Utrecht University

# Understanding the Impact of Single-Use-Plastics (SUP) Regulations on Consumer Behaviour and Sustainable Practices in the Netherlands

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## Abstract

Plastic waste represents a critical environmental and public health concern globally, prompting regulatory efforts across Europe aimed at reducing plastic consumption. This study examines the impact of Dutch government regulations on consumer behaviour regarding single-use plastics (SUPs). The regulations in question are as follows: 1) Additional charges on disposable plastic cups and containers for takeaway, and 2) Mandatory use of reusable tableware for onsite consumption. The research question guiding this qualitative research is as follows: “How have the regulations on single-use plastic (SUP) in the Netherlands affected consumer behaviour, particularly with regard to purchase decisions, and what factors are most influential in shaping this behaviour?”

The study employs semi-structured interviews with 19 Dutch consumers. These interviews explore their perceptions and behaviours related to the SUP regulations. Additionally, a comprehensive literature review underpins the analysis. This review utilises the COM-B model to categorise findings into capability, opportunity, and motivation dimensions. The study’s findings indicate a significant lack of consumer awareness regarding SUP regulations, which has led to confusion and frustration about their purpose and implementation. This lack of clarity has contributed to consumer scepticism and non-compliance. Furthermore, social stigma surrounding the use of reusable containers for takeout food persists, which has discouraged the widespread adoption of sustainable practices. Despite these challenges, participants demonstrated positive attitudes toward replacing disposable cups in workplace settings, citing reduced waste and ease of access to alternatives as motivating factors. Many participants expressed willingness to use loan cups  or their own reusable beverage containers, indicating the importance of convenient alternatives in promoting behavioural change.

In conclusion, while Dutch SUP regulations holds promise for reducing plastic waste and promoting sustainability, their effectiveness is hindered by low consumer awareness, persistent social stigma, and inadequate communication strategies. Addressing these barriers through improved public education, reducing stigma around reusable products, and enhancing accessibility to reusables are essential steps to enhance compliance and foster sustainable consumer behaviour. The implementation go these measures will facilitate the adoption of reusable products, thereby reducing SUP waste and advancing environmental efforts.

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# 1. Introduction

In the Anthropocene era, plastics, including microplastics, are ubiquitous, leaving a permanent imprint on the Earth's fossil record (UNEP, 2022). As a consequence of the pervasive utilisation use of plastics in everyday life, there is a growing scientific and societal concern, particularly in the form of small particles that are particularly toxic to the environment and human health (Rodrigues et al., 2019). The widespread accumulation of plastic waste in urban and rural areas represents a significant environmental threat. For instance, plastic waste can impede the functionality of storm drains and sewage systems, thereby increasing the probability of flooding (Chen et al., 2021). The documented cases of animal injuries and deaths due to ingestion of plastics in both terrestrial and aquatic environments are numerous. Furthermore, the presence of plastic waste, such as remnants of mulching film, in agricultural environments disrupts the natural flow of water and air in soils. This has a detrimental effect on agricultural productivity, as it impedes the uptake of nutrients by plants (Chen et al., 2021).

Despite its impact on the environment, plastic forms an integral part of today's world. Its versatility, affordability, and durability make it difficult to replace. It is used in a wide range of applications, including clothing, machinery, construction, and packaging (Herberz et al., 2020). Since the 1950s, global plastic production has increased at an average rate of 9% per year (Chen et al., 2021). As plastics become more deeply embedded in our daily lives, they continue to threaten ecosystems, human health, and overall planetary sustainability. This is because production growth is the direct result of increased demand. The most effective approach to reducing plastic pollution is to target consumers, as they are the primary source of single-use plastic (SUP) consumption (Xanthos & Walker, 2017). Globally, individuals purchase one million plastic bottles every minute and approximately five trillion plastic bags are utilised annually. In total, half of all plastic production is destined for single-use applications (UNEP, 2022). Single-use plastics (SUPs) are defined as objects made partly or entirely of plastic, typically designed for short or one-time use before being discarded (European Commission, 2021). Examples of SUPs include shopping bags, takeaway containers, bottles and straws (McClure, 2021).

In order to effectively address the issue of plastic pollution, it is essential to undertake an assessment of the entire life cycle of plastics, including design, production, consumption and disposal. The identification of unsustainable consumption patterns, ineffective legislation, inefficient waste management systems and a lack of sectoral coordination as key contributors to this global challenge has been made by the IUCN (2024). In Europe, the scale of the problem is evident, with approximately 27.1 million tonnes of plastic waste collected in 2016. Of this, 31.1% was recycled, 41.6% underwent energy recovery processes, and 27.3% ended up in landfills (Chen et al., 2021). There is growing awareness of the problem, which is prompting action by governments, industry and other stakeholders (UNEP, 2022).

While consumers express motivation to reduce SUP food packaging, their willingness to pay for sustainable alternatives is often hindered by the cost (Walker et al., 2021). For consumers to avoid SUPs, their motivations and norms play an important role. Furthermore, the motivation to reduce SUPs is linked to the satisfaction of basic psychological needs (Nguyen et al., 2022). While regulatory instruments have demonstrated effectiveness in the short term, there is a lack of long-term evidence on their sustained impact in reducing SUP consumption (Borg et al., 2022). It is therefore crucial to identify these underlying motivations and barriers in order to further enhance the impact and encourage long-term adaptive behaviour.

