

SUSTAINABILITY BEGINS AT HOME: CHALLENGES IN REPLACING PLASTIC BAGS IN URBAN HOUSEHOLDS IN THE MALDIVES

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disposal of waste in a plastic bag. Though households are aware of and interested in reducing environmental impacts, all participating households stated they cannot fully change to reusable bags.

Keywords: plastic bag, trials of improved practices, Maldives

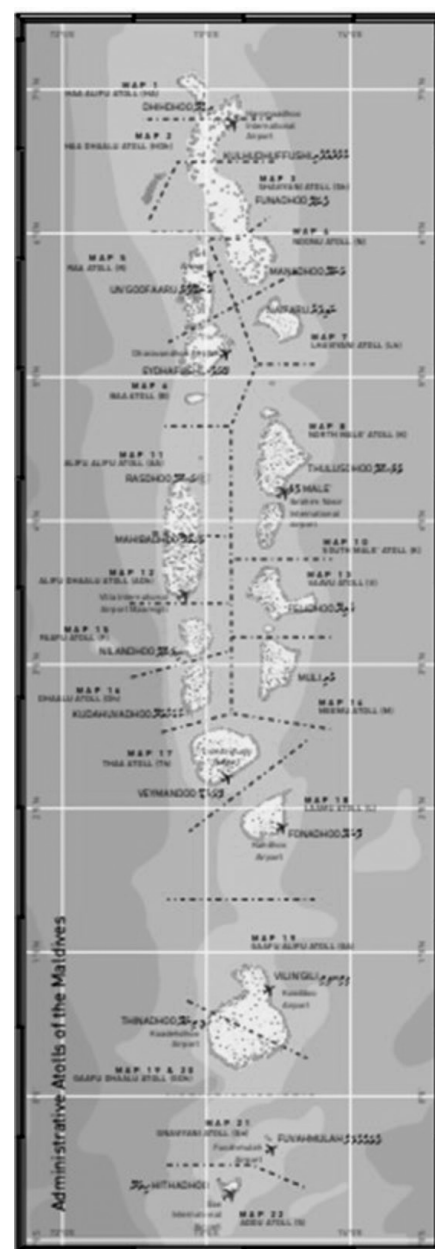
Introduction

Waste management is the biggest environmental and social challenge faced by island communities in the Maldives. The root of the problem ranges from individual behaviors to local and national waste management practices, which are compounded by geographical challenges. The Maldives, which is in the Indian Ocean, has over 1,500 coral islands scattered across 26 geographic atolls along a length of 820 km (Figure 1). The islands are very small in size, with the majority of islands being less than 1.5 meters above mean sea level. According to island data available from One-Map¹, developed and maintained by the Maldives Land and Survey Authority, more than 70% of the islands have an area less than 10 hectares, and of these, 34% of the islands are less than one hectare. Only two islands are more than 500 hectares.

¹Available from <https://onemap.mv/>

Figure 1

Map of Maldives



Abstract

The Maldives' huge waste management challenge threatens ocean and marine life. Government and non-governmental organizations have conducted environmental awareness and education programs; although, such short-lived, one-off awareness raising approaches have been unsuccessful. Our research using a modified Trials of Improved Practices (TIPs) approach looked into replacing plastic bags used in households with reusable ones, particularly for shopping. Households found changing to reusable bags hard due to habit, but a bigger barrier was the municipal waste collection guidelines that require

The lack of space on the islands makes it very challenging to store waste and find appropriate methods to dispose of waste onsite. Traditional Maldivian communities sweep the houses and surrounding streets every morning, with the waste consisting mostly of just plant litter, such as dry leaves. As many objects were repurposed or reused, for example, bottles for storage, food waste for feeding chickens, and plant litter as compost, storage and disposal of waste was not an issue for the small islands. But in the last two decades, packaged materials and plastics have made waste management a big concern.

In 2019, 1,100 tonnes of various types of plastic were imported into the Maldives, the majority of which was primary plastics such as polyethylene, fiberglass resin, and epoxied resins (Maldives Ocean Plastics Alliance, 2021). According to the Maldives Ocean Plastics Alliance (2021), single-use plastic (SUP) containers have become the most preferred, convenient, and cost-effective option for food and beverage products. The import of SUP bags tripled from 2008 to 2019, increasing from about 60 million to 180 million bags (Ismail & Hussain, 2020). The high use of plastic bags is a concern, as they end up in the landfill or are openly burned in many of the small islands. Plastic bags are also a huge part of litter in public spaces, which means there is a high chance of plastic waste entering our ocean.

