The role of clean-up initiatives in the circular economy transition on Curaçao

MASTER'S THESIS

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Abstract

Although plastics have become essential in our society, their extensive use combined with their durability has resulted in a widespread issue of mismanaged waste ending up in the oceans. Thereby, the tourism sector faces ongoing challenges from marine plastics, particularly at coastal destinations with sandy beaches that draw tourists, prompting stakeholders to prioritise clean-up initiatives. Little research has been done on the wider impact of clean-up initiatives regarding the issue of marine plastic. While clean-ups are criticised for focusing on removal rather than prevention, they offer sustainable pathways and highlight the potential of bottom-up approaches to reducing plastic pollution. This thesis aims to offer a practice-based perspective on how clean-up initiatives address the issue of marine plastic. Within this research, the case of Curaçao is analysed. The island lacks a comprehensive national solid waste management framework leading to plastic waste being dumped illegally in the (marine) environment. Stakeholders are now exploring circular economy as a strategy to stimulate transition in the waste industry. Therefore, this research focusses on identifying the role of clean-up initiatives in the transition towards a circular economy on Curaçao. Using a qualitative approach, data was collected through desk research, participant observations during clean-up initiatives, and interviews with clean-up organisations and participants. The findings reveal that clean-up initiatives play an important role in the waste sector, as they clean up the waste that is dumped illegally and not cleaned by other stakeholders. These initiatives consist of five practices that are carried out during different stages of the clean-up: picking, educating, separating, recycling and disposing. Except from disposing, these practices all share the meaning of raising awareness among citizens and are connected to larger bundles that are focused on the circular practices of reducing and recycling plastic waste. Various organisations and companies on Curaçao are engaged in the recycling of plastics and therefore of added value to the national waste management framework. The results showed that clean-up initiatives contribute to the transition towards a circular economy on Curaçao. Yet, there are some challenges that require more efforts on different areas than clean-up initiatives only. Further action points to stimulate circularity are the implementation of a deposit-refund system, an awareness programme on primary schools and (financial) support as reducing the harbour tax or the provision of resources.

Key words: circular economy, transition, waste management, marine plastic, social practices, practice bundles, zooming in and out

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1. Introduction

Plastics have become indispensable materials in our society, addressing key societal challenges, such as enhancing food safety (Almroth & Eggert, 2019). However, plastics have also been capable of changing the normal functioning of Earth-system processes in ways that amplify risks to societies worldwide (Villarrubia-Gómez et al., 2018). Their widespread use in combination with the longevity has led to an epidemic of mismanaged waste (Schmaltz et al., 2020). More than 10 million tons of these mismanaged plastics enter the oceans annually (Almroth & Eggert, 2019). At the same time, experts argue that the flux of plastics into oceans, also known as marine plastic, will continue to rise in the coming years (Beaumont et al., 2019). By destroying habitat, entangling marine animals and enabling the spread of invasive species across ecosystems, marine plastic poses a significant threat to food security, livelihood, income and public health (Beaumont et al., 2019; Schmaltz et al., 2020).

A major contributor to marine plastic pollution are land-based sources from sectors as construction, household, packaging, and coastal tourism (Almroth & Eggert, 2019; Alpizar et al., 2020). Research shows that single-use plastics (SUPs) are seen as the most problematic plastics as they are more likely to enter the environment than others. While they are commonly used, these plastics are difficult to recycle, easily littered and often made of low-density plastic polymers – making these items able to float in the ocean (Almroth & Eggert, 2019). Examples are plastic bags, cutlery, straws, cups and food containers (Schnurr et al., 2018).

Next to being considered a major contributor to marine plastics, the tourism sector also continues to be confronted with the negative impacts of plastic pollution (Xanthos & Walker, 2017). Tourism is typically among the leading industries in many countries, especially islands (Bojanic & Lo, 2016). However, one of the major challenges that islands are facing is the generation of waste. This issue is compounded by land shortages, limited economic opportunities and inadequate waste management skills, all of which undermine the prospects for effective solid waste management on these islands (Wang et al., 2021). While coastal destinations with sandy beaches remain an important travel motive that attract millions of tourists annually, beaches have become sinks for litter either disposed directly on the beaches or washed onshore from the sea and inland water bodies. This creates an aesthetic issue that negatively impacts tourism (Adam, 2021), as the lack of beach cleanliness can lead to reduced tourism revenues and a loss of recreational potential of a beach (Xanthos & Walker, 2017; Zielinski et al., 2019). Furthermore, not only is the presence of litter a factor of outmost importance for the economy but also for the ecology of wildlife and the health and safety of

beach users (Corraini et al., 2018; Rayon-Viña et al., 2019, Williams et al., 2013). Therefore, local administrations, citizens and other stakeholders have an interest in making beaches as clean as possible (Rayon-Viña et al., 2019).

Worldwide, there is a growing trend in clean-up initiatives such as beach clean-ups, aimed at mitigating plastic pollution (Nelms et al., 2022). These clean-ups are described as "designed and executed practical exercises meant to remove litter from beaches" and primarily coordinated by local communities and pro-environmental organisations with interests in reducing marine pollution (Adam, 2021, p. 3). Members of civil society who are recruited by these communities and organisations volunteer their time to remove significant volumes of litter from the environment that is left behind by beach users or washed ashore by ocean currents from different parts of the world (Adam, 2021; Jorgensen et al., 2021; Nelms et al., 2022).

On the one hand, the clean-ups have been accused of being ineffective at addressing plastic pollution, as it focuses on removing marine litter instead of targeting the source (Power, 2022). Consequently, clean-ups are often considered palliative measures that are ineffective in solving the issue of plastic pollution (Jorgensen et al., 2021; Power, 2022). However, literature on the effects of beach clean-ups shows these activities do provide alternative sustainable pathways for the future (Adam, 2021). According to Power (2022), beach cleaning improves the well-being of the beach for other users and the overall contribution of beaches to coastal recreation, while also enhancing the environmental quality of the shoreline. Furthermore, beach clean-ups are argued to increase pro-environmental behaviour intention (Wyles et al., 2017). Rangeti & Dzwairo (2021) build on this by highlighting how engagement in clean-up initiatives allows citizens to play an active role in establishing both immediate and enduring solutions for their neighbourhoods. For example, clean-ups have the potential to trigger lasting shifts in behaviour and attitude, while also motivating communities to adopt good practices like reusing and recycling. These actions can significantly impact how waste is managed within a community (Rangeti & Dzwairo, 2021).

Little research, however, has been done on the wider impact of clean-up initiatives regarding the issue of marine plastic (Jorgensen et al., 2021; Wyles et al., 2017). Since people's individual behaviour – due to commonly accepted social norms and habits – are among the key factors causing plastic usage and the high volume of plastic litter in the environment (Marazzi et al., 2020), there is a need to gain a deeper understanding on the way we make, (re)use and dispose plastics in order to develop effective solutions to promote the reduction of marine plastic (Beaumont et al., 2019; Soares et al., 2021). Kandziora et al. (2019) conducted research on the role of marine debris networks in preventing and reducing marine plastic pollution. In

their research, Kandziora et al. (2019) stated that throwaway societies need to transition towards a circular one with a focus on reducing, reusing and recycling waste, to prevent and reduce marine plastic. While top-down legislative interventions can be effective in reducing plastic pollution, the absence of global unity and consistency, along with the transboundary nature of plastic marine pollution, implies that legislative interventions alone may not effectively eliminate plastic pollution. On the contrary, non-legislative interventions are argued to provide valuable and more effective opportunities for further reductions of land-based plastic marine pollution. These non-legislative interventions are also known as bottom-up approaches encompassing actions at the individual citizen-level and mid-level by NGOs or private sector (Schnurr et al., 2018).

The use of practice theory that focusses on the relation between human activity and the social structures that shape it, allow us to delve into the circular practices connected to clean-up initiatives and how these practices possibly contribute to a circular transition of the economy. Therefore, this research project aims to offer a practice-based perspective on how clean-up initiatives address the issue of marine plastic pollution, by providing insights into the role of clean-up initiatives in the transition towards a circular economy on Curaçao. This leads to the following research question that will be the focus in this study: "What is the role of local clean-up initiatives in the transition towards a circular economy on Curaçao?".

To be able to answer this question, it is important to first zoom out to get complete picture of the current waste industry and the different actors. Then, this thesis will zoom in on the practices that constitute a clean-up initiative. Finally, a zoom-out approach will used to identify how these clean-up practices contribute to a transition towards a circular economy. Therefore, this study aims at answering the following questions before drawing any conclusions on the role of clean-up initiatives in the transition towards a circular economy on Curaçao:

- How is the current solid waste industry organised on Curaçao?
- How do social practices constitute clean-up initiatives on Curaçao?
- How do clean-up practices contribute to a transition towards a circular economy on Curaçao?

Using social practice theory to delve into the connection between clean-ups and circular activities, this study contributes to academic literature that explores the broader impacts of clean-up initiatives. While research on clean-up initiatives is scarce (Power, 2022), most of the existing studies focused on the cleaning of beaches. Since this research focuses on the larger role of clean-up initiatives in the reduction of plastic pollution, it is important to not only look at the cleaning of beaches but also at the broader range of clean-up activities that are built

around the picking of litter. Therefore, the focus in this thesis will be on practical exercises meant to remove litter at the shorelines as well as inland, e.g., the cleaning of illegal dumpsites. Furthermore, by providing action points for redefining the current waste industry, this study enhances the development of effective solutions to promote the reduction of marine plastic.

The next chapter concerns the conceptual framework that defines and elaborates on the most important concepts used in this research. Following this, the third chapter consists of a detailed discussion on the methodology and the ethical considerations that have guided the research practices. Chapter 4 puts the current waste sector on Curaçao into context to examine how clean-up initiatives can be positioned within the waste sector. The fifth chapter zooms in on the social practices that constitute a clean-up initiative and the elements that form these practices. Based on this, chapter 6 zooms out on the connections between clean-up practices and circular practices, while also providing some further action points to redefine the current waste industry and stimulate a transition towards a circular economy. Finally, chapter 7 interprets the findings and provides implications, limitations and recommendations for future research. This thesis ends with chapter 8 in which a conclusion on the research questions is drawn. The reference list and appendices can be found at the end of the thesis.

2. Conceptual Framework

As this study attempts to address the role of clean-up initiatives in the transition towards a circular economy through the lens of social practice theory, this chapter highlights how the different concepts are related to each other. First, the focus is on understanding waste management as a phenomenon. After setting the scene for the analysis of the current solid waste industry on Curaçao, the conceptual framework zooms in on social practice theory as a method to approach clean-up initiatives. Part of this discussion is the compound practice approach used to identify the connections between clean-up practices and circularity. Third, the conceptual frameworks describes transition and the zooming in and out approach to understand transition from a practice perspective. Finally, this chapter ends with a section on circular economy as a concept and how waste management is an important element within circular economy. The acquired knowledge about the concepts allows the reader to understand the relationships between waste management, social practices, transition and circular economy, that is presented in Figure 2 at the end of the chapter. This provides the basis for exploring the role of clean-up initiatives in the transition towards a circular economy from a social practice perspective.

Waste Management

The expanding middle-class on a global scale is said to drive a significant increase in consumption and, consequently, the disposal of consumer goods (Romero-Hernández & Romero, 2018). Therefore, the importance of waste management has become increasingly apparent in recent years (Jagun et al., 2023). According to Amasuomo & Baird (2016), waste management is the process of collecting, transporting, and disposing of waste in a way that minimises or eliminates its harmful effects. In 2008, the Waste Framework Directive introduced the concept of waste hierarchy in the European context, that is used as a set of guiding principles to outline the best practices for managing waste (Awino & Apitz, 2024; Zhang et al., 2022). The most impactful waste management strategies, which minimise or avoid waste, result from changes in production (rethink) or consumption (reduce, refuse). Once the waste is generated, waste management strategies are prioritised from top to bottom. As Figure 1 shows, waste reduction, reuse, recycling and recovery are prioritised over controlled and/or regulated disposal. Separated waste can remain a resource through reuse and recycling or recovery, which produces organic matter or energy. In the absence of these options, waste is either disposed of in a sanitary landfill or a controlled dump, or it is openly dumped or burned without any containment or control (Awino & Apitz, 2024).

Plastic waste is managed through various methods, including those based on a linear economy and those designed for a circular economy. In a linear economic model, plastic waste is traditionally managed through three primary methods: landfilling, incineration and composting. While landfilling and incineration manage plastic waste, these methods also carry environmental risks such as soil contamination and the release of pollutants from certain waste types. Composting on the other hand, is seen as a viable option for disposing of new biodegradable bioplastics but is limited by specific conditions like humidity and ventilation. Beyond these traditional methods, other circular techniques for plastic waste management are suggested. Examples are recycling, mechanical recycling and chemical recycling (Wamba et al., 2023). Sustainable management of plastic waste requires a comprehensive approach that emphasises the reduction of plastic waste generation, the enhancement of collection services, the development of a recycling industry and ensures the safe disposal of waste in controlled landfills (Paquibut et al., 2022). According to Idumah & Nwuzor (2019), who highlighted innovative methods for transforming municipal solid waste into energy, the most effective strategy in the waste management hierarchy is waste prevention. Waste minimisation by industries is considered a strategy that comes second after waste prevention, while product reuse comes third. Key sectors crucial for sustainable plastic waste management include the government, industries and the community. While enforcing plastic bans are one way to reduce waste, governments can also implement financial incentives to alter the behaviours of consumers, retailers and manufacturers. Furthermore, they can also fund research and development of alternative materials, raise consumer awareness and involve a wide range of stakeholders in the decision-making process (Paquibut et al., 2022). Despite there has been notable progress in waste management efforts over the last four decades, more improvement in waste management practices is considered necessary (Geisendorf & Pietrulla, 2018).

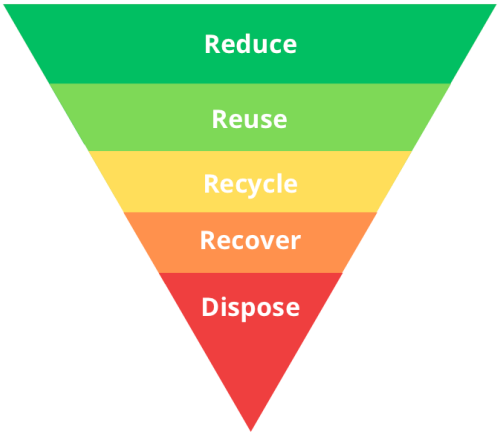

Figure 1: Waste Hierarchy

Social Practice Theory

Recently, social practice theories have become increasingly popular in understanding and explaining everyday life and social change (Laakso et al., 2022). Within social practice theory, it is argued that the social world is comprised of practices as entities. Individual agency and social structures jointly produce these practices that can be described as collective behaviours (Hargreaves, 2011; Xu et al., 2021). Social practice theory shifts focus from individual decision-making moments to the 'doing' of various social practices (Hargreaves, 2011). By exploring the processes of transformation and stability within and between social practices, Shove et al. (2012) argue that these theories of practice can be considered the first step towards understanding change. The main implication of practice theory is that changes in behaviour stem from the development of practices themselves (Hargreaves, 2011). Unlike psychological approaches, social practice theory rejects the notion of a one-way causal relationship between attitudes or values and practices. Instead, it views personal values and practices as dynamic and co-constructive; they interact with each other as personal attitudes or values can be shaped by performing a practice as well as through material and social contexts. Therefore, social practice theory allows to move beyond individual psychological factors such as attitudes, behaviour and choice (Schanes et al., 2018). The creation of more sustainable patterns of consumption is not dependent on the education or persuasion of individuals to make different decisions, but on the transformation of practices to make them more sustainable (Hargreaves, 2011). Despite the variety and complexity of environmental issues, their origins often share a common root in human behaviour, demanding large-scale changes to everyday life across all sectors of society (Hargreaves, 2011; Nash et al., 2017). As a result, social practice theory is acknowledged by policymakers, academics and advocates as a method for identifying new strategies to change behaviours that are socially harmful and environmentally damaging (Beatson et al., 2020). This explains the increased interest in using practice theories in behavioural research, particularly in studies that focus on tourism, food consumption, energy use and sustainable transport (Beatson et al., 2020; Lamers et al., 2024).

There has been a recent debate on the potential weaknesses of focusing solely on analyses of situated practices, especially when the goal is to understand and explain broader processes of social change (Lamers et al., 2016). It is widely questioned whether practice theory can develop conceptual frameworks adequate to mapping and explaining large social phenomena (Welch & Yates, 2018). A significant portion of social practice theory studies continues to focus on the micro-level of domestic everyday practices (Keller et al., 2022). Some theorists even argue that practice theory is most effective, or even exclusively applicable, to

small phenomena that are characterised by practices that are visible in immediate settings (Schatzki, 2016). This focus has drawn criticism for its perceived inability to address the broader systems and structures and as a result has recently been acknowledged and discussed within the practice theory community (Keller et al., 2022).

