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WASTE RESEARCH

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WASTE RESEARCH

GULF OF MOTTAMA

Reported by

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MCCL

Myanmar Coastal Conservation Lab

point b

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EXECUTIVE SUMMARY

The research project was supported by Gulf of Mottama Project (GoMP). The goal of the research project was collect information about patterns of behaviors, perceptions, knowledge, experiences and systems of both urban and rural communities related to waste management in Gulf of Mottama region for GoMP so that the project can design inclusive community campaigns which provide awareness to the communities and advocate the government for policy development.

This research used qualitative research including personal stories, human-centered research methodologies and visual tools to understand human behaviors, practices, mindsets, values, collaborations and contradictions in the waste management system. This research also focused on the usage, repurposing and disposal of plastic in the communities.
The research area covered six targeted locations in six townships of the Gulf of Mottama combining rural and urban communities. We interviewed 127 individuals, 15 shops, 10 waste gleaners and 2 experts during the research period.

30% of the respondents were satisfied with the current waste management system whereas 31% were unsatisfied. However, almost half of the respondents regarded the waste problem as an important issue to tackle. Among the different types of waste, the majority of interviewees responded that plastic has the most negative impacts to both social and natural environments.

In terms of access to knowledge and awareness about plastic and general waste management, a higher proportion of urban communities responded that they have knowledge on plastic and waste management compared to rural communities. Both the urban and rural areas replied that TV and personal experience were major sources of knowledge.

From our synthesis, we identified the following key learnings:

- Communities are accessing knowledge about waste management, but they have relatively little intention to change their behaviors
- Most people think that if the waste is out of their sight, it is gone. They do not think about the consequences.
- School would be a good place to start building awareness of waste management including plastic.
- Awareness raising tools and methods should be applicable and realistic for the community to follow.
- Raising awareness should include people, business and government.
- As the Environmental Conservation Department (ECD) already has a system of raising awareness to the communities, the content used in the ECD should be reviewed and revised to effectively deliver the knowledge to the communities.
- Following the awareness raising, other essential facilities for waste management system should be supported in the community.
- Introducing the methods of waste segregation might create better chances for reusing or recycling the waste.
- There is potential for reusing or reducing the use of plastic in communities in both rural and urban areas.
- In urban communities, many people who receive municipal services are satisfied with them. However, there are still urban areas that do not receive municipal services, so these services should be expanded.

Therefore, recommended actions include:

1. Expand knowledge and awareness raising about waste management in the communities.
2. Promote waste reduction practices to the public.
3. Upgrade the waste management system, including the services provided by the Municipalities to the public and updating the laws and regulations related to the waste management system.
4. Support waste segregation machines and explore potential for high heat incinerators in rural communities where adequate waste management systems are challenging to implement.
5. Promote waste recycling as business to the communities.
6. Explore opportunities to reduce plastic use through alternative products.

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CONTENTS


FORLAND

INTRODUCTION

Waste management is an important part of the urban infrastructure as it ensures the protection of the environment and human health.[1] Waste management is one of the most serious environmental and public health issues faced by developing countries, especially for populations residing in urban areas.[2]

Myanmar has been facing considerable challenges with the management of waste as a result of increasing income and consumption levels, urban population growth, and lack of effective waste treatment and disposal options.[2] In Myanmar, it is estimated that 200 tons of waste enter into waterways every day and about 80 millions of plastic bags are used every year.[3]

The Gulf of Mottama (GoM) is no exception from this nationwide waste pandemic. Like most regions of Myanmar, both domestic and industrial waste in GoM are mostly dumped in the street, on vacant land, or into drains, streams or other watercourses. Burning to reduce the nuisance from accumulating piles of waste also is a serious problem in the region.[2] This presents an increasing problem in GoM as improper waste management might adversely impact the coastal and marine environment.

Point B Design + Training's Myanmar Coastal Conservation Lab (MCCL) seeks to understand and help conserve the coastal environment along with local communities. Point B is a training and research organization which applies and promotes Human Centered Research and Design Thinking to understand issues and develop innovative solutions.

Therefore, MCCL collaborated with GoMP to conduct research on waste management in the GoM. The ultimate goal is to use information from this research to work with stakeholders in GoM to co-create solutions for waste management problems in the urban and rural communities. Our research was guided by this essential question:

"How might we understand the pattern of behaviors, perception, knowledge, experiences and system of both urban and rural communities on the waste management of the Gulf of Mottama in order to inform GoMP to design inclusive community campaigns which provide awareness to the communities while advocating government for policy development?"

References: 1. Industry as a partner for sustainable development, Waste Management. International Solid Waste Association (ISWA), 2002. 2. Waste Management in Myanmar, Current Status, Key Challenges and Recommendations for National and City Waste Management Strategies. UNEP and IGES, 2017. 3. https://www.mmtimes.com

METHODS

RESEARCH METHODOLOGY

We took a qualitative research approach, incorporating human-centered research methodologies. This included collecting personal stories and using visual tools to focus on understanding human behaviors, practices, mindsets, values, strengths and weaknesses in the waste management system, with a focus on how communities use, repurpose, and dispose of waste. This research can be described as a 'needs finding' exercise to better understand what is needed to address the plastic waste problem in the Gulf of Mottama area. The followings is the needsfinding methods we used in the research project:

IN-DEPTH COMMUNITY MEMBER INTERVIEWS

The in-depth interviews comprised three sections: 1.perception toward the waste management system, 2.patterns of behavior, challenges and opportunities in using, repurposing and disposing of waste, 3.changes communities hope for the waste management system and awareness/access to information about the knowledge on waste. The in-depth interviews took 15 – 30 minutes with people in the communities. We used opportunistic sampling to choose the respondents.

FOCUS GROUP DISCUSSIONS

We did the focus group discussions with leaders and administrative groups in the communities. We discussed stories, personal experiences and expressions for their ideal solutions about waste management.

KEY INFORMANT INTERVIEWS

The purpose of key informant interviews was to provide important, in-depth information on local context and specific topics related to plastic use and waste. We chose key informants who were particularly knowledgeable about our key research topics, including community context, local environmental issues, and plastic use and disposal. These included community leaders, local experts, and people from NGOs and CSOs.

PARTICIPATORY APPROACH

We employed a participatory approach to make the research process more interactive and to facilitate a more in-depth dialogue about experiences and perceptions. The participatory tool we used was called **Journey Mapping**.

We used Journey Mapping with community members to understand their experiences visually, through the following process:

- Outlined key steps in the process of plastic use, reuse, and disposal, and asked respondents ("users") to describe their experiences, challenges, and feelings at each step
- Identify desire changes to these steps
- Elicit ideas for possible ways to achieve changes to plastic use and disposal

DATA ANALYSIS

We analyzed our data, using Human Centered Research approaches to review interview responses as a team and to identify key ideas and themes. Two major types of analysis were **identifying personas** and **gap analysis:**

PERSONA

- We identify the types of users in the current waste management system based on their personal traits
- Empathize to understand different challenges and opportunities for each persona type of different users

GAP ANALYSIS

- Identify the goals of institutions involved in the waste management system in Mon State
- Identify the existing resources to achieve the goals and understand the challenges to reaching these goals
- Discover the strategies people are envisioning and how would they like to achieve the goals

LOCATION

The research area covered six targeted locations in six townships of the Gulf of Mottama combining both rural and urban areas. Mawlamyine is the capital and the biggest city in Mon State where industries, communities, and commercial activities are concentrated. Therefore, we interviewed people in five areas of Mawlamyine: Auk Kyin Ward, Yadanar Thiri Ward, shops and businesses along Strand Road, the Lower Market, and Kyauk Tan Ward. Similarly, we chose Kyaik Hto city to understand the experience and opinions on waste management system in a smaller urban area of Mon State. To gain insights on the system of waste management in rural areas of Gulf of Mottama, we visited four villages: Khin Tan Village in Paung Township, Zee Gone Village in Chaung Zone Township, Aung Kan Thar Village in Thaton Township, and Zokali Village in Bilin Township.