Previous studies have been conducted on the effect of introducing an additional plastic charge on SUP bags, such as that presented by Taghipour et al. (2023). However, no similar research has been conducted recently on the effects of SUP charges in the Netherlands. Given the recent developments in SUP regulations in the Netherlands, there were no publications on the effectiveness of these regulations

at the time of this research. The research gap that this study aims to fill is to understand how cultural, economic and environmental factors unique to the Netherlands may shape consumer behaviour in response to SUP regulations. The Netherlands serves as an ideal research area to study the impact of SUP regulations on consumer behaviour due to several key factors. Firstly, the country's reputation for progressive environmental policies and initiatives, as evidenced by its efforts to reduce plastic waste and promote sustainability, creates a desirable environment for this study (Government of the Netherlands, 2020). Furthermore, Dutch citizens exhibit a high level of environmental awareness and consciousness, often actively participating in environmental initiatives and readily adopting sustainable practices (Runhaar et al., 2013). The heightened awareness of the Dutch population makes it an ideal population to study consumer behaviour in relation to SUP regulations, as consumers are more likely to engage in environmentally friendly behaviours. Furthermore, the Netherlands is recognised as an innovation hub, especially in the fields of sustainability and technology (Deloitte, 2021). This culture of innovation encourages the development of alternative packaging materials and sustainable consumption practices, providing unique opportunities to study consumer responses to SUP regulations.

This is why the Netherlands was chosen for this study. The Netherlands has a progressive attitude towards environmental issues and sustainability. A number of sustainability issues are currently high on the political agenda, including the reduction of greenhouse gas emissions (Government of the Netherlands, 2020), the reduction of the use of fossil fuels (Rijksoverheid, 2023) and, of particular interest for this research, the reduction of SUP consumption (Ministerie van Algemene Zaken, 2024a). Furthermore, the Netherlands is distinguished by a high standard of living and serves as a representative setting for a developed consumer society (Numbeo, n.d.). Studying consumer behaviour in this context provides valuable data on the impact of SUP regulations on individuals with different purchasing power and consumption patterns. This leads to the following research question: "How have the regulations on single-use plastic (SUP) in the Netherlands affected consumer behaviour, particularly with regard to purchase decisions, and what factors are most influential in shaping this behaviour?."

The study will contribute to the understanding of consumer behaviour, which is crucial for bridging the gap between regulatory initiatives and their real-world impact. Rather than assessing the effectiveness of these regulations directly, the study will explore the response of consumers to SUP regulations. This research aims to investigate how consumers respond to SUP regulations in the Netherlands, specifically in relation to the introduction of SUP charges and reusable tableware in catering establishments. This approach allows for a more nuanced examination of how individuals respond to regulatory changes and the underlying factors that influence their behaviour. By focusing on consumer behaviour, researchers can gain valuable insights into the challenges, motivations and adaptations that occur in response to SUP regulations.

The following stakeholders may find this study of interest: Policy makers and government agencies may find the study valuable for decision-making purposes, as it provides insights into how SUP regulations affect consumer behaviour in the Netherlands. Understanding why people buy and dispose of SUP products helps to create better and more targeted regulations. This shift in focus allows policymakers to better tailor interventions and strategies to promote sustainable practices and remove barriers to compliance. Ultimately, by prioritising an understanding of consumer behaviour in the context of SUP regulation, this research can contribute to more effective policy implementation and positive environmental outcomes. This enables evidence-based decision making to effectively address the problem of plastic pollution. Businesses, especially those involved in the production and distribution of plastic products, have a direct interest in understanding consumer behaviour influenced by SUP regulations. This knowledge can inform companies about consumer preferences for sustainable products, allowing them to adapt their offerings and marketing strategies accordingly. The general public is becoming increasingly concerned about environmental issues, and this research informs them about the impact of SUP regulations on their behaviour. This knowledge could empower individuals to make

informed choices, support sustainable initiatives and advocate for stronger environmental regulations. In addition, this research may be of interest to environmental organisations and the academic and research community.

In addition to investigating the effectiveness of additional charges on SUP products in e.g. supermarkets, this research will extend the scope to other SUP products such as cups and containers. This extension aims to fill the gap in understanding how charges on different SUP items affect consumer behaviour. In addition, the study will examine the barriers that consumers face in changing their behaviour, providing a comprehensive view of the challenges and opportunities that consumers face in moving away from SUPs in order to promote effective regulation. This study examines consumer preferences for SUP regulation beyond willingness to pay. By addressing the gap in understanding policy preferences, it identifies which regulatory measures consumers find most effective and acceptable. This insight is crucial for policymakers to design regulations that meet consumer expectations and lead to positive behavioural change.

By identifying consumer preferences for sustainable alternatives, industry can use these insights to innovate and develop products that meet consumer expectations and promote more sustainable alternatives. Research on consumer behaviour in relation to SUP regulations has significant social and scientific relevance due to its implications for environmental impact, public health, the Sustainable Development Goals (SDGs) and economic considerations. Plastic pollution represents a global environmental concern that affects ecosystems, wildlife and human health (Silva et al., 2020). Furthermore, plastic pollution also poses a risk to public health through the contamination of water sources and ingestion of microplastics. In order to protect public health, it is therefore necessary to implement research-based policies (Heidbreder et al., 2019). Furthermore, the United Nations SDGs emphasise the importance of reducing plastic pollution and promoting sustainable consumption patterns. In particular, Goals 12 (responsible consumption and production) and 14 (life below water) emphasise this importance (UN Department of Economic and Social Affairs, 2023). An understanding of the manner in which SUP regulations influence consumer behaviour can assist in the identification of effective strategies for the reduction of plastic waste and the mitigation of environmental harm. Furthermore, the economic costs of plastic pollution extends to the costs of clean-up efforts, marine industries and tourism (Nikiema & Asiedu, 2022). The study of on consumer behaviour can help assist in the assessment of the economic impact of SUP regulations and in formulation of resource allocation decisions. In conclusion, an understanding of consumer behaviour in response to SUP regulations is of paramount importance if we are to comprehensively address plastic pollution and advance sustainability agendas.

