

Rapid Assessment of Perceptions

Institutional
capacity in solid
waste management
strategy and
planning

&

Household
perceptions of solid
waste management
information, education
and communication
activities

Public Awareness and
Community Capacity Building

Greater Male' Environmental
Improvement and Waste
Management Project



MINISTRY OF ENVIRONMENT,
CLIMATE CHANGE AND TECHNOLOGY
REPUBLIC OF MALDIVES



Japan
Fund for
Poverty
Reduction

Prepared for the Ministry of Environment, Climate Change and Technology, with assistance from the Asian Development Bank and Japan Fund for Poverty Reduction Male', Maldives

Produced by Live & Learn Environmental Education for the Greater Male' Environmental Improvement and Waste Management Project, Ministry of Environment, Male', Maldives.

April 2021

This Rapid Assessment of Perceptions (RAP) report was prepared by:

Michelle Abel, Adam Deverell, Zameela Ahmed, Fathimath Thasneem, Aishath Azfa, Mariyam Shazna, Fathimath Shadiya, Ahmed Shabin and Ahmed Faiz Rasheed of Live & Learn Environmental Education.

Photographic Contribution: Live & Learn Environmental Education Maldives

Graphic Design & Layout: Wilani van Wyk-Smit, Wildeye

Reviewed by the Project Management Unit, Greater Male' Environmental Improvement and Waste Management Project



LIVE&LEARN
Environmental Education

Live & Learn Environmental Education – Maldives

PO Box 3007, Malé, Republic of Maldives
Tel: +960 33 21417 / 79 1103
maldives@livelearn.org

Country Manager – Zameela Ahmed

Live & Learn Environmental Education – Australia

Donkey Wheel House, 2nd Floor 673 Bourke St, Melbourne, Victoria 3000
Tel: +61 3 9650 1291 / Fax: +61 3 9650 1391
enquiries@livelearn.org



Rapid Assessment of Perceptions

**Institutional
capacity in solid
waste management
strategy and
planning**

&

**Household
perceptions of solid
waste management
information, education
and communication
activities**

Contents

Acronyms	6
Figures	7
Introduction	8
Greater Male' Environmental Improvement & Waste Management Project	8
The Public Awareness and Community Capacity Building Project	9
Executive Summary	10
Solid Waste Management Systems & Challenges	12
Public Awareness & Communications Perspectives	16
Waste Management in the Maldives	26
Proposed SWM Systems Design	28
<u>SECTION 1 - Solid Waste Management Capacity Assessment</u>	31
Solid Waste Management in Greater Male' Current Practice & Challenges	32
Solid Waste management Practice and challenges	32
Community Perceptions of SWM Practices & Issues in Greater Male'	36
Issues highlighted in community focus group discussions	37
Public Littering in Greater Male'	42
Solid Waste Management Current Practice & Capacity Challenges in Outer Islands	46
Solid Waste Management Capacity - Outer Islands in Zone 3	47
Food Waste Disposal	50
Segregation of Recyclables	52
Outer Islands: Household Waste Segregation	54
Negative impacts of current SWM practice	58
Improvements that will have the most impact in SWM	59
Small Businesses and Solid Waste Management	62
Small Businesses Solid Waste Management on-site	69
Perceptions of Small Businesses on current SWM practices	71

Human Resources Capacity Assessment and Training Needs	74
HR Capacity and Gaps	74
SWM Training Needs	78
Environmental Education in Schools	81
Incorporating SWM into School Curriculum	82
SWM Practices of Schools in Zone 3	83
<u>SECTION 2 - Public Awareness & Communications</u>	85
Behaviour Change Models	86
Overview of Behaviour Change Concepts	86
Behaviour Change Models	89
Commitment Strategies	97
Perceptions on Information, Education and Communication for SWM	98
Perspectives on SWM Awareness Topics	98
Perspectives on Target Audiences	99
Perspectives on Preferred Communication Methods	100
Three Types of Attitudes	104
Systems and Behaviour	106
Observations on Past Campaigns	108
Communications Strategy Overview	110
Annex 1 - Combined Capacity Assessment of Island Waste Management	114

Acronyms

ADB	Asian Development Bank
CSR	Corporate Social Responsibility
DRR	Disaster Risk Reduction
EPA	Environmental Protection Agency
EPR	Extended Producer Responsibility
GEF	Global Environment Facility
HH	Household
IEC	Information, Education and Communication
IWMC	Island Waste Management Center
LGA	Local Government Authority
LLEE	Live & Learn Environmental Education
MNU	Maldives National University
MOE	Ministry of Environment
NGO	Non-governmental Organisation
NIE	National Institute of Education
OHS	Occupational, Health and Safety
PACCB	Public Awareness and Community Capacity Building Project
PMDSC	Project Management, Design and Construction Supervision Consultants
PSM	Public Service Media
3R	Reduce, Reuse, Recycle
R	Redesign
RAP	Rapid Assessment of Perceptions
RO	Reverse Osmosis
SME	Small and Medium Enterprises
SUP	Single Use Plastics
SWM	Solid Waste Management
TBA	To be advised
TIB	Theory of Interpersonal Behaviour
TPB	Theory of Planned Behaviour
TV	Television
UK	United Kingdom
UNDP	United Nations Development Programme
UNICEF	United Nations International Children's Emergency Fund
VTV	Villa Television
WAMCO	Waste Management Corporation
WB	World Bank
WDC	Women's Development Committee
WM	Waste Management
WMC	Waste Management Center

Figures

Figure 1: Process flow of RAP	22
Figure 2: Sample Size & Survey Tools	24
Figure 3: Food waste disposal methods used by the island communities	50
Figure 4: Segregation of Recyclables	52
Figure 5: Pipe water source and plastic waste segregation	53
Figure 6: Waste segregation at the household level	55
Figure 7: Improving SWM at the Island level	59
Figure 8: Improving SWM at the household level	60
Figure 9: Number of Small Business Enterprises and Institutions surveyed	62
Figure 10: Waste collection arrangements for small businesses, Greater Malé and outer islands	64
Figure 11: Waste segregation practices by small businesses	65
Figure 12: Top three waste streams generated through small businesses in Greater Male' and outer islands	65
Figure 13: Top waste streams in garages, public ferries and pharmacies	66
Figure 14: Waste streams generated through restaurants and cafes	66
Figure 15: Waste streams generated by supermarkets, shops, factories and food packers	67
Figure 16: Waste streams generated by guest houses	68
Figure 17: Current waste reductions practices by small businesses	70
Figure 18: Total number of staff working in Island and Greater Male' Councils	75
Figure 19: Education levels and qualifications of Island Council staff	76
Figure 20: Educational level of waste handlers in the outer islands	77
Figure 21: Summary of formal training courses relevant for the SWM Sector	80
Figure 22: SWM Practices of Schools in Zone 3	83
Figure 23: Perspectives on SWM Awareness Topics	98

Introduction

Greater Male' Environmental Improvement & Waste Management Project

Greater Male' Environmental Improvement and Waste Management Project is being implemented by Ministry of Environment with financial assistance from Asian Development Bank to establish a sustainable solid waste management system in Zone 3 region (Greater Male' capital region and 32 inhabited islands in Kaafu, Alif Alif, Alif Dhaalu and Vaavu Atolls). The project is aligned with the Government's Strategic Action Plan (SAP) for national development creating a healthy living environment. The main expected outcome is climate and disaster resilient solid waste management services improved with outputs of

- (i) An improved and efficient waste collection, transfer, and disposal system
- (ii) An enhanced community-based outer island waste management system
- (iii) Strengthened institutional capacity and public awareness within waste generators and stakeholders.

The project has two important sub-components:

1. The Project Management, Design and Construction Supervision
2. The Public Awareness and Community Capacity Building (PACCB)

The activities of both of these components are interlinked, as the design and construction of the solid waste design system is integral to all public awareness, capacity building and communications activities.

The Public Awareness and Community Capacity Building Project

The Public Awareness and Community Capacity Building consultancy is a targeted three-year development intervention to:

- Improve public behaviour and awareness towards SWM.
- Develop inclusive and cohesive island level plans on SWM through local level planning and multi-stakeholder consultation.
- Strengthen local capacity (particularly in outer islands) to manage solid waste.

The project interventions will pay specific attention to improving gender equality and Disaster Risk Reduction (DRR).

The four main objectives as outlined in the terms of reference for the PACCB project are:

1. Enhance public awareness, behavioural change and community participation in SWM and 3R in the project area (Zone 3).
2. Strengthen capacity of outer islands in community based SWM and Island Waste Management Center (IWMC) operation and maintenance, targeting a 50% women's participation.
3. Improve institutional and community awareness and capacity in DRR.
4. Support implementation of the Gender Action Plan related to SWM activities supported under the project.

Executive Summary

The PACCB Rapid Assessment of Perceptions (RAP) research has been conducted to inform the design and implementation of the above four objectives through investigation of two areas:

1. Identification and assessment of the capacity of key institutions and organisations in the SWM sector.
2. Formative research into stakeholder experiences in relation to Information, Education and Communications on SWM.


The presentation of information in the RAP is structured as follows:

- **Overview of SWM in Greater Male' and Zone 3 Outer Islands**
- **Section 1: Capacity-Building Findings and Recommendations**
- **Section 2: Public Awareness & Communication Findings and Recommendations**

Section 2 contains an overview of key behaviour change concepts and an outline of two relevant behaviour change models (Theory of Planned Behaviour and Theory of Interpersonal Behaviour). The RAP report complements the 2018 baseline¹ conducted by Live & Learn Environmental Education with 400 households in the Greater Male' area, and should be read together with the baseline report.

This RAP report provides more information from the Zone 3 outer islands, and includes a greater amount of qualitative responses. Qualitative responses are important for understanding the perceptions of current solid waste management (SWM) at household, island and regional levels. An understanding of the qualitative attitudes towards SWM practices such as waste segregation, recycling and waste reduction is essential for utilising behaviour change models to design effective capacity-building and communication strategies for communication and behaviour change interventions.

1 TA-9327 MLD: Greater Male' Environmental Improvement and Waste Management Project, Live & Learn Environmental Education

A large sea turtle is resting on a sandy beach. The turtle is dark-colored with a large, textured shell. The beach is light-colored sand, and in the background, there is a dense line of green tropical vegetation. The sky is bright and clear. The image is framed by decorative teal and green wavy lines on the left and right sides.

The top 5 waste streams identified by the RAP in both Greater Male' and the outer islands - and encompassing households, and businesses (including cafes, restaurants, supermarkets, guest houses, passenger ferries, etc) were:

- Food Waste
- Cardboard
- Plastic Bottles
- Tissues
- Aluminum Cans



Solid Waste Management Systems & Challenges

SWM Issues – Greater Male'

Residential challenges facing SWM in Greater Male' include lack of common waste bins in apartment blocks, high turnover of staff, lack of a process to segregation of recyclable waste and general household waste, contamination, customers not keeping to scheduled timings for collection and the challenge of collecting waste in the narrow lanes and congested roads and, at present, the high density living of Male'. Public littering is a concerning problem in Greater Male', whereas in the outer islands public littering is not a concerning practice for most island councils.

SWM Issues – Outer Islands

Out of the 32 islands in Zone 3, 17 islands have an Island Waste Management Centre (IWMC). The IWMC's have a basic structure with a concrete bed for composting, sorting bays or compartmentalized sheds used for use of equipment and temporary storage of segregated waste material. The open areas in the IWMC's are used to carry out open burning, often on a local custom-made grill.

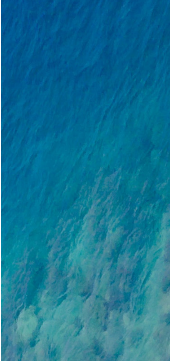
The remaining 15 islands in Zone 3 have a designated area as an open dumpsite. Some islands have put fencing around the area on one or two sides. Often the dumpsites are located on the foreshore of the island. Currently, all islands in Zone 3 use open burning to process residual waste.

16 of 32 islands have Waste Management Plans that provide basic instruction on waste disposal processes and arrangements. More comprehensive waste management plans need to be developed to assist and guide the island residents to implement actions that are needed to manage waste at the island level.

4 of 32 islands are composting food waste. The composting method practiced is highly labor intensive, it requires a few people every single day to turn the big pile of compost. The most common food waste disposal method is open burning and dumping at sea. All 32 islands have some amount of segregated and stockpiled metal waste. Extensive delays in transfer of this waste - between 2 to 7 years - have been mentioned by the Island Councils. 64% of households surveyed use bottled water for drinking, but there are higher rates of not using bottled water for drinking were reported in islands with a piped water supply system.



16 of 32 islands
have Waste
Management
Plans in place





Small Businesses and SWM

In Greater Male' the most common SWM issues reported were:

1. Delays in waste collection
2. Unavailability of closed bins
3. Public littering by customers

In the outer islands the most common SWM issues reported were:

1. Unavailability of closed bins
2. Delays in waste collection
3. Lack of knowledge in waste management

There is a marked difference in waste segregation practice between small businesses in the outer islands and Greater Male'. Three quarters (76%) of businesses surveyed in the outer islands are segregating their waste before disposal, compared to only 38% in Greater Male'. Some 91% of cafes and restaurants identify food waste as their primary waste stream, but none mentioned composting as a waste reduction policy or procedure. Only 36% of small businesses in Greater Male' have waste reduction incorporated into their business policies or standard operations. This percentage is even lower in the outer islands, where only 23% of small businesses have waste reduction in policies or standard operating documentation.

SWM Capacity-Building

SWM infrastructure and activities in Zone 3 is undergoing rapid reforms and there is a need to provide capacity building support to the implementing agencies. The current scenario is that the SWM sector has a modest number of qualified planners working at the Central Government. However, high staff turn-over rates in the sector was highlighted by the stakeholders as a major challenge, which has restricted sector development and efficient performance.

In Greater Male' WAMCO staff, including office based staff, technical operators and waste collectors in Greater Male' and those involved in transfer of waste from islands to Thilafushi need training and empowerment. In the outer islands SWM management at local level is constrained by a shortage of manpower, skills, and resources. Staff in the Island Councils lack technical or specialist background in SWM. Island Development Plans should be given a stronger consideration to improve SWM service delivery.

SWM Capacity Building - Training

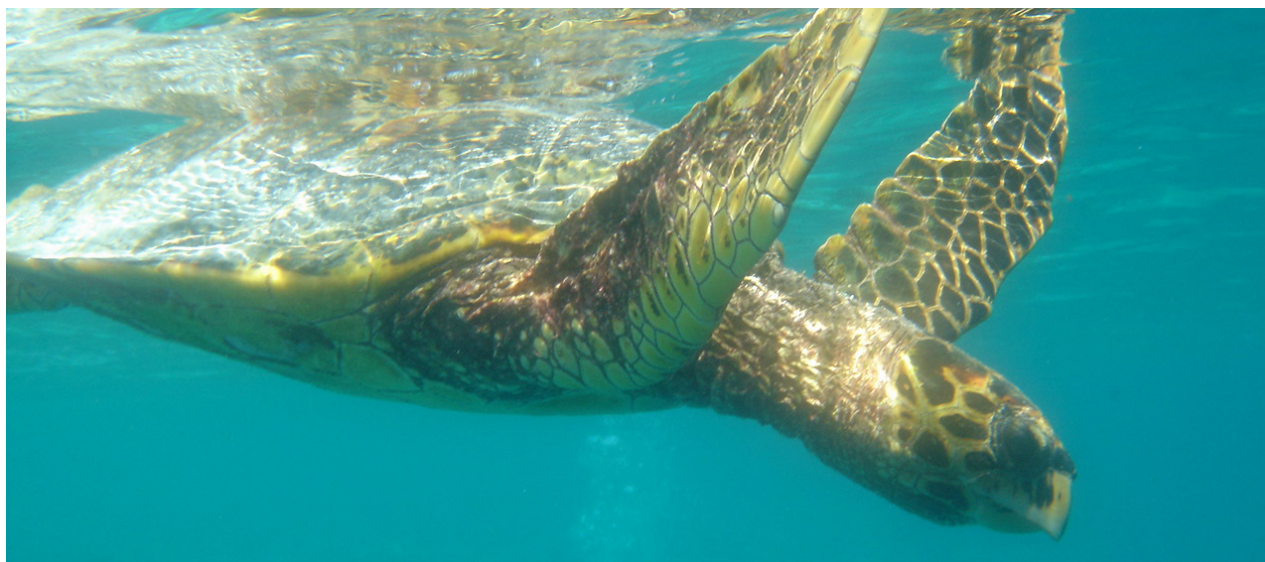
Environmental education should be a fundamental and integral part of education for all members of the society if environmental management is to be achieved. Knowledge of the environment, its conservation and threats must be integrated with the development of sensitivity to, and respect for, the environment and the formation of proper attitudes towards it. Connecting youth to the global youth voice for climate justice is also important. This would be emphasized in the education programs offered for youth by the PACCB program.

The continuity between termed councils is challenging, given there is no dedicated staff. This was highlighted by the stakeholders as one of the key challenges for training. It would be crucial to conduct regular training for people on the ground including Island Councils, waste handlers and key people from the communities. The only available formal training courses related to Environmental Management/ SWM is offered by the Maldives National University. Technical Courses offered by the Polytechnic and Maldives Institute of Technology (MIT) could be useful to train SW material processing machine operators in the outer islands.

There needs to be a perception and attitude change of the public towards WAMCO staff. Street sweepers and waste collectors report numerous instances of the difficulties in collecting waste and physical and verbal abuse from the general public and feel that their services are undervalued.

Solid Waste Management in Schools

The issues highlighted include, not being able to reduce the amount of waste generated from schools, WAMCO collecting only a certain amount of waste daily, not being aware of good waste management practices, not being able to dispose of waste properly, not having enough staff to clean, not being able to practice the 3R's at the school level and not being able to segregate waste at a school level.



Public Awareness & Communications Perspectives

Overview of Problem/Drivers related to SWM Behaviour

Public awareness and communications and behaviour change interventions implemented by the PACCB program should be informed by behaviour change theories, such as the Theory of Planned Behaviour, and the Theory of Interpersonal Behaviour. Therefore the RAP provides an overview of these theories and how they can be applied.

While the RAP confirmed the already well known problems concerning SWM, it is important to look at the problems from a systemic perspective and an individual behaviour perspective, as interventions in both areas will be needed to communicate and address the current problems with SWM.

Systemic Problems/Drivers

- Inadequate public infrastructure - such as public toilets, communal waste bins in public places, access to tap water for drinking or refilling water bottles
- Lack of clarity on WAMCO strategy for waste segregation and collection of recyclables in Greater Male'
- Delays in waste collection in Greater Male'
- 16 island councils lacking waste management planning skills, and SWM technical skills
- Island Waste Management Centre's not operating at full capacity due to infrastructure and/or equipment issues
- Solid waste disposal practices by the island councils due to lack of transfer services are currently unsatisfactory, for example large dumping of food waste into the sea, frequent open burning of non-burnable waste, dumping and the safety and health issues from stockpiling of recyclables (especially metal)
- Small to medium businesses do not have waste reduction policies or procedures.

Individual Problems/Drivers

- A passive attitude summarised as *"Move the waste somewhere else; burn it somewhere else; move it to Thilafushi or another island"* was quite common in the island surveys. Many households are expecting the problem of SWM to be mostly solved through better waste management systems - or they want the problem moved somewhere else.
- A second passive attitude summarised as: *"The Government needs to do more - both in regards to the system, the technical equipment and awareness"* was also quite common. This is not an unexpected finding, and reflects the growing frustration with the SWM stockpiling, burning and dumping that is now part of daily life.
- The RAP confirmed the problem of public littering in Greater Male' (especially on beaches).
- Household disposal of food waste into the sea in the outer islands.