Although social practice theory is increasingly used in scholarly works, the existing literature shows that there is not a single best definition of what a social practice entails. One of the widely used and more elaborate definitions of a social practice is provided by Reckwitz (2002), who described a practice as "a routinised type of behaviour which consists of several elements, interconnected to one other: forms of bodily activities, forms of mental activities, 'things' and their use, a background knowledge in the form of understanding, know-how, states of emotion and motivational knowledge" (p. 249). Although this definition is helpful for theoretical clarification, it can be challenging to operationalise into designs for empirical study on social change. Therefore, this thesis is based on Shove et al.'s (2012) practical understanding of practices. Shove et al. (2012) argue how social practices are made up of three main elements that are interconnected and can be used to guide empirical studies of practices (Bachmann-Vargas et al., 2022; Standal & Westskog, 2022). These three elements are materials, competences and meanings. Materials refer to things, technologies, tangible physical entities while competences include the skills, know-how and technique involved with an activity. Finally, meanings are the symbolic meanings, ideas and aspirations related to a particular activity (Lamers et al., 2016; Standal & Westskog, 2022; Xu et al., 2021). The connections that practitioners establish or disrupt among the three different pre-existing elements characterise social practices (Bachmann-Vargas et al., 2022; Nash et al., 2017; Standal & Westskog, 2022). Whereas working with only three elements does simplify social practices and social life as Shove et al. (2012) point out, this social practice approach can be considered beneficial for organising empirical research on social change (Spaargaren et al., 2016).

Compound Practice

In his paper, Schatzki (1996) draws a distinction between dispersed practices and integrative practices. While integrative practices entail a set of habitual routine or multiple actions shaped by histories and culture (e.g. farming and cooking practices) and occurring in a bounded space and time, dispersed practices as following rules and explaining focus on a single type of action that is not guided by rules or norms but individuals' understanding (Harries & Rettie, 2016; Jin et al., 2022; Laakso et al., 2022). Furthermore, dispersed practices circulate through various aspects of social life and through many integrative practices. Unlike integrative

practices, dispersed practices usually lack teleo-affective structures (e.g., goals, tasks, purposes, beliefs, emotions and moods) or specific rules. Instead, they rely on the teleo-affective structures and rules of integrative practices they are part of (Harries & Rettie, 2016).

Warde (2013) builds on the distinction of Schatzki (1996; 2013) between dispersed and integrative practices. According to Warde (2013), some practices such as food consumption can neither be considered a dispersed nor an integrative practice. Instead, Warde (2013) argues food consumption takes place at the intersection of multiple dispersed and integrative practices: the supplying of food, cooking, organising meal occasions and providing aesthetic judgements of taste. Therefore, eating can be considered a compound practice "formed from the articulation of different practices" (Warde, 2016, p. 86). The compound practice approach is known to have a few advantages. For example, considering the practice of eating as a compound practice makes it systemic nature, from production to waste management, more visible. Additionally, the compound practice approach highlights how the meanings, materialities and competences tied to the practice are connected with wider societal frameworks beyond the daily performance of eating (Laakso et al., 2022). For these reasons, the compound practice is considered an interesting approach in this research to look at the connections between clean-up and circular practices and identify social changes on a larger scale.

Transition

The growing and ongoing global crises, including climate change, resource depletion and increasing social inequality have sparked interest in science and policy aimed at systemic societal change. Subsequent calls for transition reflect the growing consensus that the status quo is inadequate for maintaining humanity within a safe operating space (Hölscher et al., 2018). A range of research approaches has emerged to understand, analyse and support societal transitions. In these approaches, the terms transition and transformation are often used interchangeably to describe radical, non-linear and structural changes in complex adaptive systems (Feola, 2015; Patterson et al., 2016). The term 'transition' is particularly used by the sustainability transitions research community to denote fundamental social, technological, institutional and economic change from one societal regime or dynamic equilibrium to another (Hölscher et al., 2018; Loorbach et al., 2017). An enduring debate revolves around the question of whether the emphasis in academic literature should be placed on social transformations or transitions. Proponents of both perspectives concur that social change is characterised by non-linear patterns and involves complex systems, multiple actors and a far reaching break with

former practices, common understandings, norms and traditions (Freyer & Bingen, 2012; Keller et al., 2022). However, as Hölscher et al. (2018) argue, the term transformations refer to large-scale change processes in whole societies that can be global, national or local and include interacting human and biophysical system components. Meanwhile, transitions tend to concentrate on changes within specific subsystems (e.g., mobility, energy) while focusing on social, technological and institutional interactions (Hölscher et al., 2018). In this research, the term transition will be used to describe the processes of change, given the focus on changes within waste management practices.

Due to the emphasis on integrated sustainability challenges and the practical approach of transition research, the natural interplay between science and policy has resulted in a continuously co-evolving theory and practice of transition management. The management of transition is defined as a deliberative process aimed at influencing governance activities to expedite change toward sustainability goals (Loorbach & Rotmans, 2010). There are a few characteristics that form the management of transitions. First of all, it deals with long-term thinking (at least 25 years) as a framework for shaping short-term policy. Other characteristics are a focus on learning and thinking in terms of more than one domain and different actors at different scale levels. Finally, transition management aims at keeping a large number of options open and bringing system innovation as well as system improvement (Rotmans et al., 2001). The core concept of transition management is to foster a societal movement by forming new coalitions, partnerships, and networks within arenas that generate ongoing pressure on the political and market spheres, ensuring the long-term direction and objectives of the transition process towards sustainability ambitions are maintained (Loorbach & Rotmans, 2010).

Using Practice Theory to Understand Transition

Over the preceding decades, scholars in the field of social science have increasingly embraced the social practice perspective within their research and publications, with a primary focus on comprehending and guiding social and environmental harm reduction through changes in daily activities (Parekh & Klintman, 2021). As existing literature mostly focuses on change processes related to energy-, transport- and food-related practices, there is a need for the application of practice theory to change processes in other research areas (Twine, 2017). Rather than prescribing specifically how social change processes occur, practice theory can be considered an approach that opens up new possibilities for the conceptualisation of social change (Shove, 2010). While practice theories in the past have mainly been seen as relevant for the study of small social phenomena such as daily routinised activities, practice theorists and

practice-based researchers as Nicolini (2012) and Schatzki (2016) have been theorising how to analyse large scale social phenomena from a practice perspective (Lamers et al., 2016). As these large social phenomena exists of complex nexuses of practice bundles, they are not directly accessible through experience, participation and observation (Schatzki, 2016). Instead, Schatzki (2016) proposes using the overview' mode to track large scale changes from a practice perspective. The 'overview' mode involves two main elements. First, it monitors the combination of movements within series of practices that have influenced the patterning in time and space. Second, it demonstrates how the causal nexus worked in particular significant practices or in, and between, practice bundles (Lamers et al., 2016).

In the same way, Nicolini (2012) proposes an approach that involves 'zooming in and out' to explore the complex nexuses of practice bundles. The technique of zooming in focuses attention on the details of the accomplishment of a practice to document the dynamics and effects of local practices (Ulug et al., 2021; Xu et al., 2021). By zooming in at practices, a deeper understanding of the performance within single practices is aimed, exploring their internal variations including elements, as well as spatial, temporal and social dimensions (Castelo et al., 2021). By getting engaged and becoming submerged in the practices, one is able to experience first-hand what it is like to be participant to the practice (Spaargaren et al., 2016). Zooming out, on the contrary, focuses on the connections between practices to explore the various connections single practices have to other practices as complexes, bundles and nexuses. Additionally, it delves into the role of external contexts influencing those dynamics (Castelo et al., 2021). In other words, zooming out allows for a deeper analysis by recognising the association and effects between practices in a wider network and thus identify and map interconnected practices and bundles of practices (Nicolini, 2012; Schatzki, 2006).

Considering social practices as the entities of social life, large scale social changes should be seen as a series of connected changes that happen to the practices of the more extensive bundles they are part of. Similarly, the cause of any large social change should be found in the multitude of causes of smaller changes in these practice-arrangement bundles (Schatzki, 2016). Nonetheless, it is important to acknowledge that macroprocesses can also influence these mechanisms as they may alter, redirect, constrain, emphasise, expand or delimit the causal interconnections between practices (Lamers et al., 2016). Therefore, when studying social change through the lens of practice theories, researchers are encouraged to use their analytical lens in a zoomed-in and zoomed-out position (Spaargaren et al., 2016). Within this research, the zooming in and out approach is used to connect social practices to the larger concepts of compound practices, the waste industry, transition and circularity.

Circular Economy

From the late 1970s on, the idea of a circular economy (CE) has been steadily gaining traction as a response to the unsustainable, conventional 'take-make-dispose' economic model (Geissdoerfer et al., 2017; Salmenperä et al., 2021). It is considered as an operationalisation for businesses to put into practice the widely discussed idea of sustainable development, which has been criticised for its lack of specificity. As a result, circular economy has become of great interest to both scholars and practitioners (Kirchherr et al., 2017). Geissdoerfer et al. (2017) define the circular economy as "a regenerative system in which resource input and waste, emission and energy leakage are minimised by slowing, closing and narrowing material and energy loops. This can be achieved through long-lasting design, maintenance, repair, reuse, remanufacturing, refurbishing, and recycling" (p. 759). Unlike the linear economic model, the circular economy prioritises the reuse, remanufacturing, refurbishment, repair, cascading and upgrading of products, components and materials. Furthermore, it also places a significant focus on harnessing solar, wind, biomass and energy derived from waste within the entire product value chain and through the cradle-to-cradle life cycle (Korhonen et al., 2018). While the concept of CE thus relates to the circular handling of material and energy flows, this thesis with its focus on marine plastic approaches circular economy by the solid waste system.

Circular Economy and Waste Management

At present, the global economy has been estimated to be less than 10% circular (de Wit et al., 2018; Haas et al., 2015), with a predominant focus on the management of linear material flows (Govindan & Hasanagic, 2018; Taelman et al., 2018). Recent research by Salmenperä et al. (2021) indicated the transition from linear to circular systems is limited on a global scale. This suggests that current waste management practices do not fully align with the principles of the CE concept, and innovative approaches for waste treatment and utilisation remain unidentified (Salmenperä et al., 2021). Nonetheless, waste management is recognised as a crucial factor in the shift towards a circular economy (Fellner et al., 2017; Nowakowski & Mrówczyńska, 2018), where the focus is on preserving the value of materials at every stage in a product's lifecycle, reducing waste generation and eventually closing the loops of materials through high-value recycling (Salmenperä et al., 2021).

In academic literature, CE mainly emerges through the so-called 3R's principles: Reduction, Reuse and Recycle. Through the adoption of improved technologies, the creation of more compact and lightweight products, streamlined packaging, the development of more

efficient household appliances and the promotion of a simpler lifestyle, the reduction principle seeks to decrease the use of primary energy, raw materials and waste through the improvement of efficiency in production and consumption processes. The reuse principles refers to any operation through which products or components that are not considered as waste, are used again for their original intended purpose. Finally, the recycle principle is used to refer to any process in which waste materials are converted into products, materials or substances (Ghisellini et al., 2016).

According to Kandziora et al. (2019), the shift from a traditional linear society towards a circular economy is considered to contribute to waste management issues like marine plastic. In line with this, Syberg et al. (2021) argue that the contribution of single-use plastics products to plastic pollution make the shift to a circular economy the most effective solution to address the issue. The circular plastic economy offers a viable alternative to the current linear model, where plastic is produced, used, and discarded. Its goal is to enhance the amount of plastic that is reused or recycled back into the system (Johansen et al., 2022).

However, some critics of plastics argue that the circular economy might distract from addressing the root causes of pollution and plastic consumption, which have a destructive effect across the earth. They advocate for movement beyond the call to recycle and focus more on the reduction and phasing out of plastics (Babaremu et al., 2022). Furthermore, research on modelling the Dutch post-consumer plastic packaging recycling system by Brouwer et al. (2018) highlights that packaging and other post-consumer plastics often compose of multiple polymers. This makes recycling challenging both technically and economically. Therefore, the transition to a circular economy cannot be accomplished solely through modifications in the waste-handling system; it must also involve changes across other parts of the value chain, including design, production and various usage phases (Brouwer et al., 2018). As an example, low and middle-income countries have adopted solutions from the circular economy as waste separation at the source, increased resource awareness, the emergence of recycling innovations and small scale plastic recycling initiatives. Despite being in the early stages, these solutions offer promising advantages (Pagliario, 2020). To support similar transitions, the development of a comprehensive knowledge base with a focus on studying the entire plastics value chain to explore how to design, produce, use and recycle plastics within a circular economy, is considered necessary (Johansen et al., 2022).

Currently, existing research predominantly focuses on the ‘end-of-life’ phase, focusing on enhancing recycling and recovery of plastic waste (Johansen et al., 2022). For example, research by Allwood et al. (2011) and Kirchherr et al. (2017) has shown that much policy on a

circular economy has been oriented towards promoting recycling. However, it is important to emphasise that recycling might be the least sustainable option when considering resource efficiency and profitability in comparison to the other CE's principles. For example, recyclability is constrained by natural limitations, material complexity and misuse. Finally, as reduce and reuse predominantly operate at a local or regional scale, this allows for the avoidance or reduction of packaging, transport costs and transaction costs. Recycling, on the other hand, functions on a global scale and works following the principles of industrial production (Ghisellini et al., 2016). While academic research on CE has been growing with numerous reviews dedicated to exploring this subject (Geissdoerfer et al., 2017), the concept and its practice have almost exclusively been developed and led by practitioners as policymakers. Scientific research on CE therefore still remains largely unexplored (Korhonen et al., 2018).

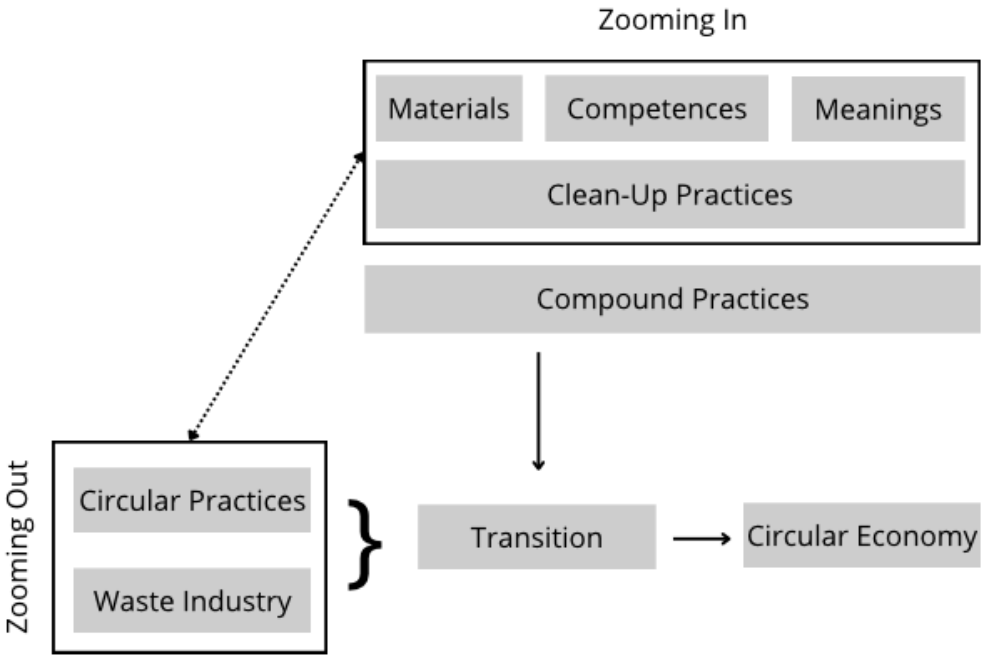

Figure 2: Conceptual Model

3. Methodology

To identify the role of clean-up initiatives in the transition towards a circular economy on Curaçao, data is collected using desk and field research from 14 March 2024 to 25 April 2024. During field research, primary methods as participant observation and interviewing are used. This section elaborates on the different methods, the ethical issues that were considered how the findings were analysed to be able to draw conclusions from the findings.