## 2. Theory

In examining consumer compliance with SUP regulations, this research employs several behavioural theories to provide a comprehensive understanding of the factors that influence behaviour change. The COM-B model, which identifies capabilities, opportunities, and motivations as crucial components driving behaviour (Michie et al., 2011), is central to this analysis. This model is particularly relevant for the identification of barriers and enabling factors for sustainable practice, offering a structured approach to this complex area. Furthermore, the research examines behaviour change interventions, which are defined as sets of activities designed to alter specific behavioural patterns (Barker et al., 2016). It is therefore evident that these interventions are of crucial importance in the development of strategies designed to promote the use of reusable products. Furthermore, the value-action gap, which highlights the unconscious habits that make rational decision-making difficult, is addressed in order to understand the discrepancy between consumers' values and their actual behaviour. The integration of these theories

is intended to provide actionable insights that will facilitate the improvement of consumer compliance with SUP regulations.

## 2.1. Insights from Previous Research on Behavioural Change and Regulations

It is possible that some individuals may not align their pro-environmental values and attitudes with their behaviours. This phenomenon is also known as the value-action gap (Spurling et al., 2013). This value-gap arises from the influence of unconscious habits on the process of rational decision-making and the connection between values and actions. Thaler and Sunstein (2008) propose that interventions have the potential to guide habits in specific directions. One example is the modification of organ donation schemes from an automatic opt-out to opt-in system. This has the effect of significantly increasing the number of donors, as individuals are no longer required to register as donors unless they wish not to be.

Spurling et al. (2013) propose a shift in the approach to policy interventions aimed at promoting sustainable consumption. Instead of focusing on changing individual behaviours, influencing consumer choices, or introducing new technologies, the recommendation is to adopt a "practice perspective." In this context, the term "practice" refers to the routines, activities, and habits that individuals engage in on a daily basis. The recommendation is to design regulations that intervene at the level of these practices rather than targeting isolated aspects such as behaviour, choice, or technology. This approach acknowledges the interconnections between actions within broader practices and strives to address sustainability in a more comprehensive manner. This is the reason this study focuses on consumers' routines, activities and habits to identify potential weaknesses or improvements within SUP regulations in the Netherlands.

The COM-B model acknowledges that behaviour is shaped by various factors. It is therefore possible to achieve changes in behaviour by addressing one or more of these factors. This model can be helpful when considering intervention methods, emphasising the need for interveners, like policymakers, to secure the sustainability of changed behaviours (Pilat & Krastev, n.d.). The model was originally developed for use in the health sector, with the intention of guiding policymakers and industry leaders in their decision-making. The model has not previously been utilised in related literature examining behavioural change subsequent to policy implementation with regard to sustainability. This research will be distinctive in employing the COM-B model to identify behavioural changes made by consumers when adapting to new regulations with the objective of reducing single-use plastic consumption. By identifying the *capabilities* (C), *opportunities* (O), and *motivations* (M) of consumers following the implementation of new regulations, it is possible to ascertain the impact of the regulations on consumer *behaviour* (B).

The model has been demonstrated to be effective in previous researches, which was primarily focused on the healthcare sector. However, given the interest in this research, it will be employed in a different manner. The primary focus of this study will be on the impact of policy implementation on consumer behaviour with regard to sustainability. Consequently, the behavioural change exhibited by consumers in response to the implementation of SUP regulations, with the objective of reducing their consumption of SUPs.

## 2.2. List of keywords

- **Consumer behaviour**: adaptability, natural behaviour, willingness to change, consumer decision-making, use behaviour, consumerism, behaviour change, pro environmental behaviour
- **COM-B model**: key factors of changing behaviour, Capability (C), Opportunity (O), Motivation (M)

## 2.3. Key Terms

**Definition consumer behaviour**: "The behaviour that consumers display in searching for, purchasing, using, evaluating, and disposing of products and services that they expect will satisfy their needs" (Bray, 2008).

**Behaviour change interventions:** a set of activities that have been meticulously planned and executed with the intention of modifying specific behavioural patterns. Such patterns are frequently quantified by measuring the frequency or occurrence of behaviours within a defined population. Behaviour change interventions are designed to bring about positive change in targeted behaviour patterns within identified populations through purposeful and organised activities (Barker et al., 2016).

## 2.4. The COM-B Model for Behavioural Change

The COM-B model, created by behavioural scientists for leaders, including policymakers, represents an essential tool for research in both the public and private sectors. The model was designed based on similar models that focused on behaviour change but made use of their shortcomings to provide an improved model (Michie et al., 2011). The COM-B model identifies three crucial factors that influence behaviour: *capability* (C), *opportunity* (O), and *motivation* (M). *Capability* is defined as an individual's mental and physical capacity to engage in an activity, which represents the internal elements. *Opportunity* is defined as the external elements that enable a specific form of behaviour. Finally, *motivation* is a process that involves both conscious and unconscious cognitive processes, guiding and inspiring a form of behaviour (Pilat & Krastev, n.d.). In more detail, the following factors must be considered:

1. **Capability**: the possession of the requisite knowledge, skills, and abilities to engage in a specific form of behaviour. This capability encompasses an individual's mental state, knowledge base, and skill set, as well as their physical strength.
2. **Opportunity**: external factors that enable the performance of a given behaviour. All three elements of physical, environmental, and social opportunity are relevant.
3. **Motivation**: the internal processes influencing decision-making and behaviour.
    a. Reflective motivation: the thoughtful process of formulating plans
    b. Automatic motivation: automated processes such as impulses and inhibition.

