential figures can demonstrate both improved usage behaviors (e.g., choosing less plastic) and proper end-of-life practices (e.g., recycling, reusing), inspiring broader adoption.

Behaviorally-Informed Incentives and Policies

Incentives and policy measures, tailored with behavioral insights in mind, can create a supportive environment for positive plastic-use behaviors. A bag tax or fee can nudge people away from single-use plastics, while policies that make sustainable alternatives—such as refill stations or reusable containers—readily available and affordable encourage longer-term shifts in consumption patterns. On the disposal side, offering convenient and well-serviced recycling infrastructure—such as reliable pickup systems, accessible drop-off centers, or household bins and bags—reduces friction and makes correct disposal a more natural choice.

Policy interventions like unit-based pricing for waste (pay-as-you-throw) bring the cost of disposal habits into immediate focus, encouraging more thoughtful decision-making. Where politically and culturally feasible, bans on certain plastics, combined with strong enforcement, can significantly reduce plastic waste too. In other contexts, providing pro-social rewards—such as automatically donating to a charity when someone opts out of plastic use—leverages people's desire to contribute positively to society (and the shame of not doing so), reinforcing both sustainable usage and proper disposal behaviors that align with broader sustainability goals.

Addressing plastic pollution effectively will require a comprehensive, evidence-based approach that integrates traditional methods with innovative behavioral and social strategies. This report offers a robust categorization of interventions old and new—spanning choice architecture and nudges, emotional and social strategies, and behaviorally-informed policies—and provides actionable, science-based recommendations for tailoring these approaches to specific challenges. By implementing these targeted interventions, communities and policymakers can foster sustainable behaviors and ensure proper reduction, reuse, recycling, and clean-up of plastic waste, paving the way for a cleaner, healthier future for our planet.

Introduction

Introduction

Among the world's many environmental challenges, plastic pollution stands out as one of the most visible. It is evident in our oceans, streets, rivers, and homes; it is found in wildlife and even within our own bodies. Although the global plastic supply chain reaches every corner of society, its impacts often hit individuals and communities hardest—especially those with less influence over policy and business decisions. In response, community-led efforts have emerged as a critical line of defense against the plastics crisis. People take action where they live, inspiring others to reduce, reuse, recycle, and clean up plastic. Yet, despite these inspiring initiatives, there remains a pressing need to strengthen and scale these behavior change solutions to effectively address the growing challenge of plastic pollution.

This report addresses that need by categorizing and synthesizing insights from over 200 examples of behavior change interventions targeting plastics. It examines the limitations of traditional approaches to plastics reduction while incorporating the latest findings from behavioral and social sciences, ultimately providing evidence-based recommendations for community-level action against the plastic crisis.

The Challenge and Opportunity: Reducing Plastic Waste

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Plastic materials have become indispensable in our everyday lives due to their being versatile, flexible, durable, and low-cost (Law, 2017). However, the overproduction and improper disposal of plastic pose a significant threat to human health and the environment. Plastics are everywhere with significant and far-reaching impacts; humans create hundreds of millions of tons of plastics annually, half of which is burned, dumped, or managed improperly, leading to pollution (WWF, 2021). Scientists evaluating various planetary boundaries for Earth systems estimate that the amount of plastics in our environment has entered a high-risk zone, potentially threatening other important processes that sustain life (Richardson et al., 2023). Moreover, plastic pollution has contributed to global injustices and inequities, where vulnerable and historically marginalized communities are the most likely to live near polluted areas, incinerators, and dump sites where plastics leach harmful chemicals as they break down (United Nations Environment Programme, 2021).

Plastics negatively impact our natural resources, biodiversity, and climate. Their lifecycle also contributes to approximately 1.8 billion tons of greenhouse gas emissions each year and contaminates our food, soil, and water. The efforts to mitigate plastic pollution are expensive, with high costs of nearly US$50 billion in management and cleanup each year (WWF, 2021). Single-use plastics have had an especially detrimental effect on marine species and comprise 60–95% of all marine plastic pollution worldwide (Schnurr et al., 2018). Addressing the many challenges posed by plastics will require a systemic effort involving solutions by and for governments, industries, communities, and individuals.

Fortunately, the plastics crisis has mobilized an international movement for action. In late 2024, the United Nations Environmental Programme gathered parties from around the world to develop a legally binding agreement that fights against plastic production and consumption (Chen, Sulan et al., 2024). While the parties were unable to finalize the treaty by the end of 2024, its successful adoption in the future could accelerate the implementation and regulation of plastics in 100 countries and enhance effective plastic waste management in 100 cities and islands (Del Rio, Dawn, 2023). Numerous global organizations have also made fighting plastic waste a priority and are setting their own ambitious goals and targets.

What does it mean to focus on behaviors and behavior change?

Behaviors are the actions that people take or do. **Behavior change** is the process of changing what people do, increasing, maintaining, or decreasing a current behavior, or adopting a new behavior. Alternatively, behavior change is the result of a process that targets motivating a change in behavior.

Addressing plastic pollution will require many different people to change their behavior; one important area of action is at the community level. For communities that are often end-users in the plastic lifecycle, there are two main categories of plastic behaviors to change: one is reducing plastics consumption and usage through specific actions such as choosing sustainable alternatives and abstaining from plastics. The other category is proper disposal and reuse through actions such as recycling, upcycling, and not littering (Nuojua et al., 2024). Both categories involve everyday behaviors that present great opportunities for behavior change solutions.

Communities around the world have already found successful ways of encouraging sustainable alternatives to plastic use and waste management. From plastic bans and community clean-ups to sustainable action modeling and waste management training, there are dozens of excellent examples of what works and opportunities to scale these solutions. Our ability to shift behaviors among communities will be an important part of solving the plastics pollution crisis.

Why Behavioral Science Matters for Plastic Management

Plastic-use behaviors are driven by a unique set of psychological, social, and contextual motivations and barriers. A recent meta-analysis on behavior change strategies to reduce plastic pollution showed that interventions applying behavioral science (such as varying the framing of a behavior's impact, using timely prompts and visual cues, or increasing people's perceived self-efficacy to change) had some of the biggest impacts on people's behavior (Allison et al., 2022a). Yet despite these findings, many plastics campaigns today still focus mainly on information dissemination and regulatory or economic strategies with mixed effects and weak evaluation metrics.

Providing information and building awareness are often the initial strategies employed to encourage changes in plastics-related behaviors. While increasing knowledge or engagement with an issue can play a valuable role in behavior-change efforts, these strategies alone rarely result in lasting behavioral change (Abrahamse & Matthies, 2018). The tourism sector provides a clear example of this phenomenon. Studies on plastic use within tourism contexts indicate that while tourists are generally aware of environmental issues, such as plastic pollution, information alone is less influential than factors like convenience, cost, and situational context (Budeanu, 2007; Juvan & Dolnicar, 2017). In Greece, for example, an informational campaign on plastic bag use and its impact on marine species around the


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Greek islands found that while willingness to pay for protective measures increased, plastic use behavior did not change (Latinopoulos et al., 2018). This outcome exemplifies a challenge of information-based strategies: they often generate changes in intention but fail to translate into actionable behavior without addressing additional barriers or motivators (Osman et al., 2020). This disconnect, known as the "intention-action gap," is a key consideration in designing effective behavior change interventions (Sheeran & Webb, 2016).