Research Design

This study is based on a qualitative approach. Qualitative research is characterised by an interpretative paradigm, which emphasises the meanings of social phenomena as experienced by individuals themselves, in their natural context (Grossoehme, 2014; Snape & Spencer, 2003). Besides the interpretation of subjective meaning, qualitative research ought to prioritise the depiction of social context and the privileging of lay knowledge (Fossey et al., 2002). Therefore, this type of research is known as providing in-depth information and detailed understanding into human behaviour, emotions, attitudes and experiences (Mohajan, 2018; Silverman, 2016), which is a prerequisite in order to identify how clean-up initiatives possibly contribute to a circular economy from a social practice perspective.

Case Study

Since Curaçao lacks a comprehensive national solid waste management framework (Clayton et al., 2021; Mol & van Vliet, 1997), plastic waste is disposed of in the landfill, dumped illegally in the environment or ends up in the ocean where it continues to fragment into microplastics. Given the country's heavy dependence on beach-based tourism, this can lead to unsustainable situations for revenue, employment, and fish consumption (Clayton et al., 2021). Furthermore, according to Steenhagen & Vijber (2024) who conducted a gap analysis on Curaçao's current institutional framework regarding plastic pollution, the landfill at Malpais can be considered the main infrastructure asset for Curaçaos solid waste management. However, the landfill is almost at its maximum capacity and has a remaining lifespan of 3-8 years (Steenhagen & Vijber, 2024). For these reasons, waste management had been identified as a critical and urgent priority in the National Development Plan and the National Report of Curaçao (Adshead et al., 2018).

Various stakeholders have come to the realisation that the current waste sector is perhaps unable to manage the waste-related issues by themselves (Fuldauer et al., 2019). Therefore,

‘circular economy’ is explored and used as a tool to promote a transition in the current waste industry (Fuldauer et al., 2019; Ministerie van Economische Ontwikkeling & Curaçao Doughnut Economy Taskforce, 2021). Waste management currently necessarily needs to include measures such as prevention, awareness and recycling. According to a report by Adshead et al. (2018) estimating Curaçao’s future infrastructure needs for energy, water, solid waste and wastewater services, plastic waste minimisation strategies are being employed on Curaçao. Their effectiveness however is limited, as will be further discussed in chapter 4. A lack of public awareness of the impending waste problem continues to be a significant challenge to successful waste management on Curaçao. Furthermore, expanding recycling activities on a large scale could potentially address Curaçao’s waste issue by redirecting substantial amounts of material away from the landfill (Adshead et al., 2018). There is a considerable number of organisations that aim at solving the problem of plastic pollution on and around the island and raising awareness among Curaçaoan citizens by the means of local clean-up events (Curaçao Clean Up, 2016; Green Phenix, 202b; Kaya Tene Kòrsou Limpi, personal communication, April 12, 2024; Kunuku Man, n.d.; Limpi, personal communication, March 21, 2024). However, what remains questionable is if and how these clean-up initiatives can be considered part of a larger, much-needed transition towards a circular economy on Curaçao.

Data Collection

Various methods have been used to answer the different research questions that are central in this thesis. First of all, desk research has been used to gather information on the current waste industry on Curaçao, clean-up practices, circular economy, and waste management. Desk research can be defined as the “process of collating and coding existing information for analysis, without direct contact between researchers and research participants” (Hoover Green & Cohen, 2021, p. 2). One of the biggest advantages here is the fast and often easy access to relevant information (Hox & Boeije, 2005). Examples of sources used for the collection of secondary data are reports on the waste management and waste sector of Curaçao, and websites of clean-up organisations and waste management actors such as recycling organisations and the public waste company Selikor.

Additionally, participatory observation has been used to support the data that is collected by desk research. Observation methods require the researcher to seek out individuals in their own surroundings and to take part of their ways of life (Zahle, 2012). This is done by simultaneously observing and documenting interactions and what and how people are doing in

the specific context (Ciesielska et al., 2018). As a result, the researcher is able to gain in-depth knowledge of the social practices that occur in an environment (Uldam & McCurdy, 2013).

Furthermore, data collected from desk research and observations formed the basis for conducting interviews with clean-up participants and organisers, a research institute and actors in the waste industry. For these interviews, two different methods were used. Clean-up participants were interviewed using a go-along approach. This approach allows research and participants to jointly explore a meaningful research setting while carrying out the study interview (Berg et al., 2023; Moran et al., 2022). Compared to participant observations that arise merely from coexisting in a space, the go-along interview method distinguishes itself by being more engaged, both with the participant and the leisure setting. In this interactive approach, the emphasis is not solely on asking the "right questions" but on generating comprehensive data through collective exposure to a multisensory environment and interaction within that context (Moran et al., 2022). Moreover, go-along interviews allow researchers to observe participant's spatial practices in their actual settings, while accessing their experiences and interpretations and gaining insights into motivations and concerns (Castrodale, 2018; Moran et al., 2022). All other interviewees, who were less dependent on the context, were interviewed in a more private setting, using a traditional one-to-one semi-structured approach where predetermined questions can be modified for each participant which allows the generation of in-depth data (Adler & Clark, 2014).

To guide the interviews, topic guides for clean-up participants, organisers and other actors in the waste industry were developed. Examples of subjects discussed in the interviews are clean-up practices, the organisation of clean-up initiatives and waste processing activities, depending on the interviewee. More information on the different subjects per interviewee can be found in the Appendices.

Sampling Method and Sample Size

In-depth information is gathered through participation in five clean-up initiatives by three different organisations. While participating in the clean-ups, attention was mainly paid at appearances, behaviour, interactions, group dynamics, conversations, practices and attitudes. Not only are these factors observed during participation, but also during the interviews with participants, organisers and other important waste management actors. Through these observations, data on clean-up practices, the social context of clean-ups and the position of clean-up initiatives in the current waste sector was collected. To add to the latter and gain information on the circularity of plastic waste, observations focused on waste management

practices, tools and knowledge/skills while visiting three waste management and/or recycling companies and organisations. Finally, to get a complete picture of the issues concerning plastic pollution on Curaçao, the current waste sector and waste management practices, eight other observations were done. These were carried out at recycling stations, supermarkets, take-away food vendors, a primary school that has an art project in collaboration with a clean-up initiative and the marine education center of research institute CARMABI.

A total of eight semi-structured interviews were carried out. Five of these interviews were with clean-up organisers Curaçao Clean Up, Kunuku Man, Kaya Tene Kòrsou Limpi, Green Phenix and Limpi. The latter two also known as plastic waste recyclers. Furthermore, interviews were conducted with CARMABI, recycling organisation Green Force, waste management company Selikor and the foundation Green & Clean Curaçao Now who, during the interviews and desk research, came forward as important stakeholders.

Participants for the go-along interviews were recruited through participation in the clean-up activities organised by Green Phenix, Kunuku Man and Limpi. This research made use of convenience sampling to select the research participants, meaning that participants were recruited because they were available, willing to participate in the thesis study and easily to contact (Palinkas et al., 2015). Every clean-up volunteer was seen as a possible participant in the research. While selecting participants, characteristics as age and gender do were considered so the research sample represents the larger population. To collect sufficient data, this research aimed at interviewing 15 participants in clean-up activities organised by the three different organisations on Curaçao. However, saturation has been used as a guiding principle for assessing the adequacy of purposive samples. Research by Hennink & Kaiser (2022) identified multiple articles to assess saturation, and found out studies using empirical data reached saturation within a narrow range of interviews (between 9-17 interviews). After interviewing 11 participants, no new information was gathered. Saturation was reached and therefore no more interviews with clean-up participants were carried out.

Data Analysis

The different data collection methods resulted in findings that all have their own structure. Desk research has resulted in written findings. In the case of participatory observations, no notes were taken to be able to immerse oneself in the situation. Instead, a field report was written that included the findings of the observations. In the process of writing, employing strategies such as description, dialogue and characterisation allow the writer to

vividly portray an observed moment by incorporating compelling details. Using these three strategies, the researcher illustrates fundamental scenes through sensory details, captures dialogue and conversations, and portrays individuals they come across (Emerson et al., 2011). Together, these observations formed a field report. Furthermore, interviews were recorded and transcribed to transform the recorded audio into written text.

The written findings from desk research, transcripts from interviews and field reports from observations were analysed using thematic analysis. Thematic analysis assumed that the recorded messages (i.e., the texts) as the data. During a detailed examination of these texts, the researcher develops codes, that typically consists of words or short phrases, as prominent themes emerge inductively from the content (Neuendorf, 2018). Guided by the research question, the development of codes allow the transformation a large amount of text into an organised and concise summary of set of themes. To ensure internal validity of the results, a full thematic analysis was run again, and the results were compared to existing literature. This way, the key features of the collected data can be identified and interpreted (Clarke & Braun, 2017; Erlingsson & Brysiewicz, 2017).

Ethical Considerations

Several measures have been taken to ensure an ethical research while guaranteeing principles as informed consent, anonymity and confidentiality. As long as data is publicly accessible on the internet, further use and analysis are permitted, provided that the original data's ownership is properly credited (Tripathy, 2013). Using desk research to collect data, privacy is considered by making sure the data that is gathered online and used in this research does not contain any personal or sensitive information.

Fisher and Anushko (2008) assert that research participants must be provided in advance with any information about the study that might affect their decision to participate. In the case of participatory observations, information on the purpose of the study and the use of the results was shared with the clean-up participants beforehand. It was also made clear that a field report would be written on the basis of the observations. Participants were given the opportunity to ask questions and to object. To ensure that participants are not placed at undue risk by the research, no personal information was revealed in the field report and thesis.

Interviewees were provided a consent form that explained the purpose of the study, and use and storage of the collected data. Included in the consent form was the permission to audio record the interview, take and use pictures and to refer to the company or organisation within

this thesis study. During the interviews with the organisations, it was recognised that there is a sense of competition between some of the clean-up organisations. Although interviewees from the different organisations gave permission to use their personal names in the report, it was decided to only refer to companies and organisations instead of persons to safeguard the participants' privacy and protect their personal information (Wiles et al., 2008). Additionally, the participants of the clean-ups that have been interviewed will remain anonymous. Results of the interviews show that joining clean-up initiatives is a rather unpopular activity among the Curaçaoan population and sometimes causes tensions among inhabitants (CARMABI, personal communication, April 9, 2024; Kunuku Man Clean-up, participant observation, April 7, 2024; Participant 4, personal communication, April 14, 2024). Finally, particular attention was given to ensuring the participants' comfort during the interviews. Prior to the interview, participants were informed that they were able to withdraw from participation, leave questions unanswered, and were given the opportunity to ask me questions during and after the interview.

Considering data management, the data collected in this research is stored on and external hard drive and the cloud storage platform OneDrive. This includes recordings of the interviews, as well as the transcripts and other data in written form. While the external hard drive is password protected, two-step verification is used to ensure the data on OneDrive is secured and no other than the researcher can access the data. Furthermore, the results are only used for the goals of this study. The information will be stored in accordance with the rules for research data management at Wageningen University for a period of ten years.

4. Current State of the Waste Industry

This section describes how waste is currently being managed on the island by highlighting the different actors and their practices within the waste sector. The information that is used in this chapter is mainly gathered through desk research and supported with collected data from the interviews. By identifying the different ways how plastic ways is managed, this chapter provides the context for clean-ups and their position within the current solid waste industry on Curaçao.

The Government

Due to its major challenges in relation to plastic pollution, waste management has been highly prioritised in both the National Report of Curaçao and the National Development Plan 2015-2030 (Adshead et al., 2018; Fuldauer et al., 2019). The governmental department responsible for waste management and related policies on Curaçao is the Ministry of Health, Environment and Nature (GMN) (Steenhagen & Vijber, 2024). For the Third International Conference on Small Island Developing States in September 2014, Curaçao prepared the National Report of Curaçao to review 14 different priority areas, including the management of wastes (Government of Curaçao, 2014). The report that is based on a study by Thierry Apoteker Consulting states how Curaçao has devoted much time and resource on the development of regulations considering waste management (Government of Curaçao, 2014).

Currently, article 20 of the *Landsverordening Openbare Orde* or *National Ordinance Public Order* states that "it is prohibited to dispose of waste or remains of food, containers, paper or other objects or to lay down, throw or leave substances visible on or near the public road" (Landsverordening Openbare Orde, 2015, p. 8). Before Curaçao became an autonomous country within the Kingdom of the Netherlands on October 10, 2010, the *Servisio pa Kòntròl i Seguritat* or *Control and Security Service*s held responsibility for overseeing and ensuring adherence to a range of environmental laws, which encompassed the imposition of fines for offences like illegal waste dumping. However, the laws related to this monitoring and enforcing responsibility were not transferred during the autonomy transition (Caribisch Netwerk, 2014; Steenhagen & Vijber, 2024). Moreover, Article 3 of the *Landsbesluit* or *National Decree* mentions that it is prohibited to commence, carry out or expand environmentally harmful activities. These environmentally harmful activities are described as "any activity undertaken by human activity or action that, whether or not tied to a fixed location, has a commercial character or can be regarded as such, and may result in danger, damage or nuisance to the

environment" (Landsbesluit, 2017, p. 2). According to Article 46 of the *National Decree* anyone who conducts contrary to the prohibition stated in Article 3 shall be punished with a prison term of not more than two months or a fine (Landsbesluit, 2017). However, since these penal provisions only refer to activities with a commercial character, the imposition of fines or prison term cannot be used for the illegal dumping of household waste. Due to the absence of specific laws that impose fines for this type of waste dumping, the government is currently unable to act against households that illegally dump their waste in the environment (Caribisch Netwerk, 2014; Steenhagen & Vijber, 2024). However, the effectiveness of these regulations and other waste minimisation strategies can be questioned because of the inadequate institutional and human resource capacities to enforce them (Adshead et al., 2018; Luff et al., 2013).

Additionally, during the autonomy transition in 2010, Curaçao also bid farewell to the *Afvalstoffenverordening* or *Waste Disposal Ordinance,* which contained rules about the processing and disposal of different types of waste (Drayer, 2021). While the government has plans for recycling and several non-governmental initiatives facilitate small-scale alternative waste management systems for voluntarily recycling, there is currently no mandate for separating recyclables at the source. The efforts of the government predominantly prioritise waste collection and disposal over prevention and recycling (Steenhagen & Vijber, 2024).

Considering plastic waste, Curaçao's legislative framework lacks any provisions specifically targeting the prevention of plastic pollution (Steenhagen & Vijber, 2024). However, Curaçao's Ministry of Health, Environment and Nature has recognised the need to include measures that prevent the generation of plastic waste (Adshead et al., 2018). Currently, numerous environmental regulations are drafted, among which is the *Kaderwet Milieu* or *Environmental Framework Law.* The existing draft includes clauses prohibiting the manufacture, importation, storage and sale of products made from oxo-degradable plastic and expanded polystyrene (styrofoam). Moreover, it provides flexibility to regulate the usage of certain plastics, such as biodegradable plastic and suggests the implementation of a ban on complimentary plastic bags (Antilliaans Dagblad, 2022; Steenhagen & Vijber, 2024).

On 22 March 2024, the Parliament of Curaçao approved the long-awaited *Lei di Plèstik* or *Plastic Law.* The law, awaiting official publication by the government, sets a period of nine months after which the use of foam containers, foam and plastic cups, plastic cutlery and plastic bags will be prohibited. An exception will be made for biodegradable plastic bags, which are considered a more environmentally friendly alternative (Antilliaans Dagblad, 2024c; Curaçao.nu, 2024; NU.cw, 2024). At the same time, a motion was adopted advocating a national strategy for the recycling of plastic products. An example referred to within the motion that has

passed in January 2024, is the call for the government to do everything possible to introduce a deposit system, which will encourage recycling in the community (Antilliaans Dagblad, 2024c; NU.cw, 2024). Although the implementation of a single-use plastic ban for Curaçao represent significant strides in the issue of plastic pollution, it will not be enough to fully address Curaçao's plastic pollution issues (Curaçao.nu, 2024; Steenhagen & Vijber, 2024). Initiator of the law and member of the Parliament, Giselle Mc William emphasises that this law should be seen as a first step and calls for more environmental stewardship (Curaçao.nu, 2024).

Selikor

Selikor, as a government-owned company is responsible for the collection, transporting, and further management of the municipal waste streams (Adshead et al., 2018; Government of Curaçao & UNDP, 2015). After functioning as a government waste collection department for two decades, Selikor has become a limited liability company in 1996 (Selikor, 2024f). From that moment on, the company divided its main activities over two different branches: municipal and commercial waste management (Selikor, 2020). On a commercial basis, Selikor provides a range of waste management and disposal services to local businesses (Selikor, 2024b). This involves the collection and transportation of waste as well as the rental of equipment such as containers and trash compactors (Selikor, 2024b; 2024c, 2024j). Next to this, Selikor also carries out municipal waste management which is based on an agreement with the government. As the cornerstone of its environmental policy, the government follows the economic concept of 'polluter pays'. This principle holds that every polluter is financially responsible for managing and disposing of the waste that is produced by the polluter. Therefore, each household monthly pays ANG 35,00 for the collection, transporting and processing of waste (Selikor, 2020). For the collection of waste, each household is provided with a free garbage container which is weekly put at the curbside for the pick-up of waste (Selikor, 2024h).