USERS

We interviewed four categories of user groups: community members, system users, experts, and business. In this research, the government officials and departments were not included as a result of difficulties in coordination. The users are defined the following ways:

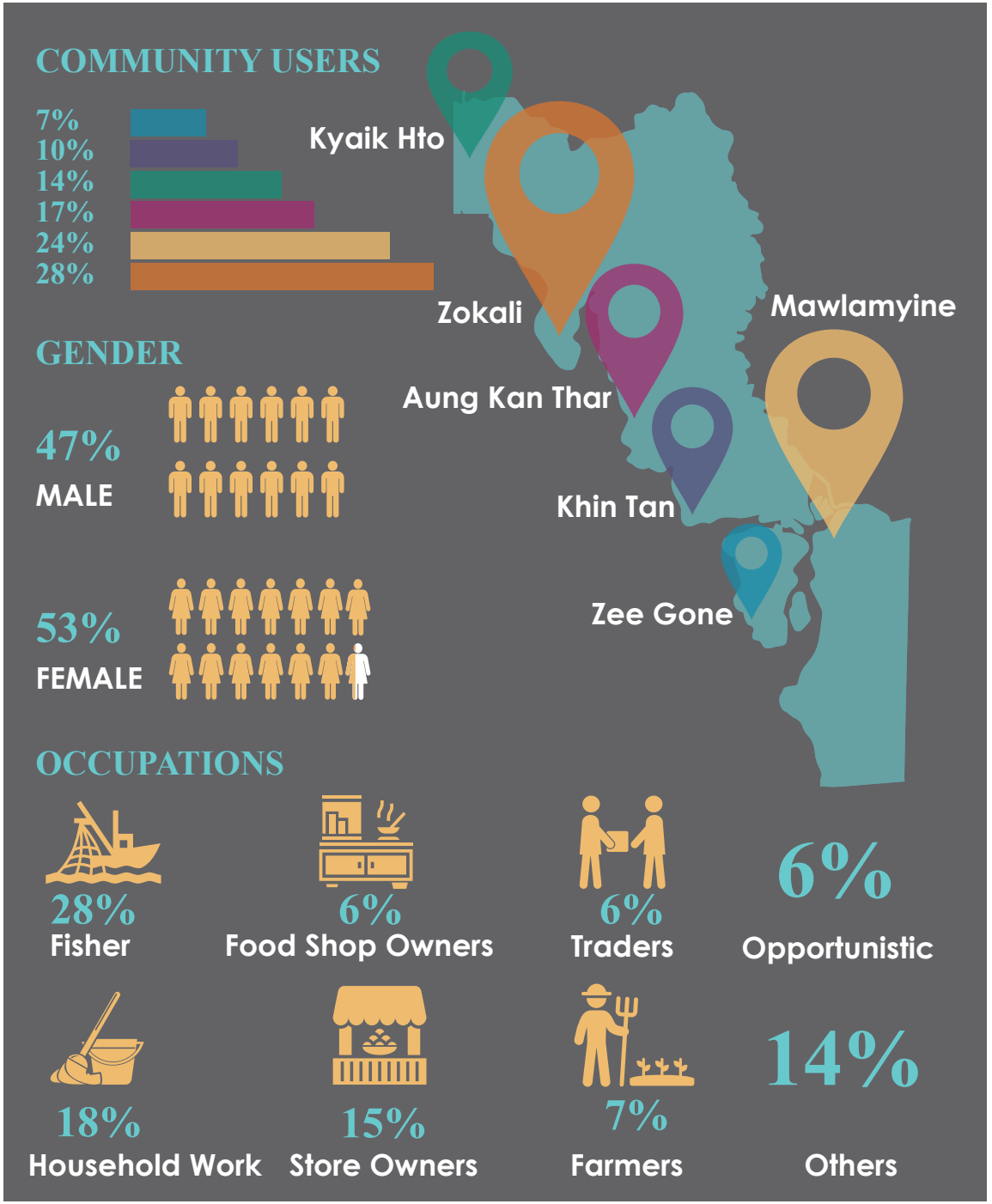
Community Users: Residents of the 6 target areas, including small businesses, who interact with the waste management system
System Users: They are the people directly working in the waste management system, which included trash collectors and trash gleaner.
Expert Users: From the previous GoMP Waste Management Design Workshop before this research, we identified two organizations working with communities and youths. Due to their experience working on waste management, we conducted key informant interviews with them
Business: Selected shops in Mawlamyine markets and Strand Road were included in the research.

RESULTS

DEMOGRAPHY

We conducted qualitative interviews with 127 individuals in 6 communities across Gulf of Mottama region of Mon State. 38 % of the people interviewed are from urban communities while the majority, 62%, are from rural communities.

We used opportunistic sampling, making sure to include almost equal numbers of both genders (53% female, 47% male) and users of different ages ranging from around 20 to 60. To understand different perspectives from diverse livelihoods, we included people from several different occupations. As most of the focus areas are fishing villages, the majority of our users are people working in fishing related jobs. Most of the women we interviewed (18% of the total sample) reported being engaged in household work. People who sell goods and food constitute 21% of the sample. Others included farmers, traders, tailors, taxi drivers, teachers, students.



RESULTS

PERSONA: TYPES OF WASTE PRODUCERS

After synthesizing our data, we classified the sampled users into 4 ‘personas’ or types of people, who are in the current waste management system: champion, follower, opposer and neglecter. A persona is a model of human traits and behaviours that describes patterns shared across people. Personas can capture a person in a particular moment in time while acknowledging that individuals are dynamic, changing with the season, over the course of time and sometimes even within a single day. Thinking about users in this way helps to imagine the different services that might be created in response to certain kinds of user needs for creating better waste mangement system.

CHAMPIONS in WASTE MANAGEMENT

They strongly accept that plastics and other waste are negatively impacting the environment, based on their own experiences or other available information sources. They are eager to share this knowledge with their neighbours. Using this knowledge, they are already leading changes in the community and have their own ways to manage waste. However, they still have difficulty solving some waste problems.

FOLLOWERS in WASTE MANAGEMENT

They have knowledge and experience related to the effects of plastic and other waste in their communities and in nature. They would like to learn more about the topic and to share this knowledge with their community. They want changes to improve the waste management system, but they have limited knowledge and courage to start this change. So, they are seeking people who can lead them to change in the community.

OPPOSERS in WASTE MANAGEMENT

They believe that plastics are not problematic and there are no consequences of the use of plastic. They think that plastic or waste are gone once the waste is out of their sight, including through throwing waste in bins or rivers, or burning it. They also believe plastic cannot be reduced as everyone is using it extensively, including themselves.

NEGLECTERS in WASTE MANAGEMENT

They do not care so much about what is happening related to waste or plastic. They just follow the same practices as everyone else in the community or the practices they have been used to using for a long time. They don’t want to seek information related to waste or the methods of waste management. They simply think waste is gone if disposed into a bin or dump site, or burned.

