

Article

Public Perceptions of Waste Management in Sri Lanka: A Focus Group Study

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Abstract: The prevention, reduction, recycling and reuse of waste is promoted by the United Nation's 2030 Agenda for Sustainable Development, but many countries lack both necessary resources and infrastructure for sound waste management. While literature pinpoints the need for an engaged public and suggests a range of factors and supportive actions that may impact citizens' waste behaviour, qualitative in-depth studies for engaging in waste management practices remain scarce. This study aimed to investigate perceptions of waste management and underlying behaviours for waste practices in the context of household waste management in Sri Lanka. Six focus group interviews were held with 23 residents across 6 regions in Sri Lanka. A thematic analysis of the interview transcripts revealed perceptions of four waste management systems, together with five motivational aspects of waste practices in urban, suburban, and rural areas. The analysis further considers how the motivational aspects are interlinked with practices within citizens' perceived systems. In addition to the novel thematic contribution to the field, the findings can be used as a foundation to inform strategies to communicate with selected target audiences about their local challenges for sustainable waste management practices, in an attempt to influence citizen behaviours.

Keywords: waste perceptions; waste motivation; waste communication; waste management; household waste; Sri Lanka



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1. Introduction

While human civilization has always generated waste, increases associated with population growth and changed consumption patterns pose a significant challenge for the waste management capacity in many countries. Global waste generation is foreseen to increase by as much as 70% by 2050 [1]. Living in the Anthropocene thus urges us to reduce waste production, close material loops, and ensure the possibility of a global economic activity within the planetary boundaries. In turn, citizens require access to infrastructure, knowledge, and motivational support to make positive contributions to this transition.

Household waste management is closely related to sustainable development [2]. Indeed, the United Nation's 2030 Agenda for Sustainable Development explicitly includes prevention, reduction, recycling and reuse of waste to diminish the negative impacts on human health and the environment [3]. Sound waste management may be regarded as an entry point to address many of the 17 sustainable development goals [4]. However, multiple countries lack the necessary resources and infrastructure to do so. In some countries, various waste separation initiatives do not endure beyond pilot-level programs [5], and household waste is often deposited in landfills [6].

In this study, Sri Lanka is used as a representative case of a lower/upper middle-income economy [7] with pressing waste accumulation challenges. Sri Lanka has been ranked as the fifth worst ocean polluter, based on data from 2010 [8]. Indiscriminate open waste dumping is the most common practice of managing solid waste in Sri Lanka. Solid waste is managed on a national, provincial, and local level, where the local authorities are

responsible for implementation; in most cases where the local authorities collect waste, they dispose of it in open dump sites [9]. In 2017, heavy rains caused a garbage landslide in one of the country's largest solid waste dump sites, claiming 32 lives [10]. While the government has set clear goals for improving waste management practices [11,12], these are yet to be met. Among currently identified problems are ineffective planning and implementation of waste management strategies [9], and a lack of public awareness and commitment [13]. For example, Saja et al. [14] have recently described multiple challenges for proper waste management in southern Sri Lanka, including lack of resources and unpredictable pick-up schedules. Furthermore, Conlon [15] argues that there may also be a need to refocus efforts from an emphasis on "downstream" management of waste to an "upstream" decrease of waste production.

As exemplified by the case of Sri Lanka, many countries face significant challenges in supporting citizens' waste management practices [16], and motivational aspects are clearly fundamental in these efforts. Although studies indicate that communication initiatives adapted to specific audiences may support waste behaviour change [16–19], a recent literature review reveals greater challenges for resident participation in lower income economies [16]. Moreover, studies of waste behaviour motivation typically analyse large-scale survey data in relation to motivation models [2,20–24]. These studies often do not capture in-depth, descriptive case-based accounts of citizens' perceptions of waste management systems, and how such knowledge might be leveraged to facilitate communication and future change in waste management behaviour (e.g., see Conlon, 2021). In this regard, the recent work by Saja et al. [14] has demonstrated how qualitative data gathered from interview approaches with local stakeholders can be used to identify current challenges and complexities of waste management systems in Sri Lanka. According to Lasswell's [25] classic model of communication, successful waste communication needs to consider who says what, in which channel, to whom, and with what outcome. Such approaches indicate a need for further research toward generating a micro-level understanding that can inform communication strategies designed for residents on a more local scale. In contributing to this objective, the specific aims of the current study are to: (i) explore how Sri Lankan citizens perceive waste management, and (ii) identify what aspects might be related to their waste management practices.