Small Island Geographic Society (SIGS) is a non-governmental organization in the Maldives that is working toward conservation of unique island environments through community and youth engagement. Concerned over the high number of SUP material discarded in the Maldives, we initiated a research project, "Sustainability Begins at HOME: Helping Our Marine Environment" or HOME

project, funded under the USAID Clean Cities, Blue Ocean (CCBO) program. The HOME project focuses on the issue of SUPs and how to address it through social and behavior change. Our research attempts to trial reduction in SUP consumption in households through continued information sharing and engagement. We use a modified TIPs method to guide our social and behavior change journey.² In this paper, we share some of the findings of the research.

Background

For decades, the government, as well as many civil society groups, have spent a considerable effort on environmental education and awareness to change waste generation and disposal practices among the public. Following the establishment of the environmental institutes in the early 1990s, the second National Environment Action Plan of the Maldives focused on creating pro-environmental behaviors among the public, such as waste minimization, consumer behaviors, and the use of renewable products.

A main concern for our team was that despite the long-term environmental education and awareness efforts in the country, there has been very little change in behavior over the years. Waste and littering behavior is one such indicator. The awareness efforts by the government have concentrated on information sharing, one-off campaigns (tree planting, ocean and beach clean-ups to mark special days), and environmental recognition programs such as the President's Green Leaf award and the National Green Resort award. Various research studies show Maldivians have a high awareness

of environmental issues, especially on issues of waste management, coastal erosion, and global climate change (Environment Research Centre, 2007).

These efforts have led to a lot of awareness creation, but our concern is that awareness has not translated to effective behavior change. Indeed, a large body of research indicates that awareness-raising is necessary but insufficient to generate sustained behavior change (e.g., Azjen and Fishbein, 1980; Rogers, 2005). We believe that long-term engagement, showing people how to change, and making it as easy as possible to perform more environmentally friendly behaviors are the missing pieces. Other programs do not show people how to change. Wi and Chang (2018) discuss that many studies on environmental awareness show positive impacts on attitude and behavior: the correlation does not explain how a large number of individuals remain indifferent to environmental action.

We observed that most awareness campaigns focus on one-way information sharing and fail to learn from the recipients or try to understand why they are finding behavior change challenging. That was the inspiration for our research: to understand behavior change from the perspectives of the individuals within a household and work with them to understand why they are continuing a particular behavior. In this research, we employ a culturally contextual approach to focus on families and communities rather than looking at individuals in isolation. Though individuals exhibit their own characteristics, they are continuously in exchange with their external environment, the people, and their surroundings, and hence their values, beliefs, attitudes, and behaviors are impacted by this existence in relation to others. Mohamed (2012)

²The Manoff Group pioneered the TIPs approach in the late 1980s in Indonesia (see Krieger's paper in this issue) as a way to test program activities and the behaviors around public health.

describes the Maldivian word for environment (*thimaaveshi*) as encompassing this idea of the self (*thimaa*) and the surrounding (*veshi*), where the surrounding is taken to include both the social and physical environments.

In this paper, we are exploring the heavy use of plastic bags, which is the most used SUP in the Maldives. Plastic bags are mainly used for grocery shopping. As we explore behavior change in the use of plastic bags, to provide some context, we include background information on household grocery shopping patterns. Shopping is usually done weekly on average, while those buying in bulk shop less frequently. Households buy fish separately from fish shops and carry them in plastic packaging. There are a couple of big supermarkets in Hulhumalé, as well as a number of corner shops easily accessible to households. Since so many of the corner shops are easily accessed on the ground floor of their apartment building or the adjacent building, households have a habit of buying something almost every day. In most households, the husband and wife go together to do the weekly shopping, but in a few households, the husband does the shopping on his way home from work. When people do their normal grocery shopping, fruits and vegetables are put in plastic bags and weighed separately. So, in addition to the main plastic bags that shopping items are packed in, there may be an additional four or more plastic bags with small amounts of fruits and vegetables.

