



# **BASELINE STUDY REPORT FOR WASTE-RELATED PROJECT IN NUWARA ELIYA, SRI LANKA**



*Monkey on waste dump by rural road near Nuwara Eliya (photo taken during field visit)*

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## INTRODUCTION AND METHODOLOGY

For the past decades, the world has been facing a waste crisis that keeps worsening year after year. All along its life-cycle, waste is dramatically affecting communities and ecosystems, with countless negative impacts on human and animal health, ecosystems, climate change, conditions of living and socio-economic systems. Considering its omnipresence, the waste issue is connected to all aspects of our lives; so much so that, at this point, putting an end to the waste crisis has become an existential priority. Unfortunately, Sri Lanka is no exception to this alarming situation; on the contrary, like in many developing countries, the negative effects of waste are particularly severe in the country.

That is why, in response to expressed needs formulated by some of its partners, PADEM intends to work more actively on the waste issue in Sri Lanka. In order to do so through relevant and adequate projects, PADEM requested a preliminary analysis of the current situation, with a primary focus on the communities and area of intervention of its partner the PALM Foundation, based in Nuwara Eliya district of the Central Province. This report is intended as a baseline study to design future activities in cooperation with the PALM Foundation and possibly other partners.

This baseline analysis was conducted in two subsequent phases:

- 1/ a *literature review* of the waste situation in Sri Lanka, in order to examine the overall waste-related situation and legal framework in the country as a whole;
- 2/ an *in-person field visit* in Nuwara Eliya (with a stop in Colombo), in order to precisely assess the situation in the target area and to discuss and collect inputs from key stakeholders.

The field mission took place from December 9<sup>th</sup> to 19<sup>th</sup>, 2024, and was primarily articulated around meetings, discussions and field visits with the PALM Foundation's team. After an initial presentation about the ins and outs of Zero Waste, main discussions were framed by a pre-established questionnaire (see Annex 1) to make sure that all aspects of the topic would be covered. In order to acquire more information, additional meetings were held in Nuwara Eliya with representatives of the Municipal Council, MENCAFEP, tea plantation managers and city dwellers, as well as with Life For All Foundation (LFA), Center for Environmental Justice (CEJ) and Environmental Foundation Limited (EFL) in Colombo.<sup>1</sup>

Upon return from Sri Lanka, collected data and information were crossed and processed before being summarized and integrated into this report. The first part presents an overall situation of waste in Sri Lanka, based on the literature review and additional inputs from Colombo-based stakeholders. The second part focuses on the target location, namely Nuwara Eliya district. Finally, the third part offers a summary of the main identified challenges and ideas to improve the waste management situation in Nuwara Eliya, as well as a recap of suggested next steps and remaining gaps to fill. The suggested ideas are intended as outlines of a possible future project to be detailed and clarified in collaboration with the PALM Foundation after filling at least part of the remaining gaps.

Finally, it should be highlighted that this study essentially focuses on municipal solid waste (MSW), mainly intended as solid waste generated by households (as well as similar non-hazardous waste generated by public institutions and businesses). Waste water, hazardous waste and other specific waste are not addressed in this study and shall be investigated further in the future if another project is to be developed to tackle these issues.

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<sup>1</sup> Both CEJ (<https://ejustice.lk>) and EFL (<https://efl.lk>) are core members of the Break Free From Plastic movement ([www.breakfreefromplastic.org](http://www.breakfreefromplastic.org)), which is one of the leading organizations in the fight against plastic pollution and for Zero Waste at global level. Being renowned experts of the waste issue (among other environmental issue) in Sri Lanka, it thus appeared important to meet these organizations and acquire insights and recommendations from them.



# 1. OVERALL WASTE SITUATION IN SRI LANKA

## OVERVIEW OF SRI LANKA

Sri Lanka is a low-middle-income country located in the South-East of India. In 2023, it had a population of 22 million and a GDP of 84 billion USD. Administratively, the country is divided into 9 provinces, which are further sub-divided into 25 districts and 335 local authorities – which consist of 23 municipal councils, 41 urban councils, and 271 divisional councils (also referred to as *Pradeshiya Sabhas*).<sup>2</sup> The capital city of Colombo is located in the Western province, which is also the most populated among all the provinces.



Figure 1: Map of Sri Lanka  
(Source: gif-map.com)

<sup>2</sup> Ministry of Provincial Councils and Local Government, [Compilation of Local Authorities](#) (2024).

Overall, as of end of 2024, the political and economic situation is considered stabilized and favorable to the development of a waste-related project. After the difficulties of the past two years, economic crisis has largely resorbed and the economy is considered by locals to be on a rather positive trend. The political situation is also considered stabilized after the 2024 elections that brought left-wing NPP party into power, both at presidential and parliamentary elections. New President launched “Clean Sri Lanka” initiative for environmental transformation, which creates a favorable context for tackling the waste issue.

## DEFINITION OF WASTE AND RECYCLING

In Sri Lanka, waste is currently defined by the Ministry of Environment as *“any material, substance or by product eliminated or discarded or as no longer required at a particular time and a particular place or form and therefore to be used either as a resource or to be treated and disposed of in an environmentally sound manner if it does not have a utility value”*.<sup>3</sup> Solid waste from different sources is identified as *“residential, commercial, institutional, biomedical, construction and demolition, industrial and agricultural wastes”*.<sup>4</sup>

It is important to highlight that Sri Lankans make difference between ‘plastic’ and ‘polythene’, although polythene is in fact a type of plastic. In colloquial language, ‘polythene’ seems to essentially refer to (soft) plastic bags, as opposed to ‘plastics’ which refers to other (hard) plastic items. In some regulations, though, ‘polythene’ has other questionable definitions, as it is for instance intended as *“any solid products, bags, material or contrivances manufactured using all forms of polyethylene, polypropylene, polystyrene, poly vinyl chloride, polyethylene terephthalate or any other similar raw material used for the purpose of carrying, packing, wrapping or packaging”*.<sup>5</sup> As these two definitions are inconsistent and entail significant ambiguity (polythene can be dense and hard, contrarily to what people’s definition imply; polythene technically is a different material than polypropylene, polystyrene and other types of plastics, contrarily to what some regulations imply<sup>6</sup>), it is vital to make sure all stakeholders are talking about the same thing when discussing polythene/plastic issues.

Incidentally, when discussing with many people, we often observe a comparable ambiguity with the word ‘recycling’, which sometimes refer not only to the process of turning waste into a new item, but also to the simple action of sorting waste at home. In this report, ‘recycling’ is strictly intended as the process of remanufacturing waste into a new item, while ‘sorting’ or ‘segregating’ or ‘separating’ waste refer to the action of isolating each type of waste from one another.

Whenever relevant, we also make a difference between ‘recycling’ and ‘downcycling’: while ‘recycling’ refers to remanufacturing a similar item (making a new PET bottle from PET bottle waste), ‘downcycling’ implies the creation of a lower-grade item that is not recyclable anymore (making sweatshirts or carpets from PET bottles, or bricks and flower pots from other types of plastic waste).<sup>7</sup> Here again, it is important to avoid misunderstandings when different stakeholders are talking about sorting and recycling.

<sup>3</sup> Ministry of Environment, [National Policy on Waste Management](#), article 8.1.1 (2020).

<sup>4</sup> Basnayake and Visvanathan, [Solid Waste Management in Sri Lanka](#) (2014).

<sup>5</sup> Ministry of Environment, [Order published under the Gazette Notification No. 1466/5](#) (2006).

<sup>6</sup> Actually, definitions of ‘polythene’ and ‘plastic’ seem to sometimes differ from one Act to another. For example, in Regulation No. 01 of 2021, a plastic item is defined as *“a product manufactured using polyethylene, terephthalate, high density polyethylene, low density polyethylene, polyvinyl chloride, polypropylene, polystyrene, any other similar raw material or any mixture thereof”*.

<sup>7</sup> This distinction is crucial to make when considering sustainability issues, as effective recycling enables circularity while downcycling fundamentally remains a linear process.

## IMPACTS OF WASTE

For many people in Sri Lanka, the Meethotamulla tragedy in April 2017 – when a landslide in the dumpsite located in Colombo killed 32 people and destroyed almost 150 houses – acted as a wake-up call regarding the current waste crisis.<sup>8</sup> In fact, waste does create many social and ecological problems in Sri Lanka like in other countries.<sup>9</sup>

Waste disposed in dumpsites and littered in the environment contaminates Sri Lankan soils and groundwaters.<sup>10</sup> Waste also contributes to air pollution and climate change<sup>11</sup> through methane emissions, and it provides homes for mosquitos, which creates corridors for diseases such as dengue.<sup>12</sup> Unstable trash heaps can cause flooding or landslides like in Meethotamulla, and open waste pits also cause health impacts to wildlife as many species including elephants scavenge these piles and regularly eat plastics.<sup>13</sup>

Waste dumping and accumulation in the ocean disrupts marine life and creates hazards for fishing livelihoods and coastal health, on which many Sri Lankans depend. Studies show the presence of microplastics in Sri Lankan coastal areas.<sup>14</sup> Micro- and nano-plastics are now very well-known for posing a huge threat to human and animal health, both inherently and as vectors for toxic chemicals and pathogens.<sup>15</sup>

From a socio-economic perspective, waste impacts range from unpleasant odor and loss in property value to deterioration of road conditions and traffic congestion, among many others.<sup>16</sup> Accumulation of waste at the bottle neck of hydro power plants is also mentioned as a problem.<sup>17</sup> More broadly, disposal of solid wastes is very expensive and the tremendous amount of money that is sunk into managing waste is lost to other public services such as Education and Health. Likewise, biodiversity loss and destruction of scenic beauty has an economic cost that hampers the wellbeing of Sri Lankans and the prosperity of their country.<sup>18</sup>

## WASTE-RELATED NATIONAL LEGAL FRAMEWORK

At the national level, the waste issue remains legally framed by the National Environmental Act No. 47 of 1980 (and its amendments), which overall governs waste management and pollution control.<sup>19</sup> Waste-related issues also interact with several other Acts, such as Mines and Minerals Act No. 33 of 1992, Fisheries and Aquatic Resources Act No. 2 of 1996, Irrigation Ordinance No. 32 of 1946, Fauna

<sup>8</sup> Daily FT, [Can Meethotamulla garbage mountain direct Sri Lanka towards a green country?](#) (2017).

<sup>9</sup> Conlon, [A Social Systems Approach to Sustainable Waste Management in Sri Lanka](#) (2021).

<sup>10</sup> Bandara and Hettiaratchi, [Environmental impacts with waste disposal practices in Sri Lanka](#) (2010); Dharmarathne and Gunatilake, [Leachate Characterization and Surface Groundwater Pollution at Municipal Solid Waste Landfill of Gohagoda, Sri Lanka](#) (2013).

<sup>11</sup> GAIA, [Zero Waste to Zero Emissions: How Reducing Waste is a Climate Gamechanger](#) (2022).

<sup>12</sup> Ayomo and al., [An approach to tackling the environmental and health impacts of municipal solid waste disposal in developing countries](#) (2008).

<sup>13</sup> Rogrido, [Deadly garbage dumps pose elephantine problems](#) (2017).

<sup>14</sup> Koongolla and al., [Evidence of microplastics pollution in coastal beaches and waters in southern Sri Lanka](#) (2018);

Dharmadasa and al., [Assessment of microplastics contamination in marine protected areas in Southern Sri Lanka](#) (2019).

<sup>15</sup> Enyoh and al. [Airborne microplastics: a review study on method for analysis, occurrence, movement and risks](#) (2019);

Donkers and al. [Advanced epithelial lung and gut barrier models demonstrate passage of microplastic particles](#) (2022); Leslie

and al., [Discovery and quantification of plastic particle pollution in human blood](#) (2022); Bhagat and al., [Toxicological interactions of microplastics/nanoplastics and environmental contaminants: Current knowledge and future perspectives](#)

(2021); Wang and al., [Airborne Microplastics: A Review on the Occurrence, Migration and Risks to Humans](#) (2021).

<sup>16</sup> Bandara and Hettiaratchi, [Environmental impacts with waste disposal practices in Sri Lanka](#) (2010).

<sup>17</sup> Meeting with EFL held on December 18<sup>th</sup>, 2024.

<sup>18</sup> Malwana, [Solid Waste Management in Sri Lanka](#) (2008).

<sup>19</sup> Central Environmental Authority, [Act No. 47](#) (1980).

and Flora Protection Ordinance, Soil Conservation Ordinance, and National Water Supply and Drainage Board Act.

Since 2006, the Central Environmental Authority (CEA) issued several legally-binding regulations directly related to waste (which can be found on the CEA’s website<sup>20</sup>), including:

- Order published under the Gazette Notification No. 1466/5 dated 10/10/2006, which prohibits the manufacture, sale or use of polythene or any polythene product of 20 microns in thickness;
- Regulations published under the Gazette Notification No. 1534/18 dated 01/02/2008, which frames the conditions of licensing for discharging, emitting, disposing or managing waste;
- Order published under the Gazette Notification No. 1627/19 dated 10/11/2009, which prohibits dumping solid waste at any place other than places designated for such purpose by the relevant local authority;
- Regulations on Polythene and Plastic Management of 2017, which – among others – notably ban the manufacture of food wrappers (lunch sheets) as well as food containers, plates, cups, spoons from expanded polystyrene, and also prohibits burning waste inclusive of plastic;
- Regulations No. 01 of 2021 on Plastic Material Identification Standards, which command that any manufactured plastic item shall be marked clearly in accordance with the Plastic Material Identification Standards;
- Order of published under the Gazette Notification No. 2211/51 dated 21/01/2021, which prohibits PET and PVC materials for packing agrochemicals, as well as sachets (used for shampoo, gel, etc.) under 20ml or 20g, inflatable toys (with few exceptions), and cotton buds with plastic stems;
- Regulations No. 2341/30 of 2023, which prohibit the use of single-use drinking straw, single-use stirrers, single-use cutlery, garlands and string hopper trays;
- Regulations No. 2353/55 of 2023, which prohibit the manufacture of colored PET bottles for the purpose of storing water, the use of PVC of labelling bottles, and the use of any non-degradable materials as shrink caps for bottles.

The CEA also formulated technical guidelines on how to manage solid waste in Sri Lanka.<sup>21</sup> These guidelines are not comprehensive and remain quite broad, but they provide general direction along with some important aspects to be considered in waste management systems. Quite relevantly, the very first requirement of the guidelines stipulates that priority must be given to at-source separation and sorted waste collection.

As of end of 2024, the main national-level guiding policy is the National Policy on Waste Management released by the Ministry of Environment in 2020.<sup>22</sup> In principle, this policy appears compatible with a Zero Waste approach. Among other similar statements, it clearly stipulates that “*waste management systems should be zero waste oriented*” (article 7.4), that “*3R principle and its extensions shall be practiced with special emphasis on waste prevention/avoidance*” (article 7.5), and that “*waste avoidance is a basic prerequisite over all the other forms of waste management strategies [...] to maximize resource conservation as a whole*” (article 1).