2. Literature Review

2.1. Moral Dimensions and Trust in Relation to Waste Management Practices

The literature suggests that citizens who perceive waste management negatively, and as a personal challenge, are less likely to commit to waste management behaviours [5]. Herein, attitudes of "laziness" and "having no time" strongly relate to a poor interest in recycling [26,27]. While observing other's behaviours can increase residents' own collection intentions [20], research also demonstrates that citizens' own perceptions of "good" and "bad" are sometimes more influential in waste behaviour than broader social and cultural norms [28]. In this regard, Zhang et al. [29] have noted that personal norms are a major factor influencing waste sorting intentions. Indeed, individual moral norms around environmental concerns such as pollution, climate change and resource depletion, are related to a higher probability of household waste recycling [30]. Furthermore, as shown by Nguyen et al. [5], trust in a waste separation system is a fundamental factor in mobilising household waste management. Trust can be strengthened by appealing to residents' personal conscience, which also leverages awareness and action. Trust in waste separation systems can also be enhanced by effective exchange of meaningful information [5].

2.2. Environmental Awareness and Infrastructure in Waste Management Behaviour

Environmental awareness has been identified as an important factor in willingness to participate in waste management behaviour [13]. As shown by Shen et al. [31] in a study of waste sorting among farmers in rural parts of China, relations between environmental views and pro-environmental behaviour are complex and multifaceted. For example, while

no direct influence of social norms on waste sorting intentions was found, it nevertheless had an indirect effect by influencing norms at the personal level, which in turn, supported pro-environmental behaviour intentions [31].

Another major influence on adapting pro-environmental behaviours in waste management practices is the infrastructure that provides availability and accessibility of waste management facilities [26,32–35]. For instance, Alhassan et al. [36] found that perceived inconvenience negatively influenced waste separating intentions among city-dwellers in Ghana, while Mamady [37] showed poor waste management practices to be related to longer physical distances to waste disposing sites. While residents often have a low confidence in the efficacy of available waste facilities [38], a functioning waste system does not automatically motivate waste separation [21]. In addition, several studies have highlighted the role of informal waste collectors in cities without official recycling systems [26,39,40]. In lower/upper middle-income economies, pro-environmental waste behaviours and intentions are also often related to citizens seeking new economic opportunities. As recently shown by Jayasinghe et al. [13] in a Sri Lankan context, entrepreneurship plays a crucial role in combining innovation with a strong motivation to address waste management problems.

2.3. Health Perspectives in Waste Management Behaviours

Citizens' perceptions and knowledge about health can influence waste management practices [34]. For example, in a Sri Lankan study, Udayanga et al. [41] investigated residents' knowledge, attitude and practices concerning dengue virus management. Many participants indicated a need for more knowledge about solid waste management as one aspect of disease control [41], implying that health considerations may be one motivating factor for effective waste management behaviour. The link between health risks and poor waste management may not always be clear, however, as shown by Kanhai et al. [42] in a study of the awareness of health hazards from unsafe waste disposal among city residents in Ghana. Although many households connected waste with health risks such as cholera and malaria, they rarely judged their household to be affected despite reporting frequent health problems that may be associated with waste. Thus, health risks may be perceived as part of everyday life rather than effects of poor waste management.

2.4. Extrinsic and Intrinsic Incentives in Waste Management Behaviours

In terms of waste management incentives, Czajkowski et al. [22] have identified that household recycling intentions are determined by the interplay of economic (e.g., reward from sorting), moral (e.g., personal responsibility) and social (e.g., expectations of others) perspectives. In support of this, a literature review by Sunarti et al. [16] recommends that it is crucial to combine both extrinsic (e.g., financial) and intrinsic (e.g., moral) factors to improve citizens' awareness, willingness, and confidence, in engaging in waste management behaviour.

Work in China by Zheng et al. [2] suggests that policy directed to promoting "material repayment" (e.g., monetary reward) as well as "spiritual repayment" (moral realisation that societal harm is reduced) can positively influence waste separation behaviour. Both of these incentives induce feelings of satisfaction when engaging in waste sorting activities and are strongly related to personal motivation. Other studies have shown that economic dimensions do not always incentivise motivation to engage in waste management activities [38,43], with many citizens of the opinion that waste services should be the sole responsibility of local and state government [23]. In terms of policy directives, Li et al. [24] found that mandatory policies positively affected residents' willingness to separate waste, while Wang et al. [20] found no significant effect of government-initiated reward or punishment policies. Comparably, Gilli et al. [21], found that the interaction between citizens' motivation and waste policies can be significantly positive, although not always leading to actual recycling behavioural change.

2.5. Knowledge and Information in Relation to Waste Management Behaviours

Various studies [2,40] show that the more knowledge and awareness residents have about household waste separation, the more likely they are to engage in waste management practices. For example, when it comes to exposure to information about waste management, respondents in a study by Akūlova et al. [43] defined lack and complexity of information as obstacles in waste management. A further knowledge-related factor found to influence waste management practices is the level of education. For instance, Liu et al. [44] found that rural residents with higher education levels were more likely to collect and classify solid waste and be aware of the need for environmental protection. In a similar vein, Tsalis et al. [27] found education level to be a factor in explaining individuals' willingness to participate in a door-to-door program. In contrast, work by Mukherji et al. [40] and Wang et al. [20] have observed that education levels had no significant effects on waste management intentions and actions.