Method

Since more than 50% of the solid waste is generated in the Greater Male Region, we chose Hulhumalé, a rapidly growing urban center, as our case study site (Figure 2). Hulhumalé, a

Figure 2

Greater Male Region Showing the Study Site Hulhumale (Source: Google maps)

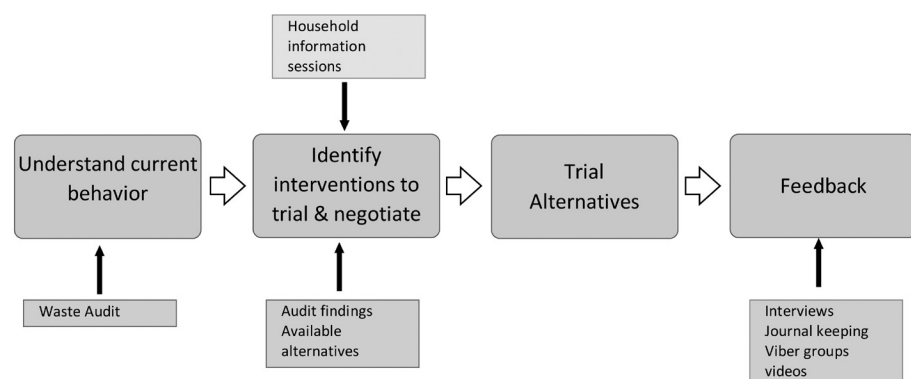


reclaimed island, was officially inaugurated in 2004 with a population of 1,000. The city had a population of over 50,000 when the HOME project initial surveys were completed in June 2021; and with the Phase Two settlement of Hulhumalé in early 2022, the current estimated population is now 240,000 (Housing Development Corporation, n.d.).

As there are no studies conducted in the Maldives on household SUP consumption patterns, we first conducted a household survey in Hulhumalé to understand the current behavior and perceptions of urban households regarding the use of SUPs. A total of 320 households from different types of housing units took part in the survey. Through the survey, we had identified plastic bags as one of the most commonly used SUPs in Hulhumalé, with an estimated 4 million bags

disposed of annually. Following this survey, we selected 12 households from Hulhumalé to work in-depth over a continued engagement period to trial alternative behaviors using an adaptation of the TIPs method. Details of the TIPs method are described in the article by Krieger on the Dominican Republic in this issue.

We chose the households based on four main criteria: household size, household composition, type of housing unit, and household income. The household size varied from two to nine members, and the composition varied from a young couple without children to nuclear families, extended families with parents and grandparents, and older couples without young children. The four types of housing units identified during our initial survey in Hulhumalé were apartments under social housing schemes; apartments in privately

Figure 3*Conceptual Diagram of the TIPs Trial for the HOME Project*

owned buildings; apartments in condominium-style buildings; and row houses, which are privately owned three-story buildings in a row. We were not able to recruit anyone from row houses, which include about 1.3% of the total housing units, to the TIPs sample.

TIPs Adaptation

For this research, we modified the TIPs method (Figure 3). The first visit was to understand the use of SUPs in the households. Since no studies had looked at household SUPs in the Maldives before, we did a two-week waste audit of the 12 households to learn more about the amounts and quantities of SUPs generated by each household. We asked households to separate their waste into wet and dry categories. Households weighed the wet waste (mainly food waste) and diapers and sanitary pads before disposing of it at normal waste collection points. Our team collected, separated, and weighed the dry waste, which included paper, plastics, metal, and glass, among other items. We provided households with detailed instructions on how to separate and what type of waste to put in each category. Throughout the two weeks, we kept in touch with the households and used Viber

groups to communicate and respond to any queries they had.³

Following the analysis of the waste audit, we met with households to present and discuss our findings. As our work was carried out during the COVID-19 pandemic, these second visits had to be conducted online using Zoom. Through the discussions, we identified some types of waste that had not been captured in the audit. This included small milk packets and food wrappers that were used by children and discarded at school. We discussed current behaviors with them and proposed alternatives, a set of menus, to trial. Similar to the initial survey, we found a high use and disposal of plastic bags during the waste audit. We categorized plastic bags as thin plastics, which also included food wrapping and packaging used for water bottle cases.

Based on the waste audit results, we explained which SUPs the household could reduce using alternative options available locally in the Maldives. This was done so that participants would have access to the alternatives if they decided to continue with the chosen new behavior. Each

³Viber is a messaging app similar to WhatsApp. It is owned by the Japanese multinational, Rakuten. This is the messaging app more popularly used in the Maldives.

household consumed many different SUPs, so we encouraged all households to attempt to change their behavior for several SUPs. Some of the SUPs identified included polyethylene terephthalate (PET) water bottles, disposable diapers and menstrual pads, plastic bags, and recyclable plastics⁴, among others.

Our initial survey showed that plastic bags were mainly used in the household for grocery shopping, lining kitchen bins, carrying goods, giving away things to family and friends, carrying fish from the market, and packaging waste for municipal collection. After discussing with households, we asked households if they would take reusable cloth bags for grocery shopping. We provided each household with two reusable bags, one foldable and one tote style bag, and asked them to try the bags for two weeks and to give us feedback. All households agreed to try and give feedback during the third visit, where we asked households:

- how the trial was going;
- if the chosen behavior was easy to practice or difficult;
- how they coped with any challenges;
- what they did to make the behavior easy to do;
- what response they receive from family and friends; and
- if they would continue the behavior.