That is not to say that information interventions should be avoided, as there are situations where clear, well-designed information can bridge the gap between intentions and actions. Decision-aiding tools—or "boosts"—can be particularly effective because they provide decision-makers not just with raw information, but with actionable skills or easy-to-remember heuristics to help them follow through on their intentions. For example, boosts have been shown to improve decision-making in various domains by empowering individuals with the tools to navigate complex choices (Banerjee et al., 2022; Grüne-Yanoff & Hertwig, 2016; Hertwig & Grüne-Yanoff, 2017).

This is especially relevant in addressing behaviors like "wishcycling"—the act of mistakenly placing non-recyclable items into recycling bins, which contaminates the recycling stream and often results in recyclable materials being diverted to landfills. Interestingly, individuals with strong pro-recycling motivations are often more prone to wishcycling, indicating that the problem stems not from a lack of motivation but from unclear or incomplete information about what is recyclable. To tackle this issue, Kramer et al. (2023) designed an intervention that (1) communicated the community benefits of correct recycling, (2) delivered highly specific and targeted requests to recycle correctly (including a simple rhyme to help people remember proper behaviors), and (3) set clear social expectations about recyclable items. This intervention, which incorporated behavioral insights to provide structured and actionable information, resulted in a 14.8 percentage-point increase in the proportion of correctly recycled items, highlighting the effectiveness of thoughtfully designed boosts in addressing intention-action gaps and promoting sustainable behaviors.

Other common levers for change include enacting laws, fines, or bans for plastic behavior (Steg & Vlek, 2009). These incentive and regulation-based strategies also have their benefits and limitations. Fines and bans can be difficult to pass, and even when they are in place, they can be challenging to enforce and monitor effectively. For example, a review of legislative and non-legislative solutions for single-use plastics (e.g., bags, microbeads, straws) found that combining both types of solutions was more effective than just regulations on their own (Schnurr et al., 2018). Behaviorally-informed policies and incentives have greater potential for supporting plastic reduction behaviors when combined with other strategies.

Decades of research demonstrate that humans do not only make decisions based on information, laws, and material costs and benefits. Rather, our brains are considering a wider set of variables that reflect many automatic and reflective decision-making processes. As a result, our pro-environmental decisions are influenced by our emotions, goals and values, identities, how decisions are framed and structured, and the behaviors and beliefs of those around us (Cinner, 2018). These factors contribute to how a choice

feels in the moment, influencing whether our options feel appealing or unappealing to us, or whether we even think about our actions as we perform them.

For example, our emotions have evolved as adaptive mechanisms that guide us toward the choices that align with our goals, or that better prepare us to handle life's challenges (even if those might not be immediately apparent; Williamson & Thulin, 2022). Strong emotional responses often signal that a particular issue or decision might lead to significant (positive or negative) consequences on our well-being, prompting us to pay closer attention and consider our options more carefully (Frijda, 2004). Emotions also play a key role in our social lives, acting as incoming and outcoming signals that can influence our behavior and the behavior of those around us, guiding us toward more socially and personally meaningful choices (Bicchieri, 2016; Fessler & Haley, 2003; Rilling & Sanfey, 2011; Young, 2015).

As social beings, we are also closely attuned to the behaviors and beliefs of others, especially those in our social groups. Indeed, we often mimic the behavior of others when we do not have first-hand experience engaging in it, when we are unsure about our decisions' outcomes, or when most other people are doing something different from what we are doing. Similarly, when a behavior is widely adopted within a social group, it generally suggests that it is a good choice—or at least one that does not result in immediate harm to the decision-maker (Cialdini & Cialdini, 2007; Gigerenzer & Gaissmaier, 2011). Social norms play a key role in our decision-making by providing cues about which behaviors are likely to be effective or acceptable within a community.

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Finally, subtle and timely cues in our environments—referred to as "choice architecture"—shape how we act and what we choose, often without us consciously noticing. The digital and physical spaces we navigate are frequently designed with specific objectives in mind. Leveraging choice architecture in interventions involves intentionally structuring decision environments to influence behavior and steer people toward certain choices. This is often exemplified by "nudges," such as directing attention or leveraging cognitive biases to subtly guide decisions. Additionally, it can include providing practical supports and shortcuts to help people overcome existing choice architecture, making it easier for them to achieve their behavior change goals.

Regardless of the insights we apply, strategies based on behavioral science must be socially and culturally informed. What works in one place may not work in another—or may work differently—due to variations in political and economic climates, social and cultural norms, available resources, and local contexts. However, if we identify shared motivations and barriers, such as similar social norms or convenience obstacles, we can gain valuable clues about which strategies are most likely to succeed and how to adapt them to be culturally appropriate (Bates & Glennerster, 2017).

In the following chapters, we will share strategies that researchers, practitioners, and organizations have used to successfully change plastic-related behaviors at the community level—ranging from fines and fees to emotional messaging. This report adds to a growing body of work exploring and quantifying

the impact that applied behavioral science has on improving outcomes for people and nature, such as reducing plastic pollution. For example, research on nudges and choice architecture interventions, framing and social norms interventions, and behaviorally-informed policy interventions have led to increases in pro-environmental behavior (Allison et al., 2022b; Byerly et al., 2018; Mathew et al., 2023; Nielsen et al., 2024; Nuojua et al., 2024; Steg & Vlek, 2009). We expect behavioral solutions to have a big impact on the plastics pollution crisis.

Systems of Change and Upstream Solutions

While this report focuses on community-based interventions for plastic pollution—targeting behaviors predominantly among end-users—it is important to note that upstream solutions, such as reducing plastic production and distribution, receive far less attention, even though they are equally, if not more, essential to addressing the crisis. For example, one review on the scale of marine plastics found that using a combination of upstream and downstream solutions could reduce marine litter by almost 50% by 2030 (Löhr et al., 2017). An analysis by the Organisation for Economic Co-operation and Development (OECD) further suggests that rethinking the lifecycle of plastics and creating circular economies could quadruple recycling rates and reduce plastic leaching into the environment by almost 96% by 2040 (OECD, 2022). Yet, the responsibility for behavior change often falls to downstream, individual actors rather than those working at the policy or market level—decreasing demand rather than reducing supply. This form of 'reduction neglect' makes it more difficult for us to solve the plastics crisis, since stopping waste production is an essential part of long-term success (Barnett et al., 2023).

There are additionally several structural and cultural hurdles to reducing plastic pollution. In countries in the Global South, the lack of sufficient waste management infrastructure and cultural norms are contributing to 70% of their plastics pollution problems (Voronkova et al., 2023). These countries have addressed some of their waste management needs through informal and unregulated waste management systems, where waste pickers have become an invaluable part of the solution (Abbott & Sumaila, 2019). Moreover, every city, state, and nation has different guidelines for plastics. There is an overwhelming amount of information on plastics and guidance for living more sustainably, leaving many well-intentioned people unclear about the best actions to take (Hołyst et al., 2024).

Levers for behavior change

Check out this comprehensive guide to Rare's six levers for behavior change.

Since decisions are made at every level of the plastics supply chain, behavior change interventions have the potential to influence all actors—from government officials and business leaders to consumers and communities directly affected by plastic waste. However, as reflected in this report, behavioral science interventions have traditionally focused on end-users. Yet, solutions implemented at multiple levels—or those that bridge levels—could accelerate large-scale impact and yield better options for downstream choices (Chater & Loewenstein, 2022; Hallsworth, 2023). While this report focuses on community-based, downstream interventions, we recommend that future work also explore and deploy upstream solutions.