On several occasions, the National Policy emphasizes the need to apply the Polluter-Pays principle and to enforce Extended Producer Responsibility policies (articles 8.2.1.1.k; 8.3.4.c; 8.7.2; etc.)<sup>23</sup>, including

<sup>20</sup> Central Environmental Authority, [Acts & Regulations](#) (2024).

<sup>21</sup> Central Environmental Authority, [Technical Guidelines on Solid Waste Management in Sri Lanka](#) (2007).

<sup>22</sup> Ministry of Environment, [National Policy on Waste Management](#) (2020).

<sup>23</sup> We should mention that, although Polluter-Pays principle and EPR imply to consider waste under the responsibility of its producer, CEJ expert mentioned during interview that, in Sri Lanka, waste legally remains the property of the municipality in



to “generate revenue” and “improve the system efficiencies in the entire waste management cycle”, although there is no clear definition of how to proceed. It is stated that “measures to reduce the generation of packaging shall be encouraged by limiting its usage only for mandatory requirements” (article 8.2.1.2.a) and that “packaging shall be designed, produced and commercialized in such a way to permit its reuse, recovery and recycling” (article 8.2.1.2.b). Emphasis is put on establishing systems that promote return and collection of used packaging (article 8.2.1.2.c), which is most consistent with the Zero Waste approach. Plastic packaging is explicitly criticized in article 8.2.1.2.f, which recommends to favor more environmentally-friendly packaging.

Therefore, in theory, current national legislation has the potential to support reduction of waste generation and implementation of Zero Waste strategies. However, it seems that the spirit of this general policy is not much reflected in current practices and implementation policies. According to some academics, current regulation on packaging and labelling remains insufficient to implement an efficient Zero Waste approach, and more specifically to enable effective at-source waste sorting at a large scale.<sup>24</sup> The 2017 ban on polythene bags under 20 microns is reported to have largely resulted in a swap for thicker plastic bags above the 20-micron threshold, which are still thrown into the environment, persist even longer, and cause even greater problems.<sup>25</sup> This example highlights that theoretically-relevant policies such as plastic bans can only be effective if integrated into a comprehensive Zero Waste regulation that is implemented as a whole, with a holistic approach, to avoid loopholes and counterproductive effects. This difficulty to properly implement and enforce plastic bans is also observed for other items theoretically prohibited by above-mentioned regulations and orders.<sup>26</sup>

In the 2020 National Policy on Waste Management, there is no clear mention of waste-to-energy (WTE), but guiding principle 7.3 states that “steps taken to address waste management issues shall be environmentally sound, nationally appropriate, socially acceptable, and economically viable” – four criteria that WTE unarguably fails to meet.<sup>27</sup> Likewise, policy statement 8.1.6 tends to beware of WTE and prefer Zero Waste as it stipulates that “infrastructure facilities that needs a minimum continuous supply of waste for its operation shall be carefully designed considering the likely minimum generation available without being an obstacle to waste prevention strategies”. Article 8.1.7 also implicitly requires to respect the Zero Waste hierarchy<sup>28</sup> when it commands that “strategies and action plans shall be developed [...] to minimize the waste to be finally disposed of by using an appropriate waste management hierarchy throughout the life cycle”. Overall, the policy does not seem to recommend to massively invest in high-tech waste management infrastructure; on the contrary, article 8.3.3.d recommends to develop “appropriate, low cost, affordable waste treatment facilities”. All in all, in principle, the National Policy on Waste Management thus appears rather unfavorable to WTE (although, as explained in the ‘Waste management systems’ section below, it did not prevent from a 10 MW waste-to-energy plant to be built in Colombo metropolitan area).

At the local level, Local Authorities (LAs) are legally in charge of implementing waste management (responsibilities are summarized in section A.b of Annex I of the National Policy on Waste Management). Among other statements, the policy requires that LAs should “promote prevention of generation and reduction at the source followed by source separation and further segregation” (article 8.2.1.1.c) and should develop waste collection time tables “with community involvement” (article 8.2.1.1.b). “Landfilling should be limited to non-recyclable, non-compostable and inert materials”

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which it is generated, according to a very old law (which was not clearly specified). Such a law would indeed be an obstacle for implementing producer’s accountability, which is why CEJ has been advocating for amending this law.

<sup>24</sup> Balachandra and Abeyssekara, [Legal Framework of Plastic Packaging and Labelling in Sri Lanka](#) (2024).

<sup>25</sup> Conlon, [Waste Management in the Global South: an Inquiry on the Patterns of Plastic and Waste Material Flows in Colombo, Sri Lanka](#) (2020).

<sup>26</sup> Center for Environmental Justice and IPEN, [Plastic Waste Management. Country Situation Report – Sri Lanka](#) (2021).

<sup>27</sup> Ecosoum, [Should we introduce waste-to-energy in Mongolia?](#) (2023).

<sup>28</sup> Zero Waste International Alliance, [Zero Waste Hierarchy of Highest and Best Use 8.0](#) (2022).

(article 8.2.1.1.f) and use of compost produced from municipal waste should be promoted (article 8.2.1.1.d). LAs are requested to “*provide places convenient for storage and treatment facilities, maintain their vehicle fleet*” and ensure that no waste is disposed in a way that may cause environmental damage (article 8.2.1.1.h). LAs are also expected to “*introduce incentive schemes in order to maximize citizen’s participation and minimize waste generation*”.

In order to facilitate implementation of the National Policy, Provincial Councils are requested to develop strategies and action plans and to “*develop master plans in collaboration with the local authorities*” (article 8.2.1.1.r). They should assist LAs by providing suitable locations for disposal (article 8.2.1.1.i), storage and treatment, as well as “*essential resources*” such as “*vehicle, machinery and equipment*” and “*sufficient budgetary provisions*” (section A.b of Annex I). LAs are supposed to develop time bound action plans with performance indicators and to submit these plans to Provincial Councils and to the Ministry (article 8.2.1.1.q). Provincial and Local Authorities should be “*guided, assisted and facilitated at the National Level to ensure availability of infrastructure and facilities*” (article 8.2.1.1.j).

Articles of section 8.3.1 highlights the need to increase awareness of all citizens, institutions and policy makers regarding life-cycle issues related to products and their usage, with special emphasis on e-waste, food waste and packaging waste. Media should be encouraged and guided to include education and awareness programs.

Finally, we should highlight that CEJ and EFL are Sri Lankan NGOs that specialize in environmental laws, including waste-related regulations and policies. Besides advising government entities and advocating for policy changes, part of their work entails to file cases in court against the government or polluting corporations. This legal fight has largely contributed to shaping the above-mentioned national legal framework. For instance, the 2020 National Policy on Waste Management was developed by national authorities as a result of the case filed by CEJ after the Meethotamulla landslide. Likewise, CEJ won a case in 2020 that forced illegally-imported containers of waste, which were discovered in 2019 by Sri Lankan customs, to be shipped back to the United Kingdom.<sup>29</sup>

## WASTE GENERATION AND COMPOSITION

Around 7,500 million tons of waste are generated daily in Sri Lanka (the Western Province, where capital city Colombo is located, accounting for nearly 60%), which means that an average person generates 0.4 kg (in Pradeshiya Sabhas) to 0.8 kg (in Colombo Municipality) of waste each day, according to the CEA.<sup>30</sup> As of 2014, waste generation in the Central Province was reported to be 775 t/day for a population of 2.74 million people, which corresponds to 0.29 kg/day.<sup>31</sup>

Although non-degradable packaging materials such as plastic, metals and glass are continuously increasing, over 60-65% of municipal solid waste remains organic matter – the majority of it being biodegradable in short term while a minority fraction would require more time to be degraded (king coconut shells, banana stalks, logs, tree cuttings, saw dust, wood chips and paddy husks).

The most common plastic waste products are reported to be straws, yogurt cups, mega bottles, lunch sheets, milk packets, meal boxes, polyethylene bags, sachet packets and wrappers.<sup>32</sup> Brand audits conducted in Sri Lanka by CEJ revealed that multinational corporations such as Coca-Cola, Unilever and Nestle contribute the most plastic pollution in Sri Lanka (like in most countries<sup>33</sup>).

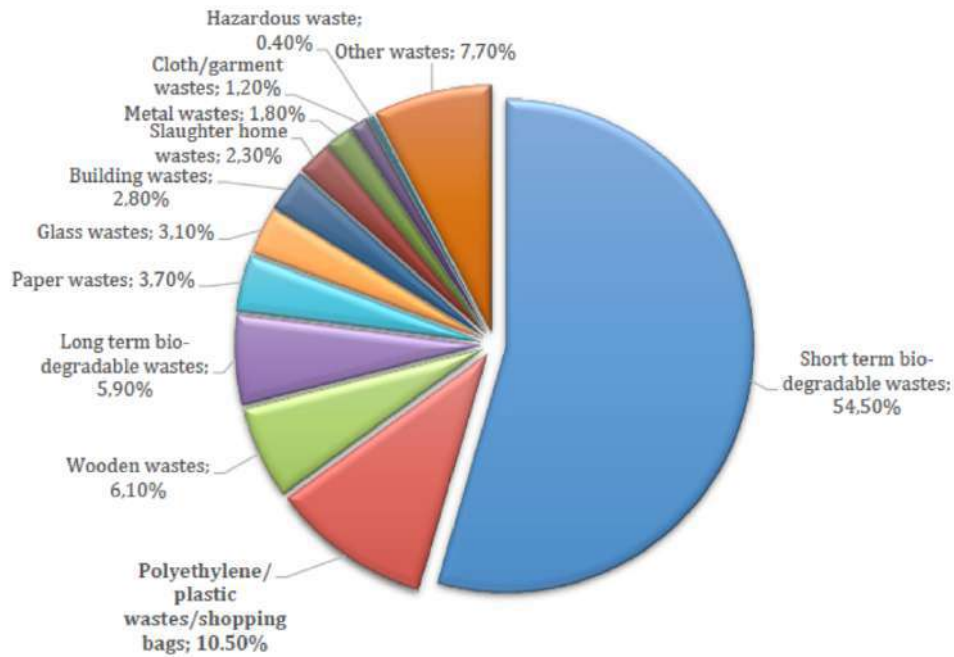
<sup>29</sup> Center for Environmental Justice and IPEN, [Plastic Waste Management. Country Situation Report – Sri Lanka](#) (2021).

<sup>30</sup> Central Environmental Agency, [National Solid Waste Management Program In Sri Lanka](#) (2018).

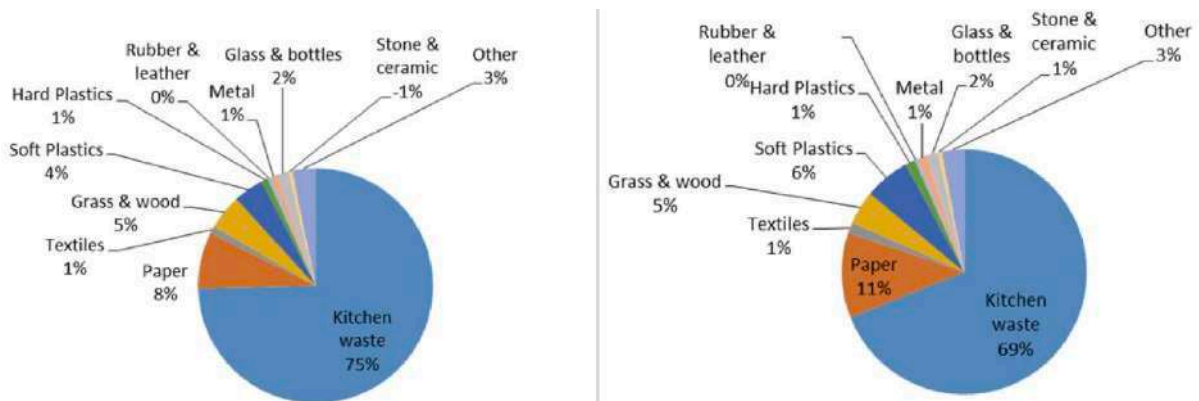
<sup>31</sup> Basnayake and Visvanathan, [Solid Waste Management in Sri Lanka](#) (2014).

<sup>32</sup> Center for Environmental Justice and IPEN, [Plastic Waste Management. Country Situation Report – Sri Lanka](#) (2021).

<sup>33</sup> Break Free From Plastic, [Branded 6. Holding the World’s Worst Plastic Polluters Accountable Annually since 2018](#) (2023).



**Figure 2: Solid waste management composition in Sri Lanka**  
(Source: Center for Environmental Justice<sup>34</sup> with data from JICA)



**Figure 3: Solid waste management composition in Nuwara Eliya Municipal Council measured in 2015 (left) and projected for 2024 (right)**  
(Source: JICA<sup>35</sup>)

### AT-SOURCE SORTING AND WASTE-RELATED PRACTICES WITHIN HOUSEHOLDS

Several studies conducted in Sri Lanka found that household behavior with regard to waste sorting and disposal is influenced by many factors, including education, gender, age, income, social and personal norms, convenience and space. For example, urban and wealthier households headed by older and more literate individuals are more likely to use municipal waste collection arrangements, while burning and dumping waste within premises are preferred by the households representing socio-economic sub-groups.<sup>36</sup>

<sup>34</sup> Center for Environmental Justice and IPEN, *Plastic Waste Management. Country Situation Report – Sri Lanka* (2021).

<sup>35</sup> JICA and Kokusai Kogyo Co., Ltd, *Data Collection Survey on Solid Waste Management in Democratic Socialist Republic of Sri Lanka* (2016).

<sup>36</sup> Kumara and Pallegedara, *Household waste disposal mechanisms in Sri Lanka: Nation-wide survey evidence for their trends and determinants* (2020)

Despite the fact that collection bins have an official national-level color-coding (green for organics; blue for paper; red for glass bottles; brown for metals and coconut shells; orange for plastic), source-separation within households appears to remain relatively low (except in few places), especially in rural areas. Despite municipality initiatives and increasing interest for the waste issue, it seems that most people remain reluctant to make efforts for reducing and sorting their waste. Studies report that many “citizens expect the local authority to keep the city clean despite lack of proactive involvement on their part”.<sup>37</sup> Their argument appears to be ‘we pay tax, the government has to clear waste’, which is why “an even very small effort that can be put easily to support SWM program is ignored intentionally”.<sup>38</sup>

In 2020, CEJ conducted a survey among 200 households to clarify their waste-related practices (geography and sociology of respondents is unclear, though).<sup>39</sup> Responses showed that:

- 40% carry their own bag for shopping;
- 75% use 1-10 plastic bags weekly;
- 83% separate plastic waste from other waste;
- 55% hand over their plastic waste to the municipality tractor/lorry;
- 29% burn the plastic waste openly;
- 90% have no idea where their trash is ending.