The main infrastructure asset for solid waste management on Curaçao is the 45-hectare sanitary landfill at Malpais that is managed by Selikor (Adshead et al., 2018; Fuldauer et al., 2019). All the gathered waste is transported straight from its origin to either the Malpais landfill or at Selikor's Koraal Specht transfer station. This latter station is used as an intermediary waste depot to save time in transportation and enhance operational efficiency. Once capacity at the transfer station has reached, the waste is transported to the landfill (Selikor, 2024a). However, a change in this waste management system has become necessary as the landfill at Malpais has

a remaining lifetime estimated at around ten years (Antilliaans Dagblad, 2024c; Breukink, 2023; Government of Curaçao & UNDP, 2015).

Selikor has been involved in recycling practices on the island in the past, for example the cleaning of illegal dump sites and educating the community on waste generation (Fuldauer et al., 2019; Selikor, 2024e, 2024g; Steenhagen & Vijber, 2024). However, these activities also have been paused due to the lack of financial resources (Selikor, personal communication, April 12, 2024). Moreover, another sustainable initiative of Selikor is the *Milieustraat* or *Environment Street*. This is a waste drop-off center where households are able to deposit their sorted recyclable waste in a responsible manner (Selikor, 2024i). The use of the drop-off center is free if the waste is separated. Waste that is not sorted before depositing as well as types of waste that are not accepted at the center, must be disposed at the landfill following standard regulations and procedures. For households, there is a maximum of 2000 kilograms that can be deposited at the landfill for free per year (Selikor, 2023; 2024d). Nevertheless, depositing waste at the drop-off center is done on a limited scale and due to financial challenges, there is no supervision making sure that the waste is well separated (Selikor, personal communication, April 17, 2024; Steenhagen & Vijber, 2024).

The reason for the shortage on financial resources can be traced back to the partnership between the government and Selikor. While the government has appointed Selikor as the sole entity responsible for the collect and processing of municipal solid waste (Steenhagen & Vijber, 2024), the public services provided by Selikor depend on the available government budget (Selikor, 2023). Previously, Selikor had the authority to issue a final settlement if the expenses for cleaning activities exceeded the predetermined budget. However, taking several measures to reduce its expenditures due to a deterioration of the government finances, the government of Curaçao aims to depart from this contract that was developed in 1996 (Antilliaans Dagblad, 2024b; Selikor, 2023). As a result, the annual prepayment of the government has decreased from ANG 27 to 22 million over the past five years. Furthermore, given Curaçao's current challenges in waste management and the frequent complaints received by the Ministry regarding litter, there has been a heightened focus on optimising waste management efforts since last year (Antilliaans Dagblad, 2024b).

Related to these waste management optimisation efforts, Selikor has received ANG 1.400.000 from the European Union under the Caribbean program Resilience, Sustainable Energy, Marine Biodiversity (RESEMBID). With this money, Selikor launched the *Transforming waste to value* project, which started in January 2024 and will continue until March 2025. First, a study has been conducted on the characteristics of the generated waste to

obtain detailed data on the volumes, composition, and nature of solid waste on Curaçao. The results of this study show that next to paper/cardboard, plastics are the second biggest waste category that is collected and received at the Malpais landfill (EcoVision, 2024).

Within the same project, a study will be conducted on potential treatments for the different types of waste, including composting, recycling of glass and cardboard, and potentially energy generation through incineration (Antilliaans Dagblad, 2023b; 2023c). The goal of this project is to create a waste management system that is circular, sustainable, and valuable (Steenhagen & Vijber, 2024). This will be combined with an educational campaign, ensuring that the population becomes conscious of sustainable waste management and raising awareness about the opportunities for reuse and recycling (Antilliaans Dagblad, 2023c).

Private Companies and Organisations

It is crucial to acknowledge that the issues with plastic pollution are primarily a consequence of extensive production and distribution of plastics, rather than solely from consumer behaviour. Therefore, the focus should also be on stakeholders throughout the supply chain, including producers, manufacturers, importers, exporters, distributors, and retailers (Steenhagen et al., 2023; Steenhagen & Vijber, 2024). Most companies that continue to import plastic products from internationally based businesses are gradually beginning to show concern for the issues related to plastic waste. In 2008, there was a significant development when the island's major supermarkets participated in a nationwide campaign in which they voluntarily agreed to stop using plastic bags at the checkout and required customers to bring their own shopping bags. The supermarkets had paper bags available for purchase for customers who did not bring a bag with them (Drayer, 2008; Government of Curaçao, 2014). However, as Steenhagen & Vijber (2024) state, most local and smaller supermarkets on Curaçao still provide their customers with single-use plastic bags due the convenience they offer. Moreover, supermarkets frequently have longstanding partnerships with suppliers of single-use plastic bags and given the profit-driven nature of these companies, a voluntary stop on the import of single-use plastics does not align with their business objectives. The reluctance of both local supermarkets and consumers to embrace more environmentally friendly alternatives, like the initiative to bring their own grocery bag, can be attributed to a phenomenon known as "lock-in". Elements as consumers preferences, markets, production patterns and cultural meanings function as a lock-in mechanism, keeping the current system dominant and stable while also making system changes complex and challenging to direct toward a sustainable future (Deleye

et al., 2019). Another example are the small food and drink vendors so-called *truk'i pans* across the island, which offer refreshments and snacks mostly served in foam boxes and plastic containers. While green alternatives are emerging in the supply chain, the market mechanisms make it challenging to achieve a plastic-free environment (Steenhagen & Vijber, 2024).

Nevertheless, a range of NGOs, businesses and volunteer groups have become committed to the protection of the environment and the recycling of waste (Government of Curaçao, 2014; Government of Curaçao & UNDP, 2015). For example, multiple public awareness programmes have been developed and waste drop-off centres have been established by these stakeholders where households can bring their plastic waste and aluminium cans (Government of Curaçao, 2014; Steenhagen & Vijber, 2024). Furthermore, these organisations and businesses are also active in community recycling (Government of Curaçao, 2014). One of the largest commercial recyclers is Green Force, a recycling and environmental company that focuses on the export and recycling of plastic bottles and aluminium cans (Adshead et al., 2018; Government of Curaçao & UNDP, 2015; Steenhagen & Vijber, 2024; Green Force, personal communication, April 9, 2024). Another example is Green & Clean Curaçao Now (GCCN). The foundation aims to raise awareness among the public and promote a conscious waste management by collecting recyclables during events on the island. As GCCN is still in a starting phase, the collected waste is kept in a storage room until the foundation has found sustainable ways to process the waste (Antilliaans Dagblad, 2023a; GCCN, personal communication, April 9, 2024). Other companies like Green Phenix, Limpi and FUSE turn collected plastic waste into valuable resources and products (Steenhagen & Vijber, 2024).

The report of the United Nations Office for Project Services emphasises that the expansion of recycling efforts on a large scale could effectively address Curaçao's waste issues by directing significant volumes of material away from the landfill. Yet, commercial recyclers have highlighted financial obstacles hindering the expansion of recycling capacity to the extent necessary for meeting the island's long-term waste management demands (Adshead et al., 2018). Although there are governmental plans for recycling (Steenhagen & Vijber, 2024), these non-governmental initiatives can be considered the most active players involved in recycling. However, as long as governmental efforts predominantly prioritise the collection and disposal of waste rather than focusing on prevention and recycling measures, local initiatives as Green Force, Limpi, Green Phenix and FUSE will continue grappling with limited funding, capacity, and the absence of regulation (Steenhagen & Vijber, 2024).

Citizens

There is no system for residents of Curaçao to separate waste at home prior to the collection by Selikor. Consequently, all waste is mixed in the garbage trucks as well as on the landfill. While it is possible for residents to deposit their sorted waste in a responsible manner at the *Environment Street,* the drop-off center is currently used sparingly (Fuldauer et al., 2019). Reasons are that not many people are aware of the ability to dispose their sorted waste at Malpais, and most of the population does not have transport to bring their waste to the drop-off center (Antilliaans Dagblad, 2024d). Furthermore, landfill users who do not reach the maximum quota of waste that can be deposited for free at Malpais lack incentive to separate their recycles at the drop-off center instead of deposing it at the landfill (Fuldauer et al., 2019).

A lack of public awareness regarding the impending waste issue resulting from the Malpais landfill reaching its capacity presents a significant challenge to effective waste management on Curaçao (Fuldauer et al., 2019). Besides the illegal dumping of household waste, littering frequently happens when people consume take-out food in cars, leading to waste being discarded out of vehicle windows (Ministry of Health, Environment and Nature, 2016). While individual consumers have limited influence over the entire lifecycle of plastic products, from production to disposal. Nevertheless, consumers can take responsibility by reducing their consumption of single-use plastics, recycle and participate in clean-up efforts (Steenhagen & Vijber, 2024). Although some public awareness programmes on waste prevention have been initiated, most are small-scale and their impact is often not monitored (Fuldauer et al., 2019). In the National Development Plan Curaçao 2015-2030 where a long-term vision of change is shared, the Government of Curaçao (2014) stated how an increase in awareness-raising and educational campaigns are needed to make residents more conscious of the waste challenges.

On the other hand, in a report on the government's strategy to phase out plastics, Profas (2020) states that the majority of the population is willing to separate their waste at home before it is collected by Selikor. In the upcoming years, residents will be encouraged to actively engage in addressing issues like combatting illegal dumping in their neighbourhood. The Ministry will also engage in discussions with residents to collaboratively explore methods for enhancing the separation of waste within the neighbourhood. While awareness-raising has become a focus of the government, an increasing number of residents are already proactively taking steps to either minimise waste generation, prevent waste altogether or perceive waste as a valuable source. Examples of such initiatives include clean-up efforts (Profas, 2020).

Clean-up Initiatives

Both organisations and citizens have become committed to the collection of plastic waste by organising clean-up initiatives. Kunuku Man and his team of volunteers have been picking litter from the beaches and streets for over four years. Volunteers but also tourists or other interested people can sign themselves up to join the weekly clean-up that is organised on Sunday. The locations for the clean-ups are chosen by the team itself or suggested by other citizens, and based on sites where large amounts of waste have been dumped illegally. Together, Kunuku Man and his team have one mission *"Kòrsou mester bira mas limpi"*, meaning that *"Curaçao needs to be cleaner"*. This is achieved by the collection of plastic waste, plastic bottles, glass bottles, aluminium cans and residual waste (Kunuku Man, n.d.; Kunuku Man, personal communication, April 20, 2024).

Another bottom-up initiative is the project *"Kaya Tene Kòrsou Limpi" or "Keep Curaçao Clean Street"*. The project was initiated after the paving of the two-kilometer road which then became a shortcut. Because there are few houses along the road, a significant amount of litter is dumped there (van Ditzhuijzen, 2019; Kaya Tene Kòrsou Limpi, personal communication, April 12, 2024). Every three weeks on Saturday, a group of volunteers comes together to pick and collect all kinds of waste from the street. Furthermore, the project also includes collaborations with primary schools. Through signs painted by children and placed alongside the road, residents are reminded of the moral obligation to keep Curaçao clean (van Ditzhuijzen, 2019; Kaya Tene Kòrsou Limpi, personal communication, April 12, 2024).

Next to these citizens' initiatives, there are also a few organisations that coordinate clean-up events. An example is Curaçao Clean Up (CCU). Their goals are built around the reduction of trash blindness, the organisation of initiatives in the field of environmental conservation to improve the quality of the living environment, and the optimisation of information provision to others on how to be handle waste in a responsible way. To achieve this, the foundation has been organising its own clean-up events to raise awareness about the severity of pollution on the island, and also supports clean-up efforts by citizens and companies by providing knowledge, experience, a network and resources. Their clean-up initiatives are linked to national events and international days, such as the World Clean Up Day and CuraDoet. During these activities, volunteers pick litter that is dumped illegally as well as waste that is washed ashore (Curaçao Clean Up, personal communication, April 19, 2024).

Two other enterprises that already have been recognised as important actors in the processing of plastic waste, but also organise clean-up events are Green Phenix and Limpi. Green Phenix strives to organise a clean-up along the shoreline every month. During the clean-

up, different types of waste are collected, and participants are provided with information on marine pollution with plastics. While most of the people engaging in these clean-up activities are local residents who want to volunteer their time or for example local organisations and primary schools who requested to participate in a clean-up, Green Phenix is working closely together with TUI Care Foundation on engaging tourists in these clean-up efforts as well (Green Phenix, 2024a; 2024b, Green Phenix, personal communication, April 15, 2024). Finally, Limpi organises clean-up activities on a less regular basis. Sometimes the organisation plans a clean-up which they announce via their social media channels and for which people can sign themselves up. The focus during these clean-ups is on the collection of type 2 and 5 plastics, as these are the plastics that Limpi is able to transform into new products (Limpi, personal communication, March 21, 2024).

In short, Curaçao's current solid waste industry depends on a few different stakeholders. Whereas the government mainly fulfils an important role in the prevention of waste, its success can be questioned by the lack of regulation, legislation and enforcement. The management of municipal waste is allocated to public waste company Selikor, which has the responsibility to collect waste from the households and to process this waste. Due to financial challenges, Selikor has paused all recycling activities and is now only taking care of the disposal of the collected waste. Besides the influence of the government and Selikor on the solid waste industry, there are various organisations and private companies that have been focussing on the prevention and recycling of plastic waste. Examples are the voluntary decisions to stop using single-use plastics and the initiatives to transform different types of plastic into valuable products. Despite these efforts, there is still a lot of waste illegally dumped in the environment by residents. For this reason, several citizens and organisations who feel a responsibility to act, have become committed to organising and joining clean-up activities. During these initiatives, the focus is on picking litter that is dumped by residents or washed ashore by the sea. Complementing Selikor's services by cleaning up the waste that is not collected along the streets, clean-up activities can be considered to play an important role in the solid waste industry. Together, these clean-up initiatives contribute to the different levels of waste management by reducing, recycling and disposing waste.

5. Clean-up Practices

From the observations and interviews, six practices were identified that constitute clean-up initiatives. With the exception of the practice registering, which was mentioned by only one organisation, the remaining five practices are referenced by at least three of the five clean-up organisations. Therefore, the focus in this thesis is on the five practices of picking, educating, separating, recycling and disposing. This chapter will discuss each of the five practices using Shove et al.'s (2012) three elements to further identify how the materials, meanings and competences of the practice are interconnected.

Picking

All clean-up organisations include the practice of picking plastic waste in their clean-ups. During organised events, participants pick up plastic waste that is washed ashore, thrown away or dumped illegally along shorelines or inland. However, how the picking is carried out and the value behind the practice differs between the clean-up initiatives.

To start, the value behind the practice can be identified by the different motivations and meanings that organisations but also participants attach to the practice of picking. Results of the interviews show that the most important meaning attached to picking waste is raising awareness. Both clean-up organisations and participants argue that their main motivation to pick litter is to show people that there are other ways to handle their waste.

> *"For me it is the awareness. It is very important to me that people start to realise at some point. You are never going to change 100% of people's minds or mindsets, but if you can reach half of them, I think you will be successful." (Participant 4, personal communication, April 13, 2024)*

By picking the litter that is dumped in the environment and washed ashore, participants and clean-up organisations confront residents with their behaviour. Next to this, Green Phenix and Curaçao Clean Up both organise clean-up initiatives on request. For example, they have organised clean-ups at the request of companies and schools. Here, the focus is on making the participants aware and conscious of the importance of plastic pollution and environmental conservation (Curaçao Clean Up, personal communication, April 10, 2024; Green Phenix, personal communication, April 15, 2024). At this moment, the lack of awareness within the local populations results in illegal dumping of waste. The lack of awareness also impacts the

way local residents view clean-ups, as they do not see the point in it. As one organisation states in their interview:

> *"It remains an awareness. Because people often ask you… For example, during the years that I have been in this: "Are you going to organise that again? Why? I do not clean up anyone's mess.". So, I say, "But if we do not do it, you would not do it either. Then you would drown in the dirt.". Someone has to do something, so you just have to keep going. That is it and that is why we have been doing it for eleven years." (Curaçao Clean Up, personal communication, April 10, 2024)*

In relation to the illegal dumping of waste, another reason behind the organisation of and participation in clean-ups is cleaning the environment. For some this has an aesthetic value, while others pick litter to prevent flora and fauna from the damage caused by plastic pollution.