The RAP data revealed perceptions and opportunities that can be built upon to improve SWM, both from a systemic perspective and individual behaviour.

Systemic Perceptions - Opportunities

- WAMCO has plans to pilot a waste segregation process with Male' City Council that can be expanded
- Businesses in Greater Male' are keen to improve SWM on site through waste segregation and composting
- Island councils were open to discussing their SWM processes and issues, and are very keen to engage in capacity-building activities
- Schools are actively working towards becoming plastic free, introducing composting and including waste management as part of their curriculum or volunteer clubs.

Individual Perceptions - Opportunities

- 53% households in Greater Male' and 90% in the outer islands are already doing some waste segregation, especially food waste and metal wastes
- In Greater Male' and in every island there were a significant (not a majority, but a significant minority) of people who expressed a positive active attitude that can be summarised as *"Individuals should do more to reduce waste."* This is positive, but it must be remembered that campaigns that promote active attitudes (such as Reduce, Reuse, Recycle) will have limited impact without improved SWM systems.

"Everyone should take responsibility for waste management. People are educated enough to know what good values are and they should practice it."



Overview of public awareness perceptions/ attitudes to SWM solutions

Island council members surveyed ranked the following as strategies they feel will have the most impact in improving SWM:

1. **Regular removal of waste**
2. **Good SWM practices**
3. **Segregation of waste**
4. **Improved rules and regulations**

Businesses in both Greater Male' and the outer islands gave the same responses as priorities to improve their solid waste management. The top four suggestions are:

1. **Segregation of waste**
2. **Keep communal bins at the harbour and at local businesses**
3. **Reduce the amount of waste businesses produce**
4. **Conduct awareness with businesses on good SWM practices and regulations**

Households in the 11 islands surveyed ranked waste segregation and composting as the two strategies that will have the most impact in SWM at the household level.

Households are interested in changing individual waste reduction behaviours and some have demonstrated a conscious decision to segregate waste. This is despite attitudes to suggest that many householders feel that most waste is ultimately combined on collection and not disposed of correctly.

However, at present there is neither the capability or the opportunity to make these positive behaviour changes, so the current waste management infrastructure and system is preventing positive waste management behaviour.

Public Awareness & Communications Preferred Methods

Households felt waste segregation was the most important topic to be covered in public awareness campaigns, followed by waste recycling and waste regulation.

Refusing consumption and waste reduction were the least important topics to be covered.

Banners/ posters, social media and billboards were seen as the most effective methods of communication. Traditional media (TV, etc) were seen as the least effective.

One-on-one meetings, workshops and group meetings and social media were seen as effective methods for training and awareness.



Overview of communications framework

The RAP informs the development of a Public Awareness & Communication Strategy to guide the planning of public awareness and communications campaigns in both Male' and the outer islands. The Communication Plan is a separate document, but this RAP provides an overall framework to guide detailed communications and behaviour change intervention planning.

The framework is based on a concept of "Three Milestones" - where progress by PMDCSC, PACCB and their respective partners and contractors is organised into three specific themes.

The three milestone awareness campaign in Male' and the Zone 3 island campaign will follow the following public awareness and behaviour change communication themes:

MILESTONE

1

"What we (waste managers) are going to do"

MILESTONE

2

"What we (waste managers) are doing now"

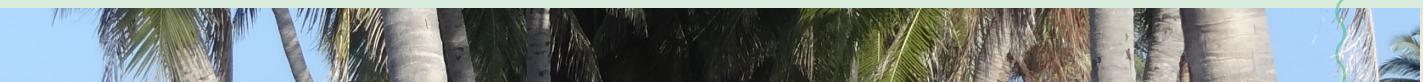
MILESTONE

3

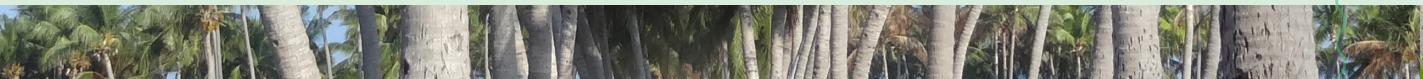
"What you (waste generators) have to do"



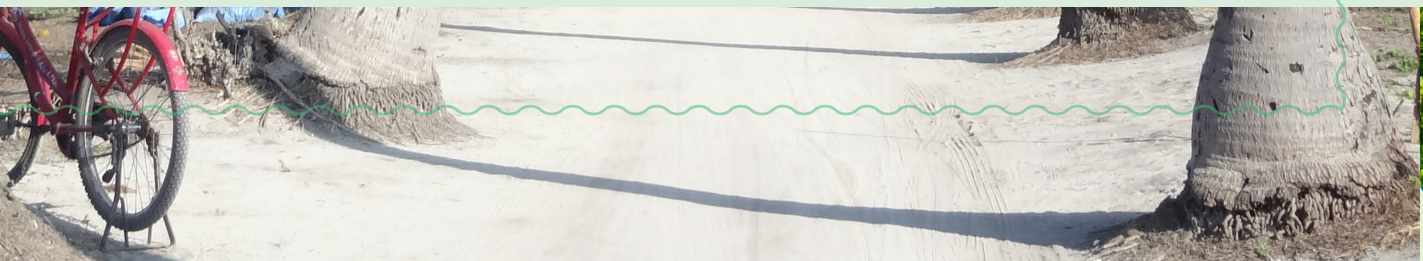
The messaging in **Milestone 1** is important to address the perceptions of delays and inaction in addressing SWM through providing positive stories of the solutions that have been designed and the capacity-building needs that will be addressed.



Milestone 2 will raise awareness at an urban and island level of the progress in establishing SWM solutions in the Zone 3 islands and in Greater Male'.



Milestone 3 will be rolled out in the lead up to the implementation of new waste management processes. It will encourage public participation in the SWM system on an island-by-island basis.



Methodology & Scope of Rapid Assessment

The RAP was carried out as the first step of the PACCB project (Figure 1) and intends to serve as a preliminary assessment to seek a synopsis of the current SWM situation and PACCB stakeholder's information and prevailing perceptions and capacity in Zone 3 (the project target population). Findings of the RAP study will be used to inform the public awareness strategy, tools and education activities that will be implemented by PACCB.

The RAP was conducted using a participatory, inquiry approach using triangulation of data from desk reviews, meetings, semi-structured interviews and focus group discussions building on four main themes; the current practices, existing issues, awareness needs and capacity gaps. Figure 1 below shows a simplified process flow diagram for the RAP study:

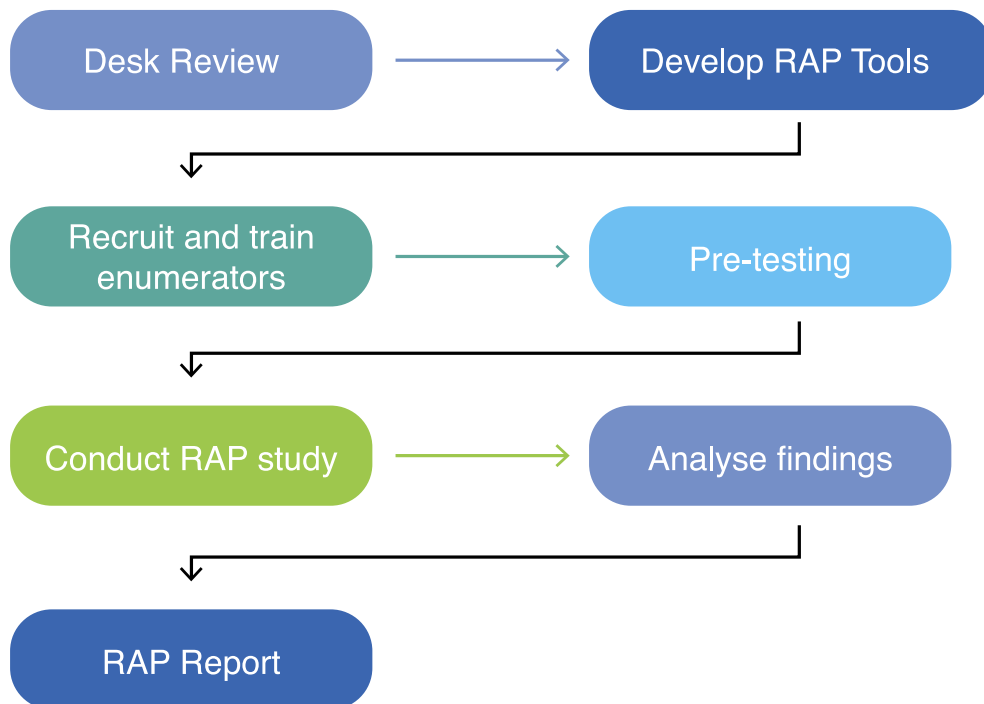


Figure 1: Process flow of RAP



Four different approaches were used to collect data and triangulation, i.e. structured meetings, focus group discussions, surveys using structured questionnaires and observations through photos. The RAP process commenced with an extensive Desk Review of all relevant documents and information relating to SWM in the Maldives. The information gathered from the Desk Review was used to determine the key stakeholders for the RAP process, the most appropriate research method to engage different stakeholder groups and determine the sampling criteria. A total of 16 stakeholder categories were identified at different levels; these include key Government Organisation, Educational Institutions, Private Sector Organisations, Households and Community-based Organisations.

The required RAP tools were developed following the desk review and sampling. The tools include detailed questionnaires tailored for each stakeholder, facilitation guides to conduct focus group discussions, survey forms and data consolidation mechanisms.

Live & Learn recruited and trained local enumerators to support the core team to collect and collate the survey data. Enumerator's selected through public announcements were trained to conduct surveys using the survey tools developed and linked to their mobile devices via Kobo toolbox. Members of the Live & Learn Local team led the stakeholder meetings and provided technical and coordination support for Enumerators to carry out the surveys.

The survey tools were pre-tested and necessary amendments made to the tools prior to data collection. Data collected through the RAP Study was pulled into a common platform and the information was thematically analysed.

Sample Size & Survey Tools

Number of respondents, targeted stakeholder groups and methods used for data collection are summarised in the table below.

	Method/ tool	Target Group/ Stakeholder group	Number of Respondents				Total
			Greater Male'		Outer Islands		
			Male	Female	Male	Female	
1	Meetings using semi-structure interviews	Central Government: lead agencies for laws, policies, regulations, infrastructure development & capacity building	9	15	0	0	24
		Local Government: Island Councils (32 Islands)	0	0	52	7	59
		Private Organisations and NGO's: Greater Male''	2	6	0	0	8
		WAMCO - Management	13	2	0	0	15
2	Focus Group Discussions using interview guides	School management and teachers	11	49	26	51	137
		Private Organisations and NGO's: Greater Male''	5	6	0	0	11
		WAMCO - Waste Handlers	12	13	0	0	25
3	Focus Group Discussions & Survey using Kobo Toolbox	General Community members / Households	15	44	75	133	267
4	Survey - using Kobo Toolbox	Businesses (Café'/ Restaurants, shops, garage, passage ferries, hospitals & pharmacies.	99	20	59	5	183

Figure 2: Sample Size & Survey Tools

Meetings were held with a total of 107 individuals, including personnel from key government Organisations, Island Councils, and local NGOs. Focus Group Discussions in Greater Male' were carried with stakeholder groups including waste handlers, Educational Institutions, Households and NGOs/CBOs.

Island Profiles have been collated for all 32 outer islands in Zone 3, summarizing information gained through interviews, data and photos shared by the island councils depicting the existing waste management situation and the process in place for SWM in the islands.

A stratified random sampling method has been used to select 30% of islands, i.e. 11 out of the 32 islands. The criteria used for selection includes population proportion, diversified economic activities, presence of active Civil Society Organisations and the presence, or absence, of functional IWMCs. Detailed data on community perceptions on SWM issues, perceived solutions and recommendations on awareness activities have been gathered through focus group discussions and surveys from the residents of these islands.

Household survey respondents were selected to ensure that the sample represents at least 50% of women; the total number of household heads surveyed are 267, representing 66.3% women (177) and 33.7% men (90).

The businesses and institutions survey sample consists of 183 samples (119 Greater Male' and 64 outer islands).

Limitations

The unprecedented restrictions arising from COVID-19 limited user research to one-on-one interactions, public gatherings and travel. This created several challenges in implementing the RAP as per the technical proposal.

The data collection methods were modified to have a virtual focus, with physical meetings changed to using telephone, Google Meet, Google survey forms, Zoom, Kobo Toolbox and other remote technologies.

Timing of data collection coincided with COVID-19 lockdown, which hindered data collection from tourist resorts.

Travel restrictions hindered conducting household surveys and focus group discussions - so local enumerators were trained to collect data and use web-based data consolidation tools.

Travel restrictions meant that the lead technical advisors from Live & Learn Australia were unable to visit Maldives as planned, so had to provide remote support.

Waste Management in the Maldives

Over the recent decades, solid waste generation has increased in Maldives - driven by population growth, changing consumption patterns, barriers in transportation and rapid growth of the tourism sector. The per capita waste generation is estimated at 1.7kg, 0.8kg and 3.5kg in Male', atolls and resorts respectively. The Male' region is responsible for a significant proportion of waste generation within the country. Organic waste constitutes the bulk of the municipal waste. The majority of this waste is either burned or dumped at sea. Only a few islands practice composting.

More than 38% of the population in the Maldives lives in the Greater Male' Region (Zone 3). This zone suffers from pollution caused by inadequate waste collection and the dumping and burning of waste that compromises the health of residents and the environment. Open dumping and burning of garbage at the 28-year-old, 10-hectare dumpsite on Thilafushi Island (six kilometers from Male') creates an environmental and public health hazard.

Population growth on islands such as Hulhumale' along with increases in local and international tourism has put huge pressures on already burdened and increasingly ineffective waste management systems. Plumes of smoke visible from Male', the international airport, and surrounding resorts compromise air quality and pose a daily nuisance to residents and tourists, while toxic leaks can put contaminated material into the soil and groundwater.

Greater Male' and 32 inhabited outer islands in Zone 3 lack an organized and sustainable waste management system for over 774 tons per day (tpd) of mixed solid waste they generate.

Because of rapid urbanization and tourism development in the region, waste generation is expected to grow to 924 tpd by 2022. Island councils are mandated to manage household waste collected at their waste management centres or a designated waste area. Where they exist, island waste management centres often lack the equipment or technical expertise to process different waste streams, and cannot access effective waste transfer to Thilafushi.

In the outer islands waste segregation (separation of glass, metals and plastics) is practiced by many households, but without an effective transfer system the segregated waste brought to Island Waste Management Centres is currently being stockpiled, or when there is no room the waste is commonly burned. Food waste is dumped into the sea, except for a few locations where it is composted to varying degrees of success.

At present, there is no mechanism in place to recycle waste in the Maldives. There are few organizations and individuals in the Greater Male' Region who collect, process and export specific types of waste materials to countries overseas. PARLEY Maldives have partnered with several island communities across the country to collect specific types of single use plastics, including water bottles. Some private companies such as Secure Bag collect and export

a selection of bulky waste items including home appliances, metals, and e-waste. The main obstacle that the outer island communities face in liaising with the waste material collectors would be transportation and lack of equipment to process waste in accordance with the requirement of the waste collectors.



Proposed SWM Systems Design

Greater Male': Proposed waste collection, transfer, disposal and transport design

The Greater Male' region is the main waste producer in the catchment area. Male' and Hulhumale' are special cases of heavily urbanised, populated and dense Islands which cannot be compared to the other islands in the country. The Greater Male' area is the area with the highest potential of recyclables.

Waste management in Greater Male' is contracted out by the City Council to the Waste Management Corporation (WAMCO), a state-owned enterprise formulated to address the growing waste management issues in the country.

SWM system design components for the Greater Male' area are still at a preliminary stage. The main criteria for the development of the waste collection and transport strategy is mechanisation, automatization, but also flexibility. Due to the different urban configuration in the greater Male' region three different systems have been proposed by the PMDCSC:²

- For Male' City (very dense, heavily populated, very narrow roads) the system could be a mix of door-to-door and central collection points using customised containers (as the density doesn't allow bin collection)
- For Hulhumale' (high population but wider roads and more manoeuvring space), the system could be also a mix of door-to-door and central collection points but with standardised bins of different sizes
- For Vilimale' (rural character, small buildings, not heavily populated, eco-friendly with banning of diesel driven motorcycles, cars and trucks) a collection point system and a household or business direct drop-off system to the centralised facility is recommended
- In these models, waste will be segregated by the household. WAMCO is proposing to collect plastic every two days, metal, every three days, glass once a week and organic waste will be collected every day.

² Summaries taken from Zone III SWM Strategy Report by the Project Management, Design and Construction Supervision Consultants for the Greater Male' Environmental Improvement and Waste Management Project - Phase 1

Outer Islands: Proposed waste collection, transfer, and disposal and transport

The main objective of waste collection for the islands is to introduce a source segregation system in order to reuse or recover waste in order to reduce the amount of residual waste and the impact on the local environment.

The proposed waste management system will either be a two-stream or three-stream system:

A Two-stream system:

Recyclables (dry waste) and residual waste (including “wet” waste).

B Three-stream system:

Recyclables (dry waste), biodegradables (“wet” waste) and residual waste.

The collection system has been planned with a mixed “door to door” collection and drop off at centralised collection points or at Island Waste Management Centres (IWMC). Small or medium dump trucks or refuse collection trucks may be used to transport waste. Waste streams other than typical household waste will be managed through special pick up services or bought directly by residents to the IWMC.

The new IWMC’s that will be constructed by the project is being finalized with the technical assistance from the PMDCSC. Procurement and construction tender process will be commenced early in 2021, with completion of the first IWMC projected tentatively for mid to end of 2021. Procurement and delivery of four SWM transfer vessels is also projected for end of 2021. These are revised targets, after delays due to COVID 19 restrictions in 2020.



An aerial photograph of a tropical island with turquoise water and a sandy beach. The island is covered in lush green vegetation and palm trees. The water is clear, showing the sandy bottom and coral reefs. The sky is blue with white clouds. The image is overlaid with a large dark blue circle containing the text 'SECTION' and a white circle containing the number '1'. There are also several vertical wavy lines in shades of blue and green running through the image.

SECTION

1



Solid Waste Management Capacity Assessment



Solid Waste Management in Greater Male' Current Practice & Challenges

Solid Waste management Practice and challenges

In Greater Male' region, solid Waste management services are provided by the state-owned Waste Management Corporation (WAMCO). WAMCO is responsible for collecting and transferring waste from the islands in the Greater Male' area, and the disposal of waste at Thilafushi. Waste collection operations by WAMCO started in August 2017.

Waste is transferred from Greater Male' to Thilafushi on sea transfer vessels or barges. The barges used to carry waste are not environmentally friendly and lack the capacity to carry large amounts of waste. Thilafushi is used as an open dump site with some sorting occurring on site. Excess waste is open burned. Pollution caused by open burning, waste pollution in the ocean surrounding Thilafushi, and the release of toxic chemicals into the ocean are some of the challenges facing WAMCO.

WAMCO reported they need more resources and spaces, such as more vehicles for waste collection, closed containers for ocean waste transfer, revised doorstep collection model to a neighborhood collection point that WAMCO would place and remove at a given time. WAMCO stressed that the number of waste collection vehicles available currently will be insufficient to implement segregated waste collection i.e., wet and dry waste from the domestic generators.