## WASTE MANAGEMENT SYSTEMS

The most popular systems for waste collection in Sri Lanka are reported to be door-to-door and curbside collection, and equipment commonly used for waste collection include hand carts, two- or four-wheel tractors, tippers (11 m<sup>3</sup>) and compactor trucks (8-12 m<sup>3</sup>).<sup>40</sup> However, most LAs do not have sufficient vehicles and many vehicles are old and not functioning.<sup>41</sup> According to 2020 nation-wide survey, only 10% of rural households get their waste collected by LAs. Thus, at national level, over 50% of households declare burning their waste (40% in Central Province), 34% dumping within their own premises (37% in Central Province), 4% composting (5% in Central Province), and 1% dumping outside of their premises (7% in Central Province).<sup>42</sup>

When it comes to collected waste, sources converge to mention landfilling as the primary method for solid waste disposal in Sri Lanka. There are approximately 330 landfills and open dumping sites, all of which are located in environmentally sensitive areas (wetlands, most often, as they are the only lands available) and/or near residential, commercial or institutional establishments. A 2015 study estimates that 85% of waste collected by LAs is dumped in open dumpsites without any treatment.<sup>43</sup> Another study states that although LAs are supposed to prepare a proper waste management plan, most of them don’t have one and simply dump garbage into a selected dumping site.<sup>44</sup> Overall, the fact that littering and wild-dumping is legally prohibited in the country does not seem to stop many people from disposing waste improperly.

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<sup>37</sup> Basnayake and Visvanathan, [Solid Waste Management in Sri Lanka](#) (2014).

<sup>38</sup> Fernando, [Solid waste management of local governments in the Western Province of Sri Lanka: An implementation analysis](#) (2019).

<sup>39</sup> Center for Environmental Justice and IPEN, [Plastic Waste Management. Country Situation Report – Sri Lanka](#) (2021).

<sup>40</sup> Basnayake and Visvanathan, [Solid Waste Management in Sri Lanka](#) (2014).

<sup>41</sup> Fernando, [Solid waste management of local governments in the Western Province of Sri Lanka: An implementation analysis](#) (2019).

<sup>42</sup> Kumara and Pallegedara, [Household waste disposal mechanisms in Sri Lanka: Nation-wide survey evidence for their trends and determinants](#) (2020)

<sup>43</sup> Danthurebandara and al., [Environmental and economic assessment of ‘open waste dump’ mining in Sri Lanka](#) (2015).

<sup>44</sup> Fernando, [Solid waste management of local governments in the Western Province of Sri Lanka: An implementation analysis](#) (2019).

Some LAs use a daily topsoil cover to avoid public opposition and nuisance, but in most cases dumped waste simply remains exposed to the elements. The high moisture content in the non-segregated MSW leads to excessive leachate generation from these dumpsites, causing numerous problems to the surrounding environment. Hazardous industrial and healthcare waste that theoretically require safe technologies and specific disposal methods tend to be disposed of with other municipal waste in open dumpsites. Medical waste is usually incinerated first to eliminate pathogens (as recommended by law when better solutions are not available), but practices depend on healthcare centers and how they are equipped (proper infrastructure is drastically lacking).

As of 2024, one WTE incinerator (10 MW) is operational in Sri Lanka, at Kerawalapitiya. It is reported to burn 630 tons of waste daily from Colombo and Gampaha. Despite opposition from CEJ (and possibly other stakeholders), other WTE facilities have been planned, although election of new government in 2024 may lead to switch strategies and stop investing in WTE.

Some recyclables are recovered from MSW at various points of the waste stream by itinerant waste collectors (from households), street waste pickers (from community bins, roads, etc.) and rag pickers (from dumpsites). In several reported cases, various recyclables (PET bottles, papers and cartons, glass bottles, etc.) are sold for recycling purposes (either for recycling within Sri Lanka, or for exporting).<sup>45</sup> Outlets do exist for most types of recyclable waste, and a list of recyclable waste collectors throughout the country (last updated in September 2024) is available online.<sup>46</sup> All in all, though, reusing and recycling appear to remain largely insufficient and not systematic in most parts of the country.

Despite existing regulations and policies, producers' accountability and EPR are not really implemented in Sri Lanka. In all countries, such policies are difficult to properly implement anyway; but, according to EFL, the difficult economic situation in Sri Lanka may be an additional challenge as most people would not accept that prices rise if EPR and eco-taxes were enforced. There are only few companies that took initiatives to develop refill systems. Presumably, people want convenience and are not much interested in reuse/refill.

## COMPOSTING

In the mid-2000s, NGOs had raised concerns about poor waste management in the country and a court ended up ruling that the national government needed to provide these resources to the local authorities to enable them to offer better waste management services. This legal decision led to the launch in 2008 of a nation-wide program known as 'Pilisaru Project'<sup>47</sup>, which focused primarily on organic waste. By 2019, thanks to State subsidies, there were more than 160 composting facilities operated by LAs across the country, most of which have a small capacity (1 to 10 tons per day).<sup>48</sup> Windrow composting is reported to be the most often used in Sri Lanka.

Overall and besides a few successful exceptions, most sources converge to say that the Pilisaru Project has not been very successful and that composting in Sri Lanka remains largely insufficient in most places. Of the composting facilities that were started during the Pilisaru project, only about half were still operational in 2022.<sup>49</sup> As of today, only 5 to 25% (depending on sources) of the collected MSW is processed through household composters and central composting systems.

<sup>45</sup> Eheliyagoda and Prematilake, [Assessment of a Planned Municipal Solid Waste Management System in Sri Lanka](#) (2016).

<sup>46</sup> Central Environmental Authority, [Waste Collectors and Recyclers in Sri Lanka](#) (2024).

<sup>47</sup> For an introductory summary of the Pilisaru Project, see p.30-37 and p.46-48 of M'Nkubitu, [Rethinking organic municipal solid waste management in Kenyan urban areas](#) (2022).

<sup>48</sup> Madusanka and al, [Questionnaire and onsite survey on municipal solid waste composting in Sri Lanka](#) (2016).

<sup>49</sup> M'Nkubitu, [Rethinking organic municipal solid waste management in Kenyan urban areas](#) (2022).



One of the main challenges remain the lack of at-source segregation. In fact, most composting facilities receive mixed MSW, which is then separated manually by the workers of the composting facilities who try to keep only the organic fraction. But it is clear that segregation is largely insufficient and sorted feedstocks are considerably contaminated with inorganic matter and pollutants. Such practices lead to virtual impossibility to respect official standards, which specify that final compost should be “free from visible non-biodegradable materials except sand”.<sup>50</sup> Even if fine sieving enables removing visible plastics, there is no doubt the final compost remains contaminated with micro- and nano-plastics (which is all the more problematic since official standards don’t include micro- and nano-plastics in the list of potentially toxic elements that must be analyzed and quantified).



**Figure 4: Segregating waste manually at composting site (left) and obviously-contaminated maturing compost pile (right)**

(Source: Madusanka and al.)

Some of the reported failure factors of the composting systems in Sri Lanka, which are largely interlinked, include:

- lack of source-segregation and improper composting techniques<sup>51</sup>, which lead to poor quality (and contamination of) compost;<sup>52</sup>
- high operational costs, especially due to the workforce needed for manually segregating mixed waste;<sup>53</sup>
- lack of equipment and financial resources;<sup>54</sup>
- lack of skilled workers, due to two main factors: 1) high turnover because jobs in waste management facilities are not prestigious and well-rewarded; 2) lack of regular trainings for new staff;
- lack of market for produced compost, including due to lack of information to the people and skepticism about quality.<sup>55</sup>

Despite these challenges, the relative failure of composting in Sri Lanka does not appear as a fatality. Considering that over half of total MSW is organic, composting remains the most suitable method and the identified barriers could be overcome with adequate support and guidance. Even the economic viability of composting in Sri Lanka was confirmed by a study in 2017, provided support for initial

<sup>50</sup> Sri Lanka Standards Institution, [Sri Lanka Standard 1635: 2019 – Specification For Compost Made From Raw Materials Of Agricultural Origin](#) (20129).

<sup>51</sup> Eheliyagoda and Prematilake, [Assessment of a Planned Municipal Solid Waste Management System in Sri Lanka](#) (2016); Madusanka and al, [Questionnaire and onsite survey on municipal solid waste composting in Sri Lanka](#) (2016).

<sup>52</sup> Madusanka and al, [Questionnaire and onsite survey on municipal solid waste composting in Sri Lanka](#) (2016).

<sup>53</sup> Basnayake and Visvanathan, [Solid Waste Management in Sri Lanka](#) (2014).

<sup>54</sup> Madusanka and al, [Questionnaire and onsite survey on municipal solid waste composting in Sri Lanka](#) (2016).

<sup>55</sup> Fernando, [Solid waste management of local governments in the Western Province of Sri Lanka: An implementation analysis](#) (2019).

investment (although the study questioned the relevance of the ‘Pilisaru Model’ promoted by the Government, which required a 23 million Rs investment, and favored the ‘Weligama Model’ experimented at the Weligama Urban Council, which required only 11 million Rs).<sup>56</sup> The most common selling price of compost was 10-15 Rs/kg for many years (although the selling price of successful Weligama Model is reported to be 8,500 Rs/ton, which means 8,5 Rs/kg), but the 2022 economic crisis may have had impacts on these prices.

Household-level composting, which is often reported to have proved more successful than centralized composting projects in Sri Lanka, should certainly be promoted further – especially since it is higher in the Zero Waste hierarchy. In fact, some interviews reveal that backyard composting is a rather common practice, at least in some places. Concrete home composters that are used by many people are considered efficient and durable, as opposed to plastic composters which are considered fragile and unsuitable (including due to over-heating when sun is out).

In April 2021, the Sri Lankan government introduced a ban on chemical fertilizer imports, with the goal of promoting organic farming. But the ban was very abrupt, without any transitional period, which led to food shortages since the organic fertilizer produced in the country was not able to meet the demand. To reduce the pressure, the government redirected fertilizer subsidy farms to help paddy farmers produce organic fertilizer. The government also provided loans to fertilizer producers who would purchase compost from the public and enrich it. The composting private companies sold a fixed quantity to the government and the rest was sold directly to buyers. After continued protests from farmers around the country, the ban was partially lifted in November 2021.<sup>57</sup>

## WASTE MANAGEMENT FINANCES

Financial provisions for solid waste management in Sri Lanka fall under the health section of the annual budget of the LAs. The main source of revenue of LAs is through property rates and taxes, supplemented by Central Government grants (through Provincial Councils). Households do not pay a direct fee for waste collection, but LAs indirectly charge waste collection fee through annual property assessment tax.<sup>58</sup>

Local Authorities spend a very significant part of their budgets on MSW management, from 12%<sup>59</sup> to up to 50%<sup>60</sup> depending on sources. There are no specifications in budget allotment, but it is estimated that LAs spend more than 70% of the allotted budget in waste collection and transportation, staff salaries and vehicle maintenance and fuel. Overall, it seems clear that budgets are largely insufficient and essentially focused on waste collection rather than prevention, reuse and recycling. Apparently, the problem of insufficient funding from national government is aggravated if respective local government bodies belong to the opposition party.<sup>61</sup>

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<sup>56</sup> Gunaruwan and Gunasekara, [Management of Municipal Solid Waste in Sri Lanka : A Comparative Appraisal of the Economics of Composting](#) (2017).

<sup>57</sup> M’Nkubitu, [Rethinking organic municipal solid waste management in Kenyan urban areas](#) (2022).

<sup>58</sup> Kumara and Pallegedara, [Household waste disposal mechanisms in Sri Lanka: Nation-wide survey evidence for their trends and determinants](#) (2020)

<sup>59</sup> Basnayake and Visvanathan, [Solid Waste Management in Sri Lanka](#) (2014).

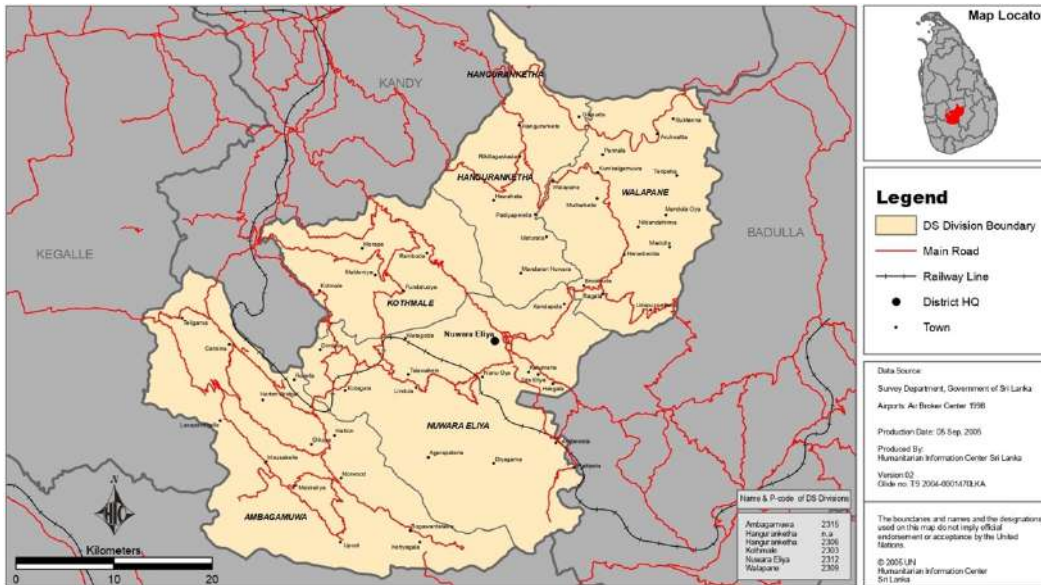
<sup>60</sup> Eheliyagoda and Prematilake, [Assessment of a Planned Municipal Solid Waste Management System in Sri Lanka](#) (2016).

<sup>61</sup> Fernando, [Solid waste management of local governments in the Western Province of Sri Lanka: An implementation analysis](#) (2019).