> *"Our motivation behind the clean-ups… Well, cleaning up. Simply that there is less waste on the coast. That is of course aesthetically pleasing. But also, that it is not taken back into the sea where it can cause damage. Or on the coast where it naturally causes damage. If the beaches where turtles nest are full of rubbish, the turtles will not lay eggs. Or for example bird that eat the rubbish. So, that is actually the goal." (Green Phenix, personal communication, April 15, 2024)*

Next to this, some participants and clean-up organisers pointed out that cleaning the environment helps to reduce 'trash blindness'. This concept refers to the phenomenon where individuals become desensitised to the presence of litter and waste in their surroundings, often failing to notice or address it. This can occur due to habitual exposure to polluted environments, leading people to overlook the environmental impact of trash. Over time, this can lead to neglecting and reduced efforts to maintain cleanliness (Curaçao Clean Up, personal communication, April 10, 2024; Ignacio, 2012). By picking litter from the environment, those involved in the clean-ups are committed to a cleaner island where residents will take the effort to keep their surroundings clean. Furthermore, motivation behind picking litter can also be explained by a sense of reciprocity. Reciprocity refers to a fundamental principle where positive actions are returned with equivalent positive responses (Falk & Fischbacher, 2006). During the interviews, participants mentioned the importance of "giving back to the island". Positive experiences of tourists and local residents with the island, for example by its beaches, climate,

nature and culture, leads to the tendency for a mutual exchange of positivity. These participants feel like they owe the island something in return for the positive experiences, and express this through picking litter (Participant 1 & 3, personal communication, April 13, 2024; Participant 5 & 7, personal communication, April 20, 2024).

> *"For me, I think it is important to show my children something about the problem of plastic pollution. But also, that I can give something back to the island. We are having a good time here. So, this way we can give something back." (Participant 1, personal communication, April 13, 2024)*

Besides the urge of 'giving something back', participants are motivated by the feeling of fulfilment after a clean-up. This sense of satisfaction is often felt by participants whom aspirations and/or needs are met. For the participants who identified fulfilment as a motivation, this is because their values and passions are aligned with the purpose of picking plastic litter (Kunuku Man, personal communication, April 20, 2024; Participant 3, personal communication, April 13, 2024; Participant 5 & 6, personal communication, April 20, 2024).

> *"It gives me a feeling of fulfilment. Because you are doing something good for the world and the environment. And you know what it is? When I see someone throwing trash on the streets, it just makes me angry. Because why would you? It can cause so much damage to the environment. So, it feels good to contribute to the environment in this way." (Participant 6, personal communication, April 20, 2024)*

While participants feel fulfilment after their needs are met during a clean-up, the values that align with the purpose of picking litter also contribute to sense of community that is seen as a fifth reason behind participating in a clean-up. There are examples from Curaçao Clean Up and Kaya Tene Kòrsou Limpi where neighbours together take the initiative to pick litter. While cleaning the area, participants have the time to get to know their neighbours better (Curaçao Clean Up, personal communication, April 10, 2024; Kaya Tene Kòrsou Limpi, personal communication, April 12, 2024). Besides, sense of community can also become a result of joining weekly clean-ups with the same people who have the same motivations and interests. Many participants consider the team as of great value while picking litter. During the clean-ups, participants not only are able to keep in contact with acquaintances and friends, but also get to know new people (Participant 2 & 3, personal communication, April 13, 2024).

Considering the materials that form the practice of picking litter, a distinction is made between materials used to guarantee safety and comfort during the picking, materials used for storage of collected waste and materials needed for the transport. What tools are needed during the clean-up depends on the location and what tools are provided also depends on the organisation. During the clean-up initiatives, participants used gloves, garbage pickers and rings to make the picking of litter safer and more comfortable. For example, every team member of Kunuku Man wears gloves during the clean-ups. One of the participants explained that the team members who join a clean-up frequently, all bought their own set of gloves which they bring with them every Sunday. She argues she has a pair of spare gloves in her car, as it can be dangerous to pick litter with your bare hands (Kunuku Man, personal communication, April 7, 2024). While gloves are mainly used for safety reasons, the garbage pickers and rings are used to provide some form of comfort to the participants. Using garbage pickers, participants do not have to bend to pick up every piece of litter. Additionally, these pickers also make it easier to grab litter from places that are difficult to reach with bare hands while keeping the flora and fauna intact. The rings are used to hold the bags open during the clean-up, so that participants can easily throw their collected waste in the bag (Curaçao Clean Up, personal communication, April 10, 2024; Kunuku Man Clean-up, participant observation, April 7, 2024).

To store the collected waste during the clean-up initiatives, many organisations use different sizes and types of bags, buckets and containers. During the picking of litter, participants often hold a bucket or a woven polypropylene bag, also known as a ‘sugar bag’, where they can put the collected waste in. Furthermore, depending on the organisation, there are big bags, big plastic trash bags or even containers to empty the buckets and/or woven bags. However, some organisations choose to collect and store the waste in the smaller woven bags instead of bigger ones. (Green Phenix Clean-up, participant observation, March 20, 2024; Kaya Tene Kòrsou Limpi, personal communication, April 12, 2024; Kunuku Man Clean-up, participant observation, April 7, 2024; Limpi Clean-up, participant observation, April 11, 2024).

In addition, there are materials needed to transport the litter that is picked by the participants. For example, Kunuku Man has a handcart that is taken along by the participants during the clean-up. From this handcart, participants can grab a new woven bag when the one they are using is full. Besides, the cart is used to collect waste that, when collected in big numbers, can quickly become heavy or takes up a lot of volume. For example, bottles of glass, plastic bottles and aluminium cans (Kunuku Man Clean-up, participant observation, April 7, 2024). A car is also considered essential when picking litter. A reason for this is that “the heavily polluted beaches are remote” and only accessible by car (Green Phenix, personal

communication, April 15, 2024). Furthermore, a car is needed to transport the waste from where it is collected to the location where the waste is being processed. In case the vehicle that is used to transport the collected waste is a pick-up truck, various organisations use a cargo net to make sure the waste does not blow off the vehicle (Limpi Clean-up, participant observation, April 11, 2024; Participant 4, personal communication, April 13, 2024).

Finally, different skills, techniques and know-how are asked from those who pick litter as a practice. For example, the weather conditions on Curaçao can be rather extreme in terms of temperature, radiation of the sun and drought. While picking litter, one has to take these factors into account by dressing oneself properly and staying hydrated (Green Phenix Clean-up, participant observation, March 20, 2024; Kunuku Man Clean-up, participant observation, April 7, 2024; Limpi Clean-up, participant observation, April 11, 2024). Furthermore, one has to be cautious of the trash that is being picked during a clean-up. For example, there can be sharp items found in the trash as shards of glass or needles.

> *"And also, for the sake of safety: be careful, there could be sharp things. There could be needles for example. So be careful." (Green Phenix, personal communication, April 15, 2024)*

The fact that clean-up initiatives are organised in different environments requires some knowledge of flora and fauna of participants and organisers. As can be concluded from the interview with Curaçao Clean Up on the 10th of April 2024, one has to be careful with the environment while picking litter. An example are the mangroves that can be found along the shoreline. Their value to the ecosystem requires that these mangroves stay untouched. Therefore, next to the right tools such as garbage pickers that make it easier to pick litter while making sure that the flora and fauna stays untouched, knowledge on flora and fauna is also essential for environmental conservation (Curaçao Clean Up, personal communication, April 10, 2024). A final competence that is mentioned by participants is a good posture of the body. During a clean-up, which often lasts for at least two hours, one has to walk, stand, bend and lift while picking litter. Therefore, the practice of picking litter requires that the participant adopts a good posture and is capable to perform physical acts like walking, bending and lifting for a longer period of time (Kunuku Man Clean-up, participant observation, April 7 & 20, 2024; Participant 7 & 8, personal communication, April 20, 2024).

Figure 3: Participants who are picking litter

Educating

A second practice that constitute a clean-up initiative is the practice of educating. One of the meanings behind the practice of educating during a clean-up initiative, is informing participants on the problem of plastic pollution. For example, organisations explain the importance of clean-up initiatives, where the waste comes from, what types of waste can be found and the issues this waste causes. This is mainly done when the participants are joining a clean-up for the first time and may not have the knowledge on the issue of plastic pollution. Finally, organisations who focus on the recycling of plastic waste like Green Phenix and Limpi complete this story by introducing their organisation, discussing what they do as an organisation to combat the issues of plastic pollution and what can be done with plastic waste (Green Phenix, personal communication, April 15, 2024; Limpi, personal communication, March 21, 2024).

> *"First, we give an instruction, at least if people are new to the clean-up. We give an instruction: Why are clean-ups important? All the waste that can be found here, where*

does it probably come from? What kind of waste do we see, or can we expect here?" (Green Phenix, personal communication, April 15, 2024)

Next to the provision of information, educating goes a step further by raising awareness among participants and non-participants and stimulate them to act environmentally and/or change behaviour. Curaçao Clean Up sees the participation of someone in a clean-up and the conversations as a form of education. By participating, seeing the plastic pollution and talking about it, the organisations is convinced that it will let participants think about the way waste is being handled and influence their behaviour positively (Curaçao Clean Up, personal communication, April 10, 2024).

"The target of the World Clean Up Day is someone who has never thought about it before. If one day, they do think about it by participating in the World Clean Up Day, they are like: We really should not do that anymore. So doing it, is education. Seeing it being done, talking about it…" (Curaçao Clean Up, personal communication, April 10, 2024)

Awareness is being raised among non-participants by starting the conversation and using signs. Both organisers and participants of clean-ups state that they frequently start the conversation with people who are passing by. During a clean-up with Kunuku Man, a young man passes by while the whole team is picking litter. Kunuku Man starts to explain that the team is picking waste that is dumped illegally along the road. Furthermore, Kunuku Man continues to tell the man about the situation with waste on Curaçao. Using the example of the dependency of Curaçao on tourism, and how tourists are deterred to come back to the island because it is not the clean, aesthetic holiday destination they are longing for. Due to Curaçao's dependency on tourism, this will become a catastrophe for the island on a longer term. Kunuku Man continues to explain the importance of handling waste in a responsible manner and invites the young man to participate in the clean-up. After Kunuku Man finishes his story, the young man answers that he understands the problem but that he must go, wishing Kunuku Man a nice day (Kunuku Man Clean-up, participant observation, April 7, 2024).

Kunuku Man makes use of two wooden signs that are placed near to where the clean-up initiative is taking place. Often these signs are placed along the road or along intersections, so that they are clearly visible. These signs have the same message painted on them, written in both Dutch and Papiamentu: *Curaçao must be cleaner.* This way, Kunuku Man strives to raise

awareness among people who are passing by while his team is picking litter. Another example are the signs along the street that is cleaned every three weeks in the Kaya Tene Korsou Limpi project. The signs that are placed along the street spread messages stimulating people who are passing by to throw away their waste in bins and waste containers to keep the island clean (Kaya Tene Kòrsou Limpi, personal communication. April 12, 2024; Kunuku Man Clean-up, participant observation, April 7, 2024).

To be able to educate people on the issue of plastic pollution, it is important to have knowledge on the problem. As discussed earlier, some organisations share information on the types of waste, where they come from, the problems that are caused by the waste and how plastic waste can be transformed into something valuable. Knowledge and information on this subject is shared by the organisations with other environmental organisations, (recycling) companies and universities. Green Phenix also carries out research studies by themselves to gain more knowledge on plastic waste. Some clean-up initiatives organised by Green Phenix are focused on data registration; to find out what waste can be found alongside the coast and how this can be targeted by policy (Curaçao Clean Up, personal communication, April 10, 2024; Green Phenix, personal communication, April 15, 2024; Limpi, personal communication, March 21, 2024).

> *"We did two research studies. What I already mentioned, one of what kind of litter is on the beach and a gap analysis about the regulations on plastic waste." (Green Phenix, personal communication, April 15, 2024)*

Figure 4: Sign with the message to keep the island clean (on the left side of the photo)

Separating

A majority of the clean-up initiatives includes the practice of separating the collected waste. Separating is done in various ways. The majority of the clean-up initiatives immediately separate the plastic waste from other types of waste. This is done consciously as well as unconsciously and based on the recyclability of the waste that is found by participants of a clean-up. There are organisations that briefly explain which types of waste can and cannot be recycled, before participants starts picking litter. Sometimes, participants are asked to leave the waste that cannot be recycled, for example styrofoam plastic, at the location and therefore to pick selectively (Green Phenix, personal communication, April 15, 2024; Limpi Clean-up, participant observation, April 11, 2024). During other clean-ups, unrecyclable plastic are picked but immediately separated from the recyclables (Kaya Tene Kórsou Limpi, personal communication, April 12, 2024; Kunuku Man, personal communication, April 20, 2024) Another reason to separate waste during a clean-up is to raise awareness among participants and residents in general. The sorted waste can be of value for some companies, which is rather

unknown for the local population. By sorting the different types of waste during a clean-up initiative, the goal is to make people aware of the recyclability of waste and the ability of adopting these sorting practices in their own households at home (Participant 4, personal communication, April 13, 2024).

> *"In the beginning everything went in one big bag… Glass, plastic, everything went together. But now everything is separated. You did it yourself last week, so you know how it goes. We do that actually to make people aware that you can separate all these different types of waste at home. That is the idea behind separating waste during the clean-up. What we do here makes a difference for the companies that recycle waste. Because a lot of the waste that is collected during clean-ups is brought to companies. But the volume is far too small. It is more human-like. If everyone starts separating waste at home, it will become a very large volume that does not go the landfill." (Participant 4, personal communication, April 13, 2024)*

Materials essential for the separation of waste are buckets and bags. What exactly is used, depends on the organisation. Some organisations use buckets to separate the recyclables from each other and from the residual waste, while others use bags (Kaya Tene Kòrsou Limpi, personal communication. April 12, 2024; Kunuku Man Clean-up, participant observation, April 7, 2024; Limpi Clean-up, participant observation, April 11, 2024).

> *"We organise a clean-up every three weeks now. Then we collect between five and ten bags. Nowadays a little less because the bottles… All bottles are separated. So I think the last time we collected three bags of residual waste. And there were four bags of bottles, that are not waiting to be picked up by Selikor like the other three bags of residual waste." (Kaya Tene Kòrsou Limpi, personal communication, April 12, 2024)*

Finally, to be able to separate the collected waste, knowledge on the various types of waste is considered necessary. Participants need to know and understand the differences between the types of waste and their recyclability. Furthermore, knowledge on the different types of plastics is also essential as not all plastics are of value to recycling companies. Most of the recyclable plastic products come with a recycling symbol with the identification code printed on the package. This way, one can see what type of plastic the package is made of, and whether it can be recycled by local companies on the island who nevertheless do not have the

ability to recycle all types of plastics. However, when participants are separating during a clean-up, this can result in the process being slowed down when one must read every recycling symbol to know if the items that are collected are recyclable or not. Furthermore, reading the identification code can be difficult when plastics have been broken down in small pieces. Therefore, to fasten and efficiently carry out the separation of waste, knowledge on the types of waste is considered an importance competence (Green Phenix, personal communication, April 15, 2024; Kunuku Man Clean-up, participant observation, April 7, 2024; Limpi, personal communication, March 21, 2024).

> *"It is of course a bit against your nature to leave something behind while you can pick it up straight away. So, most people are going to pick everything anyway. Also, because it is sometimes difficult to understand what exactly can be recycled." (Green Phenix, personal communication, April 15, 2024)*

Figure 5: Separated waste during a clean-up. The woven bags are glass and plastic bottles; the blue bags are filled with plastics categorised with type number 4

Recycling

Recycling can be considered a popular practice within clean-up initiatives. Almost all organisations are concerned with the recycling of the plastic waste that is collected during a clean-up. The recycling process is done by the organisations themselves or by other companies and organisations whom they have a partnership with. Therefore, there are multiple meanings, materials and competences required that depend on the type of plastic and the organisation.

The results of the interviews showed that the recycling of plastic waste is linked to the meaning of raising awareness. Products that are made with the collected plastics show that plastic waste can be transformed in something valuable. By showing people what can be created with plastic waste, organisations aim to raise awareness on the plastic problem and how plastic recycling plays an important role in reducing plastic waste.

> *"At the start of a clean-up, a speech is given with some examples of products to make participants aware why we do this. We are not only picking litter, but we also do something with the plastic waste. For us, that is why we started in the first place, the awareness is very important." (Limpi, personal communication, March 21, 2024)*

Not only have clean-up organisations been recycling plastic waste to raise awareness but also because of the impact it can have on society and the environment. The recycling of plastic conserves natural resources, reduces energy consumption and decreases the amount of plastic waste that ends up in the ocean (Limpi, n.d.). Green Phenix connects the impact of recycling to circularity and inclusivity. Not only does the organisation support a circular economy in which plastic waste is transformed into a valuable product, but the organisation also stimulates inclusivity by offering a Learn & Work project for people who live in poor conditions. This way, the impact of recycling goes further than the reduction of plastic waste (Green Phenix, personal communication, April 15, 2024).