To enhance *motivation*, it is beneficial to transform a desired behaviour from a mere obligation to a desired state. This can be achieved by encouraging individuals to consider the advantages associated with performing the desired behaviour. This process can facilitate the development of an internal drive and positive tendency towards engaging in the desired behaviour. *Figure 1* illustrates the interrelationships between the capabilities, opportunities, and motivations and the performed behaviour.

The COM-B model of behaviour change suggests that for a person to perform a *behaviour* (B) at a specific time, they must possess the physical and psychological capability (C), the opportunity (O) to put on the behaviour, and the need or desire (M) to demonstrate the behaviour at that time. This model is useful in that it identifies which components of behaviour need to be adjusted for an intervention to be rated successful.

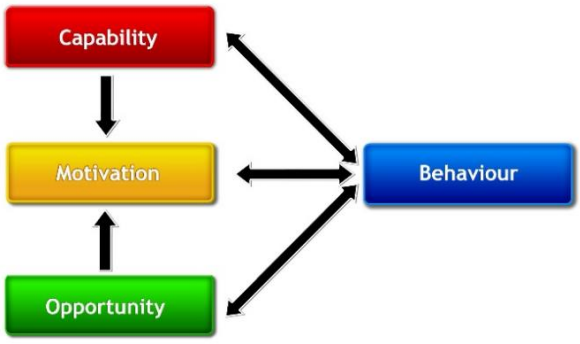


**Figure 1: COM-B model as originally presented by Michie et al., 2011.**

## 2.5. Determinants in Consumer Support

Previous research has been conducted to identify the factors that influence consumer decision-making, the willingness of consumers to act, and the efficacy of policy measures. These determinants can be of use in this research as they group determinants into different categories based on factors of behaviour (Baum & Gross, 2017), related to climate-friendly action, and willingness to address climate change (Tobler et al., 2012). The findings of this research identify the strengths and weaknesses of SUP regulations in the Netherlands, which can be grouped using determinants. Subsequently, recommendations can be formulated for different stakeholders, with policymakers being advised to relate their recommendations to the COM-B model.

In the context of willingness to act and support policy measures, Tobler et al. (2012) present a number of specific determinants. The analysis commences with a consideration of the determinants associated with climate-friendly action. There are both direct and indirect behaviours (1). An individual may choose to support a governmental initiative with the objective of mitigating climate change, or alternatively, they may choose to modify their own lifestyle in order to directly reduce the quantity of greenhouse gas emissions that they emit. The former will not have a direct, positive impact on the environment, whereas the latter will. Furthermore, there are high- and low-cost behaviours (2). These factors do not have to be viewed from an economic perspective, considering the literal cost of a product. Instead, they can also be about the amount of time a habit can take up or the discomfort or effort an action takes.

Subsequently, the factors influencing consumers' willingness to address climate change are considered (Tobler et al., 2012). These may include an individual's concern about climate change (3). This is the perception that individuals have of climate change, which directly influences their level of concern. The greater the concern, the more willing the individual is to act and to even change their behaviour (Semenza et al., 2008). Furthermore, individuals may experience a sense of powerlessness (4). This subsequently has a negative impact on their behaviour. By discouraging individuals from addressing environmental issues. Furthermore, scepticism can also have a negative effect on the willingness to address environmental issues (5). This can be attributed to the influence of individuals who adopt a lack of concern regarding the threat of climate change, or to the pervasive influence of media on public opinion. The final determinant that is discussed is the perceived costs and climate benefits (6), which is similar to high- and low-cost behaviours (2). However, it differs in that it considers the direct or indirect impact on the climate, evaluating whether the costs are justified.

The literature review indicates that the COM-B model has not previously been employed in a study of this nature. The utilisation of this model represents a novel approach within this field, with the potential to serve as a model for future research. Furthermore, the aforementioned determinants can be employed as a framework for categorising the findings in accordance with the COM-B model. The BCW will provide policymakers with valuable insights into potential recommendations regarding current SUP regulations.

# 3. SUP Regulations Netherlands

The issue of plastics has been a prominent concern across the European and global political landscape for some time. The objective is to reduce the overall leakage and pollution of plastics (Silva et al., 2020). One of the most significant challenges is the recovery of plastic packaging (Chen et al., 2021). In order to address the issue of plastic pollution, two earlier regulations concerning the use of single-use plastics (SUPs) have been implemented. These regulations are of interest in the context of this research. The second directive is specifically concerned with SUP bags. In 2010, the average number of plastic bags used per person was 176. In order to mitigate the consumption of plastic, the European Commission, Parliament, and Council passed a directive on SUPs with a target of 90 SUP bags consumed per person per year by 2019, with a further reduction to 40 SUP bags consumed per person per year by 2025. This

has resulted in a 73% reduction in comparison to 2010 levels (Chen et al., 2021). Furthermore, the European Commission, Parliament, and Council have set a goal of recycling 50% of plastic packaging by 2025 and 55% by 2030 (Silva et al., 2020).