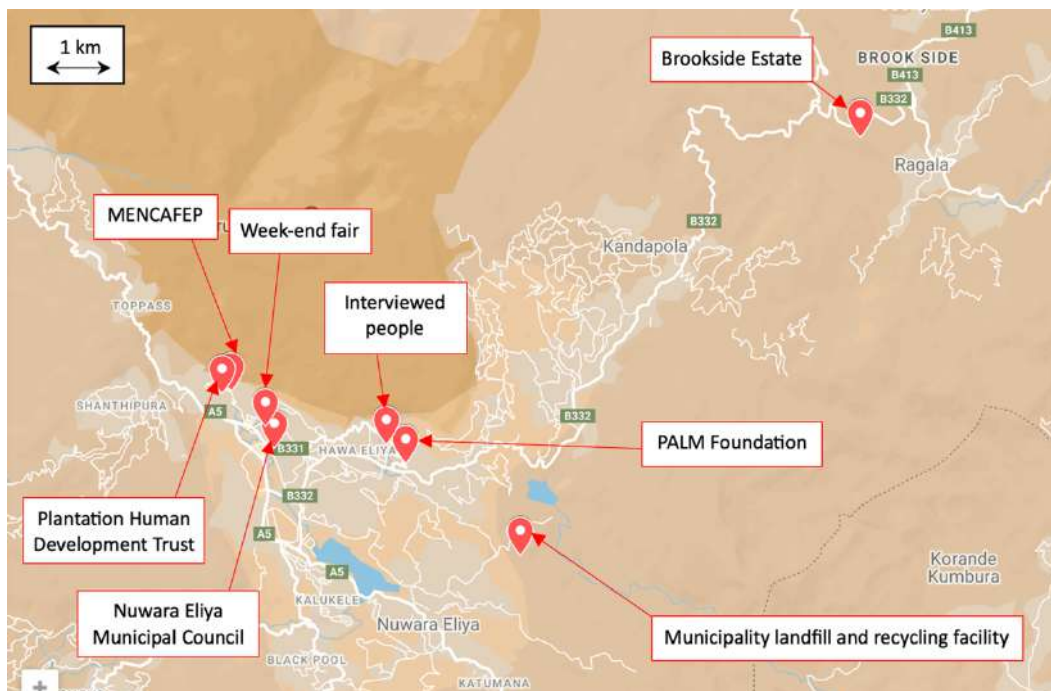
## 2. WASTE MANAGEMENT SYSTEM IN NUWARA ELIYA

### CONTEXTUAL INFORMATION ABOUT THE TARGET AREA

The target area is Nuwara Eliya District in the Central Province of Sri Lanka. The district is divided in 10 councils, including Nuwara Eliya Municipality Council (city) and 9 rural Councils (some of them are considered semi-urban, although they seem to primarily comprise farming fields). Total population of the district is approximately 780,000 persons (almost 200,000 households), including almost 40,000 people (10,000 households) living in the city.



**Figure 5: Map of Nuwara Eliya district**  
(Source: UN OCHA)



**Figure 6: Location map of the main stakeholders visited and interviewed in the framework of this study**  
(Source: Made by author on [Google MyMaps](https://www.google.com/maps))

Within the municipality, most people have typical city jobs and/or tourism-related activities. Outside the municipality, the majority of the people carry out agricultural activities, either as tea planters or as traditional farmers in the villages. A livable (although not great) income is considered to be a minimum of 60,000 Rs per month per household, which translates into 3,000 Rs per working day. Tea planters currently earn 1,000 Rs per day (they are demanding 2,000 Rs to plantation management, but discussions are still ongoing). Waste workers of the municipality are paid app. 1,500 Rs per day. Consumption patterns in both urban and rural areas could not be clearly described during the field mission; therefore, it will be useful to clarify this topic latter in order to identify which consumption habits tend to produce most waste and which could most easily and/or effectively be changed to reduce waste generation. Likewise, it would be useful to clarify if there is a division of waste-related tasks within households, in order to identify whom awareness-raising activities should target in priority and/or if awareness-raising materials should be gendered or not.

According the PALM Foundation, most people within local communities are usually prepared to get involved and engaged in behavioral change, if properly guided. A strong community spirit remains in rural areas, which enables conducting efficient community-based activities. In the municipality, city dwellers may tend to be more individualistic, although such generalization is dubious as activist-minded people can unarguably be found in the city.

At local level, waste-related regulation/legislation is assumed to be only operational, in order to implement national-level waste management policies. It would be useful to investigate this assumption further, though, to clarify whether or not specific initiatives have been taken by municipality authorities. In fact, according to the 2020 National Policy on Waste Management, Provincial Councils are requested to develop waste management master plans with local authorities, which means such a plan applicable to Nuwara Eliya probably exists. Clarifying existence and terms of such local plans and regulations will be necessary to make sure project activities always remain consistent with the local legal/policy framework. Likewise, clarifying whether or not other organizations are planning or currently implementing waste-related projects/programs in Nuwara Eliya would be useful to avoid redundant or conflicting actions.

Municipality Council, with which the PALM Foundation has a very good relationship, is the entity in charge of waste management in the city. Waste management falls under the responsibility of the Public Health Department, which is led by a waste engineer, overviewed by 3 public health inspectors<sup>62</sup>, managed by 22 supervisors, and implemented by 109 laborers. These laborers are in charge of other tasks under Health Department's responsibility, but it is estimated that approximately 80 of them work full-time for waste-related activities. 75% of these 80 workers are engaged in waste collection, 25% in the other tasks. 20 of them are also engaged in waste-related activities outside working hours (such as sweeping, waste collection, etc. – which is official duty, but paid overtime). Municipality officers highlight the difficulty to hire and keep laborers because of low salary, insufficient social benefits, and virtually no social recognition.

There seem to be also a few private intermediaries that purchase recyclable items brought to them by citizens. One of them is selected each year to come once in a while to the recycling facility to purchase the sorted recyclables. Like in other parts of Sri Lanka, there are probably also some informal waste pickers that collect recyclables for a living, at least in the city (but not in the landfill, according to municipality officers), but their number is unknown and no interviewee ever mentioned them. It will be necessary to investigate further on that regard to clarify their existence and situation and, if possible/relevant, integrate them in the project.

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<sup>62</sup> These three public health inspectors were our main interlocutors during the field visit. In the following parts of this report, the expression 'municipality officers' mainly refer to these public health inspectors. In contrast, the expression 'waste management staff' refers rather to laborers who implement the waste management tasks (collection truck drivers and loaders, recyclers in the facility, landfill operators, etc.).

Finally, according to the PALM Foundation, it seems that waste is a topic of interest and concern for most people, even those who don't necessarily sort their waste and tend to have improper waste-related practices. It is not taboo in general and can easily be discussed within a project, with maybe a few exceptions (female sanitary items, for instance).

## **WASTE PRODUCTION AND AT-SOURCE SORTING/MANAGEMENT**

In the municipality (Nuwara Eliya city), waste generation is estimated to 20 tons per day (25 tons during week-ends), which represents 700 tons per month or 9,000 tons per year. These figures actually correspond to the waste that is collected by municipality services, which means that total waste generation is probably slightly higher. Nonetheless, these estimations appear consistent with national average: if 40,000 people produce 20 tons of waste altogether, daily per capita waste generation can be estimated to 0.5kg per day.

During the month of April, which corresponds to the Sinhalese and Tamil New Year's festival, the city is flooded with people (4,000 rooms are booked in the city alone), which entails a much higher waste generation during this month comparatively to the rest of the year. In general, local people unanimously consider outsiders (Sri Lankans tourists/visitors) as a problem because they are not aware of local waste reduction/sorting practices, which means they allegedly consume and litter everywhere carelessly. We should highlight, however, that whenever an issue comes up anywhere in the world (regarding waste and most other topics), outsiders are often considered the main problem because this way of analyzing a situation tends to (unconsciously) release local people from their own responsibilities. In this case, there is no doubt that visitors are significantly littering and thus an unarguable part of the problem in Nuwara Eliya (which is why we can only recommend to address this particular challenge within the project); however, putting all the blame on outsiders and exaggerating their responsibility would not help solving the intrinsic deficiencies of Nuwara Eliya's waste management system.

In terms of waste composition, 70% of total waste is estimated to be degradable, while the remaining 30% is non-degradable (plastics, glass, metal, etc.). In addition to that, municipality officers highlight that there are frequent demolitions of buildings in the city, leading to an increasing quantity of demolition waste.

Following the dismantlement of the street collection containers (see 'Intermediary collection points and street bins' section below), a new system with two buckets was introduced ten years ago: one bucket for degradable waste and another one for non-degradable. Each family was allegedly provided with these two buckets and municipality conducted community awareness-raising campaigns with households to teach how to use these bins. Thus, as of today, the main at-source segregation practice is between organic and inorganic. However, there is no at-source segregation between recyclable and non-recyclable; all non-degradable materials are mixed in the dedicated 'non-degradable' bucket. Apparently, a 4-bucket system was attempted in the past but it did not work out as people were mixing too much, so the municipality went back to two buckets only.

This absence of at-source segregation of recyclables and non-recyclables severely hampers the efficiency of the entire waste management system, as it entails that waste management staff would have to segregate mixed waste afterwards in order to process each type of waste through its dedicated proper channel. Enabling a 3-category at-source sorting system (degradable + reusable/recyclable + ultimate non-recoverable waste) can thus be considered a major gap to fill and a top priority for any project aiming at improving the situation.





**Figure 7: Degradable waste bag displayed by interviewed man (left) and Sorting bins and bags in kitchen of household with good practices (right)**  
(Source: Photos taken during field visit)

In addition, interview of people shows that many of them don't even sort their waste properly between degradable and non-degradable. Out of the 6-7 people we interviewed, only one family seemed to sort their waste properly (others didn't sort at all, or obviously improperly with many plastics being mixed in the organic bin). The person who sorted best was more educated than average (teacher) and very much aware of the waste issue. When asked why other people in the building don't segregate waste properly, she stated that *"it has to come from the heart"*, emphasizing that awareness-raising is still most necessary within households. Apparently, there was one information session when the 2-bucket system was introduced, but nothing since then, which is considered largely insufficient to make everyone sort properly. As a consequence, especially if public collectors refuse to take their waste because it is unacceptably mixed (see 'Waste collection and transportation' section below), people tend to simply dump their waste nearby, by the road or in a small water stream along the street (see "Waste littering and open burning" section below).

No data was obtained regarding waste generation and composition in rural areas of Nuwara Eliya District. Further investigation would thus be useful to fill this gap. In the meantime, data from the municipality can be extrapolated and used for rural areas, although rural households are often found to produce less waste than urban households, with a higher organic fraction. Similarly, there was no time during the field mission to interview rural households, in order to clarify their exact practices and the main difficulties they face. Conducting such interviews as soon as possible would thus be very helpful to better understand rural people's perspective.

## **INTERMEDIARY COLLECTION POINTS AND STREET BINS**

Initially, the municipality had large concrete rings that acted as collection points where people were supposed to dispose their waste. But it was improperly used, so the municipality replaced these rings by more advanced cabins, as well as with colored plastic bins. However, even these bins and containers were misused, which is why they were eventually all removed from the streets. As of today, there is thus no more intermediary collection points.

More surprisingly, the municipality also decided that there would not even be simple street bins, as usually found in most cities (including in Sri Lanka). This absence of street bins raises the question of what to do with waste generated in public spaces, especially for outsiders. On the other hand, such a radical decision can be understandable when considering the fact that street bins are often misused anyway (improper segregation, dumping of waste all around when bin is full, etc.), which makes emptying and collecting waste from such bins very time-consuming for public services. Therefore,

removing all street bins can be a relevant strategic decision for municipalities that already lack resources to collect waste from all households. To avoid repeated littering, though, absence of street bins requires alternative solutions and ongoing awareness-raising/information mechanisms, otherwise littering could be perceived as the only solution in the streets, which would unarguably be counterproductive in terms of pollution prevention.

## **WASTE COLLECTION AND TRANSPORTATION**

The municipality waste collection fleet includes 4 compactor trucks, 3 tractors with trailer, 3 septic tank suction trucks, and 22 handcarts. Waste is collected by municipality services from most households in the city, unless their homes are not accessible to collection trucks. Such non-accessible homes are estimated to 1,200-1,300 households (over 10% of municipality population). Waste collection services are also not provided to people living outside of the city premises. It would be useful to clarify the exact proportion of people/households in the district that are covered and not covered by public waste collection services (either from municipality or from other LAs).

In the municipality, there is a time schedule for a compactor truck to collect each bucket door-to-door from each (accessible) household. The collection for degradable and non-degradable waste is conducted on different days. According to municipality officers, degradable waste is collected virtually every week-day from each family, while non-degradable waste is collected once a week, during week-ends. People are expected to put plastic bags in their two buckets, and give these bags full of waste to the collection trucks, in the streets, at the scheduled time. The collection trucks' staff don't accept mixed waste; therefore, when people don't sort properly, collection staff takes only the organic fraction of the bucket/bag and gives back the non-degradable part to the people. If waste is mixed at lot, collectors simply refuse the waste bag and command people to re-segregate it (to be collected next time). In such cases, it is frequent that people go dump and/or burn their mixed waste nearby, on roadsides or in the closest stream (see "Waste littering and open burning" section below).

Interview of a few people living in the city shows that the collection system does not always function as well as described by municipality officers. More specifically, collection frequency appears lower than claimed by authorities. In general, non-degradable waste is properly collected once a week during the week-end, although it happens that they don't come (yet, non-degradable waste doesn't seem to be considered a problem by interviewed people). Degradable waste, on the other hand, is described as the main issue as it is actually collected only once or twice per week (at least in some locations). This frequency is considered largely insufficient to follow the organic waste generation pace.

For example, the main family we interviewed (which comprises 8 people) generates one bucket of organic waste in less than two days, which means 3-4 buckets per week. As collection trucks come only once or twice a week, households have to keep organic waste in bags for several days, which is problematic because they have a small house and lack space, and because it creates bad smell in the house (waste bags can't be kept outside because of cats and dogs). This description of insufficient collection frequency and problems associated with having to keep organic waste bags indoor seems consistent with what other people complain about.

Another aspect of the problem appears to be that some waste collectors ask bribery (100 Rs) to pick up waste at the scheduled frequency. Allegedly, if people refuse to pay, collection services don't collect waste, or at least not frequently enough. On the other hand, it is likely that this kind of bribery also comes from the people in order to bend the rules. For instance, one may want to bribe waste collectors for them to accept taking their bags of non-segregated waste. In other cases, it is possible that this exchanged money is rather intended as a tip for an extra service, such as requesting waste collectors to pick waste up from within private premises instead of having to hand over waste bags in person in the street. Situations are probably varying depending on people and locations, and the fact that waste

collectors may ask or at least accept such money is easily understandable considering how low their wage are. But in any case, such practices can only contribute to disturbing the waste collection system and decreasing its efficiency.

## WASTE PROCESSING AND RECYCLING

The municipality owns and operates a waste management facility (sometimes also referred to as ‘recycling facility’) located next to the landfill. This facility includes a plastic press, a shredder (used for both plastic and glass waste), and a rudimentary plastic downcycling machine.



**Figure 8: Plastic press and downcycling machine (left) and shredder (right)**  
(Source: Photos taken during field visit)

According to municipality officers, when collection trucks arrive in the premises with non-degradable waste, they dispose it next to the recycling facility, where the staff segregate valuable items and recover them for recycling. Allegedly, 80% of all collected non-degradable waste are recovered and diverted from landfill, and only 20% is dumped. Despite clear motivation and honest attempts to recover as much as possible, field observations lead to conclude that these figures appear highly overestimated. In fact, figures provided by municipality officers and recycling facility staff are not consistent: recycling facility staff, who provided numbers that seem more realistic, stated that they recover approximately 600 kg of waste per day, which corresponds to a diversion rate of only 10% (in other words, 90% is definitively dumped in the landfill, not 20% as stated by municipality officers).<sup>63</sup>

It is fair to assume that most collection trucks actually dump their waste directly into the landfill, where staff go to recover whatever they can (which can be only a small fraction once everything is mixed in the landfill). Some at-source sorted recyclables are also sometimes delivered to the facility (for instance, PET bottles from hotels that properly segregate their waste), which largely facilitates proper processing. In fact, staff claimed that 80% of what they process for recycling is actually at-source sorted waste, while only 20% corresponds to what they manage to recover themselves from mixed waste.