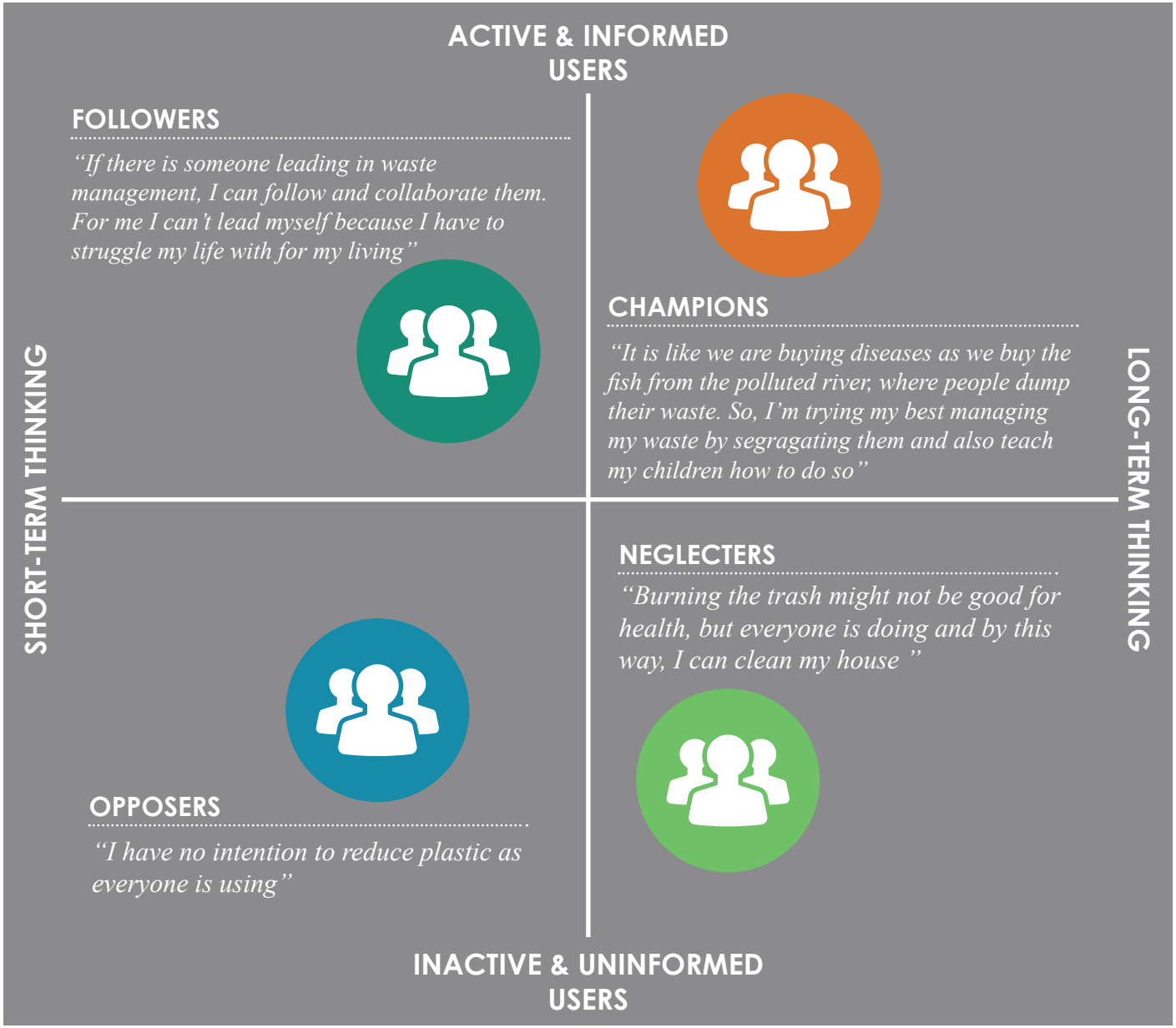
RESULTS

ANALYSIS ON TYPES OF WASTE PRODUCERS

To the right is a breakdown or analysis of four different types of users in the waste management system based on research data gathered during this study.

From the participants in Gulf of Mottama region in Mon State, Myanmar, research findings show that the majority of respondents are Followers (31%), followed by Champions (29%), Opposers (24%), and Neglecters (16%).

The biggest differentiator is that Champions and Followers are more proactive whereas Opposers and Neglecters are more passive. Champions and Followers will seek out knowledge on what they need and practice in their own ways, whereas Opposers and Neglecters tend to wait until opportunities find them and they are reluctant to change.



RESULTS

COMMUNITY PERCEPTIONS

"More and more waste is entering our environment as more and more products and food are produced. In the past, we only had Myanmar traditional goods and food"

Regarding the current waste management system, 31% of the interviewees showed they are not satisfied with the services provided by the government and the communities who are not following the rules in managing their waste. On the other hand, almost the same percentage responded, they are satisfied with the system while 39% of the users have no responses in terms of their satisfaction with the system.

However, nearly half of the interviewees (43%) considered waste as a major problem for society. They believed that the negative impacts of plastic and other waste include:

- Impact on human health from the smell and from animals that live in the waste
- Pollution in the environment (making it dirty)
- Difficulties fishing as the waste entangles in the fishing gears
- Blocking the waterways, which leads to flooding
- Impacts on animals on land and sea when they are entangled in the waste

Most of the people responded that there has been a changed in the pattern of waste production in the past 10 years. They feel that the communities are producing more waste, including plastic, than before. However, many urban respondents think that waste management systems have improved as the municipalities are now providing trash bins and collecting trash regularly.

Fig (1) Responses on satisfaction on the waste management system

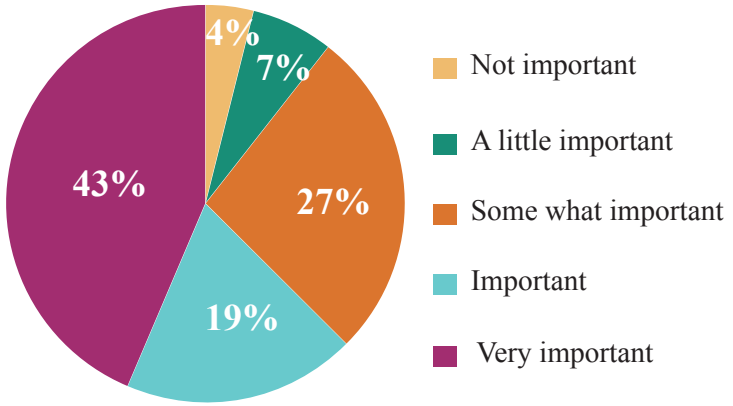


Fig (2) Responses on concerns of waste as an important problem

CHANGES OVER 10 YEARS

BEFORE	NOW
• Rivers are cleaner • Less trash • Everyone use plastic baskets called Swe-Chin • People bring containers to buy food • Pack food and goods in leaves • People commonly reused plastic products • No trash truck • No place to throw • Most people throw into the rivers • Most people destroyed the waste by open burning • No Discipline on waste disposal • A lot of trash are scattered along the road	• Better transportation • Less waste in the environment (Kyaikhto urban area) • More systematic • Community members are more involved • More trash bins • Trash cars are collecting waste • There are options besides burning • People are more aware • People are more disciplined • People are less disciplined • Municipal is not collecting • More trash are washed up to the beach • More trash in the river • Use of plastic is uncontrollable • Producing more waste • No one want to use containers • "Catch" more plastic while fishing • Still burning

"We, the people don't regard throwing plastic and waste everywhere as a problem or as an act of shame because everyone is doing so. The behavior is rooted in our mindset"

RESULTS

PERCEPTIONS: PLASTIC

Among the responses, most people responded that plastic has the most negative impact to their social and environmental environments compare to other types of waste (Fig 3). The most reported impacts of using plastics is that they are very harmful and dangerous to the health of people especially if food is packed in plastic and exposed to heat. They also have knowledge and insights about the possible impact of plastic on animals when it enteres the natural environment. Additionally, social impacts of plastic included health issues, impacts on fishing, and reducing quality of life by making the surroundings dirty. Despite the disadvantages the respondents mentioned, they are still using or producing plastic because plastic is very versatile, cheap, convenient and plays an essential role in daily activities, mainly in packaging.

"Plastics last longer than us. Even we die and no longer exit on earth, they will still alive"

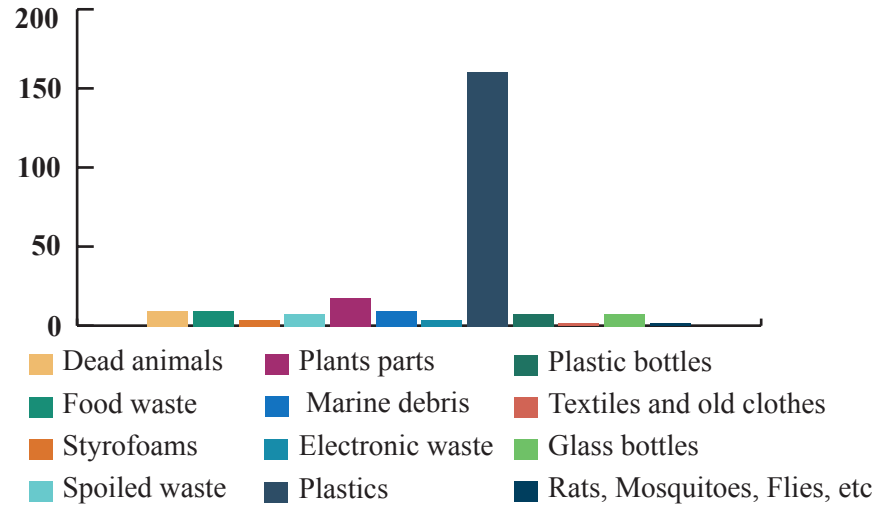


Fig (3) Types of waste with the most negative impacts

PROS & CONS OF USING PLASTIC

PROS	CONS
All answers are both Rural (R) and Urban (U) • Very convenient using in daily activities • Cheap • Reusable • Very useful and easy in packing • Safe and protective packing with plastic • Easy to buy/ access • Essential and useful in daily lives • Easy to use	• Non-decomposable (R,U) • Harmful (R,U) • They might be in our food • Impacts on animals and environment (eaten by animals, pollute the environment) (R,U) • Impact on fishing (entangled, fished plastic) (R) • Block the flow of water (creeks, drainages) (R,U) • Animals which transmit diseases can hide in the pile of plastic (U) • Unhealthy (packing the hot food, when contact with heat) (R,U) • Burning might cause problems and health issues (R,U) • Dirty in the environment (R,U)