> *"Our goal is to advance circularity and inclusivity in Curaçao through innovation, education and setting up a recycling infrastructure to combat plastic pollution and to ensure that people in poverty can improve their living conditions." (Green Phenix, personal communication, April 15, 2024)*

Third, for some organisations behind the clean-up initiatives, recycling is seen as a source of income. The products that are made from plastic waste are sold to different categories

of clients. Smaller products are sold through souvenir shops and home decoration shops, which are mainly focused on tourists and households. The custom-made orders and pieces of furniture made of plastic are more expensive, especially in comparison to other materials. Therefore, the products are mainly sold to hotels, restaurants, sport clubs and other companies. This way, by locally recycling plastic waste, the organisations generate some income (Green Phenix, personal communication, April 15, 2024; Limpi, personal communication, March 21, 2024).

Essential for the practice of recycling is plastic waste. During clean-up initiatives, all different types of plastic are collected. There are no companies that recycle PET (plastic number 1) on Curaçao. However, Green Force has partnerships with foreign companies that do recycle PET plastic. Therefore, many clean-up organisations bring their PET plastic to Green Force, so that it can be exported to foreign countries where it will be recycled (Green Force, personal communication, April 9, 2024; Green Phenix, personal communication, April 15, 2024; Kunuku Man, personal communication, April 20, 2024). In contrast to PET, HDPE (plastic number 2) and PP (plastic number 5) are being recycled on the island by Green Phenix and Limpi. Products that are made from HDPE and PP are mainly furniture, small souvenirs, works of art and handicrafts (Green Phenix, personal communication, April 15, 2024; Limpi, personal communication, March 21, 2024). Finally, FUSE Caribbean combines HDPE and PP with LDPE (plastic number 4) to create durable building materials that match local needs (Kunuku Man, personal communication, April 20, 2024).

> *"We recycle everything. The glass goes separately, plastic bottles go separately, cans go separately. For about ten months now we have also been separating other plastics such as bags, cups and straws. That goes separately and is collected by FUSE Caribbean. They make planks here on the island that are for sale to the local population. That is a very good thing. These are high-quality planks made of plastic that was thrown away and considered to be waste. They last 30 years, those planks." (Kunuku Man, personal communication, April 20, 2024)*

Another requirement for the recycling of plastic waste are the machines that are used to process the plastics. The machines used by the different organisations to recycle the plastic are similar to each other. For example, all recycling organisations have a plastic shredder that is used to shred plastic into small flakes. These flakes are then heated by means of an extruder, after which they are pressed into a mould to get the desired shape. Finally, Green Phenix and Limpi also have 3D printers in their possession. Limpi uses the printer in their designing

process, and does not produce any products with the printer. Green Phenix, on the other hand, is still facing some challenges with the printers that are not running smoothly and is therefore unable to use their 3D printers (Green Phenix, personal communication, April 15, 2024; Limpi, personal communication, March 21, 2024).

> *"The project had several pillars, namely innovative and creative recycling. So, these 3D printers were purchased, which unfortunately is not running smoothly yet. We also purchased a shredder, that is being used. And within RESEMBID, we have also come a lot further with the extruder, that we use to make the plastic blocks." (Green Phenix, personal communication, April 15, 2024)*

The machines used to recycle plastic waste and the designs that are used to make new products, require the right techniques. For example, knowledge and skills on how to use the shredder and extruder are considered necessary. Green Phenix had some issues with their machines in the past. The moulds were broken, and as a result the extruder did no longer worked properly. However, the organisation has been able to appoint someone with more knowledge and experience on the extruding process and techniques. With the acquired knowledge, Green Phenix is now able to produce blocks and beams from plastic. They still do have some problems with the 3D printers, as is mentioned in the previous section. Using the knowledge from the manufacturer, the organisation is working on getting a better understanding on the use and techniques of the printer to be able to make products locally, but also to raise awareness and generate an extra income (Green Phenix, personal communication, April 15, 2024).

> *"But it would be very nice if the printers also worked so we can just keep a small portion of the PET here to make products locally. We also would not have the capacity to do everything. Because such a printer simply needs a lot of time to print and a lot of PET comes in. So that collaboration with Green Force will continue either way. But it would be nice if we could recycle at least some of it locally. Also for awareness-raising goals and for our income." (Green Phenix, personal communication, April 15, 2024)*

Skills on how to make end products like tables from the tabletops and beams that are made with the extruder are also required in the process of recycling. For example, Green Phenix hired an artist to design and make the plastic tables. However, to reduce the costs and lower the prices of the end products, the artist is now teaching the staff of Green Phenix the right

techniques (Green Phenix, personal communication, April 15, 2024). Limpi is mainly looking at the future when it comes to skills and knowledge on recycling practices. The organisation keeps on innovating to come with new techniques and to create new machines to process the plastic waste better, faster and more efficient. However, this conflicts with continuing the other business operations (Limpi, personal communication, March 21, 2024).

Figure 6: An extruding machine for plastics

Disposing

Finally, a practice that constitute a clean-up initiative, is the practice of disposing of plastic waste. Not every piece of plastic that is collected during clean-up initiatives is suitable for recycling purposes for various reasons. Therefore, a part of the plastic waste ends up being disposed of at the landfill. Whether a piece of plastic will be recycled or disposed, depends on the recyclability of the plastic. Plastics in the categories type number 1, 2 and 5 are not being

recycled on Curaçao. Therefore, plastic from these categories are of no value for companies and organisations that focus on the recycling of plastic waste. When these types of plastics are collected during a clean-up initiative, they will be disposed of at the landfill (Kaya Tene Kòrsou Limpi, personal communication, April 12, 2024; Kunuku Man, personal communication, April 20, 2024; Limpi, personal communication, March 21, 2024).

> *"For example, you have forks and cups that are made of PS plastics. You also have cutlery and cups that are made of a different material. However, those made of PS plastics are become toxic if they are heated up. This type of plastics cannot be recycled, not even on Curaçao. You have seven different types of plastics. Only type number 1, 2 and 5 are recycled here on the island. The others not. The plastics that cannot be recycled on the island unfortunately go to the landfill." (Limpi, personal communication, March 21, 2024)*

If plastic waste is recyclable or ready for disposal at the landfill, also depends on the quality of the plastic. Some of these plastics have been in the environment or ocean for a long time. After some time, the plastic will become brittle and slowly breaks down into smaller pieces. The quality of the plastic deteriorates and therefore the plastics become useless for some recycling organisations who have strict quality requirements (Curaçao Clean Up, personal communication, April 10, 2024; Green Phenix, personal communication, April 15, 2024; Limpi, personal communication, March 21, 2024).

> *"Of course, these plastics are not the best quality because they have been in the environment for some time. In principle, these plastics go to the landfill. Still, this is not the best solution. But at least, the plastic is no longer in the coastal ecosystem." (Green Phenix, personal communication, April 15, 2024)*

Like recycling, the practice of disposing is dependent on the plastic waste that is collected during the clean-up initiatives. There are no recycling organisations on the island that are able to recycle type number 1, 2 and 5 plastics, nor are there foreign companies that showed interest in the recycling of these plastics. Therefore, plastic waste that can be classified within these three categories are transported to the landfill for disposal. Finally, another reason for bringing plastic waste to the landfill is its poor quality (Curaçao Clean Up, personal communication, April 10, 2024; Green Force, personal communication, April 9, 2024; Green

Phenix, personal communication, April 15, 2024; Limpi, personal communication, March 21, 2024). To transport the collected waste to the landfill, a vehicle is considered an important material. Most of the organisations use cars or pick-up trucks to transport the plastics waste. However, the team of the Kaya Tene Kòrsou Limpi has an informal partnership with someone within Selikor who arranges a truck that can pick up their waste and bring it to the landfill (Kaya Tene Kòrsou Limpi, personal communication, April 12, 2024).

> *"After we have collected the waste, I send a Whatsapp message to my contact at Selikor. They will collect the waste if it can be planned into their route. The waste from last Saturday is still here, because they have not had the opportunity to plan it in yet. This partnership is not part of the official Selikor policy. They are not allowed to do a number of things from higher up. However, I have contact with the middle management. They arrange a truck that goes to Blue Bay and can take our waste with them. So that is settled." (Kaya Tene Kòrsou Limpi, personal communication, April 12, 2024)*

Finally, the disposal of plastic waste at the landfill can also be the result of the lack of knowledge among the participants of a clean-up initiative. According to Green Phenix, it can be difficult to selectively pick the recyclable plastic during a clean-up since not every participants recognises the different types of plastics. Therefore, to make it easier for the participants, plastic waste that is collected during a clean-up with Green Phenix is mixed together with residual waste that is also collected and cannot be recycled. This mix is then brought to the landfill, as it takes too much time to sort it out again. Therefore, knowledge on the different types of plastic and their recyclability can be considered an importance competence within the practice of disposing (Green Phenix, personal communication, April 15, 2024).

In short, interviews and observations identified five different practices that are recognised by all clean-up organisations within their initiatives: picking, educating, separating, recycling and disposing. These practices show how clean-up initiatives are not only based on the picking of litter, but also consist of other practices that are all carried out during different stages of the clean-up and with different objectives. Materials needed for the five practices differ from garbage pickers and gloves to make the picking more comfortable, to buckets and bags to store the waste, vehicles to transport the waste throughout the different practices and machines to transform the waste into new products. Furthermore, knowledge on the types of plastic, plastic pollution and the use of recycling machines were considered important competences for the five different practices. Among all the meanings that are assigned to the

different practices, awareness-raising is considered one meaning that is associated with all clean-up practices except disposing. While picking litter, organisers and participants aim at raising awareness by showing how much litter is illegally dumped in the environment. During the clean-ups, organisers also share information on the consequences of plastic pollutions and encourage people to critically reflect on their own waste handling practices. Furthermore, participants themselves raise awareness among non-participants by spreading the word and starting conversations about plastic pollution and waste management. Finally, separating and recycling the waste are associated with raising awareness as organisers aim at showing how plastic waste can still be used and turned into something valuable. The only practice that cannot be traced back to the meaning of raising awareness is the disposing of waste. Nevertheless, clean-up organisers are unable to avoid this practice as not all plastics are recyclable because of the quality or the lack of knowledge on the island to recycle all types of plastics.

Figure 7: An improvised, unofficial landfill at Koraal Tabak (not used by clean-up organisations)

6. Clean-up Practices and Circularity

To identify the role of clean-up initiatives in the transition towards a circular economy, it is important to recognise how the clean-up practices can be connected to circularity. According to Ghisellini et al. (2016) who conducted a review on the concept of circular economy, current research mainly identifies circular economy by the three principles reduction, reusing and recycling. Within these principles, waste is minimised, used again for the same purpose for which they were conceived and/or reprocessed into new products with another purpose than the original one. For this reason, these principles can be considered key actions within a circular economy (Ghisellini et al., 2016). Furthermore, research by Kirchherr et al. (2017) on the conceptualisation of circular economy analysed 155 articles to gather definitions on CE. Assessment of these definitions required a coding framework to convert verbal or visual data into numeric data for analysis purposes. While the authors of the paper initially chose the 3R framework for their coding, several definitions were found that referred to the recovery of waste. Therefore, the coding framework was based on the 4R framework that is adds 'recover' as the fourth R. Within the coding framework, coding dimensions related to the 4R were developed deductively based upon practical knowledge on the topic and a preliminary literature review. Furthermore, coding dimensions were added inductively throughout the coding process (Kirchherr et al., 2017). These codes form the basis for the three practices used to identify circular economy that are discussed in this chapter and are shown in the table below.

Circular Practices	**Practices related to circular practices**
Reduce	Refusing, rethinking, redesigning (including prolonging the lifespan of products), minimization, reduction and/or prevention of resource use and preserving of natural capital?
Reuse	Reusing (excluding waste), closing the loop, cycling, repairing and/or refurbishing of resources?
Recycle	Remanufacturing, recycling, closing the loop, cycling and/or reuse of waste?

Table 1: Coding of Circular Practices (Kirchherr et al., 2017)

While reducing, reusing and recycling waste activities take place at the intersection of multiple practices, they cannot be seen as compound practices. According to Warde (2013), compound practices are formed from the articulation of integrative and dispersed practices. However, the codes used to identify the circular practices by Kirchherr et al. (2017) and the clean-up practices that were identified in this study can all be described as integrative practices that depend on multiple actions, are bounded by time and space, and often driven by different purposes, beliefs and goals. The lack of dispersed practices make it therefore difficult to see the 3R's as compound practices. Despite the fact that reducing, recycling and reusing cannot be seen as compound practices, connections between these circular practices and clean-up practices can still be found. Except from the practice of disposing, the other four clean-up practices can be connected to the circular practices of reducing and recycling waste by their shared meaning of raising awareness to change waste practices and co-location. According to Shove et al. (2012), these loose-knit patterns that shape each other and are based on co-location can be conceived as practice bundles. As the findings of this research show, clean-up initiatives may be considered sites where practices as picking litter and educating form a bundle. While picking litter can be a form of educating people on the issue of plastic pollution, educating by sharing knowledge on for example the different types of plastic can also be of importance for the picking of litter. Furthermore, raising awareness is also an important motivation behind the practice of separating and recycling that stimulate people to adopt sustainable waste practices. Despite the fact that the practices are not strictly dependent on each other, they share the element of raising awareness and can therefore be seen as a practice bundle.

This bundle of practices can also be split up in a smaller bundle. The results of the interviews show that the practice of separating can also be considered the start of the recycling process for many organisations. Despite separating activities are not recognised in the coding process of Kirchherr et al. (2017), the actions concerned with separating the plastic waste can be considered a requirement for the recycling and reuse of plastics as not every type of plastic is recyclable. On the other hand, the recyclability of the waste is a deciding factor in the separation of waste and influences how waste can be converted into the different products as building materials, souvenirs and furniture. Whereas the practices of separating and recycling are carried out with the overall meaning of raising awareness, other meanings as the conservation of nature and a source of income lead to the identification of a smaller bundle concerned with the recycling of plastic waste.

Circularity of Plastic Waste

The results of the interviews and observations have showed that the final destination of the plastic waste that is collected differs per clean-up initiative. A large part of the organised clean-ups by Curaçao Clean Up and Green Phenix are focused mainly on the removal of waste from the environment instead of recycling (Curaçao Clean Up, personal communication, April 10, 2024; Green Phenix, personal communication, April 15, 2024). However, clean-ups by Limpi, Kaya Tene Kòrsou Limpi and Kunuku Man do focus on both aspects of removing litter from the environment and transforming the waste into a new product (Kaya Tene Kòrsou Limpi, personal communication, April 12, 2024; Kunuku Man, personal communication, April 20, 2024; Limpi, personal communication, March 21, 2024).

Plastic waste that can be categorised as HDPE (type number 2) and PP (type number 5) and collected during smaller clean-ups by Curaçao Clean Up are brought to the factory of Limpi (Curaçao Clean Up, personal communication, April 10, 2024; Limpi, personal communication, April 12, 2024). Furthermore, Limpi itself organises clean-up initiatives where they focus on the picking of HDPE and PP plastics that can be used in their own recycling process. In their factory, Limpi transforms type number 2 and 5 plastics into new products that are divided into two types of products. On the one hand, bottles of shampoo and cleaning products are used to for example make keychains and coaster sets. The recycling process in which these bottles are transformed into new products requires high quality plastics, that households themselves bring to Limpi. Due to its lower quality, the plastic that is collected during clean-ups can only be used for the so-called works of art. These works of art are small figurines of flora and fauna that can be found on Curaçao such as fish, turtles and cacti. Together with the new products comes a tag that explains the story behind the product; made locally of plastic waste that is collected and washed ashore on Curaçao (Limpi, personal communication, April 12, 2024).