The TIPs approach included one final interview after the trial period. Prior to the final interview, we continued to engage with the households using different modes

⁴The local municipal waste collection now takes PET bottles as a separate category for recycling. In this project, we have addressed PET bottles used for drinking water as a separate SUP, and this category includes the rest of the recyclable plastic bottles, which include categories PET and high density polythene (HDPE).

to get feedback. This included journal notes, pictures, and videos, as well as through phone and Viber. We created an individual Viber group with each household. During the feedback interview, we asked if any households wanted to continue the behavior and if so, we discussed strategies for how they could improve the practice and scheduled a follow-up visit. Usually, we met with them about twice a month and interacted further via Viber.

Findings

All 12 households tried the reusable bags. Our interactions with these households indicated that seven of the 12 households had members with high environmental consciousness. For example, some were already active in environmental organizations and activities through work, school, or with extended family members. They also had ongoing sustainable behaviors that included reusing items and buying things in larger packaging; one household member even produced her own plant food from waste food items. Three of the households said they already use cloth bags for carrying items when going out or visiting people and sometimes for grocery shopping.

During the lockdowns in Hulhumalé, people relied on delivery of groceries, and this service has continued in some shops. Our sample included a couple of households that had their main shopping items delivered. Whatever the shopping pattern was, buying items almost every day (e.g., things forgotten or just suddenly needed) is common to all households. One of the households, a couple who both work extended hours and are often out of town, said they do not shop as frequently and only shop when needed.

Figure 4

The Foldable Reusable Bag Given to Households



Convenience and Bag Design

All households said the bags were very useful to carry things. They found the foldable bag better to use for shopping and used the tote-style bag for carrying other things. Figure 4 and Figure 5 show the foldable bag and *shaviyani* tote bag. *Shaviyani* is a letter of the Maldivian alphabet that is used in the design of the bag. They found it very useful to carry children's books, baby items, and personal shopping. One mother said, "Our daughter takes it to school and carries to tuition. She uses it a lot. Her friends are also very interested and like the bag." Another young mother said, "The *shaviyani* bag is very useful. It's very handy to use to carry things, especially when traveling. I used it when we recently went on a trip to the resort. I carried the baby's bottle, and other things in it." The colorful design and the current trend of carrying tote bags may be the reason for the members liking the bag for these purposes.

People found the foldable bag more useful for grocery shopping. According to household

members, the bag had more room, was sturdier, and the fact that it could be folded and easily stored in a motorcycle compartment made it very useful to carry.⁵ The design on the bag was

⁵With the Greater Male Region's narrow streets, motorcycles are more popular than cars.

Figure 5

The Tote Bag with Shaviyani Design



a Maldivian theme with coconut palms. One household member, where the husband goes shopping, thought the design was a bit “girly,” and that was a reason he did not prefer to use the bag.

Households also provided feedback on the design of bags. Most found the *Shaviyani* bag too small and too nice to take for shopping. They suggested a bigger bag that can carry heavier items would be more useful for shopping. While many liked the designs of the bags, some felt the need for more gender-neutral designs and colors suitable for both males and females.

Creating Habit

The biggest challenge reported by all households was creating the habit of taking reusable bags when shopping. This was more challenging due to the ad hoc shopping all households reported doing when they are outside the house and have unplanned shopping to do. One household member shared that once they use the foldable bag, they often forget to put the bag back in their handbag or motorcycle, and hence, they do not have the bag when needed. “I used it once but after using [it] I forgot to put the foldable bag back in my handbag after using it.” Another male participant said, “I forget to take the bag, because usually I’d need to go buy something while I am out. When I keep the bag under the motorcycle seat, I forget it’s there and I go to the shop and receive items in plastic bags.”

Another participant described using reusable bags as “a struggle to get used to. It’s only after I go to the store and buy something that I remember that I don’t have the bag. Even if it’s in the car I forget it’s there.” All households shared similar statements related to using the bags for shopping. One household member who

already exhibits sustainable practices said she always carries a foldable bag in her handbag but that this practice took time to make a habit. She usually uses this bag if she needs to buy something when she is out.

We asked households if they tried any strategies to help them remember to use the bag. Two households said they put the bags on a hook near the front door so they can see the bags when going out. This practice helped a little but requires time to make it a habit. From the feedback, we found that all households identified needing additional time to get used to the habit.