According to facility staff, out of the above-mentioned 600 kg recovered daily, 200 kg of PET bottles and other recyclables that can be sold to recycling industries (cardboards, some other plastics, etc.) are sorted, pressed and sold to middle-men who ship them to Colombo or even export them abroad. The remaining 400 kg of plastics that can't be sold are shredded and downcycled locally into construction

<sup>63</sup> If 20 tons of waste are collected each day, with a non-degradable fraction of 30%, it means that 6,000 kg of non-degradable waste (either sorted or mixed) arrive at the facility/landfill premises daily. If 600kg are recovered from them, the recovery rate is  $600/6,000 = 10\%$ .



blocs (which are mainly used to construct indoor walls that are then plastered), pavement tiles or flower pots, which are sold to local customers.



**Figure 9: Downcycling mold (left) and downcycled flower pots (right)**  
(Source: Photos taken during field visit)



**Figure 10: Unprocessed sorted plastics (left) and pressed PET bottles (right)**  
(Source: Photos taken during field visit)

One bloc is formed out of 1 to 2 m<sup>3</sup> of plastics. With the current machine, one staff can produce up to 20-25 blocs per day, which translates into a current production of approximately 400 blocks and 300 flower pot monthly.<sup>64</sup> According to municipality officers, this production remains insufficient to meet the current local demand. The selling price (which is approximately 60-80 Rs per bloc and 150-200 Rs per flower pot) goes to the general budget of the municipality. This money is considered pure profit by municipality officers since the items are manufactured by staff whose salary is already included in the budget anyways (although the time these staff spend producing these downcycled blocs is not spent on other tasks, which means there is of course a cost to this production). Interestingly, the production cost (mainly: salary of 1,500 Rs per day) turns out equivalent to the selling price (1,500 Rs for the 20-

<sup>64</sup> Assuming that one block or flower pots weighs approximately 10kg, 700 items would represent a total of 7 tons downcycled monthly. Since monthly waste collection of non-degradable waste is estimated by municipality to 210 tons (30% of total 700 collected tons), monthly downcycled items represent a little over 3% of collected non-degradable waste. If we add the pressed PET bottles to this amount, recovery rate of non-degradable waste may reach as much as 5%, but hardly much more (maybe 10% if items actually weigh 20 kg and not 10 kg). Such calculations are to be handled with caution considering the imprecision of the provided data, but we can observe that the recovery rate remains the same order of magnitude as the one calculated above based on daily recovery figures (10% maximum), far below the 80% initially mentioned by municipality officers.

25 blocs made in a day), which would suggest possible economic viability of this production if conducted autonomously (in any case, municipality officers emphasize that we can't put a price on the environmental benefits of diverting waste from landfill).

In addition to the above-mentioned plastics, other types of recyclables such as carboards, glass and metal are also recovered to a lesser extent. Transparent glass bottles are sold to recyclers, but no one purchases colored bottles. The green ones are sorted and stored anyway, until a solution eventually comes up.

To assess more precisely how things are handled at the facility, it would have been necessary to spend more time on location to observe actual practices, which was unfortunately impossible during the limited timeframe we had. In-depth investigation, for instance by spending a full day with recycling facility staff to observe how they work, would be highly beneficial to be able to suggest improved practices. Additionally, it would be interesting to clarify exactly which types of waste are currently sold, which ones could possibly be sold but are currently not, and which types of waste cannot be sold (in other words, it would be useful to have a precise list of possible outlets for the main types of waste managed in the facility).

## WASTE COMPOSTING

As of today, there is no composting activity at the waste management facility. Climate (cold temperature) is considered the main problem by municipality officers, but since temperatures rarely drop below 5-10 degrees and almost never below 0, it seems unlikely that unfavorable weather would be a relevant reason for not composting at all (although there is no doubt composting is easier in lower parts of the country where temperatures are higher).<sup>65</sup> Field observations at the landfill show that all degradable waste collected in the city is actually dumped in the landfill without any form of processing. Sludges are not composted either and simply dumped.

Municipality officers claim that there is enough land to set up a composter within the landfill/facility premises. But the area that was shown by municipality officer during the field visit actually seems largely insufficient (at least if centralized composting is intended to become the primary method for managing degradable waste from the municipality) as there seemed to be only a few hundred square meters (500 m<sup>2</sup> maximum, probably even much less).

Indeed, centralized composting requires significant surfaces, usually estimated in Global South countries to 1 hectare for 10,000 tons of degradable waste processed per year (including the composting area itself as well as annex areas such as office, resting room, shop, etc.).<sup>66</sup> As Nuwara Eliya produces over 6,000 tons of degradable waste each year (70% of the 9,000 tons of municipal waste), the theoretical land requirement can be estimated as high as 6,000 m<sup>2</sup>, which means over ten times more than the proposed area.<sup>67</sup>

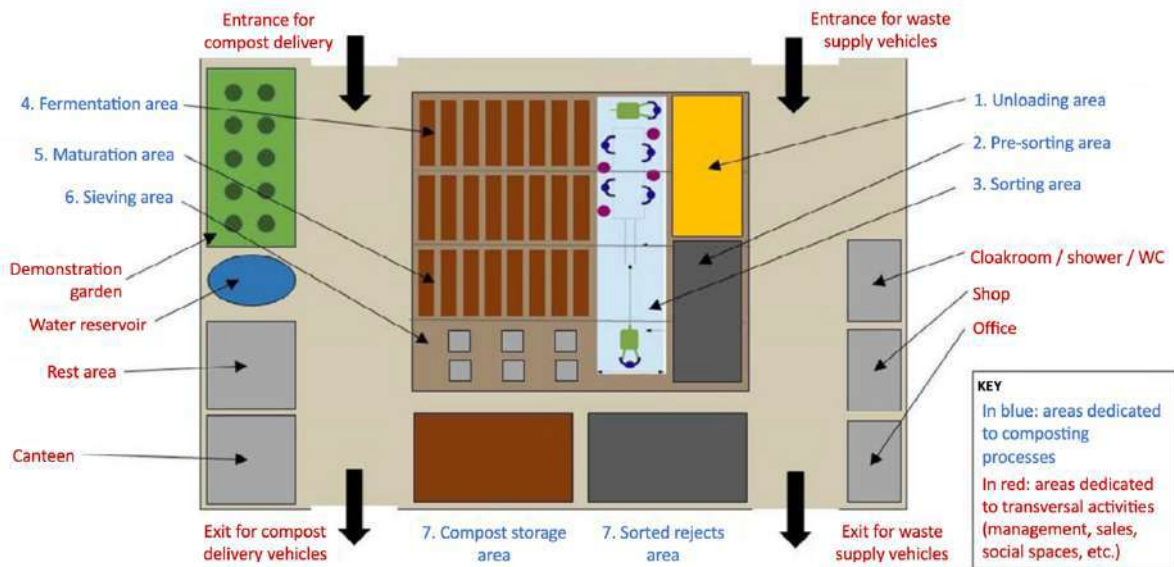
<sup>65</sup> In tropical climatic conditions, the composting process can theoretically be completed in 40 days (Nair, [Back to Earth. Composting for Various Contexts](#), 2022), but most composting facilities in Sri Lanka seem to require 2 to 3 months, followed by 3-4 weeks of maturation (Madusanka and al, [Questionnaire and onsite survey on municipal solid waste composting in Sri Lanka](#) (2016). In colder climates, the entire composting process can take at least 6 months, sometimes even more.

<sup>66</sup> PAGEDS, [Concevoir et gérer une plateforme artisanale de compostage des déchets municipaux dans un pays du Sud](#) (2020).

<sup>67</sup> This ratio of 1ha/10,000tons can greatly vary depending on each context and various factors (including how fast the composting process goes in a specific context). It is thus not impossible to develop composting processes that require less land. However, considering Nuwara Eliya's cool climate comparatively to other areas of the Global South, it is fair to assume that this ratio can be considered as a realistic minimum. In fact, another way of estimating the necessary surface leads to similar orders of magnitude: with average food waste density of 0.6 ton/m<sup>3</sup> (which equals 1,7 m<sup>3</sup>/ton), the degradable waste daily generation can be estimated to 24 m<sup>3</sup> (70% of 20 tons of municipal waste generated per day), which can be processed as a windrow of app. 15 m<sup>2</sup> (8 m long / 2 m wide / 1.5 m high); if the composting duration is 6 month, the necessary surface for daily windrows would add up to 2,700 m<sup>2</sup>, which would mean at least 5,000 m<sup>2</sup> if we consider the necessary space to circulate between windrows, and even more if we add other necessary areas for compost maturation, sieving, etc.



Lack of land is thus likely to be a major constraint to develop centralized composting at significant scale.<sup>68</sup> On the other hand, it is certainly not a good idea to envision centralized composting for the totality of degradable waste produced in the municipality. On the contrary, developing home composting would help decreasing the need for centralized composting lands, as well as reducing collection/transportation costs. Additionally, the landfill itself appears largely oversized (over 4,000 m<sup>2</sup> according to observation of aerial photography) as it is very deep and only a small fraction of it is currently used to dump waste (the rest has been colonized by vegetation). Furthermore, if improved sorting, recycling and composting practices were developed, the requirement for landfill surface could be reduced. All in all, it means that part of the landfill area could probably be turned into a centralized composting facility. Let's emphasize that, if possible, selecting another location closer to the city would be beneficial to reduce transportation costs.



**Figure 11: Example of layout for centralized composting facility**  
(Source: PAGEDS)

Beyond the issue of land, municipality officers admit that they lack knowledge and technology, as well as financial resources, to start a centralized composting operation. The three public health inspectors in charge also appear hesitant to try composting without an expert setting up a proper system, because they would be accountable if centralized composting happened to fail. However, they did clearly express their definite will to develop such centralized composting if a project can support and guide them. According to municipality officers, locally-produced compost could be used by the municipality itself (public gardens and parks, etc.); however, compatibility between amounts that can be produced and amounts that can be used in public gardens should be confirmed.

Until today, 500 home composters have been distributed to city households who are not accessible to the collection trucks. These home composters are reported to be much appreciated and relatively well-functioning. About 700-800 more are requested for the other non-accessible households, but municipality financial resources are currently insufficient to meet this demand. The cost of a home composter made of concrete, which seems to be locally considered as the most suitable one, is 3,000-5,000 Rs. Based on these figures, we can estimate that the total cost for providing all 800 missing composters could be as high as 4,000,000 Rs (app. 13,000 EUR), which appears largely accessible for a

<sup>68</sup> Surely, lack of land is a challenge in most parts of Sri Lanka, like in many countries. But it is also important to remember that land usage is essentially a matter of ownership and political choices, reflecting what is considered a priority by the society. For example, it is interesting to keep in mind that Nuwara Eliya's golf course covers more than 40 ha, which means that if only 1% of it were to be turned into a composting ground, the land issue would be totally solved.

well-funded project. If we extrapolate and envision provision of home-composter to half of the 10,000 households in the municipality (considering that the other half may not have sufficient space to install a home composter), total cost could reach 20-25,000,000 Rs or app. 80,000 EUR, which could still be an affordable amount for a 5-years project focused on developing home-composting. Keeping in mind that home-composting is the most recommended form of composting in the Zero Waste hierarchy and that developing home-composting would drastically reduce waste collection costs, this prospect appears highly commendable and should probably be considered a top priority for a future project. Associated with comprehensive information and ongoing guidance and support, chances to substantially improve the current situation appear fairly high.

## WASTE DISPOSAL AT LANDFILL

In terms of machinery, landfill seems properly equipped with a bulldozer to push and regroup the dumped waste. There is also a small excavator-shovel, but it is currently broken and needs reparation. There used to be a small incinerator (essentially of a fire place with a chimney) at the entrance of the landfill, but it was damaged and abandoned. Traces of open burning where however observed in the area, suggesting that some waste can still be openly burnt (municipality officer casually mentioned that paper/carton is sometimes burnt here, but lots of plastics were also observed on the same spot).



**Figure 12: Waste collection tractor with trailer (left) and landfill bulldozer (right)**  
 (Source: Photos taken during field visit)



**Figure 13: Landfill from the entrance (left) and from the recycling facility (right)**  
 (Source: Photos taken during field visit)



Initially, collection services disposed all collected waste in a wild dump in the forest above the city. A decade ago, JICA provided support to transform this unsanitary dump into a more adequate landfill with leachate collection system. Nevertheless, the landfill continues to constitute an environmental hazard as it is located in a creek upstream from a lake that is used for supplying drinking water to another nearby district. Leakage and water pollution is thus considered an issue, although there is currently no study to confirm this suspected contamination.

When collection trucks arrive at the landfill, they drive on the upper edge until they reach a spot where they can dump their cargo of waste, on the side of the landfill road. Later, the bulldozer comes to push the dumped waste down the slope, making room for further dumping on the side of the road. During our visit, when a truck came to dump what appeared to be mixed waste, municipality officers mentioned that it was not one of their trucks but that of another LA (two nearby Pradeshiya Sabha also to dump their waste in the same landfill). In any case, based on what we could observe, there doesn't seem to be any topsoil covering.

Overall, observation of the landfill tends to confirm that the waste diversion rate is probably not very high. Indeed, all types of waste can be observed in the landfill, including lots of recyclable materials. Here again, there's no doubt that waste management staff are motivated and trying their best – in fact, the workers we discussed with appeared very active and proud of their efforts. But without a composting area for degradable waste and without proper at-source segregation for non-degradable waste, it is unavoidable that most waste end up in the landfill, which makes the recycling efforts of the staff relatively negligible. Unarguably, there is significant room for improvement.

## WASTE LITTERING AND OPEN BURNING

At first glance, the city gives the impression of being relatively clean and free of significant littering – which is probably the case to some extent comparatively to many other locations. However, after some time walking in the streets, it becomes clear that Nuwara Eliya municipality is not as clean as it first looks, especially once we get out of the city-center. Indeed, it was observed that there are actually countless small wild dumps all over the city, distant of only a few hundred meters from one another – most particularly in areas that are not accessible to collection trucks, but also in locations where collection services are operating.



**Figure 14: Open dumping and burning places on road side within city premises**  
(Source: Photos taken during field visit)

Good observation shows that, hidden behind vegetation, there are actually lots of littered waste in the water streams next to the streets. The interviewed person who sorted waste better than average

confirmed that some people dispose lots of waste on roadsides and in waterways, sometimes even big items (pillows, mattresses, etc.), and that this waste is “washed” away during the rainy season. Unsurprisingly, waste accumulates downstream in waterways and rivers. In fact, it is particularly astonishing to observe how much trash is stuck in the river that flows through Victoria park. The contrast between how beautiful and well maintained most of the park is, and how dramatically trashed the river is even inside the park premises, is fairly stupefying.