In the period since 2021, the Dutch government has enacted further regulations with the objective of reducing plastic waste. These regulations concern the following (Ministerie van Algemene Zaken, 2024a):

- The sale of certain disposable plastic products has been prohibited since July 2021.
- The cost of plastic for all small plastic drinks bottles up to 1 litre is €0.15 since July 2021, while the cost of plastic for drinks cans is €0.15 since January 2023.
- The use of a logo is required to inform consumers that a product contains plastic. This regulation was implemented in July 2021.
- Fishermen are required to collect at least 23% of fishing gear waste. This regulation was implemented in January 2022.
- Producers of plastic products that are commonly found in litter are required to pay the costs for cleaning up waste. This regulation was implemented in January 2023.
- Additional charges are imposed on the use of disposable plastic cups and containers for on-the-go meals and drinks. This regulation was implemented in July 2023.
- Furthermore, since January 2024 , the use of reusable tableware has been required for eating and drinking on site.

Two additional regulations have already been set for the future: as of July 2024, caps must be attached to plastic bottles and beverage containers, and as of 2025, PET bottles must contain at least 25% recycled plastic.

In the three years since the initial regulations were introduced, numerous changes have been made. However, it is likely that further changes will be implemented in the near future. This research places particular emphasis on the willingness of consumers to embrace change in light of the aforementioned regulations. In particular, it considers the impact of the additional charges for disposable plastics as of July 2023 and the requirement for reusable tableware for eating and drinking on site since January 2024.

Since July 2023, the SUP regulation has introduced additional charges for disposable plastic cups and containers for on-the-go meals and drinks (Ministerie van Algemene Zaken, 2024a). This regulation comprises of two key changes: firstly, consumers are now charged extra for disposable cups and food containers when ordering takeout; secondly, there are additional charges on food and drink items containing SUPs when purchased in supermarkets or other retailers. The objective of these measures is to reduce the use of disposable plastics by encouraging consumers to opt for reusable alternatives, with the goal of promoting more sustainable consumption habits. As of January 2024, it is required for hotels, cafes and restaurants to provide reusable tableware when consumption of food and drinks takes place inside the facility (Ministerie van Algemene Zaken, 2024a). Furthermore, offices, company canteens, schools, and sports clubs are also required to cease the provision of disposable items.

# 4. Research Design and Methodology

## 4.1. Research Objectives

1. To study the impact of the single-use plastic (SUP) regulations on consumer behaviour and on their purchase decisions.
    a. To what extent are consumers aware of and informed about SUP regulations in the Netherlands?

    b. What changes have been observed in consumer purchasing decisions since the introduction of SUP charges (from 1 July 2023), particularly in industries that rely heavily on single-use plastics (e.g., food and beverage, retail)?
2. To assess the effectiveness of single-use plastic (SUP) regulations in promoting sustainable practices by consumers in the Netherlands.
    a. To what extent have consumer preferences shifted towards alternative packaging materials or reusable products following the implementation of the SUP regulations?
    b. What are the primary challenges and obstacles encountered by consumers in adhering to the SUP regulations set by the Dutch Government?

In order to address the primary research question, namely "How have the regulations on single-use plastic (SUP) in the Netherlands affected consumer behaviour, particularly with regard to purchase decisions, and what factors are most influential in shaping this behaviour?," two research objectives were established. The first objective is to investigate the influence of SUP regulations on consumer behaviour and choices. This objective focuses on current consumer awareness and understanding of SUP regulations in the Netherlands, using the COM-B model to examine the *capability* of consumers. Furthermore, the study sought to determine the changes in purchasing choices since the implementation of SUP regulations in order to assess their effectiveness.
Secondly, the research aimed to understand to what extent SUP regulations actually promote sustainable practices in the Netherlands. This was tested by examining consumer preferences for reusable products and their usage rates after implementation. The findings provide insights into current consumer motivations and the potential challenges and barriers they face when adapting to SUP regulations. These relate to the *opportunity* and the *motivation* of the COM-B model. This helps identify how opportunities could be improved to further promote sustainable behaviours and reduce the consumption of SUPs. The analysis of the interviews will focus on two specific SUP regulations:

- From July 2023, an additional charge has been implemented for the use of disposable plastic cups and containers for on-the-go meals and drinks.
- The use of reusable tableware is mandatory for the consumption of food and beverages on the premises, with the effective date of January 2024.

These two regulations have been chosen as they most relate to the use of reusables, which makes for the possibility of an analysis of the different elements of the COM-B model. They can be related to a possible increase in the use of reusable products or change in behaviour by consumers.

## 4.2. Research Type

This study employed a qualitative methodology to understand consumer behaviour with regard to SUP regulations in the Netherlands. The study focused on three key areas: usage, preferences for sustainable alternatives, and barriers to behaviour change. The primary data source are in-depth interviews with Dutch consumers in addition to the Dutch government regulations on SUPs. Secondary sources include similar scientific research and online articles for comparison and analysis purposes.

The research was descriptive in nature, providing a comprehensive description of consumer behaviour in response to SUP regulations. Furthermore, the study included an analytical perspective, whereby the underlying factors influencing consumer behaviour were analysed, patterns, themes and relationships within the data were identified, and the results were presented in a clear and concise manner. The objective of the study is to identify the underlying reasons behind observed phenomena, thereby enhancing the descriptive findings with greater depth and understanding. Qualitative interviewing was selected as the most appropriate methodology for the study, as it allows for a more in-depth exploration of participants' perspectives and the capture of nuanced insights. Conducting online interviews enabled the researcher to access a diverse sample of participants without any logistical challenges, given the

limited time for this part of the research. This methodology was therefore deemed to be the optimal choice for this specific research. The research adopted an inductive approach, with the objective of generating new insights from qualitative data.