Systematic Challenges

In spite of being interested in reducing the use of plastic bags, households shared that it is not possible to completely stop using plastic bags for shopping. One participant mentioned that the supermarket she goes to now gives cloth-like bags instead of plastic bags, which she found good. Then she mentioned this has created another issue for her. She said she needs plastic bags to line the kitchen and household bins: current household waste collection requires waste taken out for roadside collection to be in plastic bags. Households stated that if they do not get plastic bags during grocery shopping, they have to buy plastic bags separately. “When I use cloth bags, I don’t get plastic bags from the shop. So that forces me to buy plastic bags separately for garbage disposal.”

Other household members had similar sentiments: they prefer to get the free plastic bags rather than spend money on bags to line their garbage bins. One member mentioned that some shops have started charging for the plastic bags, which can encourage people to use a reusable bag. They also highlighted

the comparative cost benefits for people to change their behavior, as most households found reusable cloth bags quite costly. All household members do some shopping and would need enough reusable bags for each member to completely stop using plastic bags for shopping. Only one household member said the price was okay.

Many households also expressed discontent over the segregation regulations introduced in June 2022, which require waste to be separated into three categories: recyclable plastics, wet kitchen waste, and other. “Now that WAMCO [Waste Management Corporation, a public company responsible for waste collection in Hulhumalé] requires three segregation bags, we need more bags. So we need to buy plastic bags for the kitchen bin.” The need for additional bags each day was highlighted by all households.

Many households said they took all three types of waste out for collection daily, even if they had just one plastic bottle. This means everyday three plastic bags will be used. Only a few households kept a bag until it was filled before taking it out for collection. Maldivian households traditionally take out waste every day, as the climate is very hot, and food materials decompose and smell in the house. Even before people started living in apartments in urban areas, and there were large open spaces in the house, waste was always taken out of the house every day. Currently, almost everyone in urban areas lives in an apartment or a building complex, and these areas are quite small and do not have sufficient ventilation to keep waste for days. The apartments are in close proximity, and keeping waste in the house can disturb neighbors. For these reasons, people continued to take out all three waste types every day.

During the interactions with the households, we discussed keeping the plastics, as they are clean and will not decompose, until a bag is full, which would reduce the number of plastic bags used. WAMCO regulations require all plastics to be cleaned before disposal. Nine of the 12 households trialed this behavior. We found that in houses where bottled water was not used, it took from one to three months to fill one large bag typically used for waste disposal. In the households with children, the bags were filled more quickly, as they bought things like bottles or baby toiletries, which were used often. In households where water bottles were used for drinking, the bags filled within three to five days. Waste collection authorities could benefit from this information and have alternate or reduced collection days for plastics.

Most of the households found the waste separation done during the SIGS waste audit easier as a result of the detailed information we provided through in-house visits as well as in the Viber groups. Many said the separation for the audit was hard initially, but after practicing the behavior, it got easier. One household member said, "It was very easy for us to change to separating our waste because we had done that during the waste audit of this project. We had continued to separate waste after that, so it was easy for our household to separate when WAMCO asked us to do that." A few households continued with the separation even after we finished the waste audit.

Conclusion

The research trialed the use of alternatives to plastic bags in 12 households in Hulhumalé. All 12 households said they cannot continue using reusable bags, as they need plastic bags for waste disposal. The common sentiment

from all households was that the motivation to make the extra effort to use reusable bags is not there when municipal waste collection requires disposal in a plastic bag. We believe this will be a shared challenge for many households in Hulhumalé, and unless these systematic issues are addressed, it will not be possible to encourage more people to practice sustainable behaviors.

We found that replacing plastic bags with alternatives is important to reduce the use of plastic bags. There are some products, such as compostable and water-soluble starch-based bags, already in use in other countries. Research into testing performance and impacts of such products on the local environment is something that can be done for future introduction. Replacement of plastic bags with compostable alternatives is something that can have a greater impact, as this does not depend on people changing their habits. As we have seen from this research, changing habits takes time, and practicing sustainable behaviors is hard. Not everyone will make the extra effort to change. Our research also showed making alternatives more affordable can encourage more people to use the alternatives, although research into finding the right alternatives takes time. Finding cheaper alternatives can be tried in the meantime to encourage more people to stop using plastic bags. However, viable alternatives to plastic bags for garbage disposal will be indispensable to success. Based on the findings of this research, SIGS is researching new alternatives to plastic bags and the production of cheaper reusable bags.

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