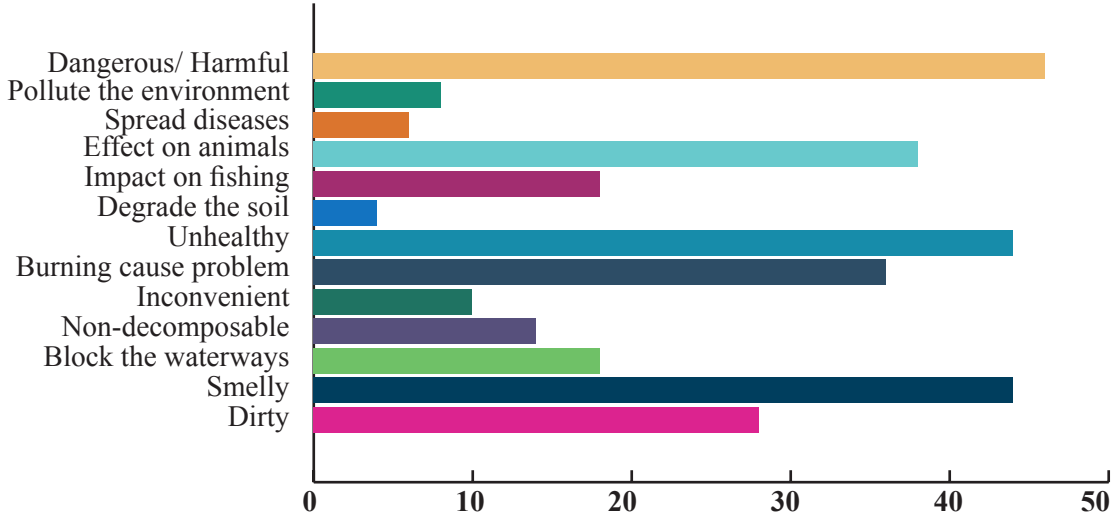


Fig (4) Impacts of waste on the environment

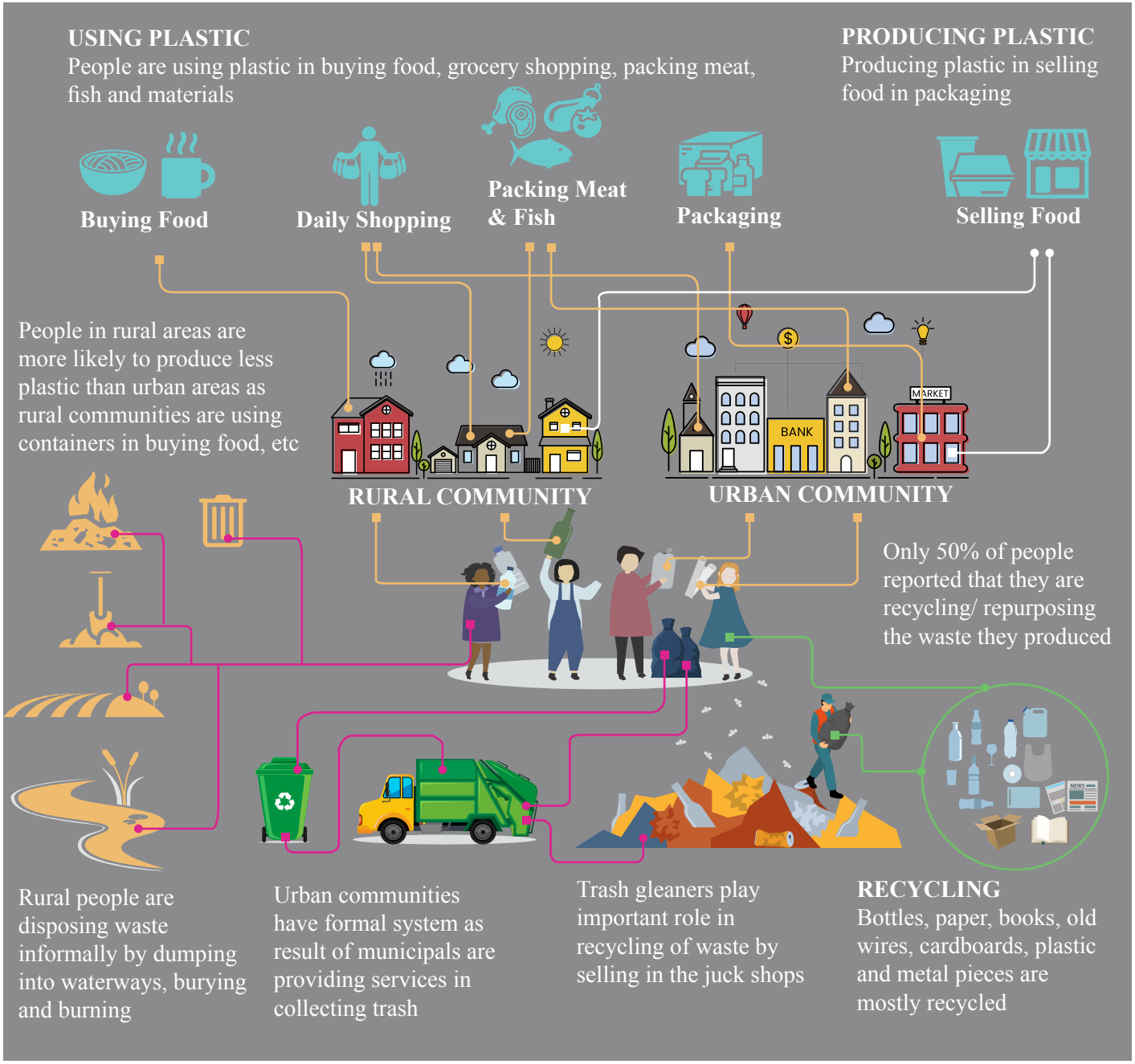
RESULTS

PATTERNS OF BEHAVIORS

Based on the participatory research tool: Journey Mapping with the users, it is indicated that plastic plays an essential role in daily lives of people from both urban and rural communities as they are using different types of plastic in food packaging, grocery shopping, general packing.10 years ago, it was most people used leaves, paper in packaging, brought their own containers for buying and carrying food and used basket (swe-chin) in daily grocery shopping. 50% of the users reported that previously they are reusing plastic in packing, using old plastic bags to pack trash, refilling water in used plastic bottles.

Presently, in most rural communities, people are disposing their waste directly into water sources (stream, creeks, beach or sea), burying waste near the farmland or near the house compound, dumping in a selected site in the village, which is poorly manged and very close to the waterways (eg: river banks or sea side). The most popular way of managing is open burning. Similar pattern of waste management is reported in urban areas where the coverage of the services from municipal is limited.

In most urban areas, municipal is responsible in collecting trash directly with a trash truck and providing trash bins. Finally, all the municipal collected waste are ended in the dump site both urban areas we studied. In Kyaik Hto, the dump



RESULTS

PATTERNS OF BEHAVIORS (Cont)

site is managed by open burning, while the site in Mawlamyine do nothing to manage the dumped waste.

The small amount of a waste in the dump site are collected by waste gleaners and they recycled some of the waste including plastic by selling to junk stations.

"It is the era of plastic, their existance is becoming essential in our daily lives and we are addicted to it. We are using them despite the disadvantages they might impact to us"

CHANGES

USING & REPURPOSING

- Use traditional packaging methods like packing with leaves, paper, etc and carry swe chin (basket) in grocery shopping (R)
- Use containers or bottles buying food and drinks (R,U)
- Restrict the use of single use plastic (R,U)
- Tax on the production of plastic (U)
- Produce decomposable plastic
- Business should encourage re-purposing the plastic they produced (U)
- Public should be introduced methods to repurpose/ recycle waste and plastic (R,U)

DISPOSING

- Individuals should be responsible in disposing waste and plastic (R,U)
- Need strong leadership for people in community to follow (R)
- Strengthen rules and regulations regarding solid waste management (R,U)
- Provide trash bins to collect trash (R,U)
- Provide services to better access the trash truck (be more frequent and punctual) (R,U)
- Dump and burn the trash (U,R)

CHALLENGES

USING & REPURPOSING

- Using and carrying the leaves or paper packed food might not be convenient (R,U)
- Carrying the containers would be very difficult (R,U)
- Alternative materials of plastic might be more expensive (U)
- People do not have enough awareness to change (R,U)
- Business cannot deny the demand of customers regarding plastic (R,U)
- Not all people might not be interested (R,U)

DISPOSING

- People have limited knowledge on dispose the waste systematically(R,U)
- Transportation might be barrier for rural community (R,U)
- Burining and dumping cause pollution (R,U)
- Budget might be problem for government (R,U)
- Regarding the dump site might be difficult in villages(R)
- People are rooted with bad behaviors (R)

RESULTS

INTERESTS AND HOPES

In discussion with people, regarding waste and plastic as a problem, 84% of the respondents are also strongly interested in reduction of plastic. Most of the people are interested to reduce by reusing the plastics and bringing containers when buying food. They also suggested that people should manage their own waste carefully by disposing it in the trash bins which will be picked up by a trash truck. They also mentioned that they wanted to burn the plastic to reduce the amount and impact of plastic in environment.