Applying Behavioral Science to Reduce Plastic Use at the Community Level

Nudges and Choice Architecture

The way our choices are presented to us—or what behavioral scientists refer to as choice architecture—can have a significant impact on our decisions without us even realizing it. These strategies typically target the choices we make out of habit or without deep thought or reflection; they can guide us towards sustainable decisions, all while (crucially) not precluding other options. Most individuals already intend to "do the right thing." People do not set out to generate plastic waste; instead, they often follow the path of least resistance, which may lead to waste if that is the path suggested by their decision context.

While choice architecture solutions often involve adding meaningful adjustments to the decision environment, another approach is to ease behaviors by removing small barriers. In this context, a "nudge" can be defined as a subtle alteration in the way choices are presented—one that encourages a desired behavior without restricting freedom of choice. In contrast, "sludge" refers to obstacles that make desired behaviors harder to achieve. Shreedhar et al. (2024) recently introduced the concept of "brown sludge" to describe the various obstacles—such as psychological burdens, time constraints, and ambiguities—that hinder pro-environmental actions, even when people intend to act responsibly. According to their review, "brown sludge" includes barriers like vague eco-labeling or inconsistent information (such as unclear recycling instructions for different plastic types). Asking people to wash packaging before recycling can also be a significant barrier to more people recycling properly (Klaiman et al., 2017). Whether intentional or not, sludge accumulates when choice architecture is poorly designed, creating unnecessary friction for those trying to make sustainable choices.

Let's explore some examples of choice architecture strategies at work for plastic behaviors.

Direct attention toward the sustainable behavior

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Design a supportive physical environment

One of the simplest forms of choice architecture is to make the target behavior easier, and this can be achieved in many different ways. Altering the physical layout and accessibility of waste disposal options, for example, has shown substantial promise. A study by McCoy et al. (2018) found that adjusting the placement of recycling bins to be more convenient and visible in a university setting resulted in increased recycling efficiency rates of just under 23%, as well as a reduction in improper waste disposal by 13%. These small adjustments showcase how rethinking convenience and access when it comes to the physical environment in which people live and make choices can play a critical role in swaying people to do the "right" thing (see also Cheung et al., 2018; Linder et al., 2021; Miller et al., 2016; Rosenthal & Linder, 2021). Increasing the number of bins itself was not the key to successfully reducing plastic pollution; what made a difference was whether the bin placement eased the behavior for the decision-maker or not (Holland et al., 2006; Leeabai et al., 2019; O'Connor et al., 2010; Ofstad et al., 2017; for municipal waste, see also Dahlén & Lagerkvist, 2007).

Design adjustments to existing infrastructure can also further facilitate correct recycling and anti-littering actions. Using bin lids that are shaped like specific recyclable items is one such strategy. Duffy & Verges (2009) found that lids designed with shape-specific openings (e.g., rectangular for paper or round for bottles) reduced ambiguity for the decision-maker, boosting recycling rates by making the correct disposal action easier (see also, Yee Siang, 2022). Creating a consistent color system for waste bins can also help serve as a consistent reminder of what goes where (WRAP, 2016). This type of choice architecture intervention demonstrates how reducing effort and clarifying options can effectively nudge people toward the desired behavior.

Similarly, placing cues in a way that naturally directs people to use bins (for example, by painting footprints on a sidewalk that lead to waste bins; iNudgeyou, 2012) is an easy way to reduce littering as it steers decision-makers towards the sustainable choice without the need for an active decision. Clear labeling, instructions, and visual aids can also simplify complex decisions by reducing the confusion or friction that stands as a barrier to engaging in the target behavior (D. Roy et al., 2022). Thus, solution designers making changes to the physical environment should start by prioritizing design decisions that guide the target audience toward sustainable behaviors (Abbott & Sumaila, 2019; Klotz et al., 2019).


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Change the default

Solution designers can take advantage of the power of defaults by setting a recommended option that people are unlikely to change. Defaults work well because they become the path of least resistance, requiring no or minimal effort to follow and adding effort to other options (Jachimowicz et al., 2019). A study by Mundt et al. (2020) demonstrated this with plastic straws in Germany: a set of education centers changed the default from providing visitors cups of lemonade with a straw to not providing a straw (unless requested). By switching the default option, straw use dropped by an impressive 32%. Ohtomo & Ohnuma (2014) used this approach in Japan by having store attendants verbally prompt customers to reconsider the need for a plastic bag at checkout, which led to a 23% reduction in plastic bag use. A similar intervention for restaurant takeaway orders in Lebanon found that prompting consumers to "opt-in" to receiving plastic cutlery (while also highlighting how they expect customers to reduce plastic use) found a nearly 78% decrease in single-use plastic cutlery usage (Nudge Lebanon, 2022). On a larger scale, Alibaba's food delivery system in China saw its share of no-plastic cutlery orders go up by 648% when they made "no cutlery" the default option after a regulation change in China (G. He et al., 2023).

Defaulting consumers to reusable options is another strategy that appears highly effective. In schools across the Solomon Islands, where meals were traditionally served in single-use plastic containers that were discarded after each use, the Behavioural Insights Team introduced a deposit return system. This required students to pay a small deposit for reusable containers, which was refunded when the container was returned, offering a practical alternative to single-use plastics (The Behavioural Insights Team, 2020). Offering reusable coffee cup or containers from container-sharing schemes as the default rather than as an "opt-in" also aligns more seamlessly with people's existing routines, bypassing the active decision required by individuals to bring their own containers each time they

go out. These examples illustrate how adjusting defaults can significantly reduce unnecessary consumption, particularly for single-use plastics.

Draw people's attention through small taxes and fees

Another common nudge is the implementation of plastic bag taxes. These small fees do more than just add a cost; they make people aware of choices that might otherwise be automatic (Homonoff, 2018; Muralidharan & Sheehan, 2016). In this case, the tax provides a brief moment of pause, allowing individuals to think about and act on their preference for sustainable alternatives.


Photo Credit: Kevin Malik Pexels

As of 2017, at least 127 countries had enacted various regulations on plastic bags (UNEP, 2018), often with notable success. In China, a nationwide policy that required retailers to charge for plastic bags led to a 49% drop in bag use early in its introduction, and to more people adopting reusable bags (H. He, 2012). The city of Buenos Aires, Argentina, also saw a significant shift: over five times more shoppers began bringing reusable bags to supermarkets where a tax was introduced (Jakovcevic et al., 2014). In Ireland, a plastic bag tax resulted in a 90% reduction in usage (Convery et al., 2007).

Across Europe, results have been similarly encouraging: Denmark saw a 50% drop (The Danish Ecological Council, 2015), Wales reported an 80% decrease (Poortinga et al., 2013; Thomas et al., 2016), England's usage fell from 57% to 21% (Poortinga et al., 2016; Thomas et al., 2019), Portugal achieved a 74% reduction (Martinho et al., 2017), and Turkey saw a shift toward reusable bags following similar legislation (Senturk & Dumludag, 2021). In Portugal, however, one unintended side effect was a 12% increase in garbage bag sales, as shoppers could no longer reuse grocery bags for this purpose—a pattern also observed in Wales (Martinho et al., 2017; Quested, 2013).

In mid-2009, Toronto, Canada introduced a city-wide $0.05 tax on plastic bags. This tax had a more modest effect compared to similar policies in Europe, increasing the use of reusable bags by only 3.4% (Rivers et al., 2017). One reason for this smaller impact might be the stringent evaluation methods used in the study. For instance, without comparing to a control group, the estimated increase was 22%, suggesting that methodological differences could explain the variance with European findings. Moreover, this discrepancy implies that factors beyond monetary incentives—such as anti-plastic norms that inspire or result from the policy—may influence behavioral changes (Heidbreder et al., 2019). Without robust evaluation, it is difficult to determine the exact causes of these differences.