2.6. Communicative Perspectives in Waste Management Practices

When it comes to influencing citizens' recycling practices, communication for cultivating knowledge about waste management should match citizens' characteristics [16] and be framed for the receivers' context. It is crucial that environmental communication empowers citizens to feel that they need to act. A Vietnamese study by Nguyen et al. [5] showed that communication must appeal to citizens' moral motives and personal conscience to encourage waste management practices. This is supported in a review of environmental behaviours by Briguglio [17], which indicates a relationship between strong moral motives and preparedness to cooperate in response to communicated initiatives. Czajkowski et al. [22] showed that citizens' responses to communicated social norms information are strongly related to their current engagement with household recycling practices. This is further supported by Ahmad et al. [45], who showed that an elevated communication of waste sorting knowledge in a Malaysian context did not necessarily translate to waste management practice. Furthermore, citizens' perceived difficulties and challenges around waste management significantly hinder them from responding to communicated initiatives [5].

Waste management communication interventions range from mass media initiatives, public education campaigns, door-to-door approaches, and emerging text data mining techniques [16–18]. In other interventions, Zand et al. [19] have found face-to-face training to positively affect solid waste recycling and source separation, while Wibeck [46] has also suggested that communication strategies that harness multimedia and ICT-based visualisation offer significant potential.

3. Methods

This study adopted a qualitative research approach in a Sri Lankan context, wherein focus groups were used to elicit participants' perceptions of waste management. Data were analysed thematically to provide an understanding of the investigated phenomena.

3.1. Participants and Data Collection

Data were gathered through unstructured focus group interviews. A focus group study is a qualitative method in social sciences and humanities, intended to study participants' sense-making processes as they occur in face-to-face interactions [47,48]. This study obtained Sri Lankan citizens' perceptions that were drawn from urban, suburban, and rural areas in two provinces. In total, we gathered six focus groups, aiming for four to six Sri Lankan residents per group [49]. Due to cancellations, one group contained one participant. The interviews were recorded via video and audio. The focus group interviews were prepared according to methods described by Wibeck [48].

Participants were recruited through a combination of open applications, random selection and through personal networks [48]. They were invited to discuss management of residential household waste, possibilities, and obstacles they face when discarding waste

and how they receive information around recycling and waste management. The focus groups were limited to adults living in one of the following six areas: urban Colombo, suburban Western Province, rural Western Province, urban Kandy, suburban Central Province, or rural Central Province (see Table 1).

Table 1. Overview of participants, their area of residence and number of women and men.

Location	Participants	Women	Men
Urban Western Province/Colombo (UWP)	1	0	1
Suburban Western Province (SWP)	5	4	1
Rural Western Province (RWP)	4	3	1
Urban Central Province/Kandy (UCP)	4	1	3
Suburban Central Province (SCP)	5	3	2
Rural Central Province (RCP)	4	4	0
Total	23	15	8

These areas were specifically chosen to ensure that the urban perspective was represented along with suburban and rural perspectives, as these two provinces each have an established and developed capital.

3.2. Data Analysis Procedure

The six focus group conversations were fully transcribed and thematically analysed in two stages, namely through open and axial coding. In contrast with an inferential statistical analysis that might seek generalisability, focus group analysis focuses on discerning recurrent trends and patterns in qualitative data [47,49,50]. Open coding uncovered an overview of reoccurring themes, and axial coding exposed topics within the themes to clarify what the themes encompassed. The analysis revealed two occurring themes; (1) the perceived waste management systems and (2) discouraging factors for acting within those systems (from here on mentioned as motivational aspects). Axial coding consisted of further elaborating the themes obtained from step one to reveal four perceived waste management systems and five motivational aspects.

4. Results

The findings of the study are reported in two sections, namely, participants' perceptions of waste management systems and the motivational aspects underlying their waste practices.

4.1. Perceptions of Waste Management at the Intersection of the Individual, the Entrepreneurial and the Societal

Perceptions of four overall systems regarding waste management, in the locations covered by the focus group interviews and in other locations in Sri Lanka known to the participants, emerged from the data.

4.1.1. Non-System

The non-system is perceived as a lack of organised garbage collection. In certain areas, mainly in rural Sri Lanka, the participants are asked by authorities to bury their garbage; however, the following quote from a resident in a rural area shows that burning waste in the garden is a common practice:

"We don't separate this stuff. What we do is we mix it all and burn. Like plastic, paper and everything. Something like food waste, we bury." (RWP)

The above quote confirms the practice of burning household waste. Other households attest to burying all sorts of garbage, with no regard for biodegradable values. This is also seen in the dumping of household waste in nature. Some participants in rural areas have been advised by visiting health inspectors from the public sector to bury their household

waste to prevent the spread of dengue fever. It appears that the lack of options for waste collection from the public sector results in an unsustainable behaviour of burning and burying household waste.