Waste is collected from subscription paying institutions, residential and business premises. WAMCO started with 3,000 registered households and 500 businesses. There are approximately 30,000 households in Male'³, only 17,000 households are registered with WAMCO. Out of this, only about 30 – 40% households pay for WAMCO's services. WAMCO reported that they require more financial resources to increase their capacity and efficiency of operations.

WAMCO offers a call- and pick-up service (CAPS) for large quantities of domestic waste and bulky waste removal. Businesses and Households could order this service when required. Prices of CAPS service is calculated according to the quantity/ volume of waste disposal. Domestic customers are offered a reduced rate.

³ Maldives Housing and Population Census (2014) National Bureau of Statistics, Ministry of Finance and Treasury, Male', Maldives



One key challenge reported by WAMCO is the lack of a robust mechanism in place to ensure customer registration. Even though households are not registered WAMCO must look after waste collection system. WAMCO waste collectors highlighted that they have no means to check which houses are registered for the service. There are no consequences or penalty for those who do not pay the fees. WAMCO is currently in discussion with City Council, trying find a solution to this issue.

There is a lack of clear information on strategic direction and plans of WAMCO's services development, and sustainability. In consultations with WAMCO they explained that they do not have a current strategic plan at present. Strategic Planning is crucial to ensure that Municipal SWM services keep pace with the demand, are appropriate to needs, contribute to a sound and sanitary environment, are cost-effective and build continuously on existing and new opportunities offered.



Household Waste Disposal challenges faced by WAMCO

WAMCO reported setbacks in waste collection in Male' due to the high density living, congestion and challenges in rout-ability. Establishment of a household collection system in Male' with bins in the collection points may not be attainable due to the congestion level, lack of space availability on the roads. In Vilimale and Hulhumale' the situation is different as the roads and pavements are wider and WAMCO plans to trial test a communal bin system.

WAMCO has instructed households to place garbage bags at the doorstep of houses or residential buildings for collection. Each household could place up to 3 bags of the specified size daily. Waste collectors of WAMCO emphasized the importance of segregation of waste at the point of generation (home) as it would improve transport and disposal of waste. A specific concern raised is that mixed waste such as metal materials could damage the compacting machine in the waste collection vehicle.



Commercial Waste Disposal challenges faced by WAMCO

There are about 12,000 businesses in Male' and some of the businesses are not registered with WAMCO. Challenges faced by WAMCO with the commercial sector include excessive amounts of waste produced from some businesses, customers who fail to pay for services, lack of segregation of waste with food and organic waste mixed in with materials such as wood or metal and the use of poor-quality bags to hold waste.

Waste Collection service Operations & Challenges reported by waste collectors and street sweepers

For operational purposes, WAMCO has divided Male' into 10 zones and each zone has a supervisor. Now (during COVID19) people are asked to bring down their waste to the doorstep of houses or residential buildings in closed plastic bags and waste is collected from these points. General waste is collected daily. Collections are done via wheelie bins and loaded manually into vehicles parked at the designated locations by WAMCO. Waste is then taken to the transfer station, loaded into transfer vessels, and transported to Thilafushi.

Waste collection team in WAMCO include residential waste collectors, commercial waste collectors and Supervisors. In addition, there is a team of sweepers who work alongside waste handlers to clean the streets of Male' and Vilimale, employed by the Male' City council. Focus group discussions were held with members from each of these groups and the challenges that they have highlighted are summarized below:

- Waste collectors and street sweepers have continued to work throughout the pandemic. They reported that they were not provided with protective equipment or safety gear or given any training before they started the job.
- With Covid-19 waste collectors do not collect waste from doorstep of each apartment but collect waste from main entrance to houses and residential buildings. Waste collectors feel this is a good improvement to the waste collection system.
- Waste collectors emphasized that some customers do not tie up waste plastic bags. There have been incidences where collectors try to tie the bags and have got injured by broken glass or sharp objects. Further, it was highlighted that they occasionally find unhygienic items such as sanitary napkins thrown on the roads. It would be important to educate the public about this issue.
- There needs to be a perception and attitude change of the public towards WAMCO staff. Street sweepers and waste collectors report numerous instances of the difficulties in collecting waste and physical and verbal abuse from the general public and feel that their services are undervalued.

Community Perceptions of SWM Practices & Issues in Greater Male'

The information presented in this section is based on two sets of data – community focus group discussions held with 59 residents from Male', Hulhumale' and Vilimale' (15 men and 44 women), and the findings from the baseline survey conducted for the Greater Male' Environmental Improvement & Waste Management Project in 2018 with 400 households (74% women and 26% men).

Summary of the some of the key findings from the 2018 baseline survey were:

- 57% reported that they segregate waste while 43% said that they do not. The respondents who segregate waste reported that they segregate waste into plastics (17%), organics (31%) and more than 2 categories (52%).
- 26 respondents (6%) said that they sell recyclable materials, while the majority 374 (94%) said that they do not sell recyclable waste materials.
- Majority of the respondents (93%) highlighted that they are aware of the health issues related to garbage while 6% said that they are not aware of such issues.
- 88% of the respondents said they pay for waste collection and 12% said that they did not pay.
- 88% reported that the monthly service charge is sufficient. 9% felt that it was more and 3% felt that the current monthly rate is not much for the service delivered.
- 8% of respondents rated the waste management service “very good” and slightly more than 40% rated it as good. 31% said that the service is average and 18% rated it as poor.

Issues highlighted in community focus group discussions

Respondents of the community focus group discussions highlighted some key challenges with SWM as summarized below:

Participants highlighted the difficulty to dispose bulky waste items such as furniture, home appliances etc. Some respondents purported that the fees WAMCO charge for disposal of bulky waste items could be unaffordable for some residents. The response rate and time to collect bulky waste was also considered to be unsatisfactory. Respondents stated that sometimes it takes two days to a week to collect bulky items. The result is that people leave such items in open areas and overtime more items get accumulated in those locations/ spots making the area a dumping ground.

Respondents claimed that the size of vehicles used by WAMCO to collect bulky waste is inadequate. One example cited is that it took several rounds in the vehicle to dispose of the cuttings from a tree.

The participants highlighted that most residents in Greater Male' do not segregate their waste. Mixed waste including biodegradable waste are included in daily waste collected. The feedback is that waste segregation is not a requirement by WAMCO. The participants said that if there were instructions or strict rules enforced by WAMCO residents would separate waste at the household level.

Participants raised concerns surrounding public health issues that may be linked to improper waste management. Participants agreed that due to piles of waste not collected, or delays in collection, diseases spread easily. Some participants stressed the issue of cats and spread of flies and mosquitoes due to poor waste management. Residents' from Hulhumale highlighted that crows feed on waste kept in the open. Households on the lower floors have to live with the bad odour from organic waste residue left on the spots that waste is kept for collection. They noted open burning in Thilafushi causing air pollution.

Several participants highlighted irresponsible waste disposal behavior of residents, citing examples such as not attending to or removing spillage in carrying waste from upper floors to lower floors in multi-storied apartment buildings. Throwing waste from the balcony is another common example that was cited.



“WAMCO uses a single fleet for the entire Male’ region, we work around the clock without a break. The vessels are operated on shifts in the morning, evening and night. WAMCO’s engineering department is working in a very challenging environment at the moment.”

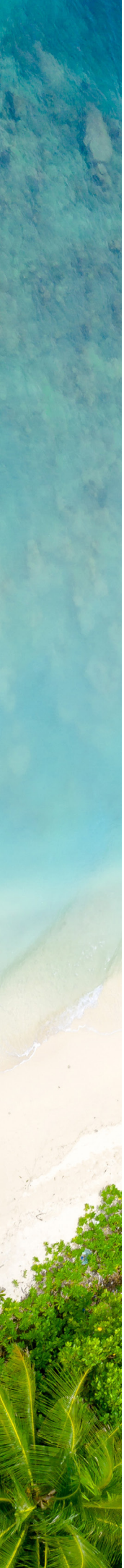


“The average household size in Zone 3 is 5 members. The proportion of male headed households is 52% and 48% is female headed. The mean age of the household head is 38.7 years.”



Suggestions for solid waste management systems improvements in Greater Male'

- Households can take **their own initiative and lead environmentally friendly lifestyles**.
- Urban gardening is becoming popular in the Male' city. This is a good opportunity to introduce the concept of **home-based composting** to the local communities.
- **Residents' can segregate the waste** at the household level, provided that there is a mechanism for that set by WAMCO.
- Numerous residents in Male' are rent paying tenants. The **owner of the building needs to take the responsibility to create a clean neighborhood** for all the tenants. The issues need to be discussed and brought to notice of the tenants when leasing out the apartment and including relevant clauses in the agreement.
- **Enforcement of measures** including penalizing non-compliance to rules and sustaining such measures until people start to adhere.
- The issues relating to delay in waste collection and related unnecessary issues could be solved when **WAMCO becomes more organized**.
- Communities need to have **role models/ champions** who will lead the community in bringing change. We need to focus on waste reduction at source.
- **WAMCO could keep communal closed bins**. This could provide solutions to most of the issues including spread of bad odour, cats meddling with the bags and crows feeding on open waste.
- For disposal and collection of large items of waste, **WAMCO could assess and determine whether the fee** is affordable.

- 
- **Behavior of people need to change**, because, even if WAMCO implements waste management strategies well, if people do not adhere to the rules, change will not happen.
 - Best waste reduction option is to **refuse single use plastics and waste** as much as possible. Start charging for plastic bags at shops.
 - MWSC needs to provide reassurance to the public that the **supplied water is up to standard** and can be used for drinking. Some residents use water filters/ and or mini Reverse Osmosis filtration systems before tap water is used for drinking. However, it was highlighted by the participants that most people cannot tell the difference between filtered water and supplied water. It is mainly a perception issue.
 - **Use reusable coffee cups and water bottles** instead of single use plastic containers.
 - A mechanism for **picnic-goers to take back their own waste**.
 - Expatriate workers also need to be brought into a **habit of not littering**.
 - A body to implement and influence needs to be established. The **environmental police** were around for some time.
 - Instead of focusing on anti-smoking campaigns, and no smoking areas, perhaps designated smoking stops with bins can aid in reducing littering.

"At this point in there is no mechanism to weigh the waste, so data is produced on estimation" WAMCO

"One of the core challenges for WAMCO is generation revenue, only about 30 to 40 percent of households pay monthly fees" WAMCO

Composting

Participants in the focus group meetings highlighted that people are interested in home composting, but the households in Male' have limited/ and or closed spaces. Most people do not have the knowledge of how to do closed-bin composting, or small size composting. There are few people in Male' who are doing worm farming on their balcony.

“Urban gardening on the terrace is becoming popular in the Male' city. Even in Hulhumale' home gardening is becoming popular, so people will like composting activities. This is a good opportunity to introduce the concept of home-based composting to the local communities.”

Male' City Council



Public Littering in Greater Male'

"Recently 80 tons of litter was collected from Male' City alone. Energy drink bottles, food wrappers, cans, are the most common types of litter found in the Male' city."

"There are more Red Bull energy drink cans discarded on the roads of the Male' City compared to "Tiger brand" drinks. So we can say locals do more littering of drink cans than the expatriate workers."

RAP results reveal that public littering is a concerning problem in Greater Male', whereas in the outer islands public littering is not such a major issue for most island councils. The following points are a summary of the key feedback from the respondents from Greater Male':

- Despite clear information about the laws and regulations prohibiting littering, people still do it. Participants in the focus group discussions believed that littering may be happening because people cannot access waste systems in public places. Participants highlighted that there are no dustbins in some public areas such as harbors. Some participants reported bringing rubbish home, which is very inconvenient.
- Male' City Council reported findings from a study they conducted in Male' to audit the composition of litter. The audit revealed that there are more Red Bull cans discarded on the roads of Male' City compared to Tiger brand energy drinks. Expatriate workers drink Tiger brand drinks while the locals use Redbull, therefore, their conclusion is that Maldivians do more littering than the expatriates in Male'.
- In Greater Male' there is a sizable population of expatriate workers. Male' City Council highlighted that some of the expatriate workers of the laborer category are illiterate (even in their native language). It would be important to find innovative ways to pass messages to them.
- Suggested mediums to raise public awareness include TV, billboards and signage. Recommendation was to focus households with traditional media programs, including TV and radio. Keep social media campaigns as an ongoing campaign, but it is also important to reach the public in the market area, where the littering is happening.



Consultations were also held with household focus groups, who shared specific issues concerning littering: Residents from Hulhumale' reported that;

- The habit of littering in public areas is quite common: on beaches there are often cigarette butts, plastic bottles, plastic plates, cutlery, and soiled diapers. There are communal bins in the beach area near restaurants/ cafes and other locations, but people still litter the public space, even right next to the bins.
- Respondents who live near the BBQ area on a beach reported that the area is often trashed by people who use it. Leftover waste (including meat) is thrown on to the beach despite the presence of dustbins.
- Throwing litter on roofs from high rise buildings have also been reported as a common problem.
- People throw waste everywhere, including in drains, so when it rains the roads get flooded.





Proposed single use plastic ban policy

The government is proposing a ban on single use plastic - currently planned to take effect in 2021. Awareness of this policy is mixed in both Greater Male' and the outer islands in Zone 3

- 52% (62) of those surveyed in Greater Male' aware of the proposed ban
- 51% (93) of those surveyed in Zone 3 aware of the proposed ban

Bottled Water and the Extended Producer Responsibility

The Environment Protection Agency considered Extended Producer Responsibility (EPR) for plastic bottles, but implementation is challenging because the recycling mechanism is not in place. The proposed single use plastic ban policy includes EPR, but this policy has not been rolled out yet.

Plastic bottles were identified as the second most common type of waste by the survey with small businesses in Greater Male' and the outer islands. Safe potable centralised piped water is available in Greater Male' and in 7 of the 32 islands in Zone 3. Some 64% of households surveyed in the outer islands use bottled water for drinking water.



Solid Waste Management Current Practice & Capacity Challenges in Outer Islands

The Greater Male' Environmental Improvement and Waste Management Project will procure four transfer ships that WAMCO will operate to collect specific waste from the Zone 3 Island Waste Management Centres (currently this waste is collected by private operators or not collected at all).

Interviews were conducted with 32 Island Councils in Zone 3 to encapsulate information about the current solid waste management situation, infrastructure, and capacity. More detailed information was collected through surveys and focus group discussion meetings from 11 islands in Zone 3. Due to the restraints of travel because of COVID 19 the surveys were conducted by remote interview. Below are summaries of the SWM practices in the areas of residual waste, food (organic) waste and segregation/ processing of recyclable waste.

"Everyone should take responsibility for waste management. People are educated enough to know what good values are and they should practice it. Council can give reminders or even conduct workshops to raise awareness on the issue"

"Problem is that each government is doing something about garbage management. But as soon as there is a change in the government the new political power refuses to continue previous work and has to restart the whole thing. Government needs to find a way to keep continuing to do such work irrelevant of which party government is in power"

"A lot of surveys are done on the issue by different parties, but no measures taken so far, public have high expectations from these surveys and hope that the survey is not meant just for the purpose of writing a report. The government should act and provide equal services to all islands."

(Above statements were made in Focus Group Discussions with Island Councils)

Annex 1 provides a summary of solid waste management situation, infrastructure and capacity for the 32 islands surveyed.



Solid Waste Management Capacity - Outer Islands in Zone 3

"185 households were surveyed across the 11 islands. Only 41% rated their satisfaction with SWM services provided as good or better. Some 42% rated their satisfaction as poor."

Out of the 32 islands in Zone 3, 17 islands have an Island Waste Management Centre (IWMC). The IWMC's have a basic structure with a concrete bed for composting, sorting bays or compartmentalized sheds used for use of equipment and temporary storage of segregated waste material. The open areas in the IWMC's are used to carry out open burning, often on a local custom-made grill.

The remaining 15 islands in Zone 3 have a designated area as an open dumpsite. Some islands have put fencing around the area on one or two sides. Often the dumpsites are located on the foreshore of the island.

Currently, all islands in Zone 3 use open burning to process residual waste. Few islands reported that burning is practiced in more than one location depending on the season and wind direction, to minimize effects of smoke and ash on the residents. In two islands burning is practiced using domestically manufactured container-drums. Some islands have been stock-piling waste for collection and transfer.

- 17 of the 32 islands have Island Waste Management Centre (IWMC)
- 9 of the 17 islands with IWMC's have some waste processing assets, but the assets are not well maintained, or large enough to process the amount of waste received
- 16 of 32 islands have Waste Management plans

Existence of WM plan and assets

Island	Waste Mgt Plan	IWMC	IWMC Assets	Comment
AA. Mathiveri	No	Yes	Can crusher, coconut husk grinder, tiles grinder and leaves crusher	
AA. Rasdhoo	No	Yes	Metal compactor, glass crusher and a 8/4 ft custom made tank/burner	
AA. Ukulhas	Yes	Yes	3 trucks for waste collection. Manual tank/ burner. Machine to produce coco peat, glass crusher, small wood-chipper and a small plastic shredder. Only the peat machine and Composting equipment are used	Some equipment not used
AA. Maalhos	Yes	Yes	Metal compactor, baler, glass crusher	
AA. Bodufolhudhoo	Yes	Yes	Glass crusher	
AA Feridhoo	Yes	No	Nil	Accumulation of metal waste
ADh. Dhigurah	Yes	Yes	Compactor (needs repair), bottle crusher, wood cutter, power generator.	Compactor is not working, it needs repair
ADh. Maamigili	Yes	No	Majority of households make their own SWM arrangements	
ADh. Himandhoo	No	Yes	Nil	
ADh. Dhidhdhoo	No	Yes	Nil	IWMC is not in use
ADh. Hangaameedhoo	Yes	Yes	Nil	

Island			IWMC Assets	Comment
ADh. Dhangethi	Yes	Yes	Metal Compactor	Metal compactor – out of service
ADh. Fenfushi	Yes	Yes	Plastic Shredder and wood-chipper	Both equipment out of service
K. Maafushi	No	No	Received incinerator, but not set-up yet	Incinerator not commissioned yet.
K. Thulusdhoo	No	Yes	Nil	
K. Huraa	Yes	Yes	Nil	
K. Gaafaru	No	Yes	Nil	
K. Dhiffushi	Yes	Yes	Nil	
K. Gulhi	No	Yes	Excavator and Dumper truck	
V. Rakeedhoo	Yes	No		
K. Guraidhoo	Yes	No	Nil	
V. Keyodhoo	Yes	No	Nil	No land space
V. Fulidhoo	Yes	Yes		

Food Waste Disposal

4 of 32 islands are composting food waste at island level in the IWMC. In addition, few residents from K. Kaashidhoo (5) reported that they dispose of waste within their compound using traditional methods of composting, such as burying in a shallow pit.

The Island level composting method practiced is highly labor intensive, it requires a few people every single day to turn the big piles of compost. It takes approximately 8 to 10 weeks for every pile to turn to compost. Compost is distributed to the community for farming and back yard gardening in islands where composting is practiced. Less labour-intensive, more innovative ways of composting can be introduced where possible.

The most common food waste disposal method is open burning and dumping at sea. Survey data collected from 11 islands reveal the following.