Botswana's 2007 plastic bag tax allowed retailers to set their own prices, resulting in substantial reductions in bag usage. A retailer's effectiveness depended on its pricing; higher charges were linked with lower demand (Dikgang & Visser, 2012; Mogomotsi et al., 2019). A clearer picture emerges from South Africa, where a plastic bag tax initially achieved a 70%–90% decrease in bag use (Dikgang et al., 2012a). But while the tax was initially supported by strong retailer compliance, over time the tax's effectiveness declined as charges began to fluctuate, and plastic bag use per capita began to increase again. Consumers adjusted to paying different amounts, and the initial "loss" felt by paying for bags faded (Dikgang et al., 2012b). More recently, O'Brien & Thondhlana

(2019) observed that plastic bags remain the most convenient and affordable option in South Africa, making it challenging for a simple nudge to alter behavior in this context.

Studies have also explored how the framing of plastic bag taxes could increase or hinder their effectiveness at swaying consumer behavior. For example, Muralidharan & Sheehan, (2016) found that the framing to use a reusable bag has a significant impact on the choices that consumers made. Specifically, informing shoppers that they would be "paying a tax" for using plastic bags appeared more effective than encouraging shoppers to "avoid a fee" by using reusable bags (for a disposable cup example, see Poortinga & Whitaker, 2018). In a similar vein, an intervention in the state of Maryland in the United States found a $0.05 plastic bag tax to be almost 40% more effective at reducing the use of plastic bags than a $0.05 bonus for the use of reusable bags (Homonoff, 2018). In both cases, presenting the tax as a loss was significantly more effective than presenting it as a gain (i.e., the bonus or the fee avoidance).

Simplify messages and decisions

Using labels and key messages to support sustainable choices

Attention-grabbing nudges, such as labeling environmentally-friendly options or using visual cues to highlight preferred choices, are successful because they make specific options more salient or alter their perceived value. These methods can also emphasize information that might otherwise go unnoticed, allowing people to weigh options more deliberately without introducing significant barriers or disruptions.

Photo Credit: Harper Sunday, Unsplash

Labels have been used across various contexts to highlight specific attributes of products, thereby influencing consumer decision-making. They have been used to denote the environmental friendliness of foods (Camilleri et al., 2019; Thøgersen et al., 2012), the toxicity levels of pesticides (Buchholz et al., 2018), the energy efficiency of appliances (Economics, 2015; The Behavioural Insights Team, 2014), and even the expected lifespan of products like smartphones (SIRCOME et al., 2016). Labeling interventions are effective because the human brain often only processes a small set of salient variables when making decisions—a concept known as satisficing rather than optimizing (Simon, 1956). By increasing the saliency of otherwise overlooked information, green labels facilitate the alignment of people's intentions with their actions.

Many existing labels on plastics can be confusing and ambiguous, potentially preventing consumers from making environmentally-friendly choices (Aday & Yener, 2014; Allison et al., 2021; Amir Kavei & Savoldi, 2021; Buelow et al., 2010); or worse, creating an environment in which greenwashing can thrive (Dorothée Brécard, 2017; Moon et al., 2017; Qayyum et al., 2023). And yet, carefully crafted labels still hold the potential to alleviate many of the uncertainties faced by well-meaning consumers regarding plastic waste (Allison et al., 2022a; Briassoulis et al., 2010). When labels convey clear and straightforward information, their impact can be significant. For example, Elgaaïed-Gambier (2016) demonstrated that a simple tag on a product stating "no excess packaging" can increase the sales of

these products compared to alternatives with excessive packaging (also see, Sokolova et al., 2023). This suggests that clear labeling can effectively guide consumers toward more sustainable choices.

Labels are less effective when they have to compete with other information—and an item's price is hard to overlook. For example, Misund et al. (2020) investigated the impact of labels such as "microplastic-free" tags or certifications by trusted third-party organizations in Norway, Germany, and Portugal. While consumers generally preferred products labeled as microplastic-free, they were less likely to choose these options when they came with a higher price tag. The study found that despite high environmental consciousness, price remained the decisive factor for many consumers. Similarly, Pallottini (2023) highlights how the type of label matters and should align with the target behavior. Labels that show CO_2 emissions or generic environmental features of a product are less important than labels about how to dispose of that item or whether it is biodegradable, to encourage waste reduction.


Photo Credit: VITA

UNDP GEF SGP MEMBER SPOTLIGHT:
Setting clearer standards among tourism businesses in Vietnam

The tourism sector is not only severely affected by plastic waste pollution, but it is also a significant source of plastic waste generation. The amount of plastic waste generated by tourists at coastal tourist sites in Vietnam in 2019 was about 230,110 tons (on average, each tourist generates 5-10 plastic bags, 2-4 plastic bottles, milk cartons, and other single-use plastic items such as toothbrushes, combs, razors, and etc. each day). It is forecasted that the total amount of plastic waste generated by tourists will reach 360,000 tons by 2025 and more than 486,000 tons by 2030. The Vietnam Tourism Association (VITA) worked with industry partners, agencies, local operators, and communities to reduce plastic waste and consumption in several provinces that have some of Vietnam's most famous tourist destinations. Through a series of interviews and surveys with businesses and tourists, VITA uncovered that all actors were supportive of reducing pollution but needed support to do so, such as clearer guidance on reducing plastic and procuring sustainable products. VITA hosted several workshops that brought together 700 participants from across the tourism sector to share information on sustainable tourism goals, the criteria for recognizing plastic waste-free tourism businesses, and the implementation of a plastic waste management app. A key solution was helping participants recognize a clear set of standards and guidelines for becoming a plastic-free business. While many businesses had already taken steps to reduce plastic waste, there were still additional steps they could take to reduce consumption. By focusing the workshops on helping participants identify their waste-reduction practices and track progress, VITA was able to focus efforts effectively. In the three months after the project's implementation, tourism businesses reduced their plastic waste by an average of 35% compared to before participating in the pilot.

Finally, the "Plastic-Free July" campaign demonstrates how simplifying decisions and providing clear guidance can achieve modest but significant reductions in single-use plastic use (Heidbreder et al., 2020). The study compared participants informed about the campaign—who received targeted messages on the environmental impact of single-use plastics and practical alternatives like

reusable bags, bottles, and utensils—with a control group that received no information. Results showed a statistically significant reduction in plastic use among the informed group. By focusing efforts within a single month, the campaign reduced decision complexity and made it easier for individuals to commit to specific actions without the pressure of a long-term lifestyle change. This approach effectively encouraged pro-environmental behavior even among groups that might not typically engage in such practices.

Give targeted prompts in timely moments

Beyond simply making choices easier, choice architecture can guide the entire decision-making process by shaping how individuals assess and select among options. By carefully structuring when and how choices are presented, these strategies can heighten awareness, prompt reflection, and even shift preferences among options, leading to more deliberate, goal-aligned decisions.