## 4.3. Sampling strategy for in-depth interviews

In order to gain insights into consumer behaviour following the implementation of SUP regulations in the Netherlands, it is essential to focus on a representative sample of consumers. This approach ensured that the findings accurately reflected the attitudes, behaviours, and experiences of the broader population regarding SUP regulations and sought to target a diverse range of individuals. The research aimed to capture the perspectives of various demographic groups, socio-economic backgrounds, and geographic regions, providing a comprehensive understanding of consumer behaviour in response to SUP regulations in the Netherlands. This comprehensive approach renders the research more applicable to policymakers, businesses, and other stakeholders involved in addressing plastic pollution and promoting sustainable practices on a national scale.

In order to represent a diverse range of individuals reflective of the general population, various factors were considered, including age, living circumstances, and other demographic variables. Purposive sampling was identified as the most appropriate methodology, enabling the selection of participants based on specific characteristics and experiences that were deemed relevant to the research topic. This approach ensured the efficient recruitment of participants within the limited time, facilitating the collection of high-quality data essential for the generation of meaningful insights into consumer behaviour regarding SUP regulations. Given that the average Dutch person is 42.5 years of age (CBS, 2022), the research focused on interviewing people between 20 and 65 years of age, with the aim of representing all ages within this range. *Table 1* presents the number of participants, their gender, estimated age, occupation, and method of recruitment. Although there is a correlation between higher education levels and more sustainable behaviour (Piao & Managi, 2023), education level was not explicitly targeted during recruitment to avoid influencing participants' responses. However, education level was considered during the screening process to ensure a diverse sample.

**Table 1: List of interviewed participants (*names changed).**

| Name* | Estimated age | Occupation | Recruited via |
|---|---|---|---|
| Isa | 35 | Coordinator | Flyer Facebook |
| Melissa | 57 | Personal Tutor | Hardcopy flyer |
| Eline | 43 | Teacher VMBO | Hardcopy flyer |
| Nick | 61 | Consultant in Administration | Flyer LinkedIn |
| Emma | 40 | Teacher VMBO | Hardcopy flyer |
| Lenno | 27 | Institutional Salesperson | Flyer LinkedIn |
| Hannah | 54 | Communications officer | Flyer LinkedIn |
| Thijs | 62 | Information Security Officer | Flyer LinkedIn |
| Frank | 64 | Data Analyst | Flyer Facebook |
| Stefan | 26 | Online Marketeer | Flyer Facebook |
| Quinten | 32 | Recruiter | Flyer Facebook |
| Sophie | 62 | Administrative Assistant | Flyer Facebook |
| Nora | 55 | Archivist | Flyer LinkedIn |
| Luuk | 28 | Product Owner | Flyer Facebook |
| Lotte | 30 | Teacher MBO | Hardcopy flyer |

| | | | |
|---|---|---|---|
| Jan | 59 | Information Specialist | Hardcopy flyer |
| Pieter | 60 | Process Expert Finance | Hardcopy flyer |
| Thomas | 50 | Hardware Engineer | Flyer Facebook |
| Tessa | 49 | Secretary | Hardcopy flyer |

It was deemed that random sampling was not an appropriate methodology given the necessity of a larger pool of participants for representativeness, which posed challenges within the research's constraints. In order to provide a more accurate representation of the average Dutch consumer, quota sampling was deemed to be the most appropriate methodology. This approach enables the selection of participants based on predetermined quotas, which allows for the mirroring of demographic characteristics. This was achieved by establishing key demographic variables. The use of quota sampling ensured that the insight gained were representative of the attitudes, preferences, and behaviours of the target population. This approach enabled to gain a comprehensive understanding of consumer behaviour regarding SUP regulations.

The participants for this research were recruited through a combination of online platforms and direct outreach. Facebook and LinkedIn were employed as the primary channels for connecting with participants. These two social media platforms were selected for their distinct purposes. LinkedIn is designed for business and professional purposes, whereas Facebook is more informal and social. This approach aimed to recruit a more diverse sample of participants to better represent the target group, in this research, the average consumer in the Netherlands. Furthermore, in order to expand the pool of participants and ensure representation of the average Dutch consumer, 200 flyers were printed and distributed across four neighbourhoods in Rotterdam and Schiedam: Delfshaven, Crooswijk, Terbregge, and Rotterdam-West. The selected neighbourhoods were chosen for their affordability and to ensure a more diverse demographic representation. The recruitment of participants was successfully completed through these methods within a three-week period from 18 March to 4 April 2024. The final sample consisted of 19 participants, including 10 males and 9 females, with ages ranging from 27 to 64. The participants were geographically diverse, representing regions such as Noord-Holland, Zuid-Holland, Utrecht, Gelderland, and Noord-Brabant.

## 4.4. In-depth Interviews

In this research, it is of the utmost importance to gain an understanding of participants' perceptions of SUP regulations. To this end, the use of predominantly open-ended questions is encouraged. A semi-structured interview approach was deemed the most suitable methodology for exploring consumer behaviour related to SUP regulations in the Netherlands. This approach strikes a balance between flexibility and structure, allowing for in-depth exploration while ensuring focus on the key research objectives.

The semi-structured interview format allowed participants to express their opinions and experiences freely while enabling researchers to cover a range of topics in depth (Clark et al., 2021). Moreover, they facilitated exploration and follow-up questions, uncovering distinct motivations and factors that might not emerge in a structured format. This approach provided the necessary flexibility, guidance, and depth to effectively explore consumer behaviour in the context of SUP regulations. The use of unstructured interviews was deemed unsuitable, as they lack focus and could potentially yield limited coverage of the research objectives. Conversely, structured interviews may not capture the richness of data needed. The structure of the in-depth interview conducted with participants can be found in *Appendix A*.