"I also feel guilty for throwing trash until I die becuase I left the bad legacy to my children in the mess.If we are not taking action, it would be problematic for the future generations"

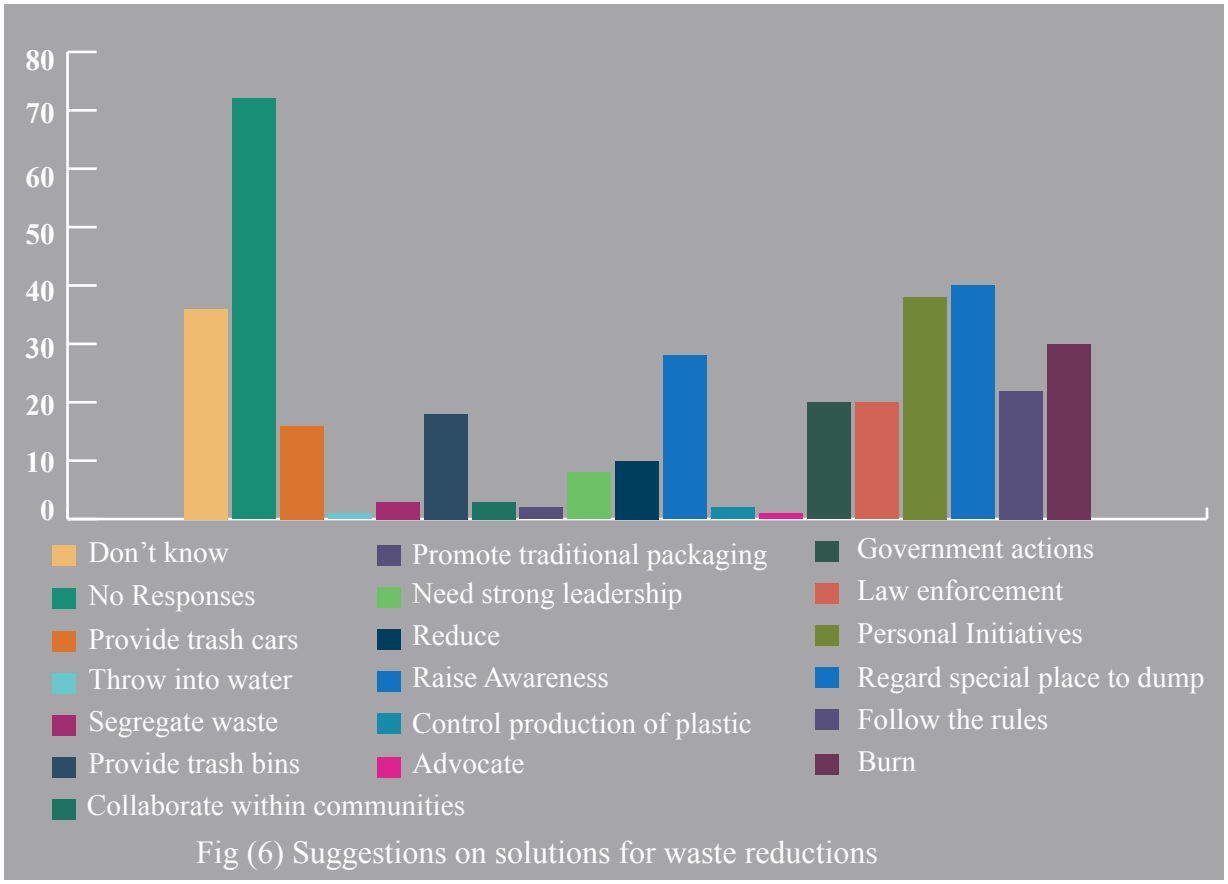


Fig (6) Suggestions on solutions for waste reductions

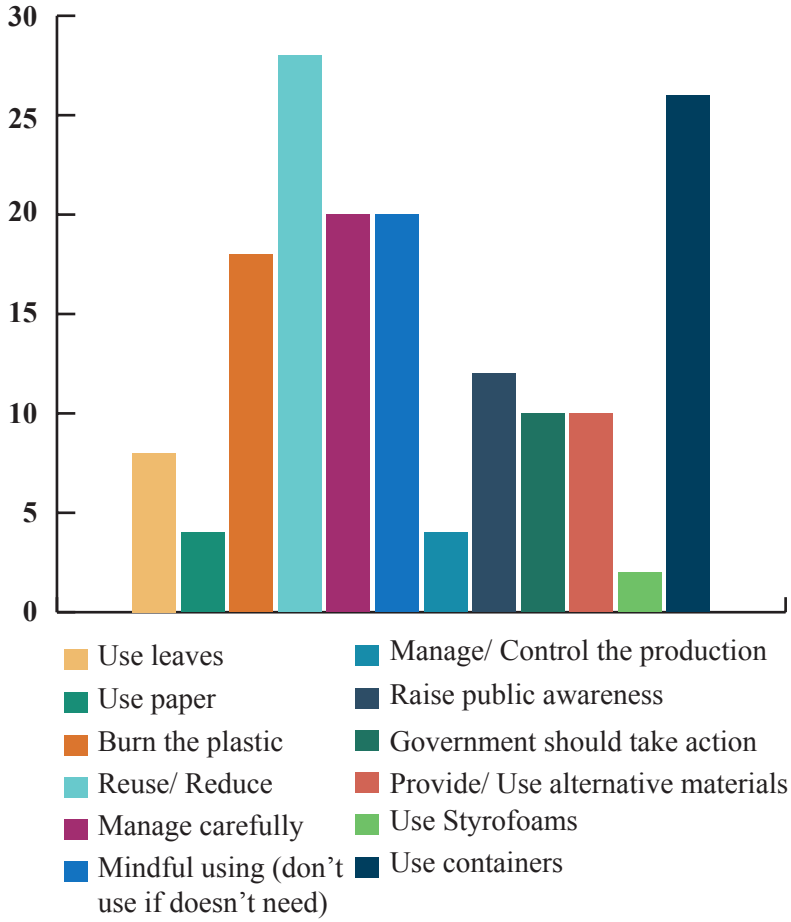


Fig (7) Ways to reduce plastic waste

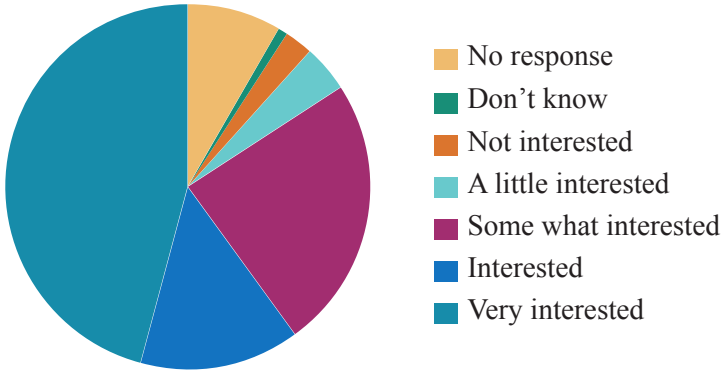


Fig (8) Responses on the interests on plastic reduction

"Raising awareness should not be limited to providing signboards, which is not effective. The old people are rooted with bad behaviors, so, we should start teaching our children in school"

RESULTS

KNOWLEDGE & ACCESS TO INFORMATION

To understand the public knowledge and access to information information on waste management, we asked the users 1. people have knowledge concerning both general waste management and waste, 2.where are people accessing the knowledge, 3. how is knowledge share about which channels or methods would be proficient for the people in both urban and rural areas.

Overall, about 53% of interviewees in urban areas responded that people have knowledge on waste while 39% of rural users said they have the knowledge. And 61% of the respondents in rural area think people lack sufficient knowledge of waste management.

The top ranked sources of information for waste in both urban and rural areas are TV channels and personal experiences in learning about the impacts of plastic and mismanagement of waste. Another important learning source is print media such as journals, newspapers. Now, more people can access news by mobile phone through social media and websites. Yet, the radio still plays an important role in distributing the knowledge, especially in rural areas. Only 6% of total responses were that they didn't have any place to learn about waste and plastic.

ACCESS TO INFORMATION

URBAN AREAS	RURAL AREAS
1. TV channels	1. TV channels
2. Printed media: books, journals, newspaper	2. Personal Experiences
3. Personal Experiences	3. Learning from peers, friends, neighbors
4. Seminars provided by organizations (government/ NGOs)	4. Radio
5. Mobile phone & Social Media: Facebook	5. Learning from elders
	6. Seminars provided by organizations (government/ NGOs)

31% TV Channels: Play an important role in informing the public. People get to know about plastic from news, Ads and programs featured in TV.

18% Learning from Experience: People learned plastic has negative impacts from their daily experiences. e.g: *"I know plastic might not be good because I hurt my eyes when I using plastic bag to start a fire"*

13% Published Materials: People, especially in urban areas, are getting information from journals and newspapers.

7% Seminars from organizations: From both government and NGOs, people are informed about plastic and waste through outreach programs

5% Radio: is an important medium for people in rural areas where they have limited access to Internet.