Photo Credit: Pixmob

Like bag taxes, introducing prompts that disrupt routine decisions can encourage people to pause and consider their intentions, often leading to different choices. Prompts have been very effective to direct people to proper disposal areas (Becker et al., 2014; Cheung et al., 2018; Fritz et al., 2017; Miller et al., 2016), and are also effective in online spaces; with a great example from Grebitus et al. (2020) showcasing how simple prompts can help guide consumption patterns away from less sustainable plastic sources even if the alternative may come at a premium. Delivering information at the precise moment of choice—via a prompt—can also be especially effective; though their success often depends on the nature of the prompt and the characteristics of the target audience (Hottle et al., 2015; Luo & Zhao, 2022; Wensing et al., 2020).

Prompts also can work on a large scale to manage plastic waste. The musical group Coldplay used a range of behavioral strategies during their 'Music of the Spheres' tour to encourage the return of reusable LED wristbands and minimize plastic waste. These included projected visual prompts before and during performances, such as reminders to return wristbands and scoreboards displaying return rates from other venues. Additionally, staff members positioned near exits reinforced the message. As a result, about 86% of concertgoers returned their wristbands, significantly reducing unnecessary plastic waste (Vishnushree Venkatesh, 2024).

Emotional Appeals and Social Influences

When we connect target behaviors to people's identities and belief systems, we have an opportunity to make behaviors feel more meaningful and value-aligned (Howell, 2013; Wang et al., 2018). The emotions we feel about our decisions indeed impact those decisions. A recent review of the literature on emotion by Williamson & Thulin (2022) identifies specific emotional pathways that can be strategically used to motivate behavior change, depending on the context and desired outcomes. For example, pride can encourage individuals who make a given choice to then showcase their achievements or positive actions to others, hope can inspire them to make a new choice when they believe their desired outcome is attainable, and fear can promote choices that feel less risky by highlighting potential threats to well-being of those riskier options.

Our decisions are also heavily influenced by the people around us. The actions, expectations, and beliefs of others play a huge role in shaping our behavior and beliefs (Cialdini et al., 1991). One powerful way social influences work is through social norms (see box). Social norms are the unwritten rules that we learn from being part of a community, showing us which behaviors are considered acceptable or desirable. They help guide our decisions by giving us clues about what others expect and what might happen if we follow or ignore those expectations (Cialdini & Goldstein, 2004). As humans, we are naturally wired to care about fitting in with the group, partly because our ancestors relied on cooperation and group success for survival (Boyd & Richerson, 1992; Richerson & Boyd, 2005). So, it is not surprising that we often look to others when deciding how to act, even if we're not fully aware of it.

Let's explore some examples of emotional and social strategies at work for plastic behaviors.

Types of social norms

When thinking about how social norms affect decision-making, it's helpful to understand two specific types: **injunctive norms** and **descriptive norms.** Injunctive norms refer to what we believe others expect from us—basically, what we think our social group values and how we think people expect us to behave. For example, you might avoid littering because you believe people in your community value cleanliness and expect you to do the same (Cialdini et al., 1990). On the other hand, descriptive norms are what we observe others doing. You might notice that most people in your neighborhood bring reusable bags to the store, which could influence you to do the same (Schultz et al., 2007). Interestingly, these two types of norms don't always match—what people expect and what they do can be quite different, and each has a unique impact on our behavior.

Make information engaging

Presenting information in an attractive, experiential, and motivating way can boost our information-based strategies, yet may not be enough on their own. One study found that interactive hands-on education, including simulation games followed by in-depth discussions, led to an increased intention to recycle plastics among students (Yeung et al., 2017). Similarly, a study by Mellish et al., (2019) demonstrated that a campaign educating zoo visitors about the harm balloons cause to wildlife, coupled with direct exposure to affected wildlife, increased the number of people reporting reduced use of single-use plastics, specifically balloons (for a similar example at an aquarium, see Baechler et al., 2020).

There have also been creative strategies for transforming routine disposal into an enjoyable experience. For example, Malmö, Sweden, introduced talking trash cans that play humorous and flirtatious audio messages when waste is deposited, combining positive reinforcement with entertainment to encourage

proper litter disposal (Mika Dahlquist, 2022). Similarly, Hubbub's "Ballot Bins" tackle cigarette butt littering by allowing smokers to vote on fun questions, such as "Who's the best footballer, Ronaldo or Messi?" through designated compartments. This interactive approach not only reduced cigarette litter by 20% in London, England within six weeks but has also expanded internationally, with Greece capturing an estimated one million cigarette butts annually (Stefanos Stasinopoulos, 2022). Making waste reduction engaging or fun provides an additional incentive for people to participate, transforming what might otherwise be a mundane task into an enjoyable experience that is rewarding.

Research on citizen science projects and educational field trips—which are often believed to create stronger and more lasting emotional responses by engaging individuals more deeply—shows mixed results. Many studies on citizen science and hands-on education have found no significant impact on reducing the amount of plastics people use or waste in their target audiences' daily lives (Chow et al., 2017; Locritani et al., 2019; Oturai et al., 2022; Owens, n.d.; Torres et al., 2019; Wichmann et al., 2022).


Photo Credit: Daria Nepriakhina, Unsplash

Finally, emerging approaches like gamification could also offer innovative means to promote recycling. Integrating gamified elements—such as feedback, rewards, and competition—into recycling systems can foster engagement and deepen commitment to sustainable behaviors. Digital platforms that incorporate gamification mechanisms, like awards and achievements, bridge the gap between intention and action by providing immediate and personal gratification for recycling (Helmefalk & Rosenlund, 2020). An applied example is the WasteApp application, which uses gamification to encourage recycling among tourists in European cities (Aguiar-Castillo et al., 2019). Gamification—if done effectively—could transform routine habits, which offer no immediate benefits (or impose immediate costs), into actions that feel more rewarding and engaging in the short term. By doing so, it could counteract our tendency to discount long-term impacts in favor of present rewards. However, few robust evaluations of their long-term effectiveness have been conducted, indicating a need for further research in this area (Vecchio & Greco, 2023).

Connect messages to personal identities and beliefs

Emotions are deeply connected to our sense of self, our identities, and the values we cherish. Individual experiences and belief systems shape which messages we find compelling and motivating. The outcomes of emotion-based interventions tend to be more reliable when they are personalized to appeal to people's goals and identities, leveraging emotional responses that are already present in the target audience. For example, individuals who already hold pro-environmental values are more likely to change their intentions regarding plastic use when exposed to messaging that emphasizes the negative consequences of plastics on the environment (Bolderdijk et al., 2013). Furthermore, possessing a green self-identity or feeling highly connected with nature is associated with higher engagement in waste-reducing behaviors, such as recycling or purchasing items with minimal packaging (Nuojua et al., 2022; Whitmarsh & O'Neill, 2010; but see Fani et al., 2022).

Rebound effects: Messages are not "one size fits all"

It is crucial to understand one's potential target audiences when considering the effect that interventions will have, given the varying perspectives of these different groups. For example, a study by Borg et al. (2021) examined the impact of exposure to plastic-targeting documentaries on people's plastic usage. Surprisingly, they found that people who already avoided plastic began to believe that fewer people were also trying to avoid using plastic after viewing clips from specific documentaries. Conversely, for individuals who used plastic, the team observed that they showed increased intention to change, perceived more benefits in reducing plastic usage, and reported avoiding plastic more often in a follow-up survey. Not every intervention will have the same effect on all individuals; therefore, it is important to understand how an intervention might impact different groups beyond simply measuring the average outcome.