The interviews were conducted via video call on Microsoft Teams, offering convenience and flexibility while minimising travel time and costs. Simultaneously, Microsoft Teams was employed to transcribe the interviews in real time. Prior to the interview, each participant was made aware of, and agreed to the terms of the privacy notice and signed a consent form. The audio recoding was completed without any

technical difficulties, with the exception of one participant who cancelled at their own discretion for reasons of a personal nature. Despite the successful execution of the interviews, the transcription process proved to be considerably time-consuming and could have been more accurate had other software been used.

The primary limitations of this approach included potential biases introduced by the recruitment methods and the constraints of video call interviews. The utilisation of online platforms and flyers in specific neighbourhoods may not fully encompass the diversity of the Dutch population. Furthermore, technical issues and distractions during online interviews could have affected the depth and clarity of the responses. Despite the aforementioned challenges, the recruitment and data collection methods employed proved effective in gathering a diverse sample and providing valuable insights for the research.

## 4.5. Interview Analysis

A thematic analysis approach was deemed most suitable for analysing data from semi-structured interviews on consumer behaviour. This approach allowed for the identification and interpretation of patterns or themes within qualitative data, aligning well with the exploratory nature of this research. By analysing the responses to the interviews thematically, the underlying motivations, attitudes, and behaviours of consumers in response to SUP regulations were uncovered. *Table 2* outlines the steps conducted in this thematic analysis on the collected interview data. Adherence to the outlined steps ensured a comprehensive analysis, which generated meaningful insights to enhance understanding of consumer behaviour in the context of SUP regulations.

**Table 2: Steps during research for thematic analysis on collected interview data.**

| Task | Description |
|---|---|
| **Transcription** | Transcribing the interview recordings verbatim. Ensuring a written records of the participants' responses. |
| **Familiarisation** | Reading the transcripts to find key phrases, ideas, or patterns. |
| **Coding** | Systematically coding the data by identifying themes, topics, or concepts within the transcripts. By using both deductive and inductive coding. |
| **Theme development** | Organise the initial codes into broader themes based on their similarities and relationships. |
| **Data interpretation** | Consider how themes align with existing literature, the COM-B model, and broader socio-cultural context of consumer behaviour and sustainability. |
| **Refinement and validation** | Review and refine the identified themes, ensuring that they accurately represent the diversity and depth of participants' responses. |
| **Reporting** | Present the findings. Organising the findings in a structured narrative that highlights the main themes, sub-themes, and their implications for understanding consumer behaviour regarding SUP regulations in the Netherlands. |

The initial step, as presented in *Table 2*, involved transcribing the interviews, which were facilitated by the online recording of audio during the interviews. The transcripts of the recorded interviews can be found in a separate document titled *Series of Interview Transcripts on SUP Regulations and Reusable Products Adoption*. The software programme NVivo was employed for the purpose of coding, with the following simplified coding scheme as presented in *Table 3.* The scheme assisted in the identification of themes for the organisation of the findings, thereby facilitating comparison with existing literature. It is important to note that this is not the entirety of the coding scheme.

**Table 3: Simplified coding scheme (of the in-depth interviews (Appendix A) using NVivo.**

| | ***Theme*** | ***Coding Schemes*** |
|---|---|---|
| *RQ1* | Attitudes to SUP regulations | Whether participants support or oppose SUP regulations |
| | Awareness of SUP regulations | Participants' current level of knowledge about SUP regulations |
| *RQ2* | Behavioural responses | Possible increased awareness, adoption of reusable products or no change in behaviour |
| | Older Behaviour | Sustainable practices among participants prior to the implementation of SUP regulations |
| | Social Disapproval | Customs that are not socially accepted |
| *RQ3* | Examples Reusable Products | E.g. Reusable bags, (beverage) containers, straws and tableware |
| | Motivations for Reusable Product use | Internal and external motivations for reusable product use |
| *RQ4* | Challenges with Reusable Product use | Most predominantly lack of preparedness and the lack of available space |
| | Confusion about SUP Regulations | The difficulty in comprehending the objectives of SUP regulations |
| | Resistance towards Sustainable Alternatives | The limited or non-availability of SUP products in supermarkets |

### 4.6. Trustworthiness

In order to enhance the reliability of this study on consumer behaviour concerning SUP regulations in the Netherlands, a number of strategies were employed. Firstly, triangulation was employed, whereby various data sources, including past surveys, interviews, and existing literature, were used to cross-validate findings where possible. This approach helped to reduce the likelihood of bias and error. Given the recent enactment of the SUP regulations under investigation, the secondary literature is very limited. Peer reviews were conducted by the supervisor and fellow students at multiple stages throughout the research process. These reviews provided feedback on the coding scheme and the findings. This process offered external validation and assisted in the identification of potential weaknesses and biases prior to submission of the final research. Additionally, a comprehensive description of the research methodology, data gathering, and analysis was provided, allowing readers to assess the credibility and reliability of the findings. These approaches collectively ensure the thoroughness and credibility of the research findings.

## 5. Results

The following section presents the findings derived from qualitative interviews exploring consumer behaviours and perceptions regarding reusable products and single-use-plastic (SUP) regulations in the Netherlands. The COM-B model, developed by Michie et al. (2011), was employed to analyse the insights provided by participants in order to gain a comprehensive understanding of consumer attitudes towards reusable products and regulatory measures aimed at reducing single-use plastic consumption.

### 5.1. Capability

The results are analysed according to the three elements of the COM-B model. The first element is the *capability* of the participants. The capability of participants is defined as the possession of the knowledge, skills, and abilities to engage in the behaviours prescribed by the SUP regulations.