During clean-ups organised by Kunuku Man and Kaya Tene Kòrsou Limpi, plastic bottles or PET plastics are separated from other types of waste. After the clean-up at Kaya Tene Kòrsou Limpi is done, the plastic bottles are brought to a recycling station at the Blue Bay resort (Kaya Tene Kòrsou Limpi, personal communication, April 12, 2024). This is a station in collaboration with Green Force, who collect, sort, process and export the bottles (NU.cw, 2022). The bottles are exported to factories in Europe, Central America, North America and Asia to transform into new PET bottles (Green Force, personal communication, April 9, 2024). On the other hand, Kunuku Man has a partnership with Green Phenix. As a result of this partnership, all PET bottles collected during the clean-ups of Kunuku Man are brought to the recycling center of Green Phenix (Green Phenix, personal communication, April 15, 2024; Kunuku Man,

personal communication, April 20, 2024). However, since the 3D printers of Green Phenix that should be able to print with PET plastics are not working, the organisation is not able to transform PET waste into a new product. For this reason, Green Phenix set up a partnership with Green Force, who is able to export these PET bottles to a recycler overseas. Within this partnership, bottles of PET plastics that are brought to Green Phenix by Kunuku Man but also households end up being brought to Green Force for the export. Therefore, Green Phenix can be seen as a transfer station for the PET bottles or mediator between Kunuku Man and Green Force. This is also where Green Phenix is facing a challenge. Green Force has certain quality requirements that the PET bottles collected during clean-ups do not always meet. Therefore, Green Force is hesitant to accept these bottles that have been laying in the environment for a longer period of time. Since Green Phenix is unable to recycle PET, they cannot use it either. On the one hand, Green Phenix is willing to play a role in the sorting of PET bottles by quality. This way, the bottles with good quality can be brought to Green Force for export while the ones with a lower quality will be brought to the landfill. However, at the same time, Green Phenix faces the issue that in this case, they are the ones who need to pay for the landfill to dispose to bottles that Kunuku Man is picking during their clean-ups. Therefore, Green Phenix is considering their options regarding their role between both partners (Green Phenix, personal communication, April 15, 2024).

For a year now Kunuku Man also has a destination for the other plastic waste that is picked during the clean-ups, such as plastic bags and cups (plastic type number 4). This waste is collected by FUSE Caribbean who, after sorting the plastics, is the only organisation able to recycle LDPE or plastic type number 4 into building materials that match local needs (Kunuku Man, personal communication, April 20, 2024; The Great Plastic Bake Off, 2023). Finally, some of the (non-)recyclable plastic waste ends up at the landfill in Malpais because it does not meet the quality requirements for recycling, or it is not separated during the clean-up. According to Selikor (Selikor, personal communication, April 12), the lack of financial resources makes it unable to include recycling in their waste processing process and as a result all waste is deposited and covered upon arrival at the landfill, without any form of waste separation.

To conclude, what is done with the collected plastic from clean-up events depends on the type of waste, its quality and the organisation behind the clean-up. Smaller clean-up events organised by Limpi and Curaçao Clean Up collect HDPE and PP plastics during clean-ups to recycle this into works of art at the factory of Limpi. The team of Kunuku Man is the only organisation that separates LDPE plastics during the clean-up. This waste is brought to the recycling center of FUSE, where the plastic waste is reused to produce sustainable building

materials. Furthermore, PET bottles collected by Kunuku Man and Kaya Tene Kòrsou Limpi end up at Green Force after which they will be exported and transformed to new PET bottles. However, due to the lower quality of PET plastics that have been laying in the environment for a longer period of time, not every bottle meets the quality requirements that are set for export. The plastics that do not meet the recycling requirements or are not separated during the clean-ups ends up being disposed of at the Malpais landfill. Finally, the results of the study show that clean-up practices are not connected to reusing practices. All the waste that is collected during clean-up initiatives and transformed into new products is first processed by extruding and shredding machines instead of repurposing the waste for extended use.

Figure 8: Products made of plastic waste (left photo: a tabletop made by Green Phenix; right photo: souvenirs made by Limpi)

Redefining the Waste Industry

While the results of this research study show that some clean-up practices can be connected to circular practices, the results of this study show that transition towards a circular economy is still in an early phase. Currently, the community, clean-up organisers and recycling organisations are facing economical and socio-cultural challenges and a lack of financial resources, knowledge, awareness, regulation and enforcement. The many factors that can be connected to the circular and clean-up practices, make the transition towards circularity complex. Whereas non-legislative interventions are argued to provide valuable and more effective opportunities for further reductions of land-based plastic marine pollution (Schnurr et al., 2018), there is a need to look further than the contribution of clean-up initiatives towards a

circular transition. This section provides the reader some recommendations on further actions that can be taken to stimulate the road towards a circular economy.

According to Steenhagen & Vijber (2024), Curaçao does not implement waste separation at the source. As a result, within the majority of households all waste is mixed and ends up in the same container. Through collection along the curbside, the waste that consists of both recyclables and non-recyclables ends up at the landfill (Selikor, personal communication, April 12, 2024; Steenhagen & Vijber, 2024). There are some facilities for households to recycle their plastic waste, for example recycling stations and the drop-off center of Selikor (Selikor, 2024i; Steenhagen &Vijber, 2024). However, despite Curaçao being classified as a high-income country, poverty and inequality have risen (Pengpid & Peltzer, 2021). According to a news article by Antilliaans Dagblad (2024a), a research report by M. Goede on the poverty issues on Curaçao concluded that 31% of the residents currently live in poverty. Alongside other determining factors as lack of knowledge, inequality and unemployment, poverty on the island is reflected in the way the environment is polluted and neglected (Steenhagen & Vijber, 2024). Research by Farley et al. (2019) on the perception of middle- and low-income communities on separation of household waste in the Caribbean shows that only 46% of these middle- and low-income communities were willing to actively participate in waste separation at source (SAS). However, to make recycling more effective and efficient, and to enable large-scale recycling, waste separation at the source will be necessary (Steenhagen & Vijber, 2024). Research by Farley et al. (2019) on households' perspectives on the separation of household waste shows that the successful implementation of waste separation at the source requires active participation of the country's residents. This is strengthened by Schatzki (2016) who argues that large scale social change is only possible by smaller changes in one's practices. To increase the efficiency of source separation and recycling, incentives are considered to be an encouraging factor for the reduction of waste and the level of participation in a separation programme, especially for middle- and low-income households (Farley et al., 2019; Xu et al., 2015). Therefore, the first recommendation is for the government to implement a deposit-refund system for PET bottles where consumers pay a small deposit for the bottles that can be refunded when the empty bottles are returned to a collection point. According to Schnurr et al. (2018), who provided a review on the reduction of marine pollution from single-use plastics, non-legislative interventions are argued to provide valuable opportunities for reduction of plastic pollution. While there is no (legislative) obligation that requires the residents to separate their PET plastics, the financial incentive that is part of the deposit-refund system will encourage middle- and low-income communities to start separate at the source. While PET plastics are only a small portion of the

recyclable plastic waste, the deposit-refund systems can be seen as an accessible, smaller step allowing residents to get acquainted with separation at the source and start adopting sustainable waste management practices.

Another major challenge regarding waste management of plastics is the lack of public awareness (Adshead et al., 2018; Fuldauer et al., 2019). Especially, awareness of the waste challenges on Curaçao and the consumption patterns are considered an urgent need to successful circular waste management practices (Steenhagen & Vijber, 2024). Although some public awareness programs on waste prevention have been established, most are small-scale, and their effectiveness is often not monitored (Adshead et al., 2018). According to Farley et al. (2019), an awareness and knowledge programme can act as a pre-cursor to changing attitudes towards sustainable waste practices as separating at source. However, when considering the implementation of an awareness programme, one has to take into account the deep-rooted beliefs that live within the population. During the interviews, trash blindness was a recurring theme where individuals fail to notice or address the presence of litter and waste in their surroundings. Over time, this leads to a vicious circle in which efforts to maintain the environment clean are neglected and reduced (Ignacio, 2012). Next to the lack of awareness, the fact that residents neglect the presence of litter in the environment can be explained by culture. During an interview with Selikor on the 12th of April 2024, it emerged that there is a stigma surrounding waste on the island. It is not a popular opinion to pick litter or clean along the road, not even for the poor. For a long time, there was also a stigma attached to working at the public waste company Selikor. Cleaning up other people's mess and trash is seen as a lower standard within the population and therefore not a popular opinion (Selikor, personal communication, April 12, 2024). In combination with the fact that clean-up initiatives are mainly organised by Western people who go against these embedded norms and values make that residents have an aversion to clean-ups and other initiatives focused on the reduction of plastic pollution and waste (CARMABI, personal communication, April 9, 2024; Participant 4, personal communication, April 14, 2024). Because of this threshold, it can be challenging to implement an awareness programme that educates residents on the issues of waste management and plastic pollution. Nevertheless, studies of educational campaigns in other countries have shown successful results. Additionally, these types of strategies are relatively low-cost to implement and can easily be integrated into educational curriculums, consumer habits and local and community initiatives (Adshead et al., 2018). To make the programme more accessible, this research study recommends targeting primary schools. By obliging lessons on waste management and plastic pollution, children will be taught sustainable practices from an early

age (Kaya Tene Kòrsou Limpi, April 12, 2024). Furthermore, they will be taught by their own teacher who is someone familiar and often comes from the same community. Bringing awareness to the new generation by someone from the local population, will lower the threshold for acceptance (CARMABI, personal communication, April 9, 2024).

Finally, various stakeholders on Curaçao have recognised that the current waste sector may not be capable of managing the waste-related issues on its own (Fuldauer et al., 2019). There are various organisations and companies who are concerned and engaged in the recycling of plastic waste and of which their knowledge is of added value to the regular waste practices by public waste company Selikor. According to Adshead et al. (2018), large-scale expansion of recycling activities could address Curaçao's waste problem by diverting large amounts of material from the landfill. However, commercial recyclers have pointed out financial barriers to increasing recycling capacity to the level needed for long-term waste management (Adshead et al., 2018). For example, during their interviews Limpi and Green Force have indicated to see possibilities to improve and expand their recycling practices. The lack of financial resources not only holds these companies back in their recycling processes but also leads to a form of competition between the companies (CARMABI, personal communication, April 9, 2024; Green Force, personal communication, April 9, 2024; Limpi, personal communication, March 21, 2024). Since a significant portion of Curaçao's recyclable waste is exported for treatment abroad, the harbour tax acts as a major disincentive for commercial recycling companies to expand their operations on the island. Because exporting recyclable plastic waste is essential, these exports are often not cost-effective or even cost-covering, leading to unreasonably high expenses due to the currently extremely low prices for recycled materials on global markets (Busch, 2022; Lachmann et al., 2017). Therefore, reducing or eliminating the harbour tax would encourage further growth of the sector in the long term (Steenhagen & Vijber, 2024). Finally, another recommendation would be more support from the government both financial such as funding as the provision of resources as land or machines as a gift (Green Force, personal communication, April 9, 2024; Limpi, personal communication, March 21, 2024).

7. Discussion

This chapter discusses and reflects upon the results of this research in relation to the existing literature. After interpreting the findings, the discussion consists of a critical reflection on the limitations of the study. Finally, this chapter ends with discussing how the implications of the research and based on this some recommendations for further research.

Interpretation of Results

While there is a growing trend in clean-up initiatives (Nelms et al., 2022), literature on the wider impacts of these efforts remains scarce (Jorgensen et al., 2021; Wyles et al., 2017). By setting the context for understanding the waste sector on Curaçao, this research identified how clean-ups play an important role in the solid waste industry. The main infrastructure asset for Curaçaos solid waste management is the landfill at Malpais, that is managed by public waste company Selikor (Steenhagen & Vijber, 2024). Nevertheless, literature shows that a considerable amount of (plastic) waste still is dumped illegally in the environment and enters the ocean where it damages the marine environment as a result of a lack of awareness and regulation (Clayton et al., 2021). Where Selikor is mainly concerned with waste collection and disposal, the findings of this study show how clean-up initiatives contribute to other waste management levels as the reduction and recycling of waste. Currently, clean-up initiatives are the only efforts on the island committed to the cleaning of waste that is dumped illegally or washed ashore along the coast.

As the landfill has a remaining lifespan of 3-8 years and the current linear waste economy is considered unable to manage the waste-related issues (Fuldauer et al., 2019; Steenhagen & Vijber, 2024), the Curaçaoan Ministry emphasises the need for a transition towards a waste industry that is based on circularity. The focus in this new framework should be on measures such as waste prevention, awareness and recycling (Fuldauer et al., 2019). Since individual behaviour, influenced by widely accepted social norms and habits, is one of the primary factors contributing to plastic usage and the large amount of plastic litter in the environment (Marazzi et al., 2020), there is a need to gain a deeper understanding on the way we produce, (re)use and dispose plastics in order to develop effective solutions for reducing marine plastic (Beaumont et al., 2019; Soares et al., 2021). Furthermore, non-legislative interventions are argued to provide valuable and more effective opportunities for further reductions of land-based plastic marine pollution. These non-legislative interventions, also known as bottom-up approaches, include actions at the individual citizen level as well as mid-

level efforts by NGOs or the private sector (Schnurr et al., 2018). An article that presents a guide for organising community clean-up campaigns by Rangeti & Dzwairo (2021) states how clean-up initiatives have the potential to trigger long-term changes in behaviour and attitudes, encouraging communities to adopt sustainable practices like reusing and recycling and thus significantly impact how waste is managed within a community. While approaching clean-up initiatives from a social practice theory, this research provides new perspective on the practices that constitute clean-ups. The practices of picking, separating, educating, recycling and disposing have been recognised as recurring practices during the clean-up initiatives organised on Curaçao. While clean-ups have been called palliative measures focused on the removal of litter instead of reducing plastic pollution (Jorgensen et al., 2021; Power, 2022), these findings show that clean-up practices go further than removing litter from the environment.

To continue on the circularity of these clean-up practices, this research made use of the 3R framework that is built around the principles reduction, reusing and recycling to operationalise circular practices. As the compound practice approach is known for its characteristics to make the systemic nature from practices more visible and emphasise how the elements of practices are connected with wider societal frameworks (Laakso et al., 2022), this research aimed at connecting circular and clean-up practices as compound practices. However, when interpretating the connections, the three circular activities of reducing, reusing and recycling were only based on integrative practices. While compound practices take place at the intersection of integrative and dispersed practices (Warde, 2013), the clean-up practices and practices identified by Kirchherr et al. (2017) were all recognised as practices that entail multiple actions that rely on tele-affective structures. Despite the fact that the circular practices cannot be seen as compound practices, the shared meaning of raising awareness during the practices of picking, educating, separating and recycling formed a bundle of practices concerned with reducing plastic waste. Furthermore, a smaller practice bundle concerned with the circular practice of recycling plastic waste can be recognised next to larger bundle of reducing plastic waste. Looking at the clean-up practices in this research, the practices do not seem to belong to a bundle of practices at first sight. All practices are entities on their own, can be performed in different circumstances and locations and have different meanings, materials and competences. However, when approaching the four practices with the clean-up initiative as a common location, they become interconnected by their shared elements of meaning. In addition to these circular practices, the results of the observations and interviews show how local clean-up initiatives on Curaçao together collect four different types of plastic that are used by local and international recyclers to create new products: HDPE, PP, LDPE and PET. This

depends on the type, quality and the organisation behind the clean-up efforts. At the same time, this means that waste that is separated during the clean-up or does not meet the quality standards required by commercial recycles, ends up at the landfill. While this research discusses how the clean-up practices can be connected to the circular practice of recycling, these findings also contribute to mapping the recycling opportunities on the island.

In this study, the concepts of social practices, transition and circularity are used to identify the contribution of clean-up initiatives to a circular transition by adopting the zooming in and zooming out approach by Nicolini (2009). While the study analysed the clean-up practices by zooming in on the actual performance of the practices and the variations in its elements, the connections between the practices in space and time were uncovered by zooming out on the connection between clean-up practices and circular practices and the current waste industry on Curaçao. Research by Klitkou et al., (2022) aimed at understanding if and how literature using social practice theory addresses the interrelations of practices and their implications on for transformative change. In their research, Klitkou et al. (2022) argue how practices are interdependent. A change in one practice can lead to changes in another, and vice versa; co-location and co-evolution of practices encourage such changes (Klitkou et al., 2022). According to Klitkou et al. (2022), interventions aimed at greater sustainability should target complexes, bundles and nexuses of practices, as they frequently co-evolve and co-locate and because changes need to be aligned between different practices. In line with Klitkou et al. (2022), this study encourages the zooming in and out approach to connect social practices, transition and circularity. While zooming in, this research identified five clean-up practices that are described by different elements. Nevertheless, while zooming out, these clean-up practices shared meanings that could be connected to circular practices. Furthermore, by identifying the current waste industry, the role of clean-up initiatives in the industry and the recycling activities connected to the collected waste, this study was able to describe the wider impact of clean-up practices on other circular practices that can be considered a catalysator for a circular transition.