**Figure 15: Waste in water streams and river**  
(Source: Photos taken during field visit)

Most of the dumping places by the streets also show some clear signs of open burning. Some people set their waste on fire right after dumping it, others prefer to ignite fires only when too much waste has accumulated to reduce the volume. During the few days of field visit, burning waste was observed on several occasions in streets and within private properties, including right next to our hotel in the city-center, confirming that open burning is neither rare nor limited to the outskirts of the municipality.



**Figure 16: Waste burning within municipality premises**  
(Source: Photos taken during field visit)

By the roads in rural areas, the main dumping spots appear more distant from one another, but also much larger, suggesting that more people come to dump their waste in these informal but well-identified dumping sites. In most cases, these dumping areas are located above very steep slopes on top of rivers. The dumping point by the road is only few meters wide, but as waste falls down the slope it spreads on both sides, forming a cone of waste towards the bottom of the valley. Down there, we



can observe that waste accumulates in the rivers, sustainably contaminating them despite the fact that these rivers flow towards lakes that are used as drinking water sources.



**Figure 17: Waste falling from dumping area on rural road side down the slope into the river**  
(Source: Photos taken during field visit)

### SITUATION IN TEA PLANTATIONS

An average tea plantation estate is considered to spread over 250 to 350 ha. Each estate is divided into a few (3 to 5) divisions. Each division broadly corresponds to one valley, in which one community is living. Each valley thus measures approximately 80-100 ha on average and is home to an average of 150 households.

There is no waste segregation nor waste management process whatsoever for community settlements within the plantation estates (plantation managers claimed there were many attempts and still are several mechanisms theoretically in place, but these are not really implemented). Besides few plastics that some itinerant merchants come to purchase occasionally, all waste is mixed and dumped in a few places (4 or 5 per community, which translates into approximately 20 dumps per estate), usually by the roads. Visitors who come from outside every week-end also contribute to generating waste within the estates.



**Figure 18: Dumped waste on road side within plantation estate**  
(Source: Photos taken during field visit)



Tea plantation factories, located within the estates, don't seem to be producing much non-degradable waste. In fact, the vast majority of factory waste is organic byproducts from tea leaves processing, which is managed internally by using it as (enriched) fertilizer. Allegedly, plastic bottles of chemicals used to enrich the compost are shredded manually and sold to recyclers (who come to pick up the plastic once in a while). There is some more plastic waste (such as tea leaves bags) but plantation manager seemed incapable or unwilling to explain how it is processed (most likely, such plastics are simply dumped nearby). In fact, some mixed waste was observed along the tea trees next to the factory.

Waste collection costs seem to be considered unbearable by plantation managers. On the other hand, one of the managers told us during the field visit that if the communities sorted their waste properly, management would collect it for proper processing. In addition, managers unanimously claimed that if communities were to perform community compost, estate management would definitely purchase it from them, as they decisively need more compost to fertilize their plantations (in a balanced mix with chemical fertilizers). All in all, from plantation managers' perspective, the main problem is undoubtedly community attitude and unwillingness to adopt better practices. Unfortunately, we did not have the time/opportunity to interview members of the planters community to better understand their perspective (this gap will need to be filled as soon as possible to enable designing relevant activities targeting communities).

Managers of estates that are close to the municipality also complain that public collection services come all around them (or even through them) to collect waste from villages, but don't collect waste within estates. On the other hand, it appears that plantation managers are generally reluctant to let public services operate inside their estates because they feel they would lose some control. This form of double-discourse echoes with the ambiguity of responsibilities even from a legal point of view: estate lands are owned by the State, under the jurisdiction of local authorities, and somewhat managed as private properties by the companies to which plantations are leased. This vague and ambiguous situation creates a loophole in which all stakeholders tend to shift the responsibility and blame on each other.

In the end, the main issue in the plantations appears to find the right balance for a fair and acceptable share of responsibilities between all stakeholders. Simply put, such a balanced system could be based on: 1/ community properly sorting their waste at-source and maybe disposing it properly in a dedicated location within community area; 2/ plantation managers collecting and centralizing this sorted waste in a single point within or at the edge of the estates (ideally, this point should be easily accessible to public waste collection services); 3/ public collection services picking up and bringing this waste to the municipality (or other relevant places) for proper management with the rest of municipal waste (alternatively, at least in some locations, recyclable waste could be collected by interested itinerant merchants). We should also highlight that there are shops within the estates that are directly supplied by suppliers' trucks; since these trucks probably go back empty, there might be an opportunity to load processed waste and ship it out of the estates (although such transporters will most likely be very reluctant to do so).

## **WASTE MANAGEMENT FINANCES**

Municipality officers explained that it is difficult to define precisely their total waste management budget because it is divided into several departments. Most likely, they do know what their budget is but were hesitant to share such sensitive information. Eventually, they provided an estimation of 40 million Rs in total, of which approximately 70% is used to pay salaries while most of the rest goes to vehicle maintenance and fuel. In other words, most of waste management budget appears to be allocated to waste *collection* rather than other waste management tasks.

There is no waste management tax or waste collection fee (except possible informal tips/bribes, as previously mentioned in the ‘Waste collection and transportation’ section above). According to municipality officers, all waste management expenses are covered by Municipality budget, with the exception of occasional support from the State. At least part of the staff salaries (including the three public health inspectors) appears to be covered directly by the national government, but it was not clear neither to some extent nor if these salaries were included in the above-mentioned 40 million Rs total budget.

The national government recently decided that 40% of municipality salaries would now have to be covered by local authorities’ income. This rate will increase to 100% by 2028. Therefore, there is an increasingly pressing need to create more income (and reduce expenses), which creates financial difficulty and uncertainties for the future. Simply put, possible increased income that may be generated through waste-related activities shall eventually be used almost entirely to pay municipality salaries, which means opportunities to invest into improving the waste management system will be drastically hampered.

Whatever income that can be made from waste-related activities (such as selling recyclable items, for example) directly goes to the general budget of the municipality. Indirectly, at least part of this money may be allocated back to the waste management budget, but it all comes down to political decisions when voting the annual municipal budget. In other words, income that municipal waste management team may be generating cannot be used directly to improve the waste management system.

## **WASTE-RELATED DATA COLLECTION**

During the interview, municipality officers mentioned that they do produce data and can share it with us if need be. Although the accuracy of at least part of the figures provided during the interviews can be questioned (see ‘Waste processing and recycling’ section above), it will be imperative to request and review the official data that has been produced until now. Analyzing this data is important not only to better understand the current situation, but also to determine if waste management monitoring mechanisms need to be improved, and in what way. Proper monitoring of several parameters – such as diversion rate, reduction rate, recycling rate, and so on<sup>69</sup> – is indeed paramount to make sure the waste management system is properly implemented and constantly improved.

## **ZERO WASTE INITIATIVES**

In addition to the above-mentioned government orders applicable nation-wide, Nuwara Eliya municipality has allegedly taken several measures on their own (including bans) to reduce single-use plastic, such as providing reusable flags to replace the single-use plastic that was previously used during funerals. It was mentioned during the meeting that food wrapping sheets would also be replaced by banana leaves if Nuwara Eliya’s climate enabled growing bananas (but there is apparently too much wind). It could be interesting to clarify whether or not it would be technically and economically feasible to import banana leaves from other regions, or more broadly to analyze what other alternatives may be more suited to Nuwara Eliya’s context.

Regarding food waste prevention, it appears that collected vegetable waste from hotels are increasingly given to local farms to feed livestock (particularly on Mondays, after week-end fairs have left significant amount of vegetable waste). Some hotels also started charging 100 Rs if people don’t finish their all-you-can-eat plates, with the goal of reducing food waste at the source.

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<sup>69</sup> GAIA, [The Zero Waste Masterplan. A guide to building just and resilient Zero Waste cities](#) (2020).

During our meeting, municipality officers expressed their will to provide lands or buildings to people who would like to engage into local recycling or other Zero Waste-oriented activities. As of today, it appears that this claim has not really translated into tangible actions; but, if implemented, such provision of land or building could become a strong incentive to develop Zero Waste infrastructure and activities.

According to the interviewed teacher, her school totally banned single-use food packaging, which means children bring their food from home in reusable containers. The situation is apparently the same in all schools in Nuwara Eliya. It would be interesting to clarify whether such bans are individual initiatives taken by each school, decision made by School Department of the municipality applicable to all local schools, or national-level policy.

Public cleanings are organized from time to time in rural areas (road sides, etc.), but such community cleanups are not systematic – and never implemented in the city. In themselves, such cleanups are inherently ineffective to reduce waste generation and improve waste management; but if properly articulated with other Zero Waste actions, they can be a useful awareness-raising tools to help people realize the dramatic amount of littered waste and the need to improve practices. As of today, despite occasional information campaigns led by the municipality, awareness-raising remain considered as largely insufficient.

### 3. KEY FINDINGS AND RECOMMENDATIONS

#### SUMMARY OF MAIN IDENTIFIED ISSUES

The main identified issues and challenges, as detailed and contextualized above throughout the report, can be summarized as follows:

- **Insufficient public awareness, concern and motivation:** Most people lack knowledge and information about all the issues associated with waste. Even when people are aware of the main problems, there seems to be a lack of motivation and proactivity to take action, starting with properly segregating waste at the source. More broadly, the concepts of Zero Waste are not fully understood by most stakeholders, which hampers planning and implementation of adequate solutions.
- **Insufficient at-source waste segregation:** Due to insufficient awareness and inadequate segregation requirements (only two categories), at-source waste sorting remains largely insufficient, which severely hampers the efficiency of the entire waste management system. Implementing waste segregation between degradable and non-degradable is already a commendable achievement in Nuwara Eliya, although it is not always implemented perfectly. But the absence of segregation between recyclable/reusable materials and residual waste (which are all mixed in the ‘non-degradable’ bucket) is a major issue that prevents proper processing at the recycling facility – which is why most waste still ends up in the landfill.
- **Insufficient capacity and incentive among waste management staff:** The imperfections of the current waste management system make working conditions difficult for waste management staff. Low wages, insufficient benefits and absence of social recognition also increase the difficulty to hire and keep waste workers (and leads some of them to request or accept bribery in some situations). Due to high turnover of personnel, waste management staff are often lacking knowledge, expertise and capabilities, which contributes to deepen waste management problems.

- **Insufficient fundings and investments:** Local authorities are in charge of implementing waste management but they lack finances both to invest in adequate infrastructure and to cover all necessary operational costs (including sufficient wages to waste workers, especially in a context where salaries will soon have to be covered entirely with municipality incomes). Despite its imperfections, the current waste management system is already rather commendable in many ways; but lack of funding hampers necessary improvements, including for distributing home composters to all households who need one.
- **Insufficient knowledge and resources for centralized composting:** Although degradable waste is theoretically collected separately from non-degradable, most of it is still disposed in the landfill with mixed waste because there is currently no centralized composting facility. While ensuring at-source segregation and collection of organic waste is often considered more complicated than implementing composting itself, the absence of infrastructure and knowledge for centralized composting appears as one of the main gaps to be filled in Nuwara Eliya. The cool local climate comparatively to other parts of Sri Lanka complicates (extends the duration of) the composting process and may reduce the relevance of blindly copy-pasting composting systems that proved efficient in other parts of the country (at least without adapting the composting duration and necessary windrow surfaces to the local climate). Marketing of the compost that will be produced in the future must also be carefully assessed and planned, taking national standards into account, as insufficient profitable outlets is often a major obstacle for centralized composters to reach economic sustainability.
- **Insufficient collection frequency for degradable waste:** The theoretical daily collection for degradable waste doesn't seem to be fully respected, at least not everywhere in the municipality. For households that don't benefit from adequate frequency of collection (only once or twice a week), keeping degradable waste bags inside their small homes is a significant problem as it creates nuisances.
- **Inaccessibility of waste collection trucks in some parts of the city:** Over 10% of municipality households are not accessible to collection trucks. In addition, municipality trucks don't operate outside the city itself, which means that rural households don't benefit from any collection service (besides where Pradeshiya Sabhas services may operate door-to-door collection). These households are left with no proper solution to dispose their waste, which unavoidably leads to improper dumping (and burning) on road sides and in rivers, with high environmental impacts and serious concerns about possible contamination of drinking water.
- **Outsiders' insufficient awareness and improper practices:** Nuwara Eliya being a very touristic area, many visitors come from all over Sri Lanka, unaware of the local waste management system and reduction/sorting requirements. These outsiders are considered as a major source of littering and improper waste-related practices in Nuwara Eliya, hampering the efficiency of the waste management system. The absence of street bins, which can be relevant if everyone is informed about alternative solutions for disposing waste, is certainly an additional challenge when it comes to outsiders who don't know what to do with the waste they produce in public spaces.
- **Insufficient reuse systems:** As of today, replacement of some single-use plastics – which is absolutely commendable – seem to have resulted in increasing single-use papers instead, which is unfortunately not more ecologically sustainable (deforestation) and does not contribute to reducing waste generation (nor making the economy more circular). There is a need to develop reuse systems, especially for food and beverage packaging and sanitary items, which commonly constitute the largest parts of the non-degradable fraction of municipal waste.

- **Insufficient land:** All over Sri Lanka, including in Nuwara Eliya, lack of land seems to be a challenge. In particular, development of centralized composting would require significant surfaces, if possible closer to the city than current landfill and recycling facility are, but such land seems virtually inexistent (at least without creating political problems and raising ownership issues).
- **Lack of space and efficient machinery in the recycling facility:** The current waste management facility appears flooded with plastics as it is probably too small. This lack of space is also to be linked with the relative inefficiency of some machines and current processes, especially when it comes to downcycling plastics into flower pots and bricks. Surely the current processes could be optimized to use more efficiently the available space; but if at-source segregation eventually improves and more recyclable waste have to be processed, the facility will most likely become way too small and unproductive to keep up with waste stream.
- **Insufficient coordination between all stakeholders in the district:** There is a clear lack of coordination between most stakeholders involved in waste management in the district, especially between urban and rural areas. Except in locations where Pradeshiya Sabhas may implement waste collection, most rural areas are left with no waste management services whatsoever, including in tea plantations. Most stakeholders appear willing to improve the current situation, but lack of discussion and coordination prevents counterparts from understanding each other’s perspectives, and hampers cooperation and coordinated actions. The ambiguity of the status and responsibility of each party within tea estates contributes to complicating this coordination.
- **Insufficient accountability of producers:** Despite the fact that current legislation emphasizes the need to apply the Polluter-Pays principle and to enforce Extended Producer Responsibility policies, manufacturers and suppliers appear to remain largely free of any real accountability. Considering how complicated and expensive waste management is, especially in rural areas where waste generating households are scattered, this unaccountability makes financial and logistical gaps virtually impossible to fill. In other words, enabling proper waste management would require that producers adapt their industrial practices to reduce waste generation (especially in terms of single-use packaging) and/or contribute financially or logistically to waste transportation between generation areas and processing facilities.