Similar effects are observed when interventions appeal to people's religious values and beliefs. A study by Kaufmann et al. (2023) in Israel employed a tailored messaging strategy that framed the use of disposable tableware as detrimental to the "purity" of the Jewish "Holy Land." This approach resonated specifically with the ultra-orthodox community, which highly values maintaining the sanctity and purity of their religious environment. Compared to generic environmental messages, this intervention significantly increased participants' willingness to forgo single-use plastic tableware. Other studies have demonstrated the effectiveness of such tailored approaches in other religious contexts, too. Heidbreder & Schmitt (2020) found that framing a reduction in plastic use by encouraging the limitation of packaged food during the Christian period of Lent effectively promoted positive environmental behavior (see also, Barkela et al., 2021). Religious messaging was also more effective than traditional environmental messaging in encouraging Muslim participants in Iran to replace plastic containers with plant-based alternatives (Siyavooshi et al., 2019).

Pairing reminders, labels, or various other nudges with emotional appeals can also help reframe a choice, reminding your audience of another consequence of their choice. A study using signage of marine animals trapped in plastic debris above bins reminded people of the impact of their plastic waste and led to a significant reduction in plastic waste by 17% in a high-rise office setting (Luo et al., 2022; see also, Nelson et al., 2021a; Wensing et al., 2020). Another example is how hotel guests are more likely to recycle if pro-recycling prompts in their hotel room use loss-framed messages that emphasize the negative consequences of not recycling. In a study by (Grazzini et al., 2018), researchers found that hotel guests responded more positively to concrete, loss-framed messages—in this case highlighting environmental harms from failing to recycle—because it increased their sense of self-efficacy, prompting them to feel their actions could make a meaningful difference. This approach led to higher engagement in recycling behaviors compared to gain-framed messages that focused on positive outcomes.

Highlight social expectations for reducing plastic use

Drawing upon injunctive norms, or social expectations, to influence plastic-use decisions has been an effective strategy used in a variety of ways. For example, affixing a red frowny face to trash cans has been shown to significantly increase recycling among elementary students in the United States, raising the proportion of waste diverted to recycling from 22% to 44% (Meng & Trudel, 2017). This effect was similarly strong when applied to university students, where recycling rates increased from 46% to 62%.

Solutions that signal an expectation appear to reliably induce behavior change: from prompting grocery shoppers to reuse bags by reminding them of other shoppers' expectations (De Groot et al., 2013; Spranz

Photo Credit: Christchurch City Council

et al., 2018), to highlighting sustainability expectations for university students (van der Linden, 2015), and even to using emojis on social media to encourage plastic-reduction behaviors (Baek et al., 2021). Another great example is how the city of Christchurch, New Zealand has been affixing "gold star" stickers to residents' curbside recycling bins, so everyone can see who is correctly sorting their recyclables. Alternatively, residents who fail to correctly sort their refuse receive a visible educational notice or have their bins removed, requiring them to visit the council to retrieve them—leveraging the social emotion of shame to reduce recidivism (E. A. Roy & Jong, 2020). A study at Princeton University in the United States explored the impact of providing reusable water bottles to incoming students. Santos & van der Linden (2016) found that students who received a reusable bottle as part of their orientation were more likely to reuse it and less likely to purchase disposable plastic bottles, due to it being an expectation.

Similarly, public commitments can be used to harness social expectations and reputational concerns. In a Parisian supermarket, an intervention asked shoppers to endorse and sign a poster advocating for the avoidance of plastic bags. This public endorsement served as a commitment mechanism, making shoppers 29% less likely to take free plastic bags (Rubens et al., 2015). Public commitments appear to be effective because they introduce the added pressure of adhering to a promise made in front of others, linking one's reputation to the fulfillment of that commitment (see also, Burn & Oskamp, 1986; De Leon & Fuqua, 1995; Lindemann-Matthies et al., 2021).

The limitations of using emotions like guilt

An emotion often employed in plastic-reduction interventions is guilt (e.g., Harth et al., 2013; Hurst & Sintov, 2022; Schneider et al., 2017); however, its effectiveness for plastic-use reduction seems to be mixed. While guilt has been shown to reduce single-use plastic bag usage in some settings (for example, when guilt-messaging is tailored to target actors; Muralidharan & Sheehan, 2018), inducing guilt and other negative emotions through strong imagery (such as images of marine life entangled in plastic) tends to be less reliable in producing sustained changes in plastic use behaviors more generally (Luo et al., 2022; Rapada et al., 2021; Septianto & Lee, 2020; Yan & Cortese, 2023). For instance, a study that used a viral internet video showing a turtle with a plastic straw in its nose to evoke guilt demonstrated only short-term effects, with no significant reduction in plastic straw usage observed one week after the intervention (Truelove & Nugent, 2020).

Similarly, the widely acclaimed "Blue Planet II" series, which featured a poignant sequence involving a pilot whale carrying its dead calf—believed to have been poisoned by its mother's milk contaminated by plastic pollution (Hunt, 2017)—was initially thought to have influenced a decrease in single-use plastic consumption. However, subsequent evaluations indicated that the negative emotions elicited did not significantly impact long-term plastic-use behavior among general viewers (Dunn et al., 2020).

There are several possible explanations for why guilt appeals and negative imagery related to plastic use may not be as effective as the broader behavior-change literature might suggest. One explanation is that repeated exposure to negative imagery and reliance on guilt-inducing appeals can lead to emotional fatigue, desensitization, or defensive reactions from the audience, such as actively avoiding the message (Bandura, 1997; Festinger, 1957; Hibbert et al., 2007). Another perspective, as provided by Dunn et al. (2020) in their analysis of Blue Planet II's effects, is that "exposure to a single documentary is unlikely to lead to a distinct increase in individual pro-environmental actions."

Show what others are doing and model good behavior

Beyond social expectations, we are often strongly influenced by what we see others doing. For example, a field experiment by Dorn & Stöckli (2018) explored how descriptive norms could promote the use of reusable takeaway boxes over single-use alternatives. The experiment took place over four weeks in a restaurant and tested two strategies. They found that sharing normative messaging about how many people were already using reusable containers did not significantly affect behavior. Yet directly observing other customers using reusable containers through social modeling was effective; customers were more likely to choose reusable containers when they saw others doing the same. Similarly, having volunteers present, who provide support and real-time feedback on waste sorting behaviors at events, has led to greater waste management outcomes (Zelenika et al., 2018). Other examples of successful descriptive norm messaging include comparing the recycling performance of individuals versus what others in their neighborhoods are doing (Milford et al., 2015), comparing one's neighborhood versus a national average (Czajkowski et al., 2019), or even just telling customers that "two in three people from this area drink tap water" to reduce the purchasing of single-use plastic water bottles (Dorigoni & Bonini, 2023).

Norms show us what to do... and not to do

Norms can backfire if an intervention unintentionally signals the wrong behavior. For instance, Nudge Lebanon's initiative in Beirut aimed to encourage glass recycling by using see-through bins, allowing people to visually confirm the correct use of the bins. However, this approach had an unintended consequence: the visibility of even a small amount of non-glass items in the bin appeared to signal to others that improper disposal was acceptable, leading to increased contamination compared to opaque bins (Nudge Lebanon, 2019).

Social norms interventions are effective and scalable in many scenarios, but their success often depends on how easily people can observe the behavior of others in their reference network (Bicchieri et al., 2022; Prentice & Paluck, 2020). Social and mass media can bridge this gap by increasing visibility and accessibility. For example, The Behavioural Insights Team collaborated with influencers on TikTok and Instagram to disseminate climate messaging in the United Kingdom, United States, and Canada. In a randomized-controlled experiment with over 6,000 users, they observed a 5% increase in intentions to avoid single-use plastic packaged food products. While this study measured intentions rather than actual behavior, it highlights the potential of influencers to act as role models, showcasing sustainable actions and providing clear demonstrations of how to adopt these behaviors, thereby reinforcing descriptive norms (The Behavioural Insights Team, 2023). By making sustainable behaviors relatable and widely visible, influencers help normalize them, demonstrating both their achievability and social desirability.