4.1.2. Public System

In urban and suburban areas, municipal garbage collectors pick up waste at the houses, while in the rural areas, the participants mention pick-up at what they call “main road”, a service provided by the public sector. The participants experience a difference in the collection frequency and segregation of materials depending on their residential municipality. Certain materials are not collected. Some participants have a regular schedule for garbage collection, some attest to a schedule that is not followed, while others rely on announcements through loudspeakers at the time of collection.

The municipalities have different methods of reaching out to their respective citizens with information regarding garbage collection and segregation, but in general, the participants say that they do not receive much information on how to dispose of household waste. Some participants recall receiving flyers when the garbage collection started, and in the areas where the collection is consistent, the participants rely mainly on tradition. The following extracts from the empirical data demonstrate the differences in experience among the participants:

“Although the [notice] board in our locality says that they are supposed to come four times a week [. . .] they only come twice in a week.” (UWP)

“They’re supposed to come once a week for this thing, and then two days later they come sometimes [. . .] there are so many delays all the time [. . .] people have their own landfills in their homes.” (SWP)

“They use a loudspeaker [. . .] and say like we are collecting this stuff, but at that time we may not [be] at home and then they call, it’s not an organised plan.” (SCP)

The three quotes above show that the continuity around waste collection varies, and that the information regarding the collection is irregular. Some participants mention notice boards, others try to rely on routines, while some must be at home to hear the speakers from the garbage trucks, to know when their household waste will be collected.

4.1.3. Private System

The private sector is perceived to be involved in waste management for recycling purposes. Participants mention individual scrap collectors who even travel to remote areas to collect or purchase different types of materials. Some of these scrap collectors are registered with the Central Environmental Authorities, while others are unregistered entrepreneurs. The quotes below represent participants’ experience with scrap collectors:

“[. . .] if we have unnecessary stuff we give [the scrap collectors] and earn a little money. Bottle collectors haven’t come for some time.” (RWP)

“You get the street collectors coming, all of a sudden [. . .] they don’t have a plan.” (SCP)

As shown by the quotes above, there are no schedules or routines for the scrap collectors. This leads to potential issues with storage space while waiting for collection; an issue mentioned mainly by participants from the suburban areas. The participant quoted above from the rural area says that they will give unnecessary stuff, meaning items they have not yet burnt or buried.

Participants have also noted that some of the municipal garbage workers separate certain materials when they come to collect their garbage. The participants assume that they do this to make extra money from selling the material. For instance, consider the following extract from a participant in an urban area:

“I see that they take [. . .] cardboard boxes and things like that, so they take that out and put it in different part of the truck . . . so I presume that they are able to kind of do something with that, or sell that.” (UWP)

The participants across the rural, urban and suburban areas note that there is a market for used materials, as evidenced by scrap collectors and municipal garbage workers collecting specific materials which they then presumably sell.

The market for used materials is further apparent in the private sector, where entrepreneurs and innovative companies are building businesses for recycling, mainly around Colombo (the de facto “commercial capital” of Sri Lanka). Participants mention companies that collect recyclables in certain areas or have drop-off locations for specific materials. Participants living near the commercial capital also have experience with subscription services for the collection of recyclables.

Established companies have also started to promote recycling. The larger supermarkets in Sri Lanka were mentioned in several focus groups, for example in the following extract, where a participant mentions a reusable shopping bag:

“I think most of the supermarkets [. . .] promote the recycled bag, you can purchase it and every time when you use it there is this royalty fee that they reduce.” (SCP)

The private sector within waste management is diverse and the stakeholders operate differently. While scrap collectors and innovative companies focus their businesses on collecting recyclables to sell, established companies are starting to partake in a circular economy as well. This is an unofficial system of private entrepreneurs who make use of a potential market for recyclables, operating in parallel to the public sector. In contrast to the public sector, the participants perceive the private sector to treat waste as a commodity, which can be given or sold to then be recycled.

4.1.4. Community System

Certain communities known to the participants have additional systems in place. These communities may involve the private sector while also promoting and installing compost bins. For example, small communities have set up their own recycling and collection in their own residential area, collectively negotiating with scrap collectors to come and pick up certain materials from their discarded waste, as seen in the following quotes:

“We promoted the composting, and such. And I think we were very successful.” (SCP)

“We organise the [scrap collectors] [. . .] maybe once every month, but we have put up good collection centres.” (SCP)

The obtained data demonstrate that there are local initiatives for better waste management, through composting or using scrap collectors from the private sector. This indicates that there is a desire to find better solutions for waste management.