5% Peer sharing: In most rural areas are peer sharing play an important role in spreading information.

5% Elders: People are also learning about the impacts of plastics from their elders.

5% Internet & Facebook: Social media plays a more and more important role in informing about waste especially in urban areas.

2% Phone: The major link to Internet and social media is through cell phones.

2% School: People also responded that they gained knowledge either when they were in school or from their children attending the school.

Fig (8) Sources of information on waste

RESULTS

KNOWLEDGE & ACCESS TO INFORMATION (Contiued)

The following are suggestions from the community on how to effectively raise awareness to the public about plastic and waste management.

COMMUNITIES' SUGGESTIONS

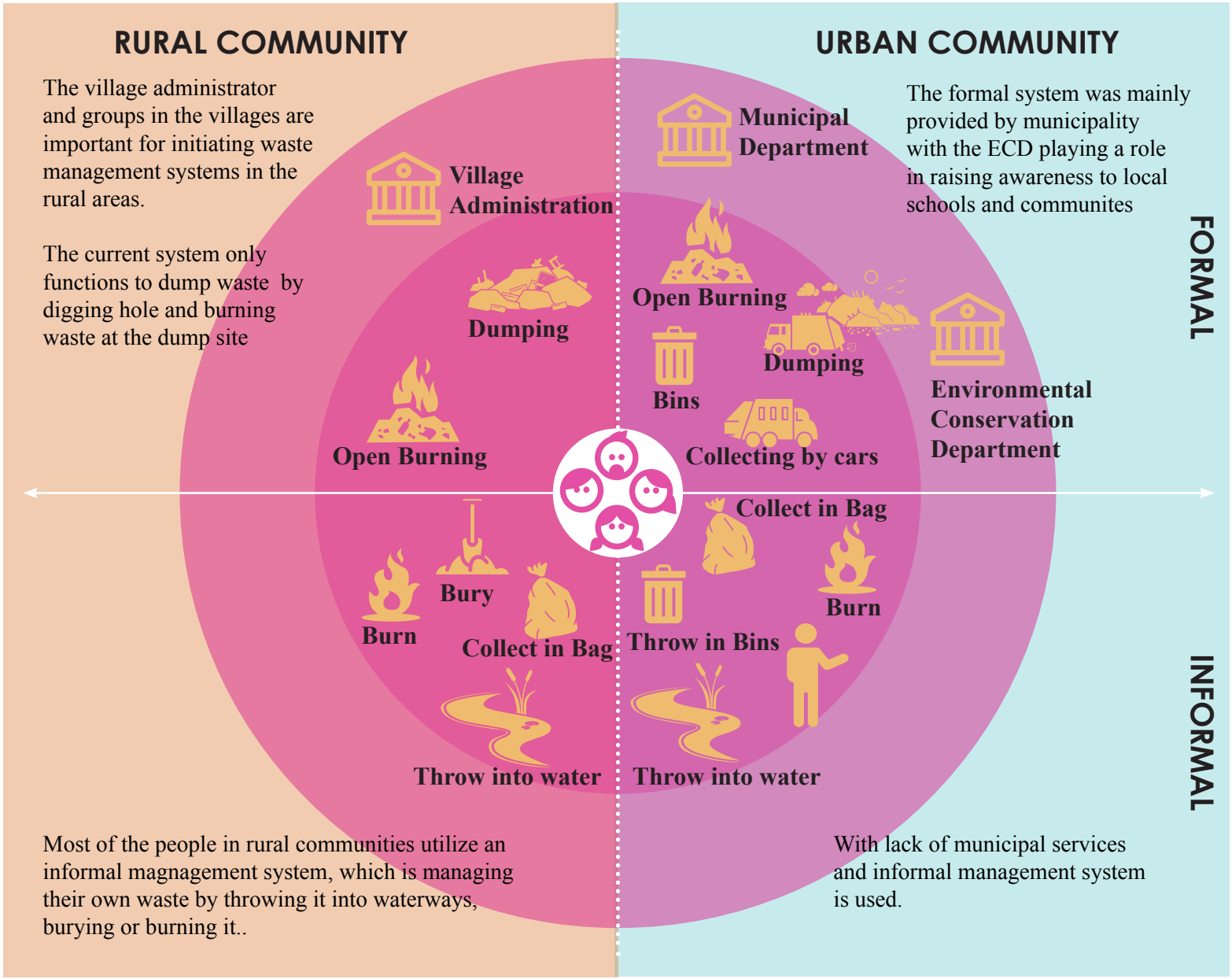
1. **Collaborate with Local Authorities:** As the village/ ward administrators play an important role in organizing community events, one third of the interviewees responded to work with them in raising public awareness in the community
2. **Organize Community Meetings:** Some responded to hold meeting concerning the waste and plastic problems by inviting each representative from every households
3. **Enforce the Law:** Most of the respondents emphasized on the enforcement of laws in waste management
4. **Develop Curriculum:** Some also suggested to teach children about waste and management in the school
5. **Talk with Business:** As most of the communities believe that they are using plastic as result of business are producing, they want to discuss with business in controlling waste production
6. **Provide Experiential Activities:** Most common response are that the awareness sessions are mostly a talk from experts, so that it is too difficult to apply back in the community. As result, the concepts, ideas using awareness sessions should be practical to apply in their daily lives
7. **Share on TV & Social Media:** TV and social media are important channels to deliver the knowledge on waste management to the public
8. **Encourage Peer Sharing:** To spread more knowledge about the impacts of waste and its management, the people who attended the trainings or awareness sessions should also be encouraged to share to their families, friends and neighbors
9. **Conduct Seminars and Discussions:** Similarly to meeting, the other suggestions are having small seminars in the communities about waste management follow up with community discussion
10. **Develop Parental Education:** To develop awareness about waste in children, the parents should be educated about appropriate waste management to teach their children
11. **Change the Mindset:** Some people responded that people are become habitual to throw trash everywhere because of the lack of knowledge, not having enough information on their behaviors, so, the force to change the people mindset is important
12. **Attract with Incentives:** In order that people would attend the awareness raising sessions and reduce waste, some incentives should be provided to attract their interests. Examples: food, small presents, etc
13. **Use Visuals:** The community mentioned that the effective use visuals help the communities to understand and engage more to the information. The examples of suggestions are cartoons, signboards, plays, books, etc

"My son is in Grade 10. Whenever he reads news about plastic and gains new knowledge on waste, he shares with me and tells me not to use plastic if unnessary and not to throw trash into river"

"It is not enough to just raise awareness and inform the impacts of plastic and waste to the people. For example, people have knowledge about waste, but if they don't have trash bins to throw away or no trash truck is collecting, being knowledgable is not practical. Therefore, we have to create opportunities for them by providing facilities for people to manage their waste"

DISCUSSION

SYSTEM ANALYSIS: WASTE MANAGEMENT SYSTEM IN MON



The waste management system we overviewed in our research is mainly divided into urban (right) and rural (left) communities. The sessions in the communities are constructed into two circles, the village/ ward (smaller circle) and the township and state level (larger circle)

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Our research uncovered important challenges, needs and potential resources.

CHALLENGES

- **Awareness Raising:** The scope of CSO awareness raising is inadequate. They are not able to cover sufficient numbers of households in the region.
- **Budget:** According to an interview with a person from Mon State Youth Affair Committee, the Municipality of Mawlamyine uses the most budget in Waste Management among the townships in Mon, their employed the staffs are collecting in 29 wards using 35 trash trucks regularly. However, the waste management staffs recieve very low salary and have no or little protection in the workplace, such as masks, gloves, and other tools for collecting or managing waste. It is a challenge for the municipality to expand coverage to collect and manage trash in all areas.
- **Lack of Baseline Data:** CSO report that they don't have enough baseline data to inform the development of targeted messages in the region.
- **Segregation of the waste:** The community doesn't segregate waste but they throw it all into the trash trucks. Therefore, it is difficult to manage to reuse or recycle the waste. In addition, the Municipalities have no way to segregate the waste. If we want them to segregate the waste, we have to provide knowledge to the public, upgrade the system to collect and dispose waste systematically. In order to do this, budget would increase a lot.

NEEDS

- **Developing Master Plan.** A more inclusive waste management plan which identifies the challenges, needs and solutions are needed.
- **Strengthen the Baseline Data for Waste Management in the region:** We need more research to understand more about public opinions on waste management, analysis on the policies and the waste management system.
- **Academic Research:** The universities located the regions should also focus research on how waste is impacting communities as well as the environment.

RESOURCES

- Most people in the communities are interested in waste management.
- The top three priorities area of Environmental Conservation Department of Mon State included Waste Management.
- Environmental Conservation Department already initiated the awareness raising program for waste management in communities of Mon State, However, they still have challenges in developing effective curriculum for

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awareness raising in the community.