And if the real norms are not currently where one needs them to be for behavior to change, solution designers can leverage dynamic norms (i.e., what people are starting to do and where the behavioral trend is growing.) For example, a study by Loschelder et al. (2019) found that by prompting café-goers with a message like "more and more customers are switching from to-go cups to a sustainable alternative," they saw the rate of customers choosing a sustainable option increase by 17.3%. This shift meant approximately 252 to-go cups were replaced by sustainable alternatives over the study period. Additional research supports the effectiveness of dynamic norms across contexts, showing that such messages increase self-efficacy, people's perception that others think the behavior is important, and social belonging, all of which drive behavior change (Sparkman & Walton, 2019). Dynamic norms are particularly effective when they highlight real growing trends, creating a sense of urgency and collective momentum.


Photo Credit: Mauritius Plastic Challenge

UNDP GEF SGP MEMBER SPOTLIGHT:
Building social norms for plastics reduction in Mauritius

Mauritius faces a critical challenge with over 140 million plastic items and 116,000 tons of plastic waste generated annually, of which less than 5% is recycled. The Mauritius Plastic Challenge addresses the severe issue of plastic pollution impacting landfills, waterways, and natural habitats across the island. The challenge focuses on tackling the excessive use of single-use plastics, inefficient recycling systems, especially for high-density and low-density polyethylene plastic, and widespread improper disposal practices, all of which contribute to environmental degradation and pose significant health risks. Key barriers for the public were plastic usage habits, lack of awareness of alternatives, lack of visibility and social norms, and poor infrastructure for waste collection and sorting. The resulting solution had several components:

- The 'Captain Fanplastic' program was designed for schoolchildren in 25 public schools and used storytelling, gamification, and interactive workshops to raise early awareness of plastic pollution and establish sustainable habits.
- Six Plastic Ambassadors visited various villages to collect plastic waste and interact directly with local communities.
- Monthly, high-visibility clean-ups reinforced the importance of community participation in waste management and encouraging the adoption of sustainable behaviors as a regular practice.
- Informative and engaging messaging on plastics appeared in schools, village halls, buses and trams, social media, and national radio broadcasts.

As a result, this campaign successfully educated over 4,000 individuals, recovered more than 5,000 kgs of plastic waste, and contributed to an annual collection of over 50,000 kgs of plastic waste. The Captain Fanplastic educational program directly impacted 1,790 students and reached over 68,000 people through digital campaigns. Twelve clean-up events involved 700 participants and resulted in 1,500 kgs of waste collected, including 400 kgs of recyclables.

Behaviorally-informed Incentives and Policies

Many people are experiencing real material barriers to plastic use and disposal behavior, where changes to existing conditions and structures are needed (Hallsworth, 2023; Madsen et al., 2024). By combining the power of emotional appeals, social influences, and choice architecture with policies and incentives, we have the opportunity to design more effective approaches (Maris et al., 2024). For example, providing free reusable bags for people must be feasible, able to be sustained over time, and aligned with people's habits (e.g., Hardy & Bartolotta, 2021). For many countries, changing plastic behaviors will rely on enabling systems because they often set the foundation for what is possible in a given context.

Let's explore some examples of behaviorally-informed incentives and policies at work for plastic behaviors.

Provide capacity and infrastructure

For behaviors such as encouraging recycling, reducing single-use plastic use, or even littering, we need to know if people can even do it. Choice architecture strategies of making existing bins easier to use and visible (O'Connor et al., 2010) are only possible if there are bins and waste management infrastructure in the first place.

An evaluation from the United Kingdom highlights how different recycling schemes can have widely differing impacts. Hahladakis et al. (2018) examined various curbside collection, household waste recycling centers (or 'civic amenity sites'), and drop-off sites/banks. They found that curbside pickup captured almost 90% of packaging plastic relative to 9% and 1% for the other systems, respectively (Hahladakis et al., 2018), likely because the curbside collection is more convenient and aligned with people's lifestyles (see also, Struk, 2017; Viscusi et al., 2012).

Hahladakis et al. (2018) also found that recycling rates were higher when pickup was "commingled" or "zero-sort" (i.e., when all recyclables are thrown in a single container rather than requiring people to separate recyclable types at home.) This trend is also reflected in Belgium in a study by Jacobsen et al. (2018), who suggests recycling infrastructure must be designed with user convenience in mind. Complex systems requiring the separation of different plastic types often result in lower participation rates, and implementing user-friendly systems, like single-container recycling for both soft and hard plastics, could increase the amount of recycled materials compared to more complicated setups. There are trade-offs for higher collection, however, as zero-sort recycling also leads to higher contamination rates later down the processing line (WRAP, 2016).

In some cases, providing bins themselves can be impactful. Chong et al. (2013) ran a randomized controlled trial of nine different pro-recycling messages in Perú, designed to encourage recycling behavior. No matter how recycling was framed,


Photo Credit: PIMC

UNDP GEF SGP MEMBER SPOTLIGHT: Creating community-based waste infrastructure in Nepal

Plastic waste management has become a critical environmental challenge in urban areas, with infrastructure and waste collection being a big barrier. The project team wanted to change daily household practices of reducing plastic consumption and sorting waste. They created a Plastics Management and Information Center (PMIC) where community members could learn about different plastic types, learn how to dispose of them, and have the opportunity to swap plastic with reusable bags. After six months of implementation, the team saw the frequency of plastic waste recycling increase from 41% to 78%, 638 visitors swapped 720kg of plastic for reusables, and weekly usage of the PMIC for waste swap increased from 7.3% to 61%. Additionally, the proportion of households generating less than 1 kg of plastic waste per week has increased significantly, from 19.5% to 40.9%. The proportion of households generating 2-5 kg and >5 kg of plastic waste has decreased from 80.5% to 59.1%.

This project was implemented by the Centre for Energy and Environment Nepal under the leadership of Ward 12 of Pokhara Metropolitan City with private partners Blue Waste to Value and Green Road Waste Management.

residents did not want to keep recyclables in their houses because of the space it took and the fear that it would attract insects. Moreover, the separation of recyclables from general waste was generally associated with unofficial workers that residents stigmatized as 'scavengers.' For these reasons, simply providing residents with recycling bins was much more effective than any kind of messaging, be it information on environmental or social benefits, social comparisons, social sanctions, rule and regulation concerns, and reminders.


Photo Credit: Bluewater Sweden, Unsplash

Beyond recycling, we find a similar story when trying to encourage people to use reusable water bottles. Studies show that increasing the availability of water refill stations significantly reduces single-use plastic bottle waste (Bethurem et al., 2021; Willis et al., 2019). In areas where standard refill stations may be unsuitable due to water potability or negative perceptions of tap water, filtered water refill stations can be highly effective. For instance, a college in Saudi Arabia used this approach to reduce plastic bottle waste by up to 90%, whereas students used to rely on bottled water for drinking before the intervention (Saleem et al., 2019).