Participants, mainly from rural but also a few from the suburban areas, mentioned how they are organised in different communities, religious or societal, where they discuss waste management or the lack thereof. While some smaller communities have managed to organise their own waste management system in conjunction with existing systems, others are struggling to become organised and are also even battling to involve their neighbours in good environmental practices. Two participants from rural areas in separate provinces discussed the lack of sustainable waste practices in their community as follows:

“I should take this problem in front of our community gathering or a meeting once more. I should convince them that this is essential to us. [. . .] If I can, I shall collect some names and get their support. After that I or someone shall go to the Urban Council. That can be done.” (RWP)

“We can’t breathe at nights, sometimes I shout at them. On the other hand if we go and tell them not to [burn waste] they come for an argument. And they angry with us. We live in a small village, we can’t stay like that, in [a] friendly manner we can live peacefully. We don’t know how to take action.” (RCP)

Whether a system is in place or not, the conversations happening within communities confirm that there is an awareness around the problems of mismanaged waste, but the proactive solutions come mainly from individual initiatives.

4.2. Synthesis of Perceived Waste Management Systems

A synthesis of the perceived waste management systems revealed by the focus group participants is presented in Figure 1. The figure captures the practices and perceived endpoints for the handling of household waste and indicates which practices and endpoints comprise each of the four identified systems. The exception is the practices of burning or burying waste, where the participants do not perceive an endpoint. The emerging views of waste systems presented in Figure 1 are also reflected in official reports on the status of waste management in Sri Lanka [9].



Figure 1. Synthesis of the perceived material flow (practices and endpoints) of residential household waste, connected to the identified systems.

4.3. Motivational Aspects of Waste Practices

While discussing the perceived material flow of household waste, the participants discussed what motivates certain behaviours. Five motivational aspects were classified as impacting participants' behaviours within the above identified systems and are presented as follows.

4.3.1. Space

Regardless of which of the systems discussed—the private, public, community or the lack of system—participants recurrently elaborated on the lack of space for proper waste management behaviour. Some participants struggle with a lack of space in their garden to bury their waste, while others say storing waste while waiting for collection is an obstacle, as is demonstrated in the following extracts:

“When you check with the CEA, they will say okay so if you have enough land you bury it [. . .] If you talk to the community level they will say okay, no it’s a small quantity, why don’t you bury it.” (SCP)

“Some have bigger lands. We have small lands. Those who live in bigger lands, they don’t have a problem [to bury waste].” (RWP)

“I’m trying to see whether I can get my whole road to [recycle], right but, who is going to give me the space, to put up [bins], they are all like taken by private houses.” (SWP)

As seen in the first quote, the advice to bury waste comes from authorities, but the participants still struggle to find space for the quantity of generated waste, as confirmed in the second quote. The third quote reflects the issue regarding space in more populated areas, where the household waste is collected by the public sector. The participant perceives not having enough space in their residential area, to store a quantity of different materials for recycling.

4.3.2. Health and Environment

The negative impact from the current waste management systems is a worry among citizens. The following quotes present a range of concerns in terms of both health and environment:

“I mean you don’t look after your garbage properly, you’re gonna get sick.” (UCP)

“Agrochemicals, empty bottles, they throw [. . .] by the side of the paddy field, [. . .] you get, you know streams [. . .]. That is a disaster, I don’t know how we’re surviving.” (UCP)

“It is harmful to the environment. That’s why we should collect the polythene and give them.” (RCP)

“When we went to the hospital [my husband] is being told that not to burn plastic, that might be the reason for cancer. There are plenty of talks about this, People say that it is not good to burn them.” (RCP)

The above quotes demonstrate concerns about environmental pollution and sickness from mismanaged waste. A participant from one rural group initiates a conversation about the relationship between cancer and burning plastics. Participants from both rural and urban groups relate waste issues to health by commenting on littering and pollution in nature. Even though health aspects are not mentioned in all six groups, there is a consensus regarding environmental concerns, where they agree that the current system is faulty, but they are trapped with bad environmental practices due to lack of alternatives. This is seen in the extracts below from one of the focus groups in a rural area:

“We know it is not good to burn plastic. That is a basic reason for diseases. That is harmful to nature, but we don’t have any alternatives.” (RWP)

“We also like to live a life according to government health authority’s instruction and rules, but we don’t have any alternatives.” (RWP)

The above quotes clarify the participants’ perspectives on the current practices and how the perceived current systems are damaging to both health and the environment.

4.3.3. Payment

While there is no clear economic model in connection with waste management practices, three ideas about how incentives could address behaviour were identified. Participants discussed opportunities in terms of income, while also expressing a willingness to pay for proper waste collection and recycling. The conversations around incentives also present the idea of discouraging waste pollution through fees and fines. The diverse ideas around economic incentives are seen in the following discussion between three participants in an urban area:

*“Woman: And I think some countries they even charge for the amount of garbage [...]
I mean like a tax like you said*

Man 1: In some countries I thought that they pay for the garbage

Woman: As in?