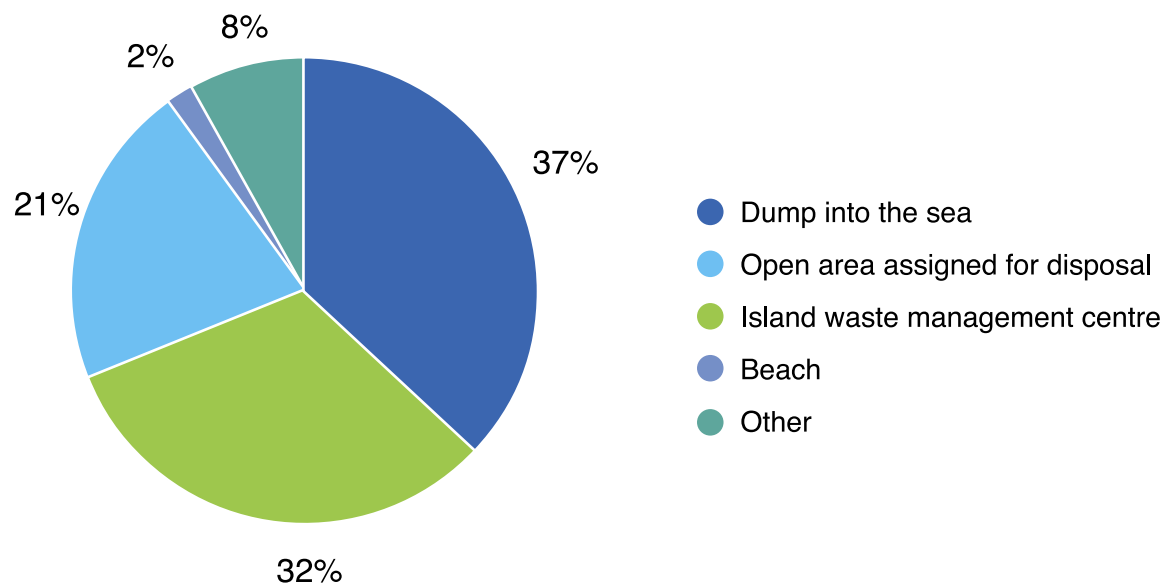


Figure 3: Food waste disposal methods used by the island communities



Segregation of Recyclables

All 32 islands have some amount of segregated and stockpiled metal waste. Extensive delays in transfer of this waste - between 2 to 7 years - have been mentioned by the Island Councils.

Survey data conducted in 11 islands reveal that:

- 5 of 11 islands are segregating glass - the majority is also stockpiled waiting transfer to Thilafushi
- 3 of 11 islands are segregating plastic
- Construction waste, especially concrete, is a major concern and is stockpiled

Island	Plastic	Metal	Glass	Stockpiling
AA. Mathiveri	No	Yes	No	3 years of metal
AA. Rasdhoo	No	Yes	No	Stockpiled
AA. Ukulhas	Yes	Yes	Yes	2 years of metal
ADh. Dhigurah	Yes	Yes	Yes	Delays in transfer
ADh. Maamigili	No	Yes	Yes	Stockpiled
ADh. Mahibadhoo	No	Yes	Yes	Delays in transfer
K. Kaashidhoo	No	Yes	No	7 years of metal
K. Maafushi	No	Yes	No	Sent to Thilafushi
K. Thulusdhoo	No	No	No	Stockpiled with residual waste
V. Felidhoo	No	Yes	No	Stockpiled
V. Rakeedhoo	Yes	Yes	Yes	Sent to Thilafushi annually

Figure 4: Segregation of Recyclables

Drinking Water

- 64% (119) of households surveyed used bottled water for drinking
- 35% (66) of households surveyed do not use bottled water for drinking
- 7 of 32 islands have an existing piped water supply system
- Higher rates of not using bottled water for drinking were reported in islands with a piped water supply system
- Only one island (Ukulhas) has both piped water supply and plastics segregation and collection as part of SWM.

Island	Piped Water Source	Plastics Segregation
AA. Rasdhoo	Yes	No
AA. Ukulhas	Yes	Yes
ADh. Dhigurah	No	Yes
ADh. Maamigili	Yes	No
ADh. Mahibadhoo	Yes	No
K. Maafushi	Yes	No
K. Huraa	Yes	No
K. Guraidhoo	Yes	No
V. Rakeedhoo	No	Yes

Figure 5: Pipe water source and plastic waste segregation

Outer Islands: Household Waste Segregation

The 11 island councils surveyed were asked about the segregation of household waste. Household survey information show that Island Councils from all 11 islands encourage waste segregation of some sort. The way that waste is sorted reflects local disposal systems or arrangements. The most common practice is to separate food waste from other types of waste material.

Food Waste

Of the total surveyed households (185) from 11 islands, 90% responded that they are practicing segregation of waste at sources. These households were found to segregate kitchen waste for their own purpose, e.g. using for traditional type composting or to comply with the disposal method required by the Island Council. In the islands where composting is practiced at the island level (Ukulhas and Dhigurah), food waste is handed over to waste collectors separately from the rest of the waste material. In other islands kitchen waste is separated to dump into the sea.

Information received through focus group discussions reveal that kitchen waste segregated at household level usually contains some inorganic (kitchen) waste such as food cans/ containers, plastic food wrappers etc. This results in marine pollution when the kitchen waste is dumped into the sea.



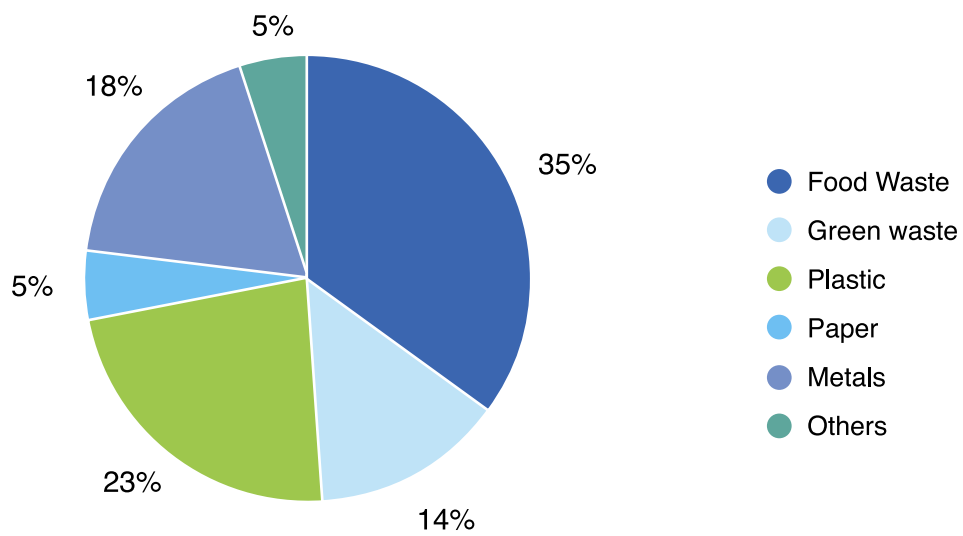


Figure 6: Waste segregation at the household level



Other Types of waste material

Residents indicated a strong understanding of the benefits to the environment and good waste management practices. 90% of the households surveyed from the 11 islands segregated waste in some way (mostly food waste and metal).

Metal Waste

18% of HH surveyed across the 11 islands segregate their metal waste at household level. The following islands have a higher participation rate for segregation of metal – AA. Ukulhas, ADh. Dhigurah, ADh. Maamigili and AA. Rasdhoo.

Plastic Waste

23% of HH surveyed across the 11 islands segregate their plastic waste at household level. The following islands have a higher participation rate for segregation of plastic – AA. Rasdhoo, ADh. Dhigurah, ADh. Maamigili, and AA. Mathiveri.

Green Waste

14% of HH surveyed across the 11 islands segregate their green waste at household level. The following islands have a higher participation rate for segregation of green waste - ADh. Dhigurah, AA. Ukulhas, and AA. Mathiveri.

Paper Waste

5% of HH surveyed across the 11 islands segregate their paper waste at household level. ADh. Dhigurah have a higher participation rate for segregation of paper waste.

Households were enthusiastic about the importance of segregation of waste and practiced it on some levels. Many, however, felt the separation of waste such as paper and plastics was ultimately futile because they believed the waste would be mixed together and burnt either on the island or when delivered to Thilafushi. So, the individual active attitude is present, but is tempered by dissatisfaction with current SWM systems, or slowness in implementing improvements.

Awareness of Waste Management Rules and Regulations

Information provided by the Island Councils show that 16 of the 32 islands have Island Waste Management Plans. Rest of the island councils reported that they had a set of rules that the island residents were informed to follow. 83 out of 185 participants of the household survey reported that they are aware of Island level waste management rules and regulations.

There are some differences in the waste management processes implemented by the islands. Results from Household survey reveal the rules and regulations followed by the island residents:

- Residents from all 11- islands segregate waste at source, the most common method is segregation in 2 streams, i.e., food waste, and all other types of materials.
- Ukulhas, Dhigurah and Mathiveri uses a centralized waste collection system led by the Island Council. Waste is collected from households, institutions and businesses and managed at the Island waste management center.
- Centralized waste collection points with bins for municipal waste have been established in Rasdhoo, Mahibadhoo and Thulusdhoo. Residents are instructed to dispose food waste in the sea and to only use bins at collection points for inorganic waste material.
- Islands councils have signed agreements with households and commercial entities to ensure compliance with the waste collection and disposal setup in Ukulhas and Dhigurah.
- Community groups led by women in Dhigurah and Mathiveri clean up the public areas of the island.
- Some respondents highlighted the need to improve implementation of the waste management rules and regulation at the island level.

Negative impacts of current SWM practice

Health

Households ranked the following as the greatest negative impact on their health:

1. Smoke from burning rubbish
2. Increases in mosquito related diseases
3. Increase in rodents/ flies/ crows.

Environment

Households ranked the following as the greatest negative impact on the environment:

1. Air Pollution
2. Rubbish washing up on the beach
3. General pollution of water and land.



Improvements that will have the most impact in SWM

Households from the 11 islands surveyed (185 participants) ranked the following as strategies they feel will have the most impact in improving SWM at Island level:

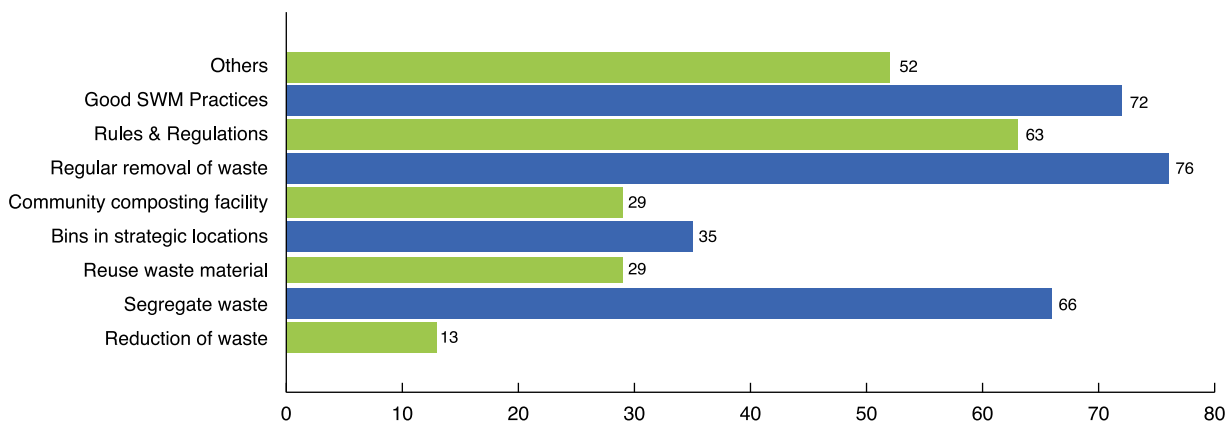
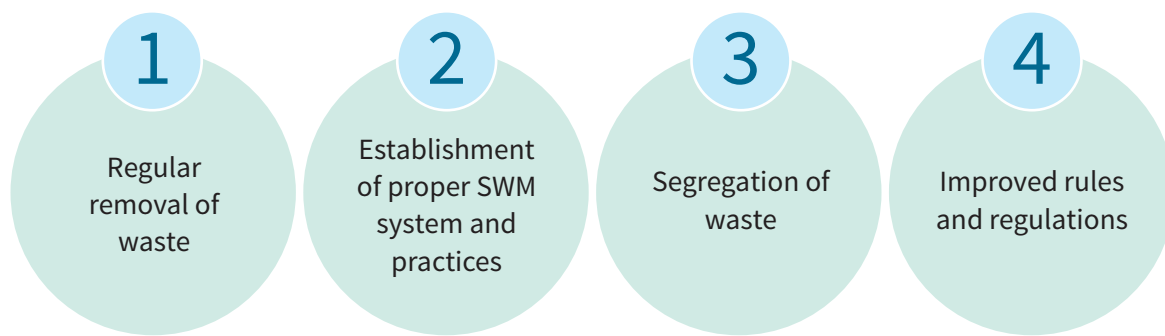


Figure 7: Improving SWM at the Island level

Survey participants ranked the following as strategies they feel will have the most impact in improving SWM at Household level:

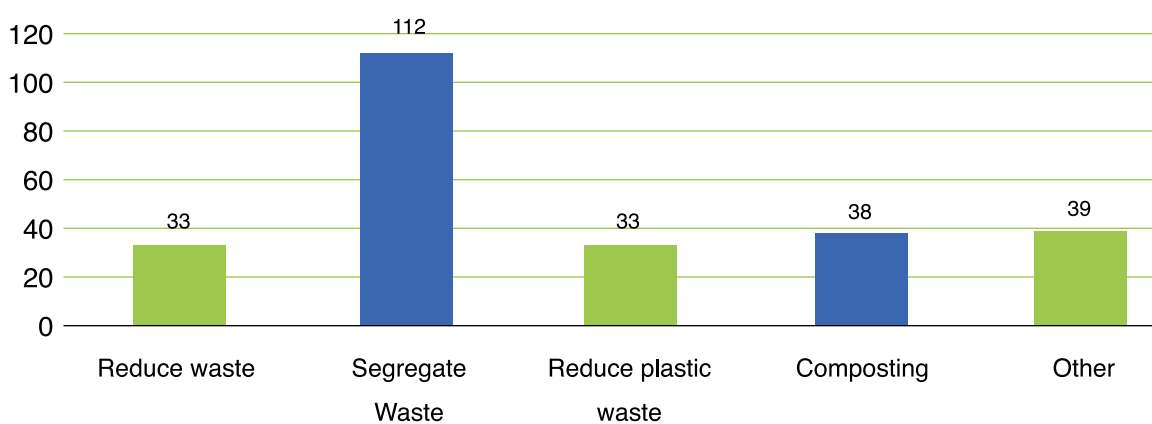


Figure 8: Improving SWM at the household level



The least mentioned strategy by the survey respondents for improving SWM is waste reduction (only 33 responses from 185). This reinforces the importance of systemic best practices approaches (including re-using, composting, etc) to managing waste that is always going to be produced, as waste reduction has a limited long-term impact because it does not resolve the harmful practices of burning or stockpiling.

Households in the 11 islands surveyed ranked waste segregation (112 responses) and composting (38 responses) as the two strategies that will have the most impact in SWM at the household level. Composting was followed closely by reducing waste, specifically plastic waste. Indicating that some households are interested in changing individual waste reduction behaviours.

Small Businesses and Solid Waste Management

A dedicated portion of the RAP survey focused on small businesses operating in zone 3. Small businesses are an important stakeholder to engage for any waste management related project to succeed. The waste generated through these entities differs both in terms of type and quantity and therefore needs to be understood carefully to identify areas where successful behaviour interventions can be introduced.

The RAP survey included 183 small businesses and institutions out of which 119 were in the Greater Malé region, and 64 from outer islands. These entities can be classified into six main clusters: restaurants and cafés, supermarkets and mini-marts, auto-vehicle garages, guesthouses, pharmacies and public ferries.

#	Type of Business	Greater Male'	Outer Islands
1	Café/ restaurant	20	18
2	Supermarket/ retail shop/ factory & food packers	61	28
3	Garage	5	0
4	Guest House	15	14
5	Hospital	2	0
6	Pharmacy	6	0
7	Passenger Ferry	11	4
Total		120	64
Total Businesses Surveyed			184

Figure 9: Number of Small Business Enterprises and Institutions surveyed



The main objective of this component of the survey was to obtain more information about specific issues pertaining to waste generation to each of these entities, and gain insight into how current waste disposal arrangements are made, and how these business owners and operators perceive solutions to the current and anticipated future challenges.

Waste collection arrangements & satisfaction level

At present, waste collection arrangements were administered mainly through state owned or public service entities (Table x). In Greater Malé, 72% of the surveyed businesses reported disposal through WAMCO, while in the outer islands, 67% reported disposal through their local councils. Small businesses in these two localities also reported having their own waste disposal arrangements in place, with 26% in Greater Malé reporting self-disposal, and 25% of the outer island businesses reporting the same. The least common method for waste collection was through outsourced contracts to third parties (2% in Greater Malé and 8% in outer islands).

Waste Collection Method	Greater Malé	Outer Islands
WAMCO/Island Council	72%	67%
Self-disposal	26%	25%
Outsourced to a third party	2%	8%

Figure 10: Waste collection arrangements for small businesses, Greater Malé and outer islands

Frequency of waste collection

Looking at the frequency of waste collection, it was reported that both Greater Malé and outer islands both have daily collection as the most common method. In Greater Malé 81% of the surveyed entities reported daily waste collection arrangements, while in the islands 80.6% of the respondents reported the same.

Weekly waste collection arrangements were also reported by 5.5% of the businesses based in Greater Malé and 12.9% of the of the surveyed businesses in the outer islands.

Issues faced by small businesses in SWM

Of the surveyed entities, majority responded favourably towards the current waste collection arrangements. In Greater Malé, 44% of businesses ranked waste collection services as ‘good’ while 27.7% ranked it as ‘very good’. In outer islands, 42% ranked the services as ‘good’ while 39% ranked it as ‘very good’.

When inquired about the most frequently encountered SWM issues they faced, the businesses in both Greater Malé and outer islands reported delays in waste collection and unavailability of closed bins as areas of concern. Businesses located in Greater Malé further reported public littering by customers while those in outer islands reported knowledge gaps in SWM as a main issue. Interestingly, 75 of the 183 businesses surveyed said they had no problems to report.

Waste segregation practices

Importance was given in the RAP survey to understand current waste segregation practices along with perceptions regarding waste separation.

It was found that businesses in the outer islands practiced waste segregation more than businesses in the Greater Malé region. Nearly 72% of all surveyed businesses in outer islands reported waste segregation as part of their local island’s waste management plan. The main streams of waste to which segregation was practiced were wet/organic waste, plastic, glass, aluminum, paper and cardboard and metal. In Greater Malé, only 37.5% of surveyed businesses reported segregation.

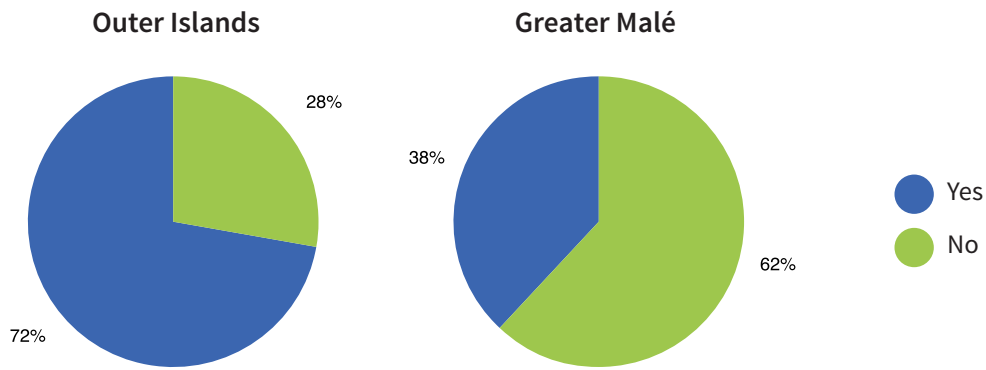


Figure 11: Waste segregation practices by small businesses

Types of business waste streams

Analysis of the waste streams generated by small businesses in the focus region showed interesting similarities. Plastic bottles were reported across all business in both localities as one of the top three waste streams that was generated. Another common waste stream that was observed across all types of businesses was food waste.