- In Gulf of Mottama regions, there are CSOs and Youth Groups who are distributing pamphlets relating to waste management. There are also conducting seminars and discussions in the community, and initiating activities like trash collection and identifies waste challenges.
- The universities could play very an active role in conductiong research in their campus.
- Business Involvement: Some local businesses are contributing small trash trucks for collecting waste around Mawlamyine. According to this scenario, Kyi Zaw Lwin from Mon State Youth Affair Committee suggested that one possibility of the management would be privatize to waste management service by transferring the service to the companies/ businesses. However, now, the municipal cost is 1000 Ks per month for waste management. If we transfer waste management to the companies, the price might rise to 5000 Ks. So people need to understand to pay more money to attain better waste management system.

DISCUSSION

KEY INSIGHTS

The analysis of the research data from different users groups, experts and identified challenges and needs, we concluded with the following insights.

COMMUNITY

1. People are accessing knowledge, but have less intention to follow suggestions.
2. People think when waste is out of sights, it is gone, they don't think about the impacts or consequences of waste.

KNOWLEDGE & AWARENESS

3. Awareness raising tools and methods should be applicable and realistic for the community to follow.
4. Raising awareness should not only be for people but also for business and government.
5. School is a good place to start awareness raising.
6. The ECD already have a system of raising awareness in communities, the methods or tools ECD use should be reviewed and revised to effectively delivered the knowledge to communities

SYSTEM

7. Other essential supports are trash bins and waste management system in the community.
8. Introducing the methods of waste segregation might create better chances for reusing or recycling the waste
9. Reusing or reducing the use of plastic would benefit communities in both rural and urban areas
10. In urban communities, the current services of municipalities are satisfied by the people and so it needs to be upgraded to support better service

According to the insights gained from the research, we can categorize the ideas into six main opportunities:

1. Knowledge and Awareness Raising
2. Promotion of waste reduction
3. Upgrading waste management system
4. Waste Incineration
5. Waste Segregation
6. Waste Recycling as Business

DISCUSSION

OPPORTUNITY 1: RAISE KNOWLEDGE & AWARENESS

Raising the public awareness is essential for developing people's knowledge and perceptions toward plastic and solid waste management.

KNOWLEDGE AND AWARENESS RAISING

1. **School Campaigns:** Schools play important roles as educational hubs for students, teachers and parents in both urban and rural communities.
2. **Community Awareness Campaign:** Some community agreed to meet concerning waste and plastic problems by inviting one representative from every households.
3. **Awareness should be Experiential:** The awareness sessions should not be the lecture based but it should be innovative, practical and experiential for the community.
4. **Visuals for Awareness:** Most respondents emphasized enforcement of laws in waste management.
5. **Edutainment:** Video documentaries and informative short videos on plastic and waste would be effective tools for the community for raising community understanding.
6. **Public Events:** Teaching children about waste and management in the school was suggested.
7. **Beach Clean Up and Waste Audit:** Communities believe that uses of plastic is the result of business producing plastic, so they want to discuss controlling production of plastic with business.
8. **Collaboration with Local Media:** An effective way of reaching communities through local media.

OPPORTUNITY 2: PROMOTE WASTE REDUCTION

The users in both rural and urban communities reported that they used to bring containers for buying drink and food, and carry basket for daily shopping and used leaves and paper for the packaging last about 5-10 years ago. Now, those practices are more common in rural areas than in urban areas. Promoting these behaviors might be very effective and sustainable.

In addition to changing actions, promoting the use and production of alternative materials for use by people and business would be helpful.

Most mentioned factors for change of the waste management system, involved personal behavioral change, therefore it would be effected to provide some easy ways to start people to change their behaviors toward behaviors that reduce waste and plastic waste.

DISCUSSION

OPPORTUNITY 3: UPGRADE THE SYSTEM: COLLECTION

The research suggested the needs of government involvement on development of current waste management system in terms of collecting trash and regulating the rules.

UPGRADING COLLECTION SYSTEM

1. **Providing Trash Bins:** Together with awareness raising the infrastructure of the waste management system needs to be developed. If we develop and inspire the populace, both rural and urban we need to make sure they have a system that includes trash bin to hold the trash and keep it out of the environment so that it can be properly disposed of.
2. **Increase the coverage of the waste collection by the trash trucks:** In urban areas, some of the areas are still lacking the trash truck services of the municipality, so that they have to rely on informal management of the waste (burning, dumping, burying)
3. **Increase the number of collection time by the trash trucks:** Some community reported that the trash truck are collecting only once a week, which is not convenient for all of the community
4. **Maintain the trash trucks to be punctual:** One of the problem of the trash collection is timing of pick up. People need to know the schedule pick up and the trash collectors need to keep to the schedule.
5. **Select site to dump waste:** Mostly relevant for the rural communities. Each village or rural community needs to designate dump site.

OPPORTUNITY 4: UPGRADE THE SYSTEM: MANAGEMENT

ENFORCING LAW AND MANAGEMENT

1. **Creating Waste Management System Map:** To help make management visual a visual that depicts the entire waste management system of a community and the different actors in the system helps management to keep a " system view". to helping to develop.
2. **Master plan for Waste Management System:** Planning timing and the route of the pickup and depositing of the waste is best planned out carefully.
3. **Reviewing the existing laws:** is research did not review the laws relating the solid waste management in Mon State. Yet, it recommends a review the laws.
4. **Advocacy:** Research on community experiences of waste management system should be used to advocate with the government to review and revise its rules and regulations.
5. **Rules and regulations:** Responses from the community suggested that the rule and regulations for waste management mismanagement are very loose and not effective. Even with, Signboards saying not to throw trash into river and fines apply to those who throw trash away, people are still throwing trash into the river.

OPPORTUNITY 5: INCINERATE THE Waste

Communities have knowledge that burning is polluting the environment, but they are still considering burning as one of the options to manage waste in the community. Therefore, supporting incinerators in the villages might be effective in managing the waste in rural area, especially, areas which are not easily accessible. However, more studies are needed about the effectiveness the incinerators.

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OPPORTUNITY 6: SEGREGATE THE WASTE

The waste can be segregated in the household and in the dump site with machine, which is more expensive and labor intensive. Following other models, the community can segregate their waste and then the municipality can collect separately four categories: Biodegradable, Hazardous, Recyclable/ Reusable, Non-degradable.

Similarly, the waste can be segregated by using machine in the dump site. This research studied two dump sites using waste segregation machines in Kyaik Htee Yoo and Bago. The machine is simply segregated the waste into two categories: degradable and non-degradable waste, the degradable waste including food waste, plant remains, small particles of plastic, etc are transformed into fertilizers.The non-degradable waste: plastic, bottles, glass, metals are segregated in the machine, cleaned, collected and exported to the recycle stations or businesses. In general, 50% of the total waste can be transformed into fertilizer, about 30% are able to recycle and 20% as final waste which are economically invaluable.

According to the interview, based on the size and capacity, the cost will be varied. In Kyaik Htee Yoo, which capable of segregating 10 tons per day cost 4,000,000,000 MMK (the cost was almost double as it is situated in mountainous region) while the Bago facility cost 3,000,000,000 to segregate 20-30 tonnes of waste per day.

OPPORTUNITY 7: RECYCLE THE Waste

Recycling is providing around 20 households in Mawlamyine dump site and around 5 households in Kyaik Hto. In the dump site, the trash gleaners are collecting recyclable products and sell back to the junk shops in the cities. Currently, small fractions of people in the communities are recycling the waste they produced. Most of the recycling are carried by the trash gleaners who collecting in the dump sites and around the city and villages. According to the interviews, people are producing about 60,000 - 100,000 MMK for 10 working days.