[...]

Man 1: They buy it

[...]

Man 2: Then they tend to reduce the amount of garbage

Woman: Yeah

Man 1: But anyway, they have separated properly, then only they do that one.” (UCP)

In the above exchange, payment is mentioned as a method to reduce the amount of garbage, but only if the waste is properly separated. Scrap collectors, who view waste as a commodity, will trade certain materials for money while in the Western urban and suburban areas, participants pay to subscribe to a service that will recycle their household waste. Furthermore, some participants mentioned that they already pay taxes for garbage collection, while others admit to having paid their garbage collectors extra money to take items the public sector normally would not accept. Simultaneously, individual municipal garbage collectors appear to sometimes act as scrap collectors, by separating materials from collected household waste. The following quotes are from participants in a suburban area:

“Of course [the municipal garbage collectors] want to make money they want [to] make a living out of it. But, the component that they are contributing is very valuable from the point of view of the society and the environment.” (SCP)

“[The scrap collectors] are coming and collecting and they, they even ask but we are saying we don’t need any money, come and collect and go.” (SCP)

The interview extracts above show that even though the involvement of payment is quite complex, the participants also display altruistic motivations behind their actions that go beyond any monetary rewards or punishments.

4.3.4. Hopelessness

In all the focus group discussions, there is an overarching sense of hopelessness about the amount of waste and the lack of proper waste management. Some participants discussed how citizens lack education or awareness, while other discussions pointed to an unwillingness to care for others. The following interview extracts portray disbelief in the effectiveness of the current systems and hopelessness regarding the situation:

“Most of the people won’t listen, they don’t have good attitude. We need proper laws like Singapore.” (RCP)

“We can tell to people to don’t do this thing but, what if they don’t have any option [...] we have to give them the answers first.” (SCP)

“You feel like you’re working against the system, not with the system. You feel that every thing is incentivising you to do the exact opposite [...] You have to find all the motivation from within yourself [...] forget giving you motivation, there are like disincentives every where.” (UWP)

“I mean the system is broken for a reason right, so we need to figure out why ... ” (SWP)

The discussions revolved around the current systems, as evidenced in the quotes. The overall dissatisfaction with the systems covered all six focus group discussions. Though perspectives on waste management issues are diverse, they can all be associated with a sense of hopelessness. This is also shown in relation to the lack of transparency regarding the endpoints of collected waste. Most participants assumed that the private sector recycles, while the public sector mainly dumps waste in landfills. The participants also believe that

even if they segregate, the municipal garbage trucks dump all different materials together in the same location, as shown in the following quotes:

“It will end up in a dump here.” (SCP)

“The garbage truck comes here, they put everything together . . . so you can see that there is no point in making an effort to segregate.” (SCP)

“We would sometimes separate, but I think the council always ends up putting it all together in the truck, and even when [. . .] they separately pick up but, [it] could all end up in the same landfill.” (SWP)

Lastly, as exemplified in the quote below, dissatisfaction with the material flow of household waste reflects the experience of hopelessness in participants’ perception of, and practices within, current waste management systems:

“It’s scary like, the way [waste pollution is] going to end up now is already bad it’s, if it gets any worse I don’t know.” (UCP)

5. Discussion

This study was initiated to gain a deeper understanding of perceptions and underlying behaviours and practices for waste management in Sri Lanka. Two interrelated themes were identified in response to the aim of the study, describing what waste management systems were perceived to exist and what motivational aspects influenced behaviours and practices within those systems, respectively.

5.1. Relationships between Perceptions and Motivations for Waste Management Behaviours

Each of the two themes is composed of a set of topics that describe waste management practices and motivational aspects in more detail. The complexities of the connections between motivational aspects and practices in the perceived systems are visually expressed in Figure 2.

The figure shows the interlinkages of participants’ perceptions of practices and systems with how experiences of lack of space, health and environmental implications, economic incentives, and hopelessness motivate household waste management behaviours.

Perceptions and motivations both contribute to a deeper understanding of the citizens’ narratives. While the former clarifies the participants’ perceptions of the existing systems, the latter highlights the motivations to why participants act in certain ways as well as their emotional relationships with the current systems. Addressing the motivational aspects is clearly fundamental for promoting better waste management practices, but the additional understanding of the complex interrelations between citizens’ perceptions and motivations paves the way for target-oriented communication interventions.