Finally, when considering the wider impacts of clean-up initiatives, clean-up efforts have been criticised for being ineffective in addressing plastic pollution, as they are considered ‘end of pipe’ actions that do not target the source (Jorgensen et al., 2021; Power, 2022). At the same time, circular economy requires changes in the product value chain such as redesign to avoid plastic waste (Geissdoerfer et al., 2017). On the other hand, research studies have found that clean-up activities are able to provide alternative sustainable pathways for the future (Adam, 2021). While clean-ups are argued to increase pro-environmental behaviour intention (Wyles et al., 2017) and able to motivate the local community to adopt good waste management

practices (Rangeti & Dzwairo, 2021), it was still rather unknown what role these initiatives can play on a larger scale regarding a circular transition. The results of this study show that while the majority of the clean-up practices contributes to the reduction or recycling of waste, the waste that is collected is an essential resource for commercial recyclers that have been supporting the waste management system. The clean-up initiatives can therefore be seen as a catalyst for large-scale change processes from a linear towards a circular economy. However, the resistance that exists towards clean-up initiatives from the local community and the lock-in mechanisms impacting the acceptance of sustainable alternatives show that the transition is still in an early phase. It is important to acknowledge that larger social changes are caused by a combination of movements within series of practices that have influence the current patterns of practices (Lamers et al., 2016). Therefore, this study recommended the implementation of a deposit-refund system, an awareness programme for primary schools, reducing the harbour tax and governmental support in resources, to encourage changes in practices that together can stimulate a transition towards a circular economy.

Nevertheless, on a more critical note, one should take into consideration the fact that islands generally face major challenges considering the generation of waste. Factors as land shortages, limited economic opportunities and inadequate waste management skills all undermine the prospects for effective solid waste management on islands (Wang et al., 2021). Willmott & Graci (2012), who conducted a case study on solid waste management on the island of Gili Trawangan, add to this that island states must also manage the large volumes of imported materials and packaging, along with the significant waste generated by tourists, including waste from both stay-over visitors as cruise ships, which is also recognised by Green Force (Green Force, personal communication, April 9, 2024). Next to the generation of waste, in their paper on waste-to-energy conversion and waste transportation within island communities, Zsigraiová et al. (20009) argue that the recycling and recovery of waste materials on island nations is challenging due to limited markets for recycled materials and the distance from larger markets. Additionally, on densely populated islands that rely heavily on tourism, finding appropriate site for waste treatment is difficult (Agatmuthu & Herat, 2014), and landfill sites are often visible to tourists (Eckelman et al., 2014). For these reasons, it is argued that the achievement of a fully circular economy on smaller islands remains a distant goal (Chandra & Ismail, 2023). However, this does not mean that island states are not capable of transitioning towards a circular capacity. According to Elgie et al. (2021), who conducted a case-study on the potential for circularity in Grenada's waste management system, CE can play an important role in addressing the urgent need for sustainable waste management systems on islands.

For example, research by Fuldauer et al. (2019) on the future of sustainable waste management in small island developing states emphasises the need for prioritising low-regret and adaptive waste management options fur Curaçao, until more information on future scenarios, policy strategies and targets considering the sustainable development goals (SDGs) targets. becomes available. Investing in low-regret circular economy initiatives now can help reduce the potential for locked-in future emissions and economic dependency from large-scale technologies. By involving the local population through back-casting, potential changemakers for implementing prevention and reuse initiatives were identified. Furthermore, coordinating inter-island recycling hubs, funded by the tourism industry, could help overcome barriers to scaling recycling efforts while contributing to the SDGs (Fuldauer et al., 2019). The findings of the research by Fuldauer et al. (2019) also suggest the feasibility of enacting laws that restrict certain tourism-generated waste streams that cannot be managed locally. These laws will require regional and global cooperation to avoid negatively impacting the tourism sector (Fuldauer et al., 2019). While the role of tourism-dependency on a circular economy in island states remains rather scarce in academic literature, Fuldauer et al. (2019) and Ferronato et al. (2024) argue that tourism activities can be viewed as an opportunity to identify solutions for supporting circularity on island states. The tourism sector for example, can play a key role in promoting sustainable development and waste valorisation due to the specific types of waste it generates and its vested interest in maintaining a clean environment (Ferronato et al., 2024). More specifically, laws and regulations aimed at reducing waste in this sector need to be developed and enforced. Hotels can adopt various measures to minimise their waste output, such as composting organic waste, prioritising repair over replacement, and offering fixed menus in restaurants to cut down on food waste, among other strategies (Fuldauer et al., 2019). Additionally, improved solid waste management systems could be financed by imposing a tax on tourists to offset their additional impact on waste management infrastructure (Ferronato et al., 2024). While this study adds to existing literature by presenting further action points for a transition towards a circular economy on Curaçao, it may be interesting to further investigate what role the tourism sector can play in this transition.

Limitations

The frequency of clean-up initiatives differs per organisation. Whereas some organisations strive to organise clean-ups every week, others aim at organising clean-ups once in two months or during national holidays. While the fieldwork in this study is carried out in a period of six weeks, not every clean-up organisation had an event planned during this period of

time. As a result, the participatory observations are based on the participation in clean-ups organised by three different organisations while there is a total of five organisations that are concerned with the organisation of clean-ups. The results on the clean-up practices might have been different and more representative if the research also included observations during clean-up initiatives from these two other organisations. Nevertheless, the two organisations that were not included in the observations, were still included in the interviews and asked about their clean-up practices to ensure external validity.

Another limitation concerns the lack of prior research studies on this topic. Only limited research has been done on the broader impacts of clean-up initiatives in the context of societal transitions, especially from a social practice perspective (Jorgensen et al., 2021; Wyles et al., 2017). Therefore, the various concepts used in this research, their operationalisation and linkages between the concepts were based on own interpretation of the researcher. While the choices of the various concepts and methods were supported by literature, there is no existing literature that linked all the concepts and operationalisations to each other.

Finally, the positionality of the researcher is also considered a limitation to the research. During the interviews with the clean-up organisations and commercial recyclers, a feeling of competition was observed among the organisations. As a result, some organisations tried to get some insights on the other clean-up organisations or commercial recyclers through the researcher. Although interviewees were asked to sign a consent form in which confidentiality regarding the data of the interviews was being ensured, this feeling of competition may have resulted in the fact that not every interviewee felt the confidence to answer all the questions honestly. However, the use of observations next to the interviews ensures the reliability and internal validity of the results.

Implications

While existing literature on the broader impacts of clean-up initiatives on the issue of plastic pollution is scarce (Jorgensen et al., 2021; Wyles et al., 2017), this study contributes to academic literature by filling in the current research gap. From a social practice perspective, the findings of this research show how clean-up initiatives address the issue of plastic pollution by contributing to a transition towards a circular economy. Whereas bottom-up, non-legislative interventions have been argued to provide more effective opportunities for further reduction of plastic pollution than top-down interventions (Schnurr et al., 2018), Kandziora et al. (2019) argue how the transition from a linear towards a circular economy is needed to prevent and reduce marine plastic pollution. The outcomes of this research can be used as an example how

clean-up initiatives as a bottom-up approach provide opportunities for a transition towards a circular economy and therefore also the reduction of marine plastic pollution. Although clean-up initiatives contribute to a circular transition, there are still some challenges regarding for example the attitude of the community that show the transition is still in an early phase and waiting for other catalysts to stimulate changes in waste management practices. This research provides recommendations on the next steps that can be taken to stimulate circular transition.

Future Research

Given the limited research on this subject, the findings of this study can serve as a foundation for future research. In addition, future research may benefit from using a multi-level perspective on the subject to further analyse the external factors that are of influence in the transition towards a circular economy. The interactions between the macro-, meso- and microlevels in this case can lead to new insights on the transition stage and other influences that stimulate circularity besides the clean-up initiatives. Furthermore, while academic literature on a circular economy on island states is scarce, research studies showed that islands face multiple challenges such as land shortages, inadequate waste management skills and limited economic opportunities. Therefore, further research could contribute by exploring the potential of circularity within islands' waste management systems. Since this study focuses on a specific case, the island of Curaçao, subsequent studies could explore other cases to see if the findings differ between countries. Especially considering the fact that the norms and values embedded in the Curaçaoan culture can be seen as a challenge within the acceptance of clean-up initiatives and sustainable waste management practices. Finally, while the tourism sector can be considered both a victim but also a contributor to the issue of marine plastic, scholars have argued that tourism activities can be viewed as an opportunity to identify solutions for supporting circularity on island states. Especially in the case of Curaçao, the tourism sector is of major importance for the economy. However, literature on the role of tourism-dependency on a circular economy in island state remains rather scarce. More research attention should be directed towards the complex challenges that island states face regarding marine plastics and sustainable waste management, an effort this research has sought to initiate.

8. Conclusion

This research aims at investigating how clean-up initiatives address the issue of marine plastic. During this research, the case-study of Curaçao is used to explore the role of clean-up efforts in the transition towards a circular economy, through the lens of social practice theory. First, this study described the current solid waste industry to set context for the position of clean-up initiatives. As a result of the major challenges in relation to plastic pollution, the government of Curaçao has highly prioritised waste management (Adshead et al., 2018; Fuldauer et al., 2019). Although the government plays a crucial role in preventing waste through regulation, legislation, and enforcement, current efforts are deemed insufficient to fully tackle Curaçao's plastic pollution problems (Curaçao.nu, 2024; Steenhagen & Vijber, 2024). Additionally, the government has assigned the management of waste to Selikor. This company is responsible for collecting household waste and processing it (Adshead et al., 2018; Government of Curaçao & UNDP, 2015). However, due to financial difficulties, Selikor has suspended all recycling activities and is now solely focused on the disposal of the collected waste (Selikor, personal communication, April 12, 2024). Next to the waste management of municipal waste, organisations and companies have been involved in the commercial recycling of plastics (Government of Curaçao, 2014; Government of Curaçao & UNDP, 2015). Despite these efforts, a significant amount of waste is still illegally dumped in the environment. Consequently, numerous citizens and organizations who feel a sense of responsibility have dedicated themselves to organising and participating in clean-up activities. During these initiatives, waste that is illegally dumped and/or washed ashore is removed from the environment. For this reason, clean-up initiatives are considered to play an important role in the current waste sector as they contribute to different levels of waste management by aiming at the reduction, recycling and disposal of waste.

When delving into the practices that constitute these clean-up initiatives, five practices were identified among all clean-up organisations: picking, educating, separating, recycling and disposing. In contrast to what academic literature states, the practices that constitute clean-up initiatives are not only based on the picking of litter but also include practices focused on educating and the handling of waste. Different meanings, materials and competences can be aligned to these five clean-up practices. However, the motivation of raising awareness is one that overlaps the practices of picking, educating, separating and recycling. During clean-ups, organisers and participants raise awareness by highlighting the extent of illegal dumping. They share information on plastic pollution's consequences and encourage reflection on personal

waste habits, for educational purposes. Participants also spread awareness by discussing the issue with others. Additionally, the process of separating and recycling waste demonstrates how plastic can be repurposed, emphasising its potential value.

Looking at how the different clean-up practices can be connected to the three circular practices of reducing, reusing and recycling, two different practice bundles were found. First of all, within clean-up initiatives the picking of litter, educating, separating and recycling can be considered to be part of the larger bundle of practices that is focused on the reduction of waste. On the other hand, separating and recycling practices are both part of a smaller bundle of practices concerned with the recycling of plastic waste. Whereas the practice of disposing itself does not have a circular focus, it is for the same reason that it cannot be connected to circular practices. This research also explored the waste stream to further identify how clean-up practices become connected to circular practices. The waste stream of the collected waste depends on the type of waste, its quality and the organisation behind the clean-up. However, together different clean-up initiatives collected HDPE, PP, LDPE and PET plastics. While HDPE, PP and LDPE are used by commercial recyclers to transform into new products as souvenirs and building materials, PET is exported to recycling companies overseas. Here, the bottles are used for the production of new PET bottles. While part of the plastics from clean-ups is used for recycling purposes, there is also a large part that ends up being disposed of at the landfill as it is not separated from other wastes during the clean-up or does not meet the quality standards of commercial recyclers.

There has been limited research on the broader impact of clean-up initiatives in addressing the issue of marine plastic (Jorgensen et al., 2021; Wyles et al., 2017). According to Kandziora et al. (2019), marine plastic can be prevented and reduced by shifting from a throwaway society towards a circular economy. While clean-up initiatives have been subject to criticism for being ineffective in addressing plastic pollution (Power, 2022), the purpose of this research is to identify how clean-up initiatives address the issue of marine plastic pollution by providing insights into the role of clean-up initiatives in the transition towards a circular economy on Curaçao. From the findings of this research, it can be concluded that clean-up initiatives contribute to the transition towards a circular economy on Curaçao. While the majority of the clean-up practices contributes to the reduction or recycling of waste, the waste that is collected is an essential resource for commercial recyclers that have been supporting the waste management system. Together, these activities address the issue of marine plastic pollution by raising awareness among the local community on the problem and transforming plastic waste into valuable new products. Therefore, clean-up initiatives can be viewed as

catalysts for large-scale transitions from a linear to a circular economy. However, the community, clean-up organisers and recycling organisations are still facing economical and socio-cultural challenges and a lack of financial resources, knowledge, awareness, regulation and enforcement. While these challenges make the transition towards circularity more complex, it also indicated that the transition is still in its early stages. As Schatzki (2016) argues, large scale social change is only possible by smaller changes in practices and practice bundles. These larger social changes can be traced back to a combination of movements within series of practices that have influenced the patterning in time and space (Lamers et al., 2016). Therefore, the transition from a linear to a circular economy requires more efforts on different areas than clean-up initiatives only. Examples of recommendations to stimulate a circular transition are the implementation of a deposit-refund system, an awareness programme for primary schools, reducing the harbour tax and governmental support in resources necessary for circular waste practices.

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Appendices

Appendix A: Topic Guide Clean-up Participants

TOPIC		PROMPTS
INTRODUCTION AND BACKGROUND	*Introductions*	Who I am, who is the participant, aim of the study, length of the interview and ethical considerations
	Participation	For how long
		How did you come in contact
		How often
		Motivation
		Participation in other activities related to plastic pollution
CLEAN-UP INITIATIVES	*Practice*	Describe what participation in a clean-up looks like
		Other practices besides picking litter; education, awareness-raising
	Social context	The team participating in the clean-up
		Participation of friends/family/relatives
		Topics of dialogue
SOLID WASTE MANAGEMENT	*Household*	Waste management practices in own household; prevention, separation, disposal, recycling/reusing
		Challenges with solid waste management on household-level
		Solutions that will support solid waste management on household-level
	National	Challenges with solid waste management on national level
		Solutions that will support solid waste management on national level
CLOSING STATEMENT	*Questions*	Any questions
	Thank you	Thank for participation

Appendix B: Topic Guide Clean-up Organisers

TOPIC		PROMPTS
INTRODUCTION & BACKGROUND	*Introductions*	Who I am, who is the participant, aim of the study, length of the interview and ethical considerations
	Organisation	History
		Mission
		Main activities
CLEAN-UP INIATIVES	*Organising aspects*	For how long
		How often
		Where; motivation behind locations
		Gathering of participants
		Main objective
	Practices	Describe what a clean-up looks like
		Other practices besides picking litter; education, awareness-raising
SOLID WASTE MANAGEMENT	*Organisational*	Different kinds of waste collected during clean-up
		What happens with waste after it is collected
		Challenges with solid waste management on organisational level
		Solutions that will support solid waste management on organisational level
	National	Challenges with solid waste management on national level
		Solutions that will support solid waste management on national level
	Partnerships	Partnerships with other organisations/companies/government that focus on waste management
	Other activities	Other activities organised with a focus on waste management
CLOSING STATEMENT	*Questions*	Any questions
	Thank you	Thank for participation

Appendix C: Topic Guide Waste Companies and Organisations

TOPIC		**PROMPTS**
INTRODUCTION & BACKGROUND	*Introductions*	Who I am, who is the participant, aim of the study, length of the interview and ethical considerations
	Organisation	History
		Mission
		Main activities
WASTE PROCESSING	*Activities*	Collection of waste; also organising clean-ups? If so: how often, where, participants, objective, what does a clean-up look like, what kinds of waste and what is done with the waste?
		What kinds of waste
		What is done with the waste; recycling/exporting
		End products in case of recycling and clientele
		Other practices besides processing waste; education, awareness-raising
SOLID WASTE MANAGEMENT	*Organisational*	Challenges with solid waste management on organisational level
		Solutions that will support solid waste management on organisational level
	National	Challenges with solid waste management on national level
		Solutions that will support solid waste management on national level
	Partnerships	Partnerships with other organisations/companies/government that focus on waste management
	Other activities	Other activities organised with a focus on waste management
CLOSING STATEMENT	*Questions*	Any questions
	Thank you	Thank for participation