Some 91% of cafes and restaurants identify food waste as their primary waste stream, but none mentioned composting as a waste reduction policy or procedure.

It was observed that restaurants, cafes, supermarkets, and guesthouses operating in both localities had similar types of waste generated, but in varying volumes. Table x below summarizes the different waste streams generated across businesses in both localities.

Business Type	Greater Malé	Outer Islands
Cafes and restaurants	Food waste Plastic bottles Tissue	Food waste Plastic bottles Tissue
Supermarkets	Food waste Plastic bottles Cardboards	Food waste Plastic bottles Cardboards
Guesthouses	Food waste Plastic bottles Tissue	Food waste Plastic bottles Tissue

Figure 12: Top three waste streams generated through small businesses in Greater Male' and outer islands

Additionally, food waste and plastic bottles appeared as common waste streams in the remaining surveyed businesses, apart from pharmacies. The main types of waste generated through these entities are tabulated below.

Garages	Public Ferries	Pharmacies
Food waste Plastic bottles Aluminium cans Waste oil	Drink Packets/Food waste Plastic bottles Tissue Sea sickness bags	Plastic bottles Medical waste Cardboard/tissue

Figure 13: Top waste streams in garages, public ferries and pharmacies

Waste streams from Restaurants and Cafés

From the RAP, it was noted that food waste comprised the largest waste stream generated through restaurants and cafes in all surveyed entities. Food waste contributed to 91% of the waste stream, demonstrating its significance, and potential for reduction. Plastic bottles were the second largest waste stream in this group (70%) followed by tissue (67%). Further details are included below.

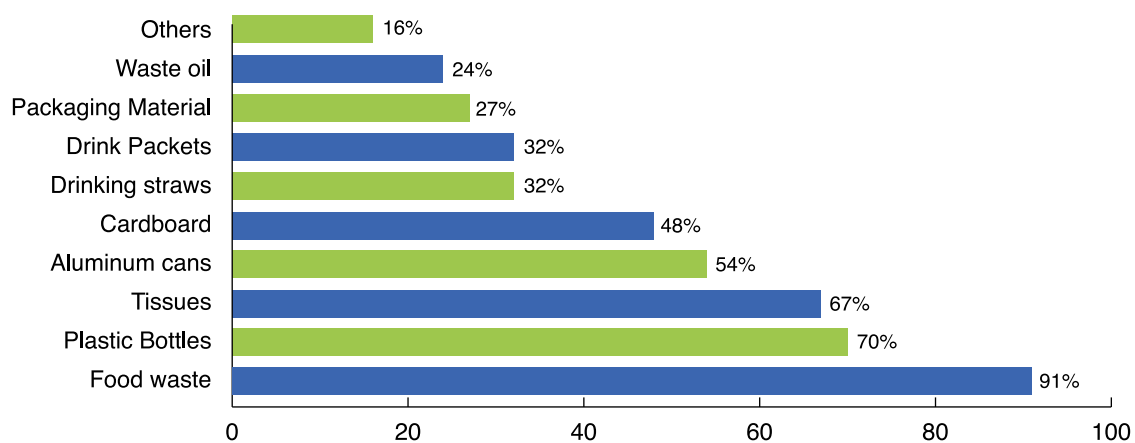


Figure 14: Waste streams generated through restaurants and cafes

Waste streams from Supermarkets, shops, factories and food packers

Waste streams generated by supermarkets, shops, factories and food packers are similar in component but differ in frequency in the responses. The table below compares the difference between Greater Male' (61 businesses) and the outer islands (28 businesses). In both locations plastic bottles are mentioned frequently, but in Greater Male' the waste streams identified the most is food waste, whereas in the outer islands the top waste stream is cardboard.

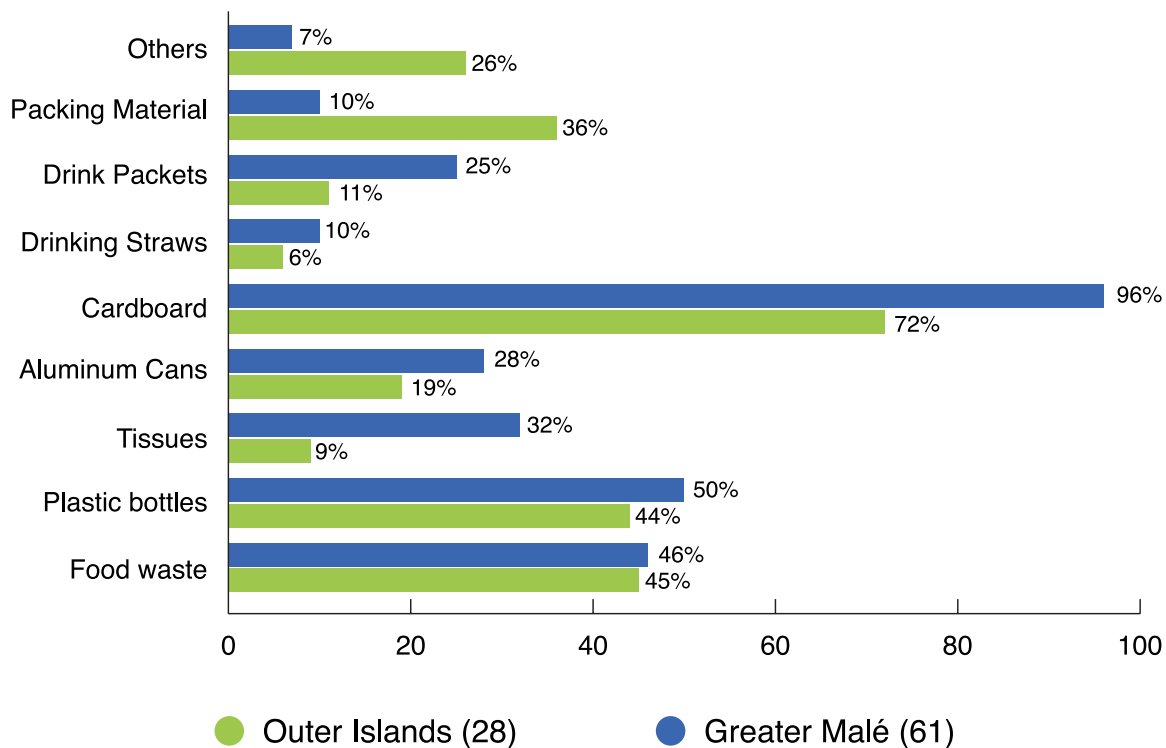


Figure 15: Waste streams generated by supermarkets, shops, factories and food packers

Other types of waste:

wooden pallets (2), plastic bucket (1), plastic bags (7), sacks (2), Jerry can (1), paper (4), nylon bags (1)

Waste Streams from Guest Houses

Waste streams generated by guest houses in Greater Male' and the outer islands are very similar. The three biggest sources of waste mentioned in both areas are food waste, plastic bottles and tissues. There are opportunities for either centralised composting of the food waste and tissues, or on-site composting. Concerning plastic bottles, solutions are either waste reduction (through use of water dispensers and reusable glass) or collection and recycling of plastic bottles.

Waste Stream	Greater Male' (15)	Outer Islands (14)
Food waste	80% (12)	100% (14)
Plastic Bottles	100% (15)	85% (12)
Tissues	60% (9)	85% (12)
Aluminum cans	26% (4)	57% (8)
Cardboard	26% (4)	57% (8)
Drinking Straws	26% (4)	35% (5)
Drink Packets	33% (5)	57% (8)
Packaging material	13% (2)	7% (1)

Figure 16: Waste streams generated by guest houses

Waste Streams from other institutions

Waste streams generated by hospitals, pharmacies, garages and passenger ferries are similar to those mentioned above, with the addition of medical waste, chemical waste, engine oil, and sea-sickness bags. For passenger ferries, the most common waste mentioned is plastic bottles. For hospitals and pharmacies, the most common waste mentioned was cardboard, followed by medical waste.

Small Businesses Solid Waste Management on-site

There is a marked difference in waste segregation practice between small businesses in the outer islands and Greater Male'. Three quarters (76%) of businesses surveyed in the outer islands are segregating their waste before disposal, compared to only 38% in Greater Male'.

Only 36% of small businesses in Greater Male' have waste reduction incorporated into their business policies or standard operations. This percentage is even lower in the outer islands, where only 23% of small businesses have waste reduction in policies or standard operating documentation.

This is reflected in the waste reduction activities that are voluntarily being implemented. More effort is currently being made in Greater Male'. But the voluntary actions are varied - both in impact and effort. For instance, despite the country's strong dependence on imported food to meet its demand, there appears to be little focus on employing composting as a business strategy for tackling this issue. None of the businesses who took part in the RAP reported composting as a key waste management strategy which they employed.

Businesses also reported re-selling of recyclable items such as metal. Again, this was more common among the Greater Malé region, compared to the outer islands. Approximately 77% of the businesses who were operating in Greater Malé reported selling or giving away recyclables while only 22% of businesses in the outer islands reported the same. One likely explanation for this difference is the high logistical costs associated with transport of recyclables, and the lack of adequate infrastructure (such as accessible harbours) and vehicles necessary (such as forklifts) necessary for easier transfer of such bulky items. Paper and cardboard were identified as the waste stream that was mostly resold (32% in Greater Malé and 55% in outer islands), followed by plastic (26% in Greater Malé and 29.8% in outer islands). Metal, as mentioned before, is harder to transfer due to lack of adequate infrastructure. Metal made up 15% of the items that were resold by businesses in Greater Malé and about 10% of the items resold by the islands.



According to respondents the current most prevalent waste reduction activities include:

Current Waste Reduction Practices	Greater Male'	Outer Islands
Consider waste reduction when purchasing supplies	17% (22)	3% (2)
Use refillable glass bottles	13% (16)	6% (4)
Reduce plastic wrapping when displaying items	11% (14)	8% (5)
Install water dispenser	11% (14)	8% (5)
Other	11% (14)	3% (2)
Use alternative reusable straws	5% (6)	8% (5)
Use alternative to single-use plastic takeaway containers	3% (4)	5% (3)

Figure 17: Current waste reductions practices by small businesses

While all are important, the top four practices in the table above have greater impact than single issues such as reusable straws. So capacity-building with businesses should promote the good work modeled by those already practicing high impact waste minimisation. Businesses should also be better informed of comprehensive waste reduction approaches, perhaps through a self-audit tool.

Perceptions of Small Businesses on current SWM practices

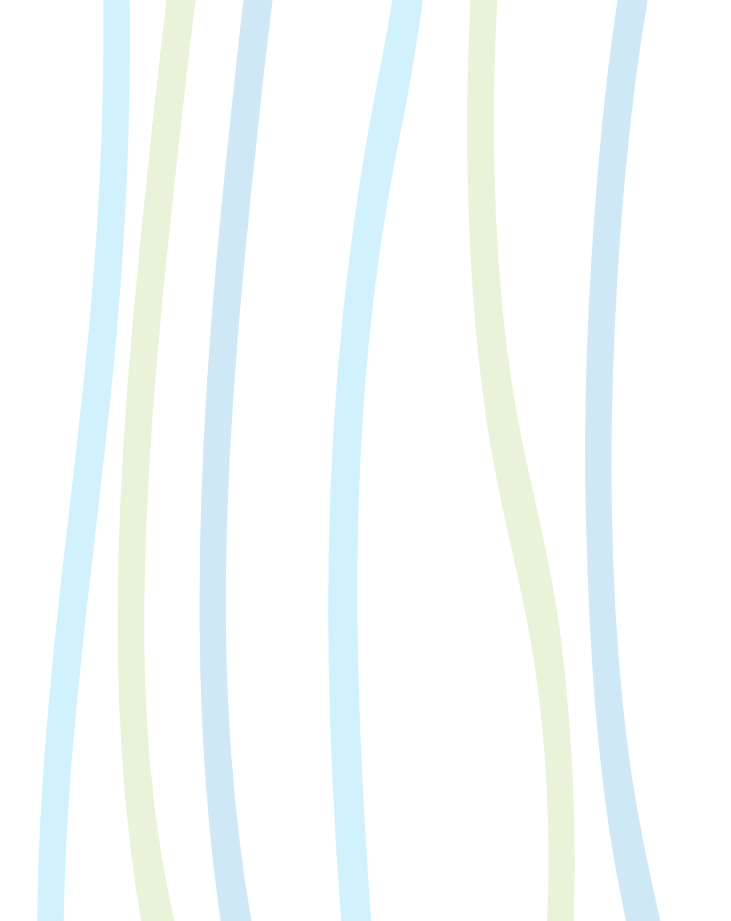
Current perceptions regarding SWM practices

It is important to understand the underlying perceptions of small businesses regarding current SWM practices, in order to design an effective behavioural change programme. As mentioned earlier, majority of the businesses surveyed viewed their current waste disposal arrangements favourably. However, areas where services could be improved were also highlighted. In Greater Malé, these issues related to WAMCO's operations on waste collection. Businesses surveyed expressed concern about frequency of waste collection and issues arising from delays such as foul smell and public hygiene. There also appeared to be a gap in understanding between businesses and WAMCO regarding the types of services sought and received. Small businesses expressed concern about difficulties in disposing larger waste items which WAMCO are unable to cater on a daily basis due to operational difficulties. Concerns were also raised about the subscription fees which certain businesses felt was too high for the services rendered.

In outer islands, most of the issues related to self-segregation and absence of a waste collection system. Small businesses such as guest houses further expressed concern over ocean waste dumping, which directly affects their businesses and leads to additional cost.

The following ideas were suggested by these entities as a way forward.

1. Segregation of waste
2. Keep communal bins at the harbour and at local businesses
3. Reduce the amount of waste businesses produce
4. Conduct awareness with businesses on good SWM practices and regulations.
5. Install water dispensers and use refillable glass bottles
6. Reduce WAMCO rates for small businesses
7. Learn and follow good waste management processes
8. Have more training for WAMCO staff
9. Have a dedicated parking zone for WAMCO to avoid pick-up delays.



Capacity of small businesses on SWM

It was understood from the RAP that majority of the small businesses in both Malé and outer islands had no formal training on SWM. Only 10.8% of businesses in Greater Malé and 4.7% of businesses in outer islands reported having undergone any form of SWM training.

However, majority of the businesses in both localities reported being aware of the Government's single use plastic policy. Approximately 52% of businesses in Greater Malé and 51.6% of businesses in outer islands reported of being aware of this policy.

Over 90% of businesses in both localities expressed willingness to use SWM awareness materials in their businesses operations (91.59% in Greater Malé and 96.88% in outer islands). Businesses in both localities cited 'waste segregation' as the main topic to be covered in such a programme, followed by waste reduction strategies and waste recycling.

In person training programs and workshops were highlighted as the most appropriate method for delivering any capacity building programme alongside social media (both were cited equally by 32% of respondents). In social media, Facebook was identified as the most preferred platform for awareness creation (37%) followed by Viber (21.69%) and Instagram (15.56%). Other methods suggested by both localities included use of traditional media (13%), print materials (6%), online news (6%) and billboards (5%).



Human Resources Capacity Assessment and Training Needs

The objective of the Human Resource capacity assessment was to substantiate the existing capacity, especially at the local island level and to inform the capacity development activities by the PACCB project. A review of the SWM capacity in the central and local levels reveal that SWM infrastructure and services in Zone 3 are undergoing rapid reforms and that it is imperative and urgent to provide capacity building support to the implementing agencies.

Two agencies primarily work on policy, planning, regulation, and sector development at the National level. They are the Ministry of Environment (Waste Management and Pollution Control Department), and the Environmental Protection Agency (EPA). One of the core functions of these agencies is to create an enabling environment with appropriate policy and legal frameworks for the sector.

Decentralization of administrative responsibilities for planning, implementing, financing infrastructure and service delivery is an evolving process. The Island Councils have legal responsibility to ensure safe disposal of solid waste and to administer related affairs including development plans. This implies a stronger role in the oversight and evaluation of SWM activities. At the local level, Island Councils provide the necessary support to implement policies, plans, regulations, and monitor service delivery activities. The Island Councils also play the lead role in community engagement activities.

HR Capacity and Gaps

The current scenario is that the SWM sector has a modest number of qualified planners working at the core National Government agencies. Staff working at senior management, middle management and technical level are graduates with qualification in Environmental Science, Management, or related fields.

The consultant was not able to gather qualification details of the personnel working in the WAMCO, hence, it is not possible to provide an assessment of their capacity in this report. In consultations with WAMCO they explained that they do not have a current strategic plan at present, but one is currently being formulated that will inform their direction in the mid-to-long term.

SWM management at outer island level is constrained by a shortage of manpower, skills, and resources. Data received from 23 islands show that staff Island Councils lack technical or specialist background in SWM. It is expected that this would be the scenario for the rest of the island councils in Zone 3. The following tables show HR capacity of the Island Leaders and Waste Handlers in the outer islands.

High staff turn-over rates in the sector were highlighted by the stakeholders as a major challenge which has restricted sector development and efficient performance. It would be critical to introduce and institutionalize training programs to support sector development and ensure delivery of quality services.

There is significant difference in the number of male and female staff employed in the Island councils. Out of 139 Council staff including management and administrative staff, Combined, 70.5% are men and 29.5% are women.

Data on training in solid waste management training shows that only 8% of the 221 staff, has acquired any form of Solid waste management training (only men).

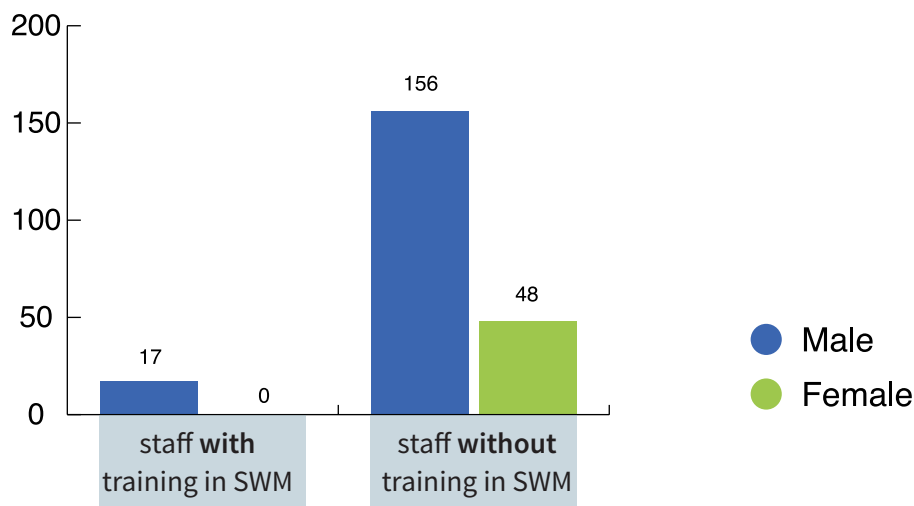


Figure 18: Total number of staff working in Island Councils with skills/ training in SWM

Qualification of Island Councils Staff

The figure below represents education qualification of staff working in the Island councils in 23 islands the consultant was able to gather information from.