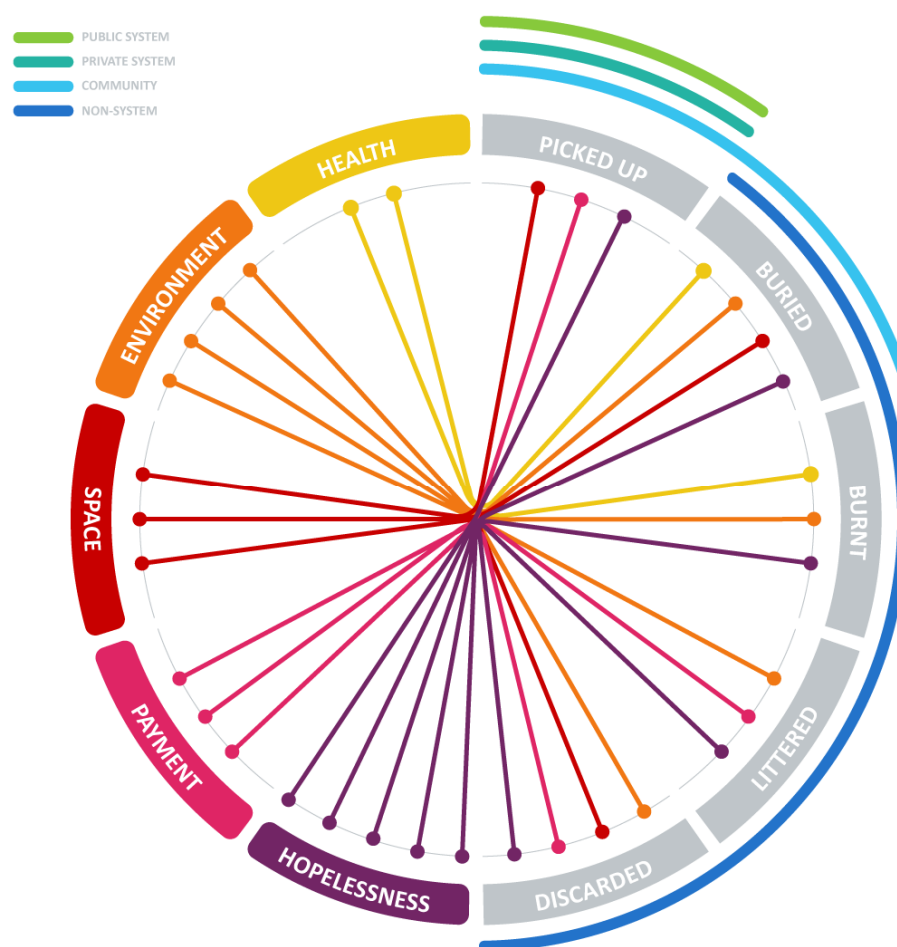


Figure 2. The relationships (coloured nodes with lines) between motivational aspects (left half of figure) and the practices (grey) within the systems (coloured arcs).

5.2. Perceptions and Motivations in Waste Communication

Communication has received limited attention in comparison with other factors that influence waste management [17]. Nevertheless, previous studies show the complexity of communication processes and interventions. On the one hand, some studies suggest that the more knowledge and understanding residents have about household waste management, the more likely they are to engage in waste management practices [2,16,40,51]. On the other hand, other studies report that knowledge about waste recycling does not always correlate with effective practice [19,45]. The relationship between knowledge on waste management and the practice of waste management reveals the attitude–behaviour gap in environmental communication and simultaneously raises questions about the design of communication interventions for waste management. As the literature describes, questions remain regarding what communication interventions have an effect. In the following, the discussion of the findings in the present study is structured according to Lasswell’s [25] communication model (i.e., Who, What, to Whom, and through which Channel).

The *Who* question draws attention to the communicator or the sender of a message and simultaneously addresses questions of perceived credibility from the audience’s point of view as we constantly judge the adequacy of information given to us. In communication for household waste separation, the literature on senders is scarce, but a study by Wang et al. [20] suggests a strong credibility from the surrounding community. Consideration is given to informal relationships such as community members, neighbours, friends and family in communication interventions for waste management to make it more meaningful to people’s everyday lives; indeed, this is also seen in the community system in this

study. One implication of this is that the community should be involved in the formulation of communication initiatives, for example, in the form of participatory design approaches.

The *What* question reflects the content of communication interventions. The research field of waste management is diverse in its findings on the links between information, perceptions, and behaviours. While some point to the links between knowledge about household waste management and engagement in waste management practices [2,16,40,51], others conclude that communication interventions with the intention to increase citizen knowledge on “the right way” to manage waste seem to have little influence on behaviour [19,45]. Rather, studies have found citizens’ perceptions of difficulties and challenges around waste management to significantly hinder them from responding to communicated initiatives [5,17]. Similarly, this study shows that waste behaviour is motivated by participant experiences of the lack of proper waste management options rather than a lack of knowledge about environment and health implications of their behaviours. For example, participants appeared to have an overall understanding that burning waste was associated with health risks; at the same time, it was obvious that some saw no way of avoiding this due to a lack of better options. Hence, communication interventions focused on a correct, or proper waste behaviour can therefore be seen as redundant to an already engaged and worried public.