DISCUSSION

RECOMMENDATIONS

OPPORTUNITIES	PROS	CONS & NEEDS	RECOMMENDATIONS
Knowledge and Awareness Raising School Campaign	• Might need more coordination than community campaigns and events • Align with what ECD is working	• Assessments might be needed to understand the information appropriate for the school	★★★★☆
Community Campaigns	• Cover bigger audience	• Effective communications tools are important to connect the audience • Co-create participatory campaign with communities	★★★★☆
Visuals	• Effective communication tools to create connection • Easy to understand and useful for audience/ users from diverse back-ground (education, languages, etc)	• Might be expensive and take time to create visuals • Should critically consider who the users are, what they should know and what we want them to do	★★★★★
Promotion of Waste Reduction Behaviors	• Might be more effective and practical than recycling • Suitable for communities with limited waste management services especially in rural area • Most communities already familiar with the ideas • Most people responded this was changes they wanted • Cost effective • Promote together with awareness sessions	• People are attached to the convenience of plastic, so they might reluctant to change • Challenging to change behavior of people • Might need to support or suggest alternative ways to reduce plastic or other solid waste (eg: promote the use of basket (swe chin), containers in buying food)	★★★☆☆

DISCUSSION

RECOMMENDATIONS (CONTINUED)

OPPORTUNITIES	PROS	CONS & NEEDS	RECOMMENDATIONS
Upgrade Waste Management System Supporting trash bins	• Easy to perform • Can define quantitative efforts • People want them	• Expensive • Might not know how people use it and how the system manage the waste in the bins	★★★☆☆
Having regular trash collections	• Very effective in municipal coverage area • More convenient in disposing the waste	• Municipal have constraints (budget, human resources) • Difficult or not relevant for rural communities	★★★★☆
Setting areas for Dumping	• Suitable for rural communities • People can easily follow throwing in the dump site	• Need regular maintainance • Might be expensive • Have to set the place critically • Need additional studies on how it might impact the environment and how to reduce the impacts	★★★☆☆
Waste Incineration	• Useful in both rural and urban area • Easy to use and maintain • Cost effective	• Need to segregate the waste to incinerate • Should do more study on the experience of using the incinerators	★★★☆☆
Waste Segregation Household segregation and disposing	• Promote better chance to reuse/ recycle • Cost effective and can manage within household	• Might be complicated to segregate • Have to collect the trash sepearatley, and it might be difficult based on the current system • Need to raise awareness	★★★★☆

DISCUSSION

RECOMMENDATIONS (CONTINUED)

OPPORTUNITIES	PROS	CONS & NEEDS	RECOMMENDATIONS
Waste Segregation (continued) Utilize a waste segregation machine	• Support recycling the waste • Very few percentages of byproducts are produced • Can be economical by selling the recycle materials and natural fertilizers	• Expensive in setting and operating the machine • Labor intensive • Need human resources in operating and maintain the machine • More studies is needed on the effectiveness of the machine	★★★☆☆
Recycling as Practice and Business	• People responded they do not like recycled products • Create job opportunities • Small financial investment is needed • Profitable	• The working conditions is challenging • Safety and health might be important issue for the waste gleaners • More studies is needed to promote recycling as business despite we know the market values of recyclable products	★★☆☆☆

FOLLOW UP ACTIVITY: THE CLEAN UP & WASTE AUDIT
METHODS

THE CLEAN UP

The clean up site was divided into two zones with the length of 2 miles and width of 500 yards respectively. Each zone was assigned 12 people to collect trash. The 12 participants were then divided into pairs and each was assigned to collect one of the following categories: plastic bags, plastic bottles, glass materials, metal, textile and fragmented or unidentified materials. In collection, the decomposable waste and hazardous waste were excluded for the safety of the volunteers.

The collection was conducted in morning and afternoon sessions, each taking about one hour and 30 minutes. Finally, the collected bags were piled in their respective zones. The total numbers of bags in each zones was counted and the total weights were weighted using scales.

THE AUDIT

On the next day after the beach clean up, Each team counted every pieces of the collected waste and categorized then according to the following table. Each category was weighted and recorded.

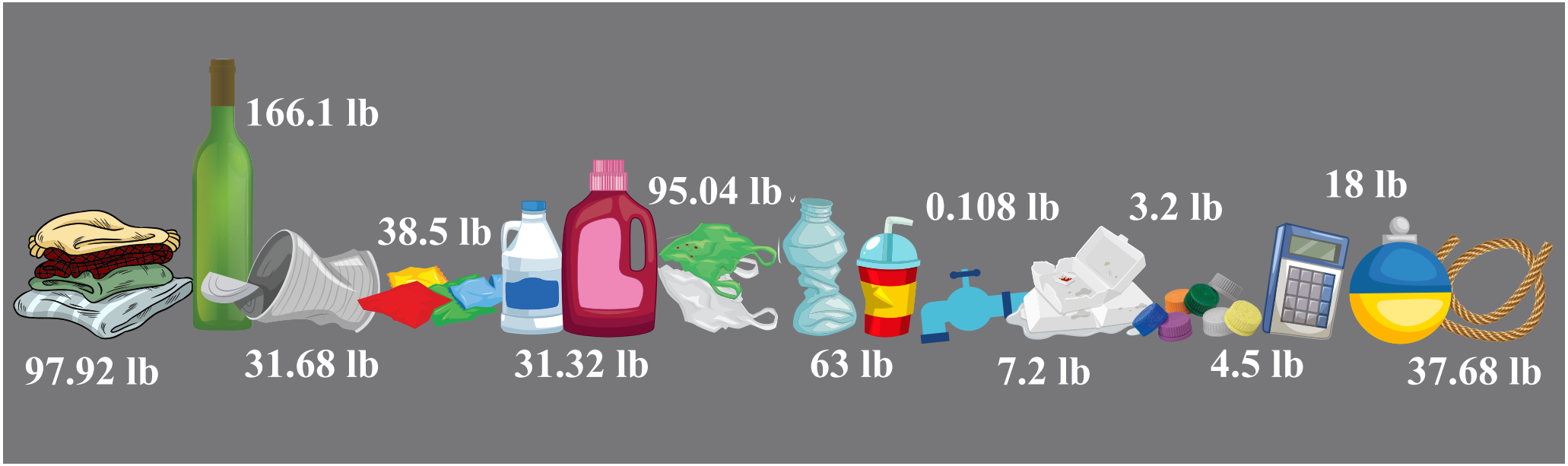
Plastic Bags	Plastic	Glass	Metal	Unidentified Objects
- Single layer plastic bags - Multiple layered plastic bags	- PET: Water bottles, Drinks, Cups, Cooking condiments - HDPE: Drinks, Personal prodcuts, Cups, Bottles, Matches	- Bottles - Cooking condiments - Soft drinks - Personal care products - Medical products - Alcohol	- Can - Aresol - Drinks - Food - Household products - Metal pieces	- Fragmented objects - Pieces of electronic waste - Fishing gears/ materials - Pieces of Styrofoams

Table: Categories of waste for Clean Up and Waste Audit

THE CLEAN UP & WASTE AUDIT

RESULTS

The overall weight of waste from clean up activity was 669.5 lb. Among the waste, the glass materials contributed the most weight of 166.1 lb (about 25% of total weight) followed by 97.92 lb of textiles and 95.04 lb of single layed plastic. 38.5 lb (6% of total weight) are multi-layered plastic.



DISCUSSION

The clean up we performed was on 31th of May, which is the start of the monsoon and very difficult to get to the site. As result of the rain, the waste was wet which might impact the calibration of the weight of the collected waste. Yet, the villagers revealed that the season has the largest amount of waste washing up to the shore from the nearest city, Mawlamyine.

In this activity, we didn't count the number of waste in each category and we didn't identify the brand of the companies producing the waste we collected. We recommend to carry out a clean up activity such as ours during the dry season. Even if the full audit can't be done, the clean up team should count the number of bags and weight them. They can also subsample about 10-20 % of the total weight of the waste and audit on the subsampled waste.

NEXT STEPS

1. **Waste Management Design Workshop:** According to discussion with GoMP, there will be a Design Workshop in September, which will be collaborative effort to create campaign ideas with multi stakeholders. MCCL will share the research in the workshop and co-facilitate the workshop to develop public awareness campaign ideas and prototypes.

1. **Publication of the Research Report in Myanmar Language:** The report will be shared to GoMP in English version. If it is relevent, we would like to recommend the report be translated or create as shorter versions to share through the communities as well as the government departments.

2. **Community Campaigns:** The community campaigns should be co-created with communities. The schools in rural communities would be our targets and we would like to create visuals and tools to raise awareness within communities. The campaigns are not just limited to trainings but also open to project based activities. eg. Clean Up and Waste Audit, Co-designing waste disposal sites in communities.

3. **University Plastic Campaign:** As Point B, MCCL is collaborating with universities in GoMP and students are involving in the waste research in both Mawlamyine and Bago, we can adapt the campaigns design we used in the communities with relevant to the university students. If further supports from GoMP are available, the MCCL team could develop project based course in the campuses to co-design the waste management system on the campuses.

4. **Public Campaigns:** According to the plan of GoMP, there will be public campaigns in Mawlamyine, the MCCL team are able to co-design and co-facilitate the campaigns with GoMP.

5. **Research on Waste Incinerators:** Further detail research on community perceptions and social impacts of waste incinerators could be continue. The research should focus on the villages or communities where SDC implemented waste incinerators in past project.

6. **Business Research on Recycling as Business:** As the recycling business is profitable, business research on recycling the waste could be conducted to understand more about the profits, sustainability and people preferences to start recycling as business

7. **Policy Reviews with Government Departments:** In this research, the data relating government actions and policies regarding the waste management system is very limited. Therefore, system analysis workshop or policy reviews with government departments like ECD, Municipals and GAD could be done.

THANK YOU

Special thanks to:

Research participants
Community members
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