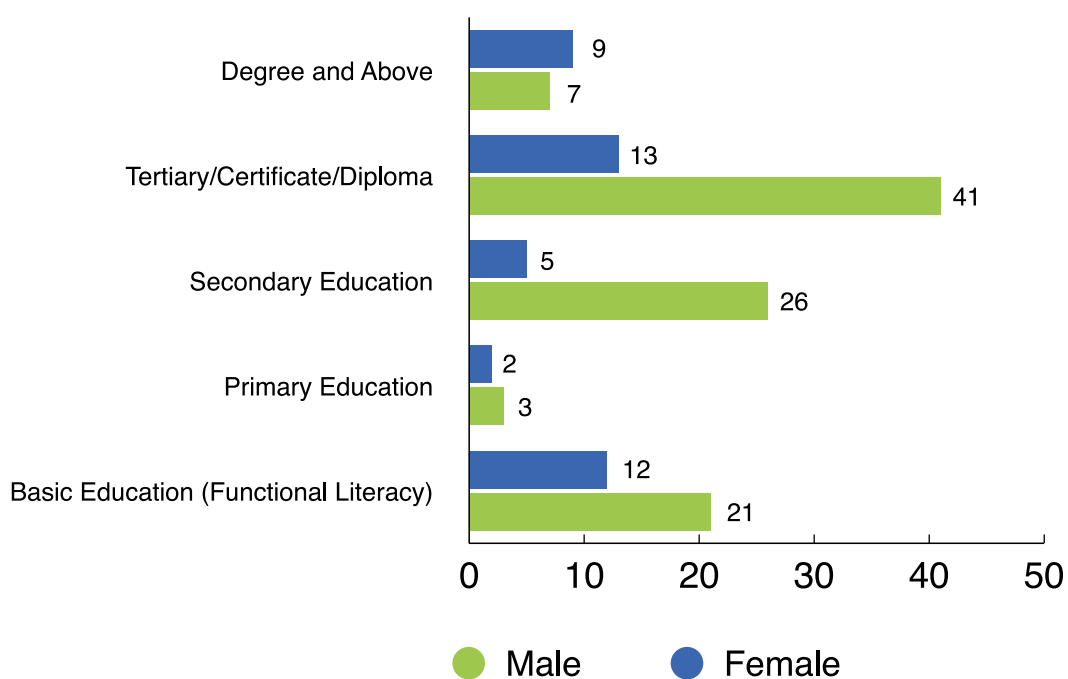


Figure 19: Education levels and qualifications of Island Council staff

Qualification of waste handlers in the outer islands

Human Resource data received from 23 islands in Zone 3 show that there are 76 people working as waste handlers. This group consist of staff involved in sweeping, waste collection, transfer and disposal. Many Island Councils have hired foreigners as laborers to work as waste handlers. Out of 17 staff trained in any form of Solid Waste Management, 7 are foreigners and 10 are locals. All local waste handlers have at least basic level of education, while 42 out of 49 foreigners have not completed any formal education.

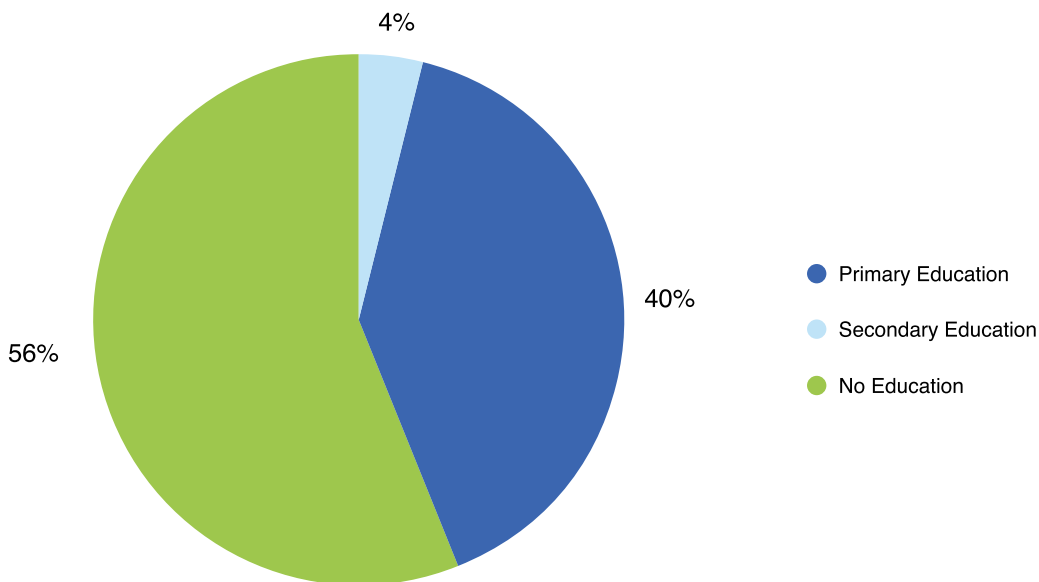


Figure 20: Educational level of waste handlers in the outer islands

SWM Training Needs

Environmental Protection Agency

The Environment Protection Agency (EPA) considers their staff have a lack of knowledge about new technologies and initiatives in SWM. They gave an example that incinerators have been provided to some islands, but the EPA does not have staff with sufficient knowledge to prepare rules and guidelines to operate the technology. Currently they rely on assistance from donor agencies for such specialist support.

Island Councils

The continuity between termed councils is challenging, given there is no dedicated staff. This was highlighted by the stakeholders as one of the key challenges for training. It would be crucial to conduct regular training for people on the ground including Island Councils, waste handlers and key people from the communities. Suggestions made during stakeholder consultations are:

- There is a need to “diffuse political polarisation” and work around it towards overall civic development
- Reservations in communities on paying fees for waste management have been observed, so awareness of the importance of a user-pays mechanism should be emphasised.
- Consider social media at local island level; it is vital for communication
- It is important to document islands with good practices in the knowledge portal
- Waste handlers should be one target group that should be provided with crucial knowledge and skills.
- Training to be provided for Island Councils in order for it to be implementable at the island
- Address combustion, composting, segregation and setting up waste bins in the technical training program
- Training programs for Island to include SWM Planning, communication of rules and regulations, operations and maintenance of SWM infrastructure.

WAMCO

WAMCO supervisors and waste handlers stressed the importance of including office-based staff, technical operators and waste collectors in Greater Male' and those involved in transfer of waste from islands to Thilafushi and the staff working at island waste centres in training and empowerment programs. They also highlighted that training is required in community engagement and communication skills to deal with customers.

There needs to be communication and awareness strategies for WAMCO staff who collect waste from households to give them a sense of empowerment. A significant number of WAMCO workers are expatriates, mainly from Bangladesh. Communication tools and education programs will need to take into consideration that some workers do not speak English or Dhivehi. Material accompanied by visuals would need to be produced in Bengali.



"There is no training conducted for SWM workers and with no-one supervising at the (waste) centre the work can be poor."

AA Mathiveri Island Council

"The most important thing to change is the public perception towards our job. The public views sweeping as a very low-level and menial job, while we are in fact doing a public service and duty, and something noble to keep everyone's environment clean."

A Female WAMCO street sweeper

"Problem is that each government is doing something about garbage management. But as soon as there is a change in the government the new political power refuses to continue previous work and has to restart the whole thing. Government needs to find a way to keep continuing to do such work irrelevant of which party government is in power."

Focus group discussion ADh. Mahibadhoo

Training Programs relevant for SWM staff development

The only available formal training courses related to Environmental Management/ SWM is offered by the Maldives National University. Technical Courses offered by the Polytechnic and Maldives Institute of Technology (MIT) could be useful to train SW material processing machine operators in the outer islands.

	Specialist – SWM	Technical Non-SWM	Comments
Bachelor of Environmental Management (MNU)	Yes		Offers specific subjects/ modules in SWM
Bachelor of Science (MNU)	Yes		Offers specific subjects/ modules in SWM
Certificate in Electrical and Electronics Engineering (Polytechnic & MIT)		Yes	Offers programs that may be relevant to technical staff / provide skills in equipment operations and maintenance
Certificate in Engine Repair and Maintenance (Polytechnic & MIT)		Yes	Offers programs that may be relevant to technical staff / provide skills in equipment operations and maintenance

Figure 21: Summary of formal training courses relevant for the SWM Sector

Environmental Education in Schools

Significant investments and emphasis by the Government and its global partners on the social sector in Maldives has contributed to achieving five out of eight Millennium Development Goals (MDGs) by 2010, making it South Asia's only MDG+ country. Attaining universal Primary education is one of these goals. However, the rate of improvements in achieving three other goals including ensuring environmental sustainability (MDG-7) has been slower and requires intensified efforts.⁴

The School curriculum is organized in such a way that children learn through the local curricula till year 8 (13 or 14 years). For the rest of the school years (until higher Secondary Education is completed) schools use the International General Certificate of Secondary Education (IGCSE, UK). The only exception for this is in three subjects: Fisheries Science, Local Language and Islamic Studies. This set-up in the education system creates a major gap and disconnect in engendering local knowledge including knowledge about the environment.

Environmental education should be a fundamental and integral part of education for all members of the society if environmental management is to be achieved. Knowledge of the environment, its conservation and threats must be integrated with the development of sensitivity to, and respect for, the environment and the formation of proper attitudes towards it. The activities in the PACCB will support and empower school children and/ or youth to advocate for health and environmental justice.



Incorporating SWM into School Curriculum

Environmental education elements are not adequately integrated and emphasised in curricular and co-curricular activities in schools in the Maldives. From Grades 1 to 8, there is some emphasis on Environmental Education including SWM through subjects such as Science and Personal Development, Health and Physical Education, among others. Formal teaching alone is insufficient if awareness linked to behavior change is to be emphasised and achieved.

The National Institute of Education (NIE) is the designated authority under the Ministry of Education that designs and revises the National Curriculum. The NIE is developing a framework to introduce the “Green Schools” initiative in schools. The program is meant to promote the concept of “Green Schools and Healthy Communities”. One of the themes/ pillars of this initiative will be waste management.

The Green School initiative will provide “recognitions” linked to a series of activities/ achievements that the schools are required to complete. The activities are targeted for individual performances as well as school level performances. Once the three levels are completed, schools can submit their report to NIE for evaluation. This framework is in the process of finalization. PACCB Project will coordinate with NIE to seek information about the progress of this initiative and share the information through the program targeted for the schools.



SWM Practices of Schools in Zone 3

Focus group discussions were conducted with 14 schools in Zone 3. Each group averaged six to eight participants. The total number of participants consulted from the schools are summarised in the table below:

Target Group/ Stakeholder group	Greater Male'		Outer Islands		Total
	Male	Female	Male	Female	
School management and teachers	11	49	26	51	137

Figure 22: Number of educators consulted

How the curriculum and the teaching/ learning activities in schools address SWM

The National Curriculum Framework is based on eight key competencies. Two of the competencies focus on safe and sustainable waste management practices and Living a Healthy Life. Additionally, extra-curricular programs related to Solid Waste Management are conducted under the Environment Club, Scout and Girl Guide activities.

Waste generated in schools

Green waste, paper waste, food packets and packaging were the most frequently identified waste items disposed from Schools. Several schools reported that they have school policies that have banned single use plastics from their schools.

Waste Management Practices in the schools

School cleaners collect litter from the classrooms waste bins and empties into larger dustbins. The most common practice is to dispose of mixed waste items in bags. In Male' and Hulhumale' schools, WAMCO is contracted out to collect and dispose of the waste. In the outer islands, waste is disposed of through arrangements made by the Council or school staff.

Issues with Solid Waste Management in the Schools

Issues highlighted by the Schools are as follows:

- Delay in waste collection
- In Greater Male', WAMCO collects 4 bags of waste from school per day. If a school generates more waste than that, they leave the additional bags behind.
- Even though best practices are taught and practised in the Schools, when the children go out of the school they do not see these good practices implemented by the larger community.

The image features a vibrant tropical scene with a clear blue sky and a turquoise ocean. A large, dark blue circular graphic is centered over the image, containing the text 'SECTION 2'. The background shows a small island with palm trees and a sandy beach, surrounded by shallow, clear water with visible coral reefs. The overall aesthetic is clean and modern, with a focus on natural beauty and a structured layout.

SECTION

2

An aerial photograph of a tropical island. The island is covered in lush green vegetation and palm trees. A white sandy beach curves along the edge of the island. The surrounding water is a vibrant turquoise color, with darker patches indicating coral reefs or sandbars. The sky above is a clear, bright blue with a few wispy white clouds.

Public Awareness & Communications

Behaviour Change Models

Overview of Behaviour Change Concepts

The Value-Action Gap

Changing attitudes are rarely enough to influence behaviour. The **value-action gap** is the gap between what people say, and what they do. Methods for closing the value-action gap are a constant topic of discussion in behaviour change projects! Addressing the value-action gap is particularly difficult in environmental behaviour change communications strategies.⁶ But research has shown that the value-action gap can be closed when people see others in their area doing a particular behaviour.⁷

Emotions can be both conscious and unconscious. Emotion can be used to draw people into something, for example, someone may feel guilty for not recycling after seeing an advertisement about waste. However, guilt alone will not directly change their behaviour. Research has shown that campaigns with positive emotional perspectives can be more successful in influencing behaviour change.⁸

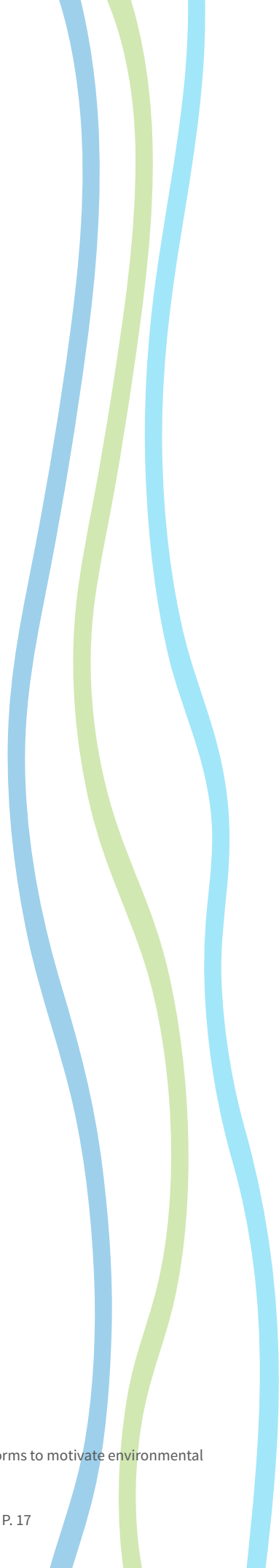
Self-efficacy is when people sense that they can carry out a particular action successfully and that their actions will bring an expected outcome. It can also be called “perceived behavioural control.” The crucial aspect to self-efficacy is not the actual behaviour, but the person’s belief that they can be successful. Removing barriers to taking action is often at the core of successful interventions.⁹ Barriers can be physical and psychological. Physical barriers to self-efficacy include systemic problems (for example, lack of waste transfer systems in the outer islands), or physical infrastructure (such as inactive equipment at island waste management centres). Psychological barriers to self-efficacy include social norms (see below), emotions and habits.

6 Barr, S., 2006. Environmental action in the home: investigating the ‘value-action’ gap. *Geography* 43–54.

7 Blake, J. (1999). “Overcoming the ‘value-action gap’ in environmental policy: Tensions between national policy and local experience”. *Local Environment: The International Journal of Justice and Sustainability*. 4 (3): 257–278. doi:10.1080/13549839908725599.

8 Russell, Young, Unsworth, Robinson (2017). Bringing habits and emotions into food waste behavior. *Resources, Conservation and Recycling*. 125

9 Bandura, A (1977). “Self-efficacy: Toward a Unifying Theory of Behaviour al Change”. *Psychological Review*. 84 (2): 191–215. doi:10.1037/0033-295x.84.2.191. PMID 847061.



Social norms are the informal understandings that influence the behaviour of individuals in a society. Social norms vary from place to place, culture to culture. For example, the RAP surveys show that waste segregation is not a norm in Greater Male', but that some waste segregation is a norm in the outer islands. In the Maldives an almost universal social norm is the practice of burning waste, even though most people are unhappy with the impact of it.

Because it is a social norm many RAP responses suggested moving the problem of burning waste “somewhere else” rather than suggesting alternative behaviours. Descriptive norms are the informal understandings of how behaviours are performed, while injunctive norms are the rules and regulations that tell us what we should do. Descriptive norms have been shown to be more effective at influencing behaviour than injunctive norms.

We can sometimes assume that following rules and regulations will be easier than changing social norms - as shown by RAP survey feedback that awareness programs should clearly explain the rules and regulations - but research has shown that emphasis on rules and regulations is insufficient. In addition, descriptive norms that use a local lens have been shown to be more effective than those that do not.¹⁰

Habits form when we repeat a behaviour. The more we repeat a certain behaviour the more automatic it becomes. As the behaviour becomes automatic, it becomes a habit which in turn, becomes a self-generating motivation to act. Ideally, a behaviour like recycling becomes habitual and people do it without having to reason or convince themselves. Research has found that habit is a predictor of the intention to recycle.¹¹

¹⁰ Goldstein N. J., Cialdini R. B., Griskevicius V. (2008). A room with a viewpoint: using social norms to motivate environmental conservation in hotels. *J. Cons. Res.* 35, 472–482. 10.1086/586910

¹¹ COI/IPA, How Public Service Advertising Works, World Advertising Research Centre, London. P. 17



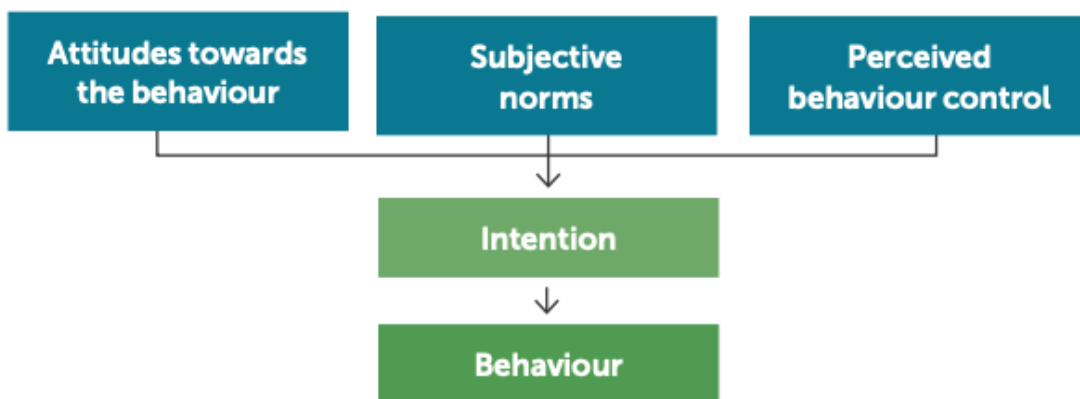
Behaviour Change Models

There are over 80 different types of behavioural change models, and a number of them are relevant in understanding how communications campaigns can be used to influence solid waste management behaviour including food waste and recycling. After considering the findings from the RAP research we think that two well-known behaviour change models are worth considering in detailed planning for capacity-building and communications activities. These are the *Theory of Planned Behaviour* and the *Theory of Interpersonal Behaviour*.