Restrict behavior with bans

Laws and bans targeting specific plastic items serve as a crucial intervention in reducing plastic waste. Many states around the world have implemented bans and legislation on single-use plastics in some form (Knoblauch et al., 2018; UNEP, 2018). In the absence of top-down mandates, we also see many jurisdictions introducing bans on single-use items, such as plastic bags and straws (Bishal Bharadwaj, 2016; Wagner, 2017). For instance, in the United States cities of Seattle and San Francisco, bans against plastic bags led to significant reductions in their distribution (Clapp & Swanston, 2009; Wagner, 2017).

Unfortunately, such policies are rarely evaluated so we lack data from many other places with bans (Abbott & Sumaila, 2019). Implementing laws successfully relies on the population desiring anti-plastic regulations, the availability of alternatives, as well as partnerships with stakeholders (Clapp & Swanston, 2009; Knoblauch et al., 2018; Muralidharan & Sheehan, 2016). However, several examples of bans show that even if there was resistance to the ban initially, beliefs shift positively once the ban is in place (Adeyanju et al., 2021; Carrigan et al., 2011; Heidbreder et al., 2019; Macintosh et al., 2020; Omondi & Asari, 2019; Sharp et al., 2010). This is likely due to how these regulations can create or reinforce a social norm (Thøgersen, 2003).

Policy-makers must also consider the unintended consequences of bans. While plastic bag use may decrease, alternatives like heavier reusable or paper bags often replace lightweight single-use bags, with consumers maintaining previous disposal habits. This can undermine environmental benefits, as seen in Australia and Kenya, where reusable bags were frequently discarded after minimal use (Macintosh et al., 2020; Omondi & Asari, 2021). Similarly, in the United States, plastic bag bans led to significant increases in paper bag usage, which carries its own environmental costs (Taylor & Villas-Boas, 2016).

Offer financial and material incentives

Integrating behavioral nudges with financial incentives can significantly encourage waste reduction. For example, when refusing a plastic bag leads to a charitable donation, it can reduce single-use bag consumption by half through feelings of reciprocity and social obligation (Lange et al., 2021). Conversely, framing undesirable behaviors, such as accepting single-use plastics, as resulting in a donation to a disliked cause, like a rival sports team, can further nudge individuals toward sustainable choices (Romano & Sotis, 2021).

Photo Credit: Aleksander Dumala, Pexels

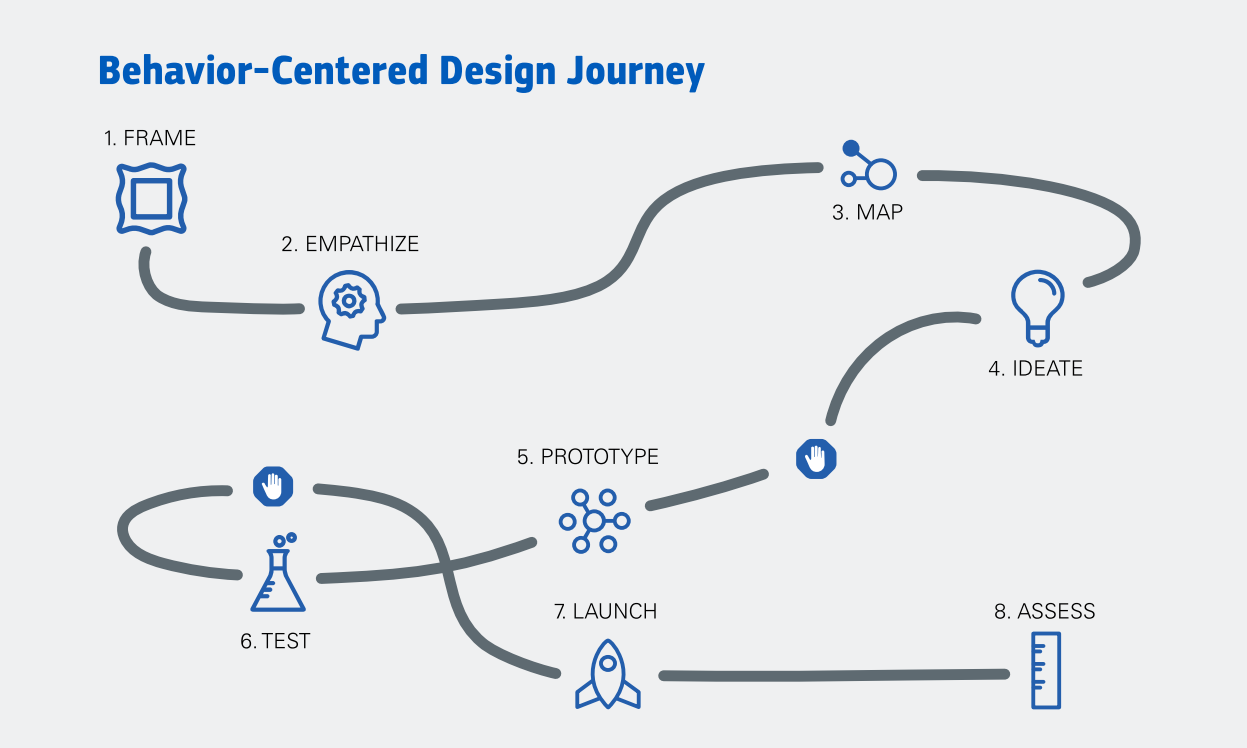
Economic instruments like unit-pricing schemes offer another effective approach to waste management. Research on Taiwan's waste policies demonstrated that charging users based on the volume of garbage generated reduces overall waste and increases recycling rates, effectively aligning financial costs with waste generation (Yang & Innes, 2007). Complementing these findings, Morlok et al., (2017) documented the long-term success of pay-as-you-throw (PAYT) schemes in Germany. By connecting waste disposal costs to actual usage, these schemes led to lasting reductions in waste and improved recycling, leveraging psychological principles such as loss aversion and perceptions of fairness to incentivize behavior change.

Despite their promise, such policies must address potential unintended consequences from socio-cultural dynamics and equity concerns. PAYT schemes, for instance, may disproportionately impact low-income households if price-per-quantity is not adjusted for people's income. To mitigate these inequities, implementing tiered pricing models can balance affordability with incentives for waste reduction (Chu et al., 2017, 2019). In another example from Mexico, a waste cleanup intervention that offered collective payments for a community event unexpectedly reduced participation compared to offering no payment. The researchers found that community members did not trust local leaders managing the funds. However, participation improved when payments bypassed authorities and went directly to individuals or when communities exhibited higher trust in their leaders (Kerr et al., 2012).

Conclusion

Conclusion

Across global communities and community-based plastic behaviors, there are significant opportunities to apply behavioral insights to address our plastic pollution crisis. Combining levers of information, regulations, incentives with emotional appeals, social influences, and choice architecture levers will make our behavior change work more effective and long-lasting. The local context cannot be ignored, and social, cultural, economic, and political factors are important considerations when designing behavioral solutions. While community-level campaigns are key to addressing plastic pollution, we encourage practitioners to explore where there may be opportunities to engage additional actors across the plastic supply chain in governments and businesses to support individual behavior change. Such partnerships and systems-based approaches will allow us to tackle the plastics crisis holistically and for the long term.



The next step from here is to put these insights into practice. Behavior-Centered Design is a framework that combines principles of human-centered design with behavioral insights to generate behavior change solutions to environmental challenges. This approach requires a series of steps, including understanding the target behaviors and actors, gathering data on motivations and barriers for change, and brainstorming, testing, and evaluating solution ideas. For more information and tools on the steps of Behavior-Centered Design, please visit https://behavior.rare.org/bcd.

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