## SUGGESTIONS OF POSSIBLE ACTIONS

Based on the identified key issues summarized above, and taking into account the ideas of the PALM Foundation’s team (as brainstormed during the field visit), suggestions to improve the current situation through a Zero Waste-oriented project include the following:

- **District-level project with coordinated actions in pilot areas:** Considering that waste is a common problem and that a significant part of the issue in Nuwara Eliya comes from the lack of cooperation between different stakeholders and different levels within district, the project should be formulated at district level, with a focus on the municipality and a selection of pilot tea plantations, communities and villages. Developing a coordination mechanism between municipality, communities and plantation managers would help connecting urban and rural areas and enabling periodic waste collection from remote locations.
- **Ongoing awareness-raising and community involvement:** Community involvement is absolutely necessary in all aspects of the waste issue, so it will be essential to base the project on the PALM Foundation’s expertise and methodology for community work. Awareness-raising shall be conducted extensively and ongoingly towards all relevant groups of stakeholders, from



grassroot up. It is paramount to provide ongoing trainings/activities on the most important topics and create opportunities for the most active/aware people to mobilize their own communities. Zero Waste concepts and hierarchy, with all their ins and outs, must be thoroughly explained to everyone.

- **Improving at-source segregation with a 3-bucket system:** As it will forever remain impossible to properly process mixed waste at the waste management facility and landfill, it is absolutely essential that a 3-bucket system is introduced to enable at-source segregation of degradable, recyclable/reusable, and residual waste. Before being formalized and officialized by municipal decree, and carefully explained to all waste generators, this new system must be designed with the participation of the people, taking into account their suggestions and the feedback from failure of the 4-bucket system attempted in the past. Additional measures such as differentiated collection frequency (recyclable/reusable waste collected significantly more often than residual waste) would also be commendable to incentivize people to carefully sort their waste. Likewise, municipality should probably enforce more strictly the legislation and fine people who litter, mix and/or openly burn waste (provided that convenient and effective solutions are indeed accessible to everyone).
- **Primary focus on home composting:** Composting as close to the source as possible is always the best solution because it reduces the need for transportation and workforce, and thus both environmental impacts and expenses (saved money can then be used to improve the system and/or increase wages). Therefore, considering that 70% of municipal waste is degradable, the project should probably put its primary focus on supporting home composting (all the more since home composting is already implemented successfully in Nuwara Eliya and that there is an expressed demand for home composters from many households). Everywhere possible, both in the municipality and rural areas, home composters should be distributed or subsidized along with proper training and ongoing guidance and assistance. Efforts should be made to support composting initiatives not only for households but also for institutions (schools, hospitals, etc.) and economic actors that generate a lot of degradable waste (food markets, restaurants, hotels, etc.). Relevant alternatives to home composting, such as distribution of food leftovers to people in need or farm animals as well as community compost wherever home composting is not suitable or convenient, should also be promoted to reduce the need for public collection/transportation.
- **Development of pilot centralized composting facility:** As a complementary solution where food waste diversion and home/community compost are not feasible or sufficiently efficient, development of a centralized composting facility would be extremely beneficial to properly manage collected degradable waste that is currently dumped in the landfill. The facility should be very carefully designed and sized after detailed assessment and following proper methodology/guidance.<sup>70</sup> If primary efforts (and thus significant part of the project budget) are focused on home composting, as it is recommended, it might be wise to plan only a relatively small and simple centralized composting facility in this project, as some kind of experimentation. Such a pilot approach would have the benefit of reducing risks of failure, acquiring first-hand experience for municipality staff, clarifying precisely what the best way of operating would be in Nuwara Eliya, and giving all involved stakeholders time to carefully design a perfectly-suitable facility to be set up by Sri Lankan authorities themselves and/or as a second phase to this project.
- **Extensive information/education of visitors:** Outsiders who litter a lot are considered to be essentially Sri Lankans (not foreigners) who come by bus and/or stay in hotels. Therefore, a

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<sup>70</sup> PAGEDS, [Concevoir et gérer une plateforme artisanale de compostage des déchets municipaux dans un pays du Sud](#) (2020).

systematic awareness-raising campaign that would target visitors in buses and hotels could show some positive results if it is properly implemented in partnership with municipality authorities, hotel managers and bus companies.

- **Development of reuse/refill systems:** In order to reduce the reliance on single-use packaging and items, and thus to decrease waste generation altogether, it would be highly beneficial to develop local reuse and refill systems. Such reuse systems must be enabled and supported by municipality authorities, through a combination of legal prohibition of single-use items and support to realistic alternatives, with a suitable transition period. The easiest places to start are closed-loop locations such as schools, hospitals, restaurants, hotels, and so on, where infrastructure is usually already in place to easily replace most single-use items with washable/reusable ones. Efforts can then be expanded to other sectors, such as take-away food/beverages or reusable sanitary items, following feedback and recommendations from local and global experts.<sup>71</sup> For example, developing locally-produced reusable baby diapers or sanitary pads, with a possible subscription to washing/supplying services for those who don't want to wash at home, could significantly decrease the need for single-use diapers and pads. Support to local entrepreneurs (for instance with provision of lands or buildings) and promotion of locally-produced eco-friendly alternatives to single-use items would help reducing waste generation while creating jobs.
- **Improvement of the waste management facility:** If at-source segregation is improved and an increased amount of sorted waste is brought to the recycling facility, the building may become drastically too small and may require an extension (at least a roof to protect from rainwater). Likewise, it may become necessary to acquire new machines/technologies, especially for local downcycling of non-tradable recyclable/reusable waste, so as to meet the local demand for downcycled products by increasing productivity and quality. However, we should highlight that investing in such downcycling might send mixed signals and hamper development of more relevant reuse/recycling systems, as it would put light, efforts and money on an activity that is relatively low in the Zero Waste hierarchy. Such improper prioritization is a flaw observed in many waste-related projects, which is why we should beware of making the same mistake.
- **Training and capacity building of waste management staff:** Staff knowledge and capacity should be enhanced through proper trainings, depending on how the waste management system is intended to be reorganized through the project. Field trips to other parts of Sri Lanka where good practices have been implemented can also be commendable. Positive links and interactions should also be developed between the general population and municipality waste workers, so that their hard work is better appreciated and socially recognized.
- **Production of data for research and advocacy:** Producing solid data through practical research on the field could be useful to promote good practices. Likewise, quality data is also paramount not only to design proper waste management systems but also for advocacy purposes. For example, brand audits – which help clarifying what types of materials/products and companies comprise most of municipal waste – are very useful to advocate for producer's accountability.
- **Capitalization:** In order to ensure that the project doesn't benefit only to Nuwara Eliya but also to other parts of Sri Lanka, it would be relevant – by the end of the project – to capitalize on introduced good practices by producing reports, guidebooks, videos and/or other useful materials. Even within Nuwara Eliya district itself, since the project would focus in rural areas only on a selection of few pilot plantation estates and villages, producing replication/dissemination materials would be paramount for other relevant stakeholders (LAs,

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<sup>71</sup> Global Plastics Policy Center of the University of Portsmouth, [Making Reuse a Reality: A systems approach to tackling single-use plastic pollution](#) (2023).

planation managers, etc.) to be able to implement the same good practices and waste management systems in the future.

## NEXT STEPS AND REMAINING GAPS TO BE FILLED

The findings of this baseline study lead to conclude that implementation of a waste-related project in Nuwara Eliya could definitely help overcoming at least some of the main obstacles and contribute to significantly improve waste management in the municipality and rural areas of the district. At this point, the main next step consists in formulating the project itself as concept note with budget outline.

However, as mentioned throughout this report, some useful information and data are still missing in this baseline study. Ideally, but depending on how the future project is envisioned, it would be beneficial to fill at least part of these gaps as soon as possible, either prior to designing the project or before launching it (part of the information can also be gathered later, as an initial phase of the project itself).

These main gaps to be filled are summarized below:

- **Interview of households:** During the field visit, there was no time to interview rural households of Nuwara Eliya District, and only a few households in the municipality. Conducting more interviews (see household questionnaire template in Annex 2) as soon as possible would be beneficial to gather at least three types of information:
  - **Waste composition:** Understanding precisely waste generation and composition in each location (plantations, villages, city center, etc.) is necessary to design waste management systems adequately.
  - **Opinion and perspectives:** Understanding the point of view, faced difficulties, and waste management practices of each population group (especially rural households, whose perspective is totally absent in this report) is also vital to suggest relevant improvements to the current waste management system.
  - **Consumption patterns:** Understanding, in both urban and rural areas, which consumption habits tend to produce most waste and which could most easily/effectively be changed to reduce waste generation, can be useful to determine waste prevention strategies and policies.<sup>72</sup>
- **Local-level waste-related regulation/legislation:** Local policies and decrees are assumed to be only operational (for implementation of national-level waste management policies). But it would be useful to investigate this assumption further and clarify whether or not specific initiatives have been taken by municipality authorities or other local decision-makers. More broadly, Provincial Councils are requested to develop waste management master plans with local authorities, which means such a plan applicable to Nuwara Eliya probably exists. Likewise, LAs are supposed to produce a time bound action plan with performance indicators. Clarifying existence and terms of such local plans and regulations (in municipality and surrounding Pradeshiya Sabhas) would be necessary to make sure project activities always remain consistent with the local legal/policy framework. Furthermore, it would be interesting to clarify whether bans on single-use food packaging in local schools are either initiatives taken individually by each school, decisions made by School Department of the municipality applicable to all local schools, or only a direct consequence of national-level policies. Finally,

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<sup>72</sup> What do people mainly purchase and/or consume in their everyday life, depending on where they live? Do the products they use at home or work come from other locations (other parts of the country or imported from abroad) or are they mainly produced locally? How are these main products (both locally-produced and imported) packaged (plastic wrapping, paper bags, etc.)? How exactly do these consumption patterns translate into waste generation? Etc.

clarifying whether or not other organizations are planning or currently implementing waste-related projects/programs in Nuwara Eliya would be useful to avoid redundant or conflicting actions.

- **Informal waste workers:** Like in other parts of Sri Lanka, there are probably some informal waste pickers who collect recyclables for a living. However, their existence was never clearly mentioned by anyone during the field visit and their number thus remains unknown. It would be necessary to investigate further on that regard to clarify their existence and situation – and, if possible/relevant, integrate them in the project.
- **Best practices of waste management and composting in Sri Lanka:** According to EFL, some small municipalities in the country are managing their waste fairly well, and some centralized composting facilities have been operational for many years now. Beyond the general information presented in the first part of this report (literature review), it would be beneficial to investigate, identify and maybe visit a few municipalities and Pradeshiya Sabhas that currently implement proper systems and could be an inspiration to improve the situation in Nuwara Eliya. Weligama, in the Southern Province, could be the first location to visit as it seems to have been an inspiration for the whole country in terms of centralized composting.
- **Study to design and budget composting facility:** After acquiring more information about the best centralized composters in Sri Lanka, if construction of a centralized composting facility is confirmed to be part of the project (especially if it is intended not as a small pilot but immediately as a large-scale facility), it will be essential to conduct a detailed study to design, size and budget it properly. Marketing issues, depending on how much compost is expected to be produced, must be carefully thought out. Land issues, including possibility to set up the composting area within the landfill itself, should also be discussed.
- **Best option for home composters:** Concrete home composters currently used in Nuwara Eliya appear much appreciated, while plastic composters seem unanimously criticized. But an even more efficient, lighter and/or cheaper option might be available on the Sri Lankan market, so it could be useful to investigate this matter further to make sure the project funds the best possible option. On the other hand, keeping unchanged something that is already appreciated and well-functioning (concrete composters) could be the smartest decision.
- **Clarification of waste management facility operations:** To assess more precisely how things are handled at the facility, it would be useful to spend more time with the staff. In-depth investigation, for instance by spending a full day with recycling facility personnel to observe how they work, would be highly beneficial to be able to suggest improved practices. Additionally, it would be interesting to clarify exactly which types of waste are currently sold, which ones could possibly be sold but are currently not, and which types of waste cannot be sold (in other words, it would be useful to have a precise list of possible outlets for all types of waste managed in the facility).
- **Plan and budget necessary extension and machinery for recycling facility:** If the facility is to be extended and/or equipped with new machines, it would be necessary to clarify the exact plans, so that construction work can be budgeted properly. On the other hand, if this aspect is not considered a priority and/or remains unclear by the time the project is formulated, it is possible address this matter the other way around: considering that there is already a functioning and relatively well-equipped building in which it will be possible to process waste no matter what (even if it is too small to reach optimal efficiency), the project could plan an arbitrary sum for this budget line and make the most of it when project implementation starts.

- **District-level waste collection ratio:** Interview of municipality officers helped clarifying the waste collection ratio within the municipality (approximately 90%, as only 10% of households are not accessible to collection trucks), but it remains unclear how many households in the whole district benefit from door-to-door collection services, either from another public authority or from a private entity. Knowing the exact proportion (or at least an accurate order of magnitude) of people/households in the district that are covered and not covered by public waste collection services would help clarifying the needs and envision relevant coordination mechanisms.
- **Composting experts in Sri Lanka:** As this project will probably focus primarily on composting (home composting and/or centralized composting), it would be beneficial to identify the best Sri Lankan experts as early as possible, to involve them from the beginning and/or at least to properly budget their possible fees/wages when we will reach out to them throughout the project. According to EFL, there is a professor in Colombo that is conducting research on microorganisms for boosting composting processes. Even if compost boosting is not necessarily part of our project (such boosters can easily be self-made without requiring advanced technologies<sup>73</sup>), this academic – which remains to be clearly identified – could be a first contact in the search for experts and possible research partners.
- **Municipal data about waste:** Although the accuracy of at least part of the figures provided during the interviews can be questioned, it is imperative to request and review the official data that has been produced by municipality until now. Analyzing this data is important not only to better understand the current situation, but also to determine if waste management monitoring mechanisms need to be improved, and in what way.
- **Banana leaves and other possible alternatives to plastics:** With the aim of replacing single-use plastics, along with efforts to develop reuse systems, it can sometimes be interesting to revive traditional ways of packaging food. If banana trees really can't grow in Nuwara Eliya, it could be interesting to clarify whether banana leaves could possibly be imported from surrounding regions instead of importing plastic wrapping. More broadly, investigating the traditional ways of wrapping food in Nuwara Eliya area could bring up interesting techniques that may deserve a second chance and could be tested during the project.
- **Municipal lands/buildings for Zero Waste initiatives:** As municipality official claimed they would be willing to provide lands or buildings to support Zero Waste initiatives, it would be useful to clarify with them what they have in mind exactly, under what conditions, and what solution could effectively be offered to Zero Waste-oriented entrepreneurs and non-profit associations. Knowing in advance what exactly can be expected will help shape ideas and initiatives as realistically as possible.
- **Advocacy partners:** It would be useful to explore possible partnerships (either formally as implementing partners of the project, or more informally for mutual benefit) with Colombo-based advocacy organizations such as CEJ and EFL – especially since these organizations also specialize in scientific and legal activities, which can be useful to the project. When project design becomes clearer, and more specifically when advocacy activities and/or scientific/legal needs are clarified, it would be interesting for the PALM Foundation to meet with CEJ and/or EFL to discuss what role they could play formally or informally.

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<sup>73</sup> Nair, [Back to Earth. Composting for Various Contexts](#) (2022).