Theory of Planned Behaviour

The Theory of Planned Behaviour (TPB) is a well-known model of behaviour change¹² which has been used to model and better understand the behaviour of individuals and households in relation to food waste reduction and waste recycling. These studies have allowed researchers to use the model to predict household waste separation behaviours.¹³

Theory of Planned Behaviour



12 Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. UMD, pp.11-43
Metropolitan Waste and Resource Recovery Group, *Food waste recycling social research: Elements of effective communications: Final report*, (May 2019) <https://www.mwrrg.vic.gov.au/assets/resource-files/Food-Waste-Recycling-Social-Research-Final-web.pdf>

13 Metropolitan Waste and Resource Recovery Group, *Food waste recycling social research: Elements of effective communications: Final report*, (May 2019) <https://www.mwrrg.vic.gov.au/assets/resource-files/Food-Waste-Recycling-Social-Research-Final-web.pdf>



Attitude

Attitude is an important variable for estimating a person's willingness to separate waste and actual behaviour. However, it should be noted this is not always true as people may hold different values to their actions.

Subjective Norms

Subjective Norms are the perceived societal pressures stemming from a person's family, friends, neighbours, colleagues, government, and mass media. This could include council communications, which may also work to influence a person's behaviour.

Perceived Behaviour Control

Perceived Behaviour Control is the belief a person has about whether they can actually carry out the new behaviour. A lack of agency can be a strong barrier to behavioural change. For example, island councils described a lack of agency in being able to transfer waste regularly off their islands. A second example from the RAP is that many businesses and households felt that they had agency to start segregating their waste.

The TPB assumes people behave rationally, and that they think through the consequences of their actions. According to this model - **Intention** leads directly to behaviour, assuming that we understand the attitudes, subjective norms and perceived behavioural controls influencing the target group.

The TPB is a useful framework for informing communication campaigns targeting business and household behaviours that support the wider SWM system being established through the Greater Male' Environmental Improvement & Waste Management Project. An example of this framework in use is provided for waste segregation (see Theory of Planned Behaviour models on page 89 and 90).

This RAP report will not provide detailed TPB plans. Instead it provides the data for detailed planning that is to be done by capacity-building staff and communications staff during project implementation - as many perceived behavioural control issues will only be addressed as capacity-building is conducted with island councils, and as the overall SWM system components are completed (the new IWMC, transfer ships, etc).



Theory of Planned Behaviour

Example Target Behaviour:

Household and Businesses are segregating their waste for collection or delivery to SWM facilities

The RAP provides the following relevant information for the TPB framework:

Attitudes to Waste Segregation:

- Over 90% of HH are willing to segregate their waste in outer islands
- 57% of households are willing to segregate their waste in Greater Male'
- Majority of small businesses are willing to separate their waste
- 90% of food waste in the islands is already being segregated by households.

Social Norms of Waste Segregation

- Currently waste segregation is not a social norm in Greater Male'
- In the islands some waste segregation is a social norm - specifically food waste (either for composting or dumping in the sea), and metal waste (especially cans).

Perceived Behavioural Control issues

- In Greater Male' focus group responses indicated doubt that WAMCO is willing to segregate waste, and small businesses gave examples of where they separated waste and WAMCO waste collectors combined it all on site before taking it away
- In the islands metal waste is being stockpiled, sometimes for years, and possibly contributing to increased disease through mosquitoes breeding in the water in empty cans
- In the islands 9 out of 11 surveyed islands are dumping or burning food waste
- Islands are interested in composting, but current methods are considered labour intensive and can't manage the volume of organic waste generated.

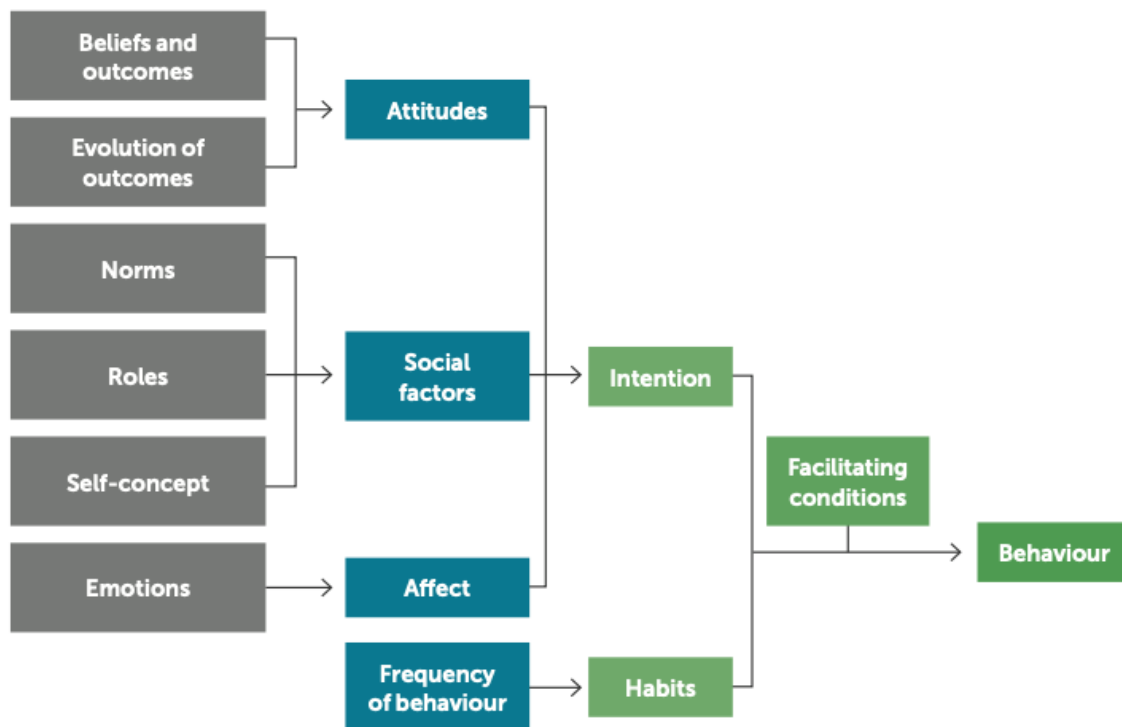
So, the TPB model directs the development of capacity building activities and campaigns that provide solutions to mainly address social norms and perceived behavioural control issues.

These could include:

1. Information campaigns about WAMCO waste segregation pilot and expansion in Greater Male' (Perceived Behavioural Control)
2. Information on procurement of the new waste transfer ships, and extensive promotion of the delivery and launching of the new waste transfer ships and their island-to-island waste transfer schedule (Social Norms, Perceived Behavioural Control)
3. Campaigns and training in home-based composting of food waste, and/or less labour intensive composting systems in the islands that provide households with compost for gardening.

Theory of Interpersonal Behaviour

Theory of Interpersonal Behaviour



The Theory of Interpersonal Behaviour (TIB)¹⁴ is similar to the TPB, but considers the impact of emotions and habits on behaviour intentions. Our emotions and habits are extremely important to us, but are often unconscious (so can't be considered rationally).

In the TIB **Habits** are behaviours that have been repeated and become automatic and less deliberate, thus making it difficult for programs or communications to intervene. **Intentions** are a result of attitude, social factors and affect. **Social factors** include norms, roles and self-concept.

The TIB has three levels:

1. How personal characteristics and prior experience shape our personal attitudes, beliefs, emotions and social factors related to behaviour
2. How cognition, affect and social determinants and personal normative beliefs influence the formation of intentions with regards to a specific behaviour
3. Intentions regarding behaviour, prior experience and situational conditions predict whether a person will perform a specific behaviour

14 Russell, Young, Unsworth, Robinson (2017). Bringing habits and emotions into food waste behavior. Resources, Conservation and Recycling. 125

“Attitudes and emotions around sustainable behaviour influence whether people act and make an effort to reduce their waste or not.”

The TIB is particularly useful in explaining and understanding complex behaviours that are influenced by social and political environments. This is highly relevant to food waste and recycling and highlights the importance of community-based waste management programs. Attitudes and emotions around sustainable behaviour influence whether people act and make an effort to reduce their waste or not. Sustainable acts come down to whether people are willing to be involved. The TIB identifies emotions as key motivation for food waste, recycling or conservation behaviour. For example, let’s look at public littering in Greater Male’.

The RAP provides the following relevant information based on the TIB framework:

Possible Waste Emotions identified:

- Frustration at lack of waste management options (no waste transfer services so constant burning of waste)
- Fear that piped drinking water is unsafe (plastic bottles identified as the main waste product across all sectors surveyed)
- Disinterest - assuming the waste will be taken care of by someone else (street-sweepers, WAMCO, island councils, etc)
- Confusion or embarrassment or “out-of-sight, out-of-mind” (rubbish thrown onto other rooftops)

Possible Waste Habits identified:

- Public littering by locals in Greater Male’ around food eateries and on beaches (evidence of more Red Bull cans than Tiger cans - Male’ City Council)
- Daily emptying of household food waste into the sea
- Reliance on plastic bottles for drinking water, even if piped water is safe and available



Example of using the the Theory of Interpersonal Behaviour for planning:

Norm / Emotions	Attitude / Social Factors	Intention / Habit	Intervention (systemic and communication)	New Behaviour
Using bottled water for drinking water	<p>“Everyone does it!”</p> <p>“There is no other option!”</p> <p>“Water from the pipes is unsafe”</p> <p>“There is no other option when I am out”</p>	Use of plastic bottles for drinking water	<p>Solutions:</p> <p>Installation of public refill stations in supermarkets, cafes, etc to refill reusable bottles.</p> <p>Maintenance or improvements to piped water supplies to homes and businesses (e.g. filters)</p> <p>Communications:</p> <p>Campaigns to change attitudes and social factors (addressing the emotion) and build trust in piped water supplies.</p> <p>Campaigns to change norms in carrying refillable water bottles, and trust in access to places to fill them.</p>	<p>Use of refillable bottles when out.</p> <p>Use of piped water, filters or refillable bottles at home</p>

Commitment Strategies

Commitment-making strategies have been shown to lead to behaviour change in both the short and long term¹⁵. This can be achieved through asking community members to make a pledge to change behaviour. Alternatively, community advertising highlighting a commitment to changing a certain behaviour, can be a strategy that influences social norms.

The 'foot in the door' technique posits that individuals who are first asked for a small commitment are more likely to agree to a larger commitment later on. For example, people who were asked to participate in small community-based programs were more likely to implement recycling in the home compared to people who were asked to start recycling via non-community-based programs.



15 Lokhorst, A. M., et al. (2013). "Commitment and Behaviour Change: A Meta-Analysis and Critical Review of Commitment-Making Strategies in Environmental Research." *Environment and Behaviour* 45(1): 3-34

Perceptions on Information, Education and Communication for SWM

Perspectives on SWM Awareness Topics

Survey respondents were asked their opinion on what topics should be included in public awareness, communication and capacity-building programs:

Topics to be Covered in Public Awareness and Capacity Building

	Yes	No
Refuse consumption	9	155
Waste reduction	29	135
Waste reuse	47	117
Waste recycle	70	94
Not littering	48	116
Waste segregation	110	54
Waste regulation	67	97
Others	37	127

Figure 23: Perspectives on SWM Awareness Topics

Perspectives on Target Audiences

164 household survey respondents were asked their opinion on who should be targeted by public awareness, communication and capacity-building programs:

The responses are given in order of frequency:

1. Youth - 125 responses
2. Head of households - 122 responses
3. Health professionals - 91 responses
4. Migrants - 84 responses
5. School Management - 84 responses

Others - 125 responses mention “others” and the data breakdown of responses is available and will be used in detailed planning.

Businesses were surveyed on their opinion on who should be targeted by public awareness, communication and capacity-building programs. The top 5 audiences they nominated are: Business owners, Youth, Waste Handlers, School Children, and Island Councils.



Perspectives on Preferred Communication Methods

Survey respondents were asked to nominate the communication channels they prefer, or think are most effective. The responses are given in order of perceived reach:

1. Banners / Posters - 125 responses
2. Social Media (Facebook, Twitter, Instagram) - 122 responses
3. Billboards (still and digital) - 94 responses
4. Print materials (poster, flyers, booklets) - 82 responses
5. Online news / print media (Mihaaru, Sun Online, Vaguthu, etc) - 80 responses
6. Traditional media (PSM, VTV, Raajje TV, etc) - 73 responses

Billboards and posters received mixed comments from residents. Some felt that posters are not read and are a source of litter. However, large outdoor billboards and posters are highly visible (hard to ignore) and are more likely to be read than smaller complex written materials.

Social media users in Maldives



Facebook

376 400



Instagram

180 000



Messenger

327 100



LinkedIn

108 100



Source: <https://napoleoncat.com/stats/social-media-users-in-maldives/2021/02>

Social Media Channels

With access to 4G and 5G networks, social media is used extensively throughout the islands in the Maldives. Social media penetration (the percentage of the population that accessed social media) in the Maldives stood at 71% in January 2020. All islands suggested social media as the primary use of communication when delivering messages about waste services and awareness.



Source: <https://gs.statcounter.com/social-media-stats/all/maldives>

Community groups and individual household responses also recommended using **Viber chat groups**. Viber is a free messaging and calling app. Covid-19 has seen the Maldives embrace the use of Viber to communicate with friends and family. The number of group messages sent rose 134%, and the number of group calls received by an average Viber user rose to 370% during 2020.

- *“There are community Viber groups in Mahibadhoo. This medium will be very effective in public messages.”*
- *“Social media in general will be easy to reach the mass public.”*
- *“Social media in general.”*
- *“Social Media: there are Viber chat groups that are quite effective in messaging and passing information.”*

Businesses surveyed responded that the most frequently used social media platforms are: Facebook (79 responses); Viber (46 responses), and Instagram (33 responses). Communications using social media will include video posts, posters, and links to the SWM Government website and imagery that assist in influencing social norms, emotions and habits regarding targeted behaviours.



One-on-One Communication

Respondents from almost all islands interviewed suggested one-on-one / door-to-door briefings as an effective mode for training, awareness and education. This allows messages to be tailored to individuals and for households to feel comfortable asking questions or for practical displays of waste handling, composting or segregation of waste.

Some respondents felt that community group events would not work on their island because of the difficulty of gathering large groups together and the failure of group meetings in the past. One on one briefings are also workable for islands with lower levels of population.

- “The best way is to meet the people and to provide the information face to face. Canvas, leaflets are good but people really don’t like to read. It is best if you could do things face to face. We would like to get information about composting.”
- “Distribution of leaflets and door to door campaigns could be workable.”
- “Social gathering is not possible in Maafushi. It’s difficult to gather the community for a training program, mainly because everyone is employed and keeps busy with daily affairs.”
- “Door to door training and community level training.”
- “Awareness programs - physically meet the participants and conduct awareness programs. You can visit the IWMC with the participants, see the status of the place, discuss how you could manage waste there. You could also visit the households and explain to them.”

Workshops and Group meetings

While there have been limitations on the success of workshops and meetings on some islands, there is still support for providing training and awareness through workshops and with larger groups. This would be more time efficient for larger islands or for specific demographics.

“Previously, Mahibadhoo has effectively conducted community talks on health issues at households where community groups gather. This type of gathering into a household sitting room seems quite workable in the Mahibadhoo community. The purpose is to bring a relaxed and unofficial feel to the program.”

“The Live and Learn team could visit the island to conduct specific training in workshop style. This could be carried out during the day or in the evening.”

Waste Generators:

- Households in both Greater Male' and 11 outer islands
- Small businesses (including cafes, restaurants, supermarkets, retail shops, and passenger ferries)
- Primary, Secondary and Higher Education schools
- Institutions

Waste Managers:

- Island Waste Management Councils
- WAMCO
- EPA
- Local Government Authority
- Male' City Council
- Parley and Secure Bag

Three Types of Attitudes

In Greater Male' and each of the 11 islands where detailed surveys were conducted we received a great deal of qualitative responses concerning SWM problems and solutions. These responses have been referred to in different sections of the report. Three broad generalised attitudes emerged in household consultations about the solutions and suggestions for SWM. These are summarised below:

1

Attitude One

“Move the waste somewhere else; burn it somewhere else; move it to Thilafushi or another island.”

There were many suggestions from households to move the IWMC elsewhere to be away from the smell and sight, or move the waste off their island and burn it or dispose of it somewhere else.

Because of the cost of transportation, the lack of services from some islands to Thilafushi, the excess waste that Thilafushi already receives from Greater Male' and the lack of alternatives on the islands to replace existing IWMCs.

2

Attitude Two

“Government needs to do more - both in regards to the system, the technical equipment and awareness.”

There were quite a lot of responses about how the government needs to support local councils with equipment and transfer of waste, and conduct awareness. However, there were few practical suggestions on what exactly “awareness” should address.

3

Attitude Three

“Individuals should do more to reduce waste.”

Respondents from every island talked about individual responsibility to try to reduce waste at the source or to manage waste more smartly e.g., via composting.

Awareness of these general thematic attitudes are essential for planning of communications campaigns and behaviour change interventions based on the behaviour change models such as Theory of Planned Behaviour and Theory of Interpersonal Behaviour.

The first two are examples of **passive attitudes** - mostly wanting the problem moved elsewhere and taken care-of by others. Many households are expecting the problem of SWM to be mostly solved through better waste management systems, or they want the problem moved somewhere else.

The third point is an **active attitude** that indicates individual willingness to do something to solve the SWM problem. The active attitudes are present in the responses from all islands, but the passive attitudes are much more prevalent. This is not an unexpected finding, and reflects the growing frustration with the SWM stockpiling, burning and dumping that is now part of daily life in the Maldives.

Campaigns that promote **active attitudes** (such as Reduce, Reuse, Recycle) are important as underlying values for all communications activities, but will have limited impact without being linked with communications and behaviour change activities that result in households engaging actions that are part of **improved SWM processes** established by the island councils and supported through improved transfer and SWM infrastructure.

Through public awareness and behaviour change communications our goal is to support and magnify those in the communities with active attitudes, and to provide solutions to the passive attitudes of our audience by communicating progress for the improved SWM systems in Zone 3.



Systems and Behaviour

All of us make decisions and implement individual behaviours within wider complex systems. The challenges of SWM in the Maldives result from individual consumption needs (food, clothes, etc) that are embedded in a system that can generate more waste than necessary (such as single use plastics, non-biodegradable packaging, etc).

The 11 island councils surveyed felt that the strategies that would have the most impact on SWM are the regular removal of waste, good SWM practices, the segregation of waste and improved rules and regulations. But less than half of the islands have a waste management center or some kind of IWMC. Those with an IWMC have some waste processing assets, but the assets are not well maintained, or large enough to process the amount of waste received. Only three of the islands compost food waste - most open burn. All the islands stockpile metals and construction material. Over half of the islands dump waste in the sea, keep food waste in an open area, bury or do not segregate it. Only a third take food waste to the IWMC.

43% of householders consider that solid waste management in their island was “poor.” When asked what strategies would have the most impact in SWM at the household level households ranked waste segregation (112 responses) and composting (38 responses) as the two strategies that will have the most impact. These two strategies are systemic responses that also engage individual behaviour.

Partial waste segregation is practised at household level with 90% (167 responses) of households segregating their food waste. Households are interested in changing individual waste reduction behaviours and some have demonstrated a conscious decision to segregate waste. This is despite attitudes to suggest that many householders feel that most waste is ultimately combined on collection and not disposed of correctly.

However, at present there is neither the capability or the opportunity to make these positive behaviour changes, so the current waste management infrastructure and system is preventing positive waste management behaviour.



The goal is to establish effective SWM as a service supported by household and business behaviours that biome social norms. The most effective and sustainable tactic is to make the behavior habitual. Habits are actions that occur without a conscious decision when we encounter a particular situation or cue. It is important to keep a focus on waste management capacity building and behaviours, and not get side-tracked into individual behaviour change campaigns focused on waste reduction until there are effective waste management systems in place. Otherwise we risk asking people to take individual actions (such as waste segregation) that fail because the wider system isn't ready for the behaviour change.