Whom concerns the receivers of a message, ranging from individual recipients to the audience of mass communication. Questions of receivers of a message invite the discussion on criteria for audience segmentation. Applied to communication interventions for household waste management, several studies suggest that communication must appeal to citizens’ motives to encourage waste management practices [5,21]. Previous studies have found that while some are motivated by economic incentives, others are motivated by moral obligations and yet a third group by social factors [2,22]. It is particularly relevant as multiple studies, including this study, show that for some audiences, economic dimensions do not incentivise motivation to engage in waste management activities [38,43]. In addition to the generation of motivation through economic incentives, knowledge of negative health and environmental impacts, this study points to more practical motivational drivers in terms of perceived lack of waste storing capacity. Clearly, any communication strategy should take the target audience’s physical conditions, such as not having anywhere to place their garbage while waiting for the waste pick-up truck, into account. Furthermore, the participants of this study expressed a sense of hopelessness that goes beyond the individual to include perceptions of local and state responsibilities for waste services [23]. Consequently, waste communication interventions need to consider differences in motivations for waste management, since communicating “the wrong” incentive—from the audience’s point of view—may severely affect trust and credibility. Hence, the literature suggests that audience segmentation based on motivations may positively support the design of more efficient communication interventions for household waste management.

In parallel to studies on motives for citizen engagement in waste management, research has also identified environmental awareness and attitudes as important for participation in waste management behaviour [16,26–28,31]. Hence, segmenting audiences of waste communication according to levels of awareness, attitudes, and concerns, as well as various social or cultural groupings, may therefore be a way forward for audience-specific waste communication interventions.

The *Channels* question addresses the medium of transmission. This study showed an inconsistency in the use, if any, of Channels for communicating desired waste practices. Regarding waste management, studies have included media initiatives, public education campaigns, door-to-door approaches [17], face-to-face training [19] and social media [18] while there is also recognition of the need to involve various other approaches [16].

5.3. Practical Implications of This Study

The qualitative study design used thematic analysis of focus groups to shed light on citizens’ views of waste management. As such, the findings represent a range of

perceptions that exist in Sri Lanka. While participants were systematically recruited from areas to represent a variety of communities, the number of participants was low in relation to the population. It should therefore be emphasised that the findings are not intended to be generalised in a statistical sense.

The findings inform potential communicative initiatives for supporting waste management behaviours by particularly highlighting the importance of communicating waste management in ways that resonate with the various interpretative frames of target groups. While Lasswell's [25] *Who says What in Which Channel to Whom with What effect* model of communication has its disadvantages in terms of linearity and lack of feedback or interactional elements common in human interaction and communication, it offers a simple and potentially powerful method to structure communication interventions and studies to further discuss waste information, perceptions, and behaviours. As the model implies, all aspects of the communication process need to be addressed for successful waste communications as the answer to one of the questions informs the design of the other. Furthermore, in promoting moral obligations in empowering citizens, literature suggests that communication should avoid inducing public awareness about environmental issues through overly negative "doomsday" narratives, since they often lead to feelings of hopelessness and passivity [46]. Using the findings from this study as a foundation, subsequent research will explore the interconnection between motivations and a sense of agency for communication interventions. The continued research will use participatory design methods and exploratory design with the intention of motivating and engaging citizens in waste management practices. A suggested next step is to look at the impact estimated future scenarios have on behaviour, especially in environmental communication.

6. Conclusions

This study offers insights into citizens' perceptions of waste management systems in Sri Lanka and their intertwinement with factors that influence waste management behaviours and practices. Specifically, the two identified themes described four waste management systems that participants perceived to exist, and how five different behaviours and practices within those systems were motivated in five different ways. Importantly, an overarching sense of hopelessness was revealed, which indicates that a sense of agency may be one important aspect to prioritise in future interventions. Findings from previous studies show how trust in functioning systems engages citizens in waste management practices, while on the other hand, a negative experience of waste systems leads to a lack of engagement [5,37,38]. However, a functioning system does not automatically lead to engaged citizens [21]. Sunarti et al. [16] identify extrinsic and intrinsic motivations as crucial for engaging citizens in waste management practices. This study stresses the importance of understanding the sense of agency among citizens, and how a sense of agency along with motivational factors might affect practices for managing household waste. For communication interventions, this becomes important, as previous studies have found how perceived difficulties and challenges hinder citizens' responses to communicated initiatives. The emerging multifaceted view of waste management reality, as perceived by citizens, emphasises the need for any communication initiative to carefully take the perspective of local inhabitants into account. Environmental communication should empower citizens to act; therefore, motivational communication interventions should start with a clear understanding of the sense of agency among the target audience. The current study provides a tentative model for waste management perceptions that may be used as a starting point in such a communicative process.

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