**ANNEX 1**  
**OVERALL QUESTIONNAIRE TO FRAME FIELD MISSION**

# QUESTIONNAIRE FOR FIELD MISSION

## ABOUT WASTE SITUATION IN NUWARA ELIYA, SRI LANKA

December, 2024

*In this questionnaire, each bullet-point addresses a specific topic (in **bold**) and usually contains several questions (which are not necessarily exhaustive but rather intended to guide us and make sure answers enable to fully grasp the situation regarding each topic).*

### 1) GENERAL CONTEXT

*The goal of this part of the questionnaire is to better understand the context of Sri Lanka and the target location, in general and from a broad waste perspective.*

- **Overall context:** *What is the current political, economic and social context, both at national and local levels? What are most people's main concerns and interests at the moment? How can this context affect (positively or negatively) the development and implementation of a waste-related project? What are the main overall information we need to take into account before we start designing our project?*
- **Definition of the target area:** *Where does PALM currently operate? Is it a rather urban or rural area? How many / which villages/districts/provinces are included in this 'target area'? How many people/families live in the target area? Who are the local authorities? If PALM operates in several remote locations, in which one(s) would you prefer to work on the waste issue, and why?*
- **Livelihood and activities in target area:** *What are the standards and conditions of living in the target area? What do most people do (professionally and/or otherwise)? How are these activities mainly connected to the waste issue (do these activities produce a lot of waste? are these activities impacted by existing waste? etc.)?*
- **Level of activism and action:** *How activist are usually people in the target area? Do people get easily involved in actions for social changes or is there mainly apathy and disinterest? Do people tend to passively rely on authorities to induce positive change, or are they willing to take action by themselves if authorities are not active enough?*
- **Level of community spirit:** *Do people have a strong community spirit in the target area? Do communities carry out many activities together as a group, or do most people essentially mind their own business individually? Does social pressure (from the community) significantly contribute to determining people's practices/habits or not so much? Are there authority figures within the communities that people tend to listen to (elderly, educated people, charismatic person, etc.)?*
- **Main institutions and organizations in target area:** *What are the main public institutions in the target area (administration office, school, hospital, cultural center, etc.)? What are the main organizations active in the area (workers unions, CSOs, international NGOs, private corporations, etc.)? Are all these institutions/organizations connected and collaborating with each other?*

- **Legal framework:** *What is the current waste-related legal framework (both national and local)? Is this legal framework effectively respected/implemented in the country, and more specifically in the target area? Are you aware of new laws or policies that may be coming up soon?*
- **Waste-related projects and plans:** *Are there other waste-related projects implemented in Sri Lanka, and more specifically in the target area? Have the government or other stakeholders (including local communities) discussed or announced (officially or not) plans for the near future in terms of waste-related projects, policies, activities, etc.?*
- **Main stakeholders:** *To your knowledge, who are the main stakeholders involved in waste-related issues, both at national and local levels? Who may/will we need to consider and possibly talk to (as allies or opponents) when developing and implementing a waste-related project?*
- **Local authorities:** *Do you currently have relationship/collaboration with local authorities? Is this relationship rather good/smooth or bad/conflictual? Are local authorities usually helpful/cooperative and motivated, or not? Do you consider likely or not that local authorities (in charge of waste management in the target location) will be interested in cooperating with us and take action to improve the waste situation?*
- **Consumption patterns:** *What do people mainly purchase and/or consume in their everyday life? Do the products they use at home or work come from other locations (other parts of the country or imported from abroad) or are they mainly produced locally? If both, please mention the main products that are produced locally and the main products that are imported from the rest of the country or abroad. How are these main products (both locally-produced and imported) packaged (plastic wrapping, paper bags, etc.)?*
- **Common perception of the waste issue:** *What do most people think about waste? Is it an issue of concern and/or interest that needs to be solved, or do most people pay no real interest in the topic? Is the topic taboo (difficult to talk about and address) or not (culturally, religiously, etc.)?*

## 2) CURRENT WASTE MANAGEMENT SYSTEM IN TARGET AREA

*The goal of this part of the questionnaire is to understand in detail the waste stream in the target area.*

- **Waste production and at-source sorting/management:** *Who are the main waste producers in the target area (households, public institutions, private businesses, etc.)? Do these waste producers sort their waste (at-source) somehow or not? In their homes and at work, how exactly do people handle/manage the waste they produce?*
- **Main person in charge of waste within households:** *Who is/are the main person(s) in charge of waste management within households? Who cleans the house and handles waste inside homes? Who takes garbage out and disposes it? Who is more aware of waste-related hazards and importance of proper waste management within households?*
- **Waste open burning:** *Do people burn waste where they live or work? If yes, what kind of waste is burnt? Is it open burning or do people use machines/incinerators designed for this purpose? Is burning waste (the way it is currently done) authorized/legal or is it theoretically forbidden/illegal?*
- **Waste-to-energy incineration:** *Are there waste-to-energy (WTE) facilities in Sri Lanka, and more specifically in (or close to) the target location? If yes, are these WTE facilities rather large*

centralized plants (run by private entities with significant invested capital), small-scale incinerators (simple machines operated by individuals), or both? What do people think about WTE? Do people realize WTE is harmful and dangerous? Are there discussions/debates about WTE in the country?

- **Waste composting:** Do people compost their organic waste where they live or work? If yes, what kind of organic waste do they mainly compost? Do they compost individually within their premises or elsewhere together with other families, as a community? What are the main difficulties they face with composting (time, knowledge, nuisances, cost, etc.)? If people don't compost much or at all, are there clear reason(s) why?
- **Intermediary collection points and street bins:** Are there street bins or other intermediary waste collection points? How and by whom are these bins/containers used and operated (is someone in charge? present all the time at collection points or just occasionally to empty them? etc.)?
- **Waste collection and transportation:** Is there any waste collection/transportation system in place? If yes, how does it work exactly? What kind of vehicle and equipment are used? Is it door-to-door? What is the frequency of waste collection? Who is in charge and who exactly is operating the system? Is it a formal or informal system? How is it financed?
- **Waste disposal and dumpsites:** How and where is waste disposed of? Is there a proper landfill in the target area? Are there open dumpsites, whether formal or informal? How are these landfills/dumpsites usually operated/managed? By whom?
- **Waste littering:** Do people litter waste a lot? Are there impacted/polluted locations (rivers, fields, roadsides, etc.) in the target area? What types of product/waste do you think is littered and/or pollutes the most in the target area?
- **Waste reusing and recycling:** Are there currently any form of waste reusing or recycling in the target area? How exactly? What types of waste/materials? By whom? Is it formal or informal? Systematic in an organized manner, or only occasional? Is part of the waste produced in the target area sent elsewhere to be reused or recycled? (if yes, where and by whom)? On the contrary, does any stakeholder in the target area buys/receives waste from other area to reuse/recycle/compost it?
- **Waste management equipment and infrastructure:** What kind of equipment and infrastructure are there in the target area (for example: waste management facility; waste collection trucks; plastic press; glass crusher; sorting bins and containers; etc.)? Who owns and/or operates these equipment and infrastructure? Are they in good condition and sufficient number, or rather in bad condition and insufficient number?
- **Public cleanings and other waste-related events:** Are there regular or occasional public cleaning (waste picking) events in the target area? Has anyone ever conducted a brand/waste audit (to identify what types of waste are littered the most, and from which companies/corporations they mainly come from)? Are there any attempts to prevent or clean up waste during specific events? Who is in charge of organizing and implementing them?
- **Waste-related tax and finances:** Is there a waste management tax in place (either local, provincial or national)? How much is it? Is it to be paid regularly (monthly/annually) or occasionally when a specific service is provided? Is the tax effectively collected? How and by whom? How is the tax money actually spent? Is there any plan to modify this tax in the near

future? Assuming that people would be explained and would believe that the waste management situation would finally be improved, how would people be likely to react if such a tax was introduced or increased?

- **Waste-related data collection:** *Is there any data currently being collected about waste in the target area? Who is in charge of collecting the data? How is the data collected exactly? Is it accurate/reliable? Is this data publicly available and up to date?*
- **Zero Waste:** *Are there or have there been any Zero Waste initiatives, policies or activities in the target area (either failed or successful)? (for example: single-use plastic ban; community compost; repair or refill shops; businesses that introduce reusable packaging; etc.)*
- **Links with other locations/areas:** *Is waste management in the target area connected in any way with other locations/areas or authorities? (for example: is locally-produced waste managed together with the waste produced in other villages/districts? is waste management in the target area under the responsibility of a provincial authority/operator? etc.)*
- **Noticeable similarities and differences with the situation in the rest of Sri Lanka:** *Is the situation in the target area largely similar to the rest of the country or are there any specific features in the target area that are very different from elsewhere? Would the answers provided above have been significantly different if these questions had been asked in other parts of the country?*
- **Additional information:** *Please add any information you consider relevant.*



**ANNEX 2**  
**QUESTIONNAIRE TEMPLATE FOR INTERVIEWING HOUSEHOLDS**

## WASTE-RELATED QUESTIONNAIRE FOR HOUSEHOLDS

Date:

Location/address of the household:

Name of interviewer:

Name of interviewee:

#	Question	Comment/clarification for interviewer
1	<p><b>How many people live together in your home (including you)?</b></p> <p><b>How many adults / children?</b></p>	<p>Please make sure they count only the people actually living in the home we will try to estimate waste production for – sometimes people add other members of the family who live somewhere else.</p>
<p><i>Adults:                                  Children:                                  Total:</i></p>		
2	<p><b>Can you estimate how much waste your household produces in one week?</b></p>	<p>The answer can be approximative. If people don't know in kilogram, they can try to estimate based on number and size of waste bags or containers.</p>
3	<p><b>What are the main types of waste that constitute your waste? If possible, can you name them in order of amount starting with the type of waste you have the most?</b></p>	<p>You can give few examples of categories to guide the answerer such as the main ones which are plastic, glass and food, as well as other usually found in smaller amount such as paper, fabric, e-waste... If possible, try to get semi-quantitative estimations and make sure they somehow are consistent with response to the previous question.</p>
4	<p><b>Do you segregate your waste? What are the reasons why you do/don't sort your waste?</b></p> <p><b>If you sort your waste, what kind(s) of waste do you separate? Why these ones and not others?</b></p> <p><b>If you sort some waste, do you reuse/recycle/compost it yourself?</b></p>	<p>Please try to understand as much as possible why they may not sort their waste and what they find difficult about it. If possible, try to understand why they sort only some kinds of waste. If relevant, try to detail which plastic waste (PET bottles, hard plastic containers, plastic bags, plastic wrapping...).</p> <p>The matter of composting will be addressed again in question #8, but it can be interesting to jump into the subject with this question.</p>

5	<p><b>How do you currently remove your waste (sorted and not sorted)? If you have several ways of removal, does it depend on type of waste? Can you estimate the proportion of your total waste that is removed through each removal method?</b></p>	<p>You can give them example and options: is it taken by collection service? Do they burn it? Do they dump it themselves, in which case where?</p>
6	<p><b><u>If your waste is collected at your home by a waste collection service:</u></b></p> <ul style="list-style-type: none"> <li>- <b>Do you have to pay for this service? How much?</b></li> <li>- <b>Does the collection service collect only mixed waste, only sorted waste (which kind?), or both?</b></li> <li>- <b>How many times per week is waste collected from your home? Are you satisfied with the frequency of waste collection? (if not, what would be the perfect frequency for you?)</b></li> </ul>	<p>This question is to better understand collection service from household's point of view, and information will be crossed with information about collection from authorities and collectors' point of view.</p>
7	<p><b><u>If you have to dispose your waste yourself:</u></b></p> <ul style="list-style-type: none"> <li>- <b>Where do you dump your waste?</b></li> <li>- <b>How often do you go to dump your waste? Walking or with a vehicle?</b></li> <li>- <b>Do you ever burn waste? Why? Where? What kind of waste?</b></li> </ul>	<p>Please try to ask these questions both for sorted waste and other waste if household do separate their waste. Make sure you understand where the drop point is: container downstairs, middle-men somewhere in the city, official intermediary drop point, dumpsite...</p>
8	<p><b>Do you compost your degradable waste, by yourself at home or with your community? If yes, how do you proceed? If not, why? What difficulties are you facing and what would you need to compost more or more easily?</b></p>	<p>Please try to understand what composting practices are implemented, what kind of composter they use, if they use the compost they make in their own garden, etc. If not, what are the precise reasons for not composting and what would make them start composting at home?</p>

9	<p><b>Do you ever sell (or give) recyclable waste (such as PET bottles)? If yes, what kind? Where? To whom? How much do they pay you?</b></p>	<p>Please try to get as much details as possible.</p>
10	<p><b>Who is the main person in charge of handling waste in your family? Are waste-related tasks divided between men, women and/or children?</b></p>	<p>Please try to get as much details as possible. The goal is to understand if we need to focus awareness-raising activities on specific members of the household.</p>
11	<p><b>Are you satisfied with the current waste management system implemented in your living area?</b></p> <p><b>Are you interested in improving the way you manage your waste at home?</b></p>	<p>The goal of these questions is to evaluate how satisfied/unsatisfied people are, and if they do want to improve the system and their own behavior or not. It may have already been answered through previous questions, but it can be useful to ask again and see if answers vary depending on living areas.</p>
12	<p><b>Do you think you have enough information about waste sorting?</b></p> <p><b>How do you find the information about waste sorting (community, training, TV, social media, event, law, NGOs, etc.)?</b></p>	<p>You can try to deepen the question depending on answer. If they say they have enough information, try to feel if they just don't care, challenge them a bit to see if they really now about waste sorting. If they say they don't have, try to feel if they say that because they are interested to know more, or if again they don't know but don't really care.</p> <p>Regarding source of information, try to understand if they look actively for this information or if they are passively receiving it.</p>
13	<p><b>What additional material and equipment would you need (at home or outside) to improve your waste management and sorting?</b></p>	<p>Here we try to understand if they need bins at home, compost or containers, etc. You can specifically ask about ideas we already have (such as 3-bucket system) to see how they feel about it.</p>

14	<p><b>What additional service would you need to improve your waste management and sorting?</b></p>	<p>It can mainly be service collection if there is none. It can also be a recycling facility close by to drop/sell waste directly there. But the question is more open in case they have other ideas.</p>
15	<p><b>If a waste management tax/fee/contribution was introduced and if you had the certainty it was going to be reliable, qualitative and efficient, how much would you be willing to pay (per week or per month)?</b></p>	<p>This question is usually a good indirect indicator to feel how much people care about waste management (there is an income bias but usually people who don't care usually say very little amount and people who are really concerned by waste management are much more "generous"). This question is also interesting from an economic analysis perspective regarding collection services.</p>
16	<p><b>Is there anything else you would like to add?</b>  <b>Do you have special recommendations, requests or advices to give us in order to try to improve the waste management system?</b></p>	<p>This final question aims to give an opportunity to interviewees to add something that may not have been covered through previous questions, and to share what is most important to them regarding waste.</p>