Previous awareness campaigns and changes in behaviour in the Maldives have failed to make any sort of impact on waste management practices. This is because systemic processes have not been in place to serve the changed behaviour. Campaigns to stop littering, disposing of plastics into the ocean or illegal dumping; or to make people aware of the environmental damage of open burning, dumping of chemical waste or damage caused to the reefs by dumping kitchen waste in shallow water will have very limited to no impact if there are no processes in place for people to “do the right thing”.

It is critical that we focus on waste processes and not deviate to alternative messages that locals cannot hope to make an impact on. For example, we cannot encourage locals to segregate waste when there are no facilities or processes in place to dispose of segregated waste effectively. This will continue to cause frustration with island councils and Maldivians who cannot treat segregated waste effectively.

So all public awareness and behaviour change communications need to be linked closely with the system improvements. This includes the establishment of the two/three tier bin system, new or remodelled IWMC in operational mode, the introduction of effective waste management processes by WAMCO in Greater Male’, the introduction of transport barges that can efficiently and routinely remove waste from the islands to Thilafushi, the operation of transfer stations in Greater Male’ and the operating status of the waste to energy plant that is going to be installed in Thilafushi.

“People are aware about waste management, but there is no proper mechanism to segregate waste in our WMC and transfer waste to Thilafushi. Government should provide support to Council to address the issue and to transfer waste to Thilafushi.”

K. Thulusdhoo Island Council

“Establishment of a waste management center is essential to overcome the issue of waste accumulation. Instead of individuals discarding food waste themselves, a proper way of collecting and transporting such waste needs to be established.”

Maafushi Island Council

“The current IWMC is inadequate to keep all the machines and provide all the services required. It is also located near the school.”

Alif Alif Ukulhas Island Council

Observations on Past Campaigns

Plastic Noon Gotheh (Alternatives to Plastic)

- Plastic Noon Gotheh (PNG) is a project that started in 2018 and which advocates for alternatives to single use plastic bags in Male'. The project is run by Maldives Authentic Crafts Cooperative Society.
- The PNG page on Facebook is a mix of hard facts about the plastic problem, anti-plastic initiatives and proposals for alternatives to plastic. The PNG's bite-sized posts of little graphic drawings drive home points such as how by using a reusable bag a person can forgo at least 16 bags monthly.
- The initial intention of the campaign was to work with businesses in Male' to reduce "free give away" plastic bags. The specific target was supermarkets and small retail shops. Plastic Noon Gotheh realized the market was not ready for a change. The shops that agreed not to give away "free" bags later went back on their decision stating that the customers stopped coming to their shops as the shop next door gave "free bags".

Plastic Noon Gotheh shared the following observations on their single use campaign:

- To implement the campaign, PNG chose young, fresh people who had been educated in marketing and communications to develop a communications strategy. The materials, including a song and videos were developed through an educated group of volunteer support. The technical team intervened and guided in every stage of production of materials. E.g., scripts for the videos were developed with PNG input.
- Work has been ongoing with State Trading Organisation and Dhiraagu (the main mobile and internet service provider). The idea is to use alternative bags to plastic in the supermarket in which Dhiraagu partners with them to provide an incentive of free data for the customers who choose to have the alternative bag.
- The experiences in the field had been useful in contributing to the SUP Ban Committee. The biggest success PNG had with the campaign is the branding/ tagline that has been used. At the very initial stage some of the volunteers working in the team advised PNG to have branding and a tagline.
- The tagline had been developed in hindsight that became very effective in bringing a behavioural change. The advice by Plastic Noon Gotheh is to use an effective tagline that the public accepts and takes ownership of. PNG has achieved this as people have taken it and used rhyming taglines in their own campaigns.
- The focus of the SWM awareness campaign should be women.
- In terms of usage of plastic bags, the older generations have a habit of going to the corner shops frequently. They would carry more plastics through multiple grocery shopping trips per week.
- PNG has a positive approach on having a formal setup or an alliance - a platform for all the interested parties to bring common thoughts, work on common issues and work together supporting each other, while working in their respective areas.
- The challenge will not be to endorse the policy, but the phasing out of certain products within the time frame. e.g. Through discussion it was agreed to ban production/ and sale of bottled water in smaller than 330ml bottles.
- PNG highlighted that it would be crucial to focus on reduction of consumption/use. Awareness should start from making people understand how much waste is being generated per person.

EPA discussion

- Community programs are becoming more and more difficult as there have been promises made to the people and have not materialized.
- Best approach to give information to the public is to go through schools (meetings for parents) and door to door. Schools can play a key role in bringing communities together on collective actions.
- Awareness/ training should be focused for waste handlers.
- Mixed approaches could be used for training for councils. Some islands have shown better results when councillors are trained as opposed to the civil service staff.
- Community Focused Groups would be useful.

The Make My Island App

- There have been many Apps made and such initiatives rolled out. However, even though the concept behind the apps were good, it has failed to work. Challenge is the lack of a system, who does what is not defined and clear, and budget allocations were not made for actions that were required to be implemented.
- Social media, especially Twitter works better than Apps. Response is quicker and there is acceptance as well.

The Environment Policing initiative

- A group within the Special Constabulary Force was formed and established with the request of EPA/ME. They are paid through the EPA/ME budget on a contract basis. The initiative is rather expensive.
- General discussion took place among the participants on how effective a behavioural change campaign would be. There have been many awareness campaigns without much impact in the past.
- It is crucial to note that true change in behaviour could only come when a working system is put in place. It is important that infrastructure systems are in place for education and awareness to be effective and sustainable.
- The EPA could not stress the importance of launching an awareness campaign AFTER the infrastructure systems are in place or along with the system for a successful outcome for the campaign.

Communications Strategy Overview

Three Milestones Framework

The Greater Male' Environmental Improvement and Waste Management Project includes diverse activities such as SWM system designs, procurement of specialist assets (eg. waste transfer ships), construction of improved island waste management centres, capacity-building with civic leadership, education, awareness and behaviour change campaigns with businesses and the public, etc.

While the RAP has shown similar solid waste management challenges in both Greater Male' and Zone 3 outer islands, there is a difference in context between Greater Male' and the outer islands - both in waste management infrastructure and household behaviour. Differences in waste management capacity and geography also mean that implementation of these diverse activities will progress at different times for different islands. Each activity across the project is potential material for public awareness, stories and to influence changes in social norms.

We have developed a strategic framework to guide the planning of public awareness and communications campaigns in both Male' and the outer islands. It is based on a concept of "Three Milestones" where progress by PMDCSC, PACCB and their respective partners and contractors is organised into three specific themes. The three milestone awareness campaign in Male' will mirror the Zone 3 island campaign in that it will follow the following public awareness and behaviour change communication themes:



The "waste manager" refers to the broad categories described earlier - WAMCO, Island Councils, LGA, Male' City Council etc.

VALUES: The foundational values for all public awareness, capacity-building and behaviour change communications are the 3Rs: Reduce, Reuse, Recycle - with a focus on core areas of waste segregation, recycling streams, and waste management planning.



"We cannot stress the importance of launching an awareness campaign AFTER the infrastructure systems are in place or along with the system for a successful outcome for the campaign."

EPA Maldives

MILESTONE

1

“What we are going to do”

This stage of the project is about raising awareness of the project objectives in Greater Male’ and at an island level. It outlines how the waste management project will meaningfully affect the local community, and how the planned processes and capacity-building will positively impact the waste management of the island.

This stage will also involve traditional public relations activities that will be a source of holistic information on the project in Male’ and Zone 3. The public relations activities will provide information on the overall approach for waste solutions in the Maldives including the new waste facilities, transportation of waste, new IWMC’s in the islands and improvements to waste collection in Greater Male’.

The messaging in Milestone 1 is important to address the perceptions of delays and inaction in addressing SWM through providing positive stories of the solutions that have been designed and the capacity-building needs that will be addressed.

MILESTONE

2

“What we are doing now”

This stage will raise awareness at an urban and island level of the progress in establishing SWM solutions in the Zone 3 islands and in Greater Male’.

Public awareness and communications under this milestone focuses on messaging about things that have been achieved - for example, updating the community when construction starts on a local island IWMC facility, or the launch of an island’s waste management plan after capacity building training.

MILESTONE

3

“What you have to do”

This stage will be rolled out in the lead up to the implementation of new waste management processes. It will encourage public participation in the SWM system on an island-by-island basis.

Public awareness and communications activities under this milestone are focused heavily on utilising the Theory of Planned Behaviour and the Theory of Interpersonal Behaviour to design and implement behaviour change required for effective operation of the SWM systems established through the Greater Male’ Environmental Improvement and Waste Management Project.

Messaging will focus on preparing the community to be part of the new solid waste management process and to provide solutions so they can actively and consciously change their behaviour in regards to waste management.

The Three Milestones Approach is our combination of a united approach (everyone doing their part to make the waste management project a success) with implementation flexibility to the context/timing of communications messages for each island based on the progress. As the island reaches each milestone the specific activity relating to that phase is rolled out.

The milestone definitions are planned to be tangible and flexible. Greater Male’ and each island will have communications rolled out based on milestone achievements. The messages will be consistent according to the waste management set up of the island (two or three tier waste system and/or new IWMC) with a focus on awareness, education and public relations.

Annex 1

Combined Capacity Assessment of Island Waste Management

ISLAND PROFILE: Summary of SWM Arrangements and Practices in the Outer Islands

#	Atoll/ Island	Population	Economic Activities	Institutions/ Infrastructure	SWM Arr	
					Existing IWMC Infrastruncture	
					IWMC	Dumpsite
1	K. THULUSDHOO (Atoll Capital)	1408	Atoll capital, Local tourism	Government offices, Coca cola factory, School, Atoll Court, Health Center, Power house, mosque	YES	NO
2	K. HURAA	1300	Fishing, local tourism, home agriculture/ gardening	Council office, school, health center, power house, Pre-school, tuna processing plant, Power house, Water system, mosque	YES	NO
3	K. HIMMAFUSHI	1725	Fishing, tourism	School, Magistrate Court, Police station, Jail, Drug rehabilitation center, Power house, mosque	NO	Fenced location
4	K. KAASHIDHOO	2000	Agriculture	Council office, School, Health Center, power house	YES	NO
5	K. MAAFUSHI	3025	Local tourism	Prison, Council office, School, Power house, mosque, water system, health center	NO	YES
6	K. GAAFARU	1066	Fishing, Tourism,	School, Health Centre , Court, Power House, mosque	Yesm 2 IWMCs, in two locations	dumpsite for waste that cannot be disposed (metal waste)
7	K. GURAI DHOO	1738	Local Tourism, fishing	Council office, school, Pre-school, Center for special needs persons, health centre, police station, Court, boat yard, Sports arena, Youth Centre, harbor, water system, power house, mosque.	NO	YES

Arrangements and Practices				
IWMC Practices				
Segregation	Composting	Kitchen Waste Disposal Method	Machinery/ Equipment	Challenges/ Issues
YES	NO	Dumped into lagoon	No equipment	Lack of land, location of IWMC as it is in the center of the island. People set fire to this center on and off. No budget. Some resorts dump waste into the sea and it gets washed up on the island beach
YES	NO	Burnt	No equipment	Lack of funds. Cannot make new IWCM center which is badly needed. Present one very old and full of metal waste. No equipment.
YES	NO	dumped into sea	No equipment	No machinery, budget restrictions, no trained personnel
NO	NO	Burnt	No equipment	Disposal of metal based waste
YES	NO	Dumped into sea	Incinerator - not in use	Lack of funds. Council feels a percentage of tourism green tax should be allocated for such SWM
No (except for those that cannot be disposed)	NO	Dumped into sea	No equipment	lack of adequate land for waste management, Lack of appropriate mechanism for waste disposal, No transfer facility or mechanism for bulk and metal waste, No IWMC and No equipment
NO	NO	Dumped into sea	No equipment	No functional waste management center, issues related to open dumping including spread of waste into a large area and the difficulty in removing bulk waste including metal waste out of the island.

#	Atoll/ Island	Population	Economic Activities	Institutions/ Infrastructure	SWM Arr	
					Existing IWMC Infrastruncture	
					IWMC	Dumpsite
8	K. DIFFUSHI	1053	Tourism	Council Office, School, Health Center, Power house, water system, mosque	YES	NO
9	K. GULHI	912	Fishing	Council office, mosque, school, Power house, Health Center, mosque	NO	YES
10	AA. RASDHOO (Atoll Capital)	1067	Atoll Capital, Local tourism and fishing	Police station, Council office, Atoll School, Atoll Court, Hospital, power house, bank post, water system, mosque	YES	NO
11	AA. MAALHOS	434	Fishing, local tourism, agriculture, employment in resorts	Island Council, School, Health Centre, Court, Pre-school, power house, mosque	YES	NO
12	AA. HIMANDHOO	724	Mat weaving, farming, tourism	STO Pharmacy, Court, police station, power house, School, Health Center, mosque	YES	NO
13	AA. BODUFOLHUDHOO	608		Council Office, School, Health Center, Power house, mosque	YES	NO
14	AA. MATHIVERI	662	local tourism	Council Office, School, Health Center, Power house, mosque	YES	NO
15	AA. UKULHAS	1000	Local tourism and fishing	Council office, School, Water System, Health Center, power house, mosque	YES	NO
16	AA. THODDOO	1534	Agriculture, Tourism	Island Council, Court, Health Centre, School, Water system, power house, mosque	NO	YES
17	AA. FERIDHOO	441	Tourism, fishing, agriculture	Council office, health center, magistrate court, school, power house, mosque	NO	YES
18	ADH. MAHIBADHOO (Atoll Capital)	3500	Atoll Capital, Fishing and local tourism	Bank, hospital, Council office, Atoll School, Atoll Court, Water System, Bank post, power house, mosque	NO	YES

Arrangements and Practices				
IWMC Practices				
Segregation	Composting	Kitchen Waste Disposal Method	Machinery/ Equipment	Challenges/ Issues
YES	NO	Dumped into sea	No equipment	Difficulties and diseconomies of scale associated with transporting items that cannot be managed at the island level. Lack of knowledge on composting. Inability to find solution for kitchen waste. Difficulties in managing large concrete and demolition waste.
NO	NO	outsourced	Excavator, dumper	Lack of awareness of the community
YES	NO	Dumped into sea	Metal compactor, glass crusher, tank for burning	No budget, no machinery or equipment. Close proximity between the IWCM and police station due to smoke issues.
YES	YES	Dumped into outer ocean	Shredder, compacter, Baler	Lack of capacity - not enough vehicles, - discomfort to residents due to burning of waste in IWMC, smoke issue. - Lack of public compliance with waste management regulations, poor practice in household level waste segregation. - Biggest challenge is lack of a proportional budget for this service
YES	NO	Dumped into sea	No equipment	No necessary equipment
YES	NO	Dumped into sea	Glass Crusher and plastic shredder	Lack of equipment and difficulties in transporting the waste to Thilafushi
YES	NO	Dumped into sea	Can crusher, coconut husk grinder, tiles grinder, leaves crusher	Accumulation of metal waste in a very large amount. No budget to manage metal waste.
YES	YES	Composting	Manual incinerator, machine to produce coco peat, small wood chipper and small plastic shredder	Disposal of concrete waste and plastic waste, no budget, absence of lifting heavy equipment, lack of equipment
YES	NO	Dumped into sea	No equipment	No machinery or equipment
YES	NO	dumped into sea	No equipment	No transport facility, lack of public awareness, accumulation of metal waste
YES	NO	Dumped into sea	No equipment	Accumulation of construction waste, need an alternative modern and sustainable disposal system, lack of land for composting

#	Atoll/ Island	Population	Economic Activities	Institutions/ Infrastructure	SWM Arr	
					Existing IWMC Infrastruncture	
					IWMC	Dumpsite
19	ADH. MAAMIGILI	3000	Tourism	Regional Airport, Port for bonded warehouse, cold storage and cargo area, School, Court, Health Center, power house, Water systems, mosque	NO	YES
20	ADH. DIGURAH	610	Local Tourism	Council Office, School, Health Center, Power house, mosque	YES	NO
21	ADH. MANDHOO	367	Tourism, agriculture, fishing, thatch weaving, boat building	Health center, school, Council office , Mosque, Court, power house, mosque	NO	YES
22	ADH. OMADHOO	883	Fishing, local tourism	Council office, school, health center, court, power house, mosque	NO	YES
23	ADH. DIDDHOO	153		Council office	YES	NO
24	ADH.KUNBURUDHOO	462	Fishing, tourism and construction	Council office, school, health center, power house, magistrate court	NO	YES
25	V. FELIDHOO (Atoll Capital)	506	Fishing, local tourism	Health center, school, Council office, powerhouse, mosque	NO	YES
26	V. KEYODHOO	675	Fishing, local tourism	Council office, court, Health center, school, powerhouse, mosque	NO	YES
27	V. RAKEEDHOO	150	Fishing	Council office, power house, health post, mosque	NO	YES
28	V. THINADHOO	152	Tourism	Health post, Council office, school, power house, mosque	NO	YES
29	V. FULIDHOO	372		Health post, Council office, school, power house, mosque	YES - NOT USED	YES
30	ADH.HANGNAMEEDHOO	517	Tourism	Council office, health center, school	YES	NO
31	ADH. Dangethi	824	Tourism (Guest houses, Souvenirs) Boat yard, construction and carpentry	Council office	YES	NO
32	ADH. Fenfushi	837	Tourism	Council office, School, Megistrate Court, Police Station, Power House, Health Centre, Community Centre, pre school	YES	NO

angements and Practices				
IWMC Practices				
Segregation	Composting	Kitchen Waste Disposal Method	Machinery/ Equipment	Challenges/ Issues
YES	NO	Dumped into bin /sea	No equipment	Dumping plastic into sea with kitchen waste, some do not segregate waste, mixed waste is dumped into dumping area, public littering, clearance and removal of scrap metal pile, since Maamigili port is next to dumping site so burning of waste affects the operation of the Port activities. Dumping ground is affected by seasonal occurrence of tidal waves.
YES	YES	composting	Compactor, bottle crusher, wood cutter, power generator	Lack of equipment
YES	NO	Dumped into sea	No equipment	Lack of proper transport facilities, lack of equipment
YES	NO	Dumped into sea	No equipment	No IWCM center, lack of funds, lack of equipment
YES	NO	dumped into sea	No equipment	Transport of accumulated waste to Thilafushi, lack of any equipment and manpower, no solution upto now
NO	NO	dumped into sea	no equipment	lack of fund and no land space
YES	NO	Dumped into sea	No equipment	Removal of accumulated metal waste, water retention and mosquito breeding.
YES	NO	dump into sea	No equipment	no land space, no transport
YES	NO	dumped into sea	No equipment	No waste management center and inorganic waste can be taken out of the island only once a year
NO	NO	Dumped into sea	No equipment	Financial/funding issues
YES	NO	Dumped into sea	No equipment	Lack of equipment, lack of know-how, lack of human resources, difficulties in removing large non-biodegradable waste from island
YES	NO	Dumped into sea	No equipment	Lack of labour and no way of getting rid of accumulated waste
YES	NO	Collected in separate dustbins	Bottler crusher and can crusher but not working	Accumulation of waste, spread of mosquito diseases and lack of land to build a better IWMC center
YES	YES	Composting	metal compactor out of service, Plastic shredder out of service, wood chipper out of service, 2 vehicle	Machineries do not hold the capacity to fuction to produce satisfactory result. Accumulation of metal and concrete waste an inability to dispose them is challenging.



LIVE & LEARN
Environmental Education