The interviews revealed a significant lack of awareness among participants regarding the different SUP regulations set by the Dutch government since 2021. Awareness is defined as the knowledge that participants possess regarding these regulations and their level of understanding. It encompasses two distinct elements: physical ability and psychological ability. Physical ability encompasses the practical knowledge and skills required to implement sustainable practices. Psychological ability, on the other hand identifies the cognitive understanding and attitudes towards the importance and impact of these regulations. It is noteworthy that none of the participants could provide any details regarding these regulations. In fact, ten participants acknowledged that they were previously unaware of SUP regulations, indicating a pervasive lack of awareness regarding this significant environmental legislation. The manner in which the participants became aware of the SUP regulations was diverse. Some had encountered them when they had to pay extra at the supermarket, *"I sometimes buy those ready-made salads and I know that on my receipt there is then a contribution I pay for it (Hannah)."* Others had become aware of the regulations when products had become unavailable. Increased awareness of the regulations ensures that consumers are aware of the implications of the regulations, the reasons for their existence, and the means of compliance. This provides consumers with the necessary information to act in accordance with the regulations.

The participants frequently became aware of the SUP regulations after implementation through passive consumption of media, such as reading about them in the news or seeing reports on television, *"I see that on TV and then I think of well that's going to change (Hannah)."* This observation indicates that the majority of participants learned about the SUP regulations passively, rather than actively seeking out this information. This also indicates that while some participants were aware of the regulations prior to their implementation, others only became aware of them once the changes had taken effect. This highlights a potential gap in communication between the government and consumers regarding the implementation of new regulations. Upon being informed by the interviewer about some of the regulations during the interview process, all participants demonstrated at least partial familiarity with the SUP regulations, recognising at least a few of them. This partial familiarity indicates that while there is some awareness of the regulations, it is not comprehensive.

Secondly, forgetfulness was identified by seven participants as a significant barrier within the capability related to the utilisation of reusable product. Forgetfulness is directly related to psychological capabilities, as it relates to the cognitive processes required to remember to perform an intended action. When consumers forget to bring their own reusable products, this indicates a deficiency in their psychological ability to adopt and sustain the habit of consistently utilising reusable items. This forgetfulness can be attributed to two primary reasons. It is possible that individuals may genuinely overlook the act of bringing their own bag. A more prevalent reason for this forgetfulness, as cited by participants, is the spontaneous nature of shopping trips or errands. Individuals often leave the house without prior consideration of taking a bag, as they are not expecting to make a purchase. As one participant noted, *"I happened to purchase one again yesterday because I went shopping spontaneously (Eline)."* A number of participants indicated that they are typically prepared and consistently carry a reusable bag when leaving the house. However, they acknowledged exceptions, such as spontaneous trips, where they might forget to bring a bag. For instance, one participant highlighted their regular practice of carrying a reusable bag, stating, *"I typically just have a shopping bag with me. I have a whole stash (Eline)."* This indicates a preference for thriftiness, with individuals opting to reuse bags in preference to purchasing new ones.

Participants also reported difficulties in consistently remembering to bring their reusable beverage containers from home, which resulted in either sporadic usage or continued reliance on disposable alternatives. Similarly, the challenge of forgetfulness was identified with regard to the usage or reusable bags. This lack of preparedness was a source of frustration for a number of participants, as one participant expressed the following, *"I have brought a cup from home on occasion, but that's something I*

*quickly forget (Eline).”* Moreover, it is noteworthy that none of the participants reported any physical limitations that would prevent them from engaging in sustainable behaviours or adhering to SUP regulations. These observations indicate that physical constraints or limitations are not perceived as significant barriers to behaviour change in this context. Rather, the primary barriers appear to be rooted in cognitive factors such as awareness, understanding, and knowledge.

*Table 4* presents the elements of the COM-B model as they relate to the various types of reusable products. Each type of reusable product is categorised according to the capabilities, opportunities, and motivations identified by participants during the interviews. This table serves as a reference throughout the results, indicating the frequency with which each factor emerged from the study. It is important to note that this refers only to the specific examples mentioned by participants in the interviews. It is possible that the number of participants who hold this view is greater than which is represented here.

**Table 4: Overview of the different elements of the COM-B model as they relate to various types of reusable products, accompanied by the number of participants who discussed each determinant. N/A relates to a specific product, other capabilities are discussed in general for not specific product.**

| *Type of Reusable Product* | ***Capability (Psychological and Physical)*** | ***Opportunity (Physical and Social)*** | ***Motivation (Automatic and Reflective)*** |
|---|---|---|---|
| *Reusable Bags (12)* | Forgetfulness (3) | Durable and versatile design (3) | Financial incentive (1) |
| | | Availability (2) | |
| *Reusable Containers (11)* | N/A | Convenience and practicality (5) | Familial norm (2) |
| | | Storage constraints (4) | |
| | | Cleaning burden (3) | |
| *Reusable Beverage Containers (9)* | Forgetfulness (4) | Ease of cleaning (2) | Environmental benefits (1) |
| | | Social appeal (1) | |
| | | Odour retention (1) | |
| *Reusable Straw (3)* | N/A | Ease of cleaning (3) | Dislike alternative paper straw (3) |
| *Reusable Tableware (3)* | N/A | Convenience (2) | Cost effectiveness (1) |
| | | Durability (1) | Environmental benefits (1) |

## 5.2. Reusable Product Adoption

The following section examines the *opportunities* and *motivations* outlined by the COM-B model in relation to participants’ experiences with utilising reusable products. *Opportunities* refer to the challenges and external factors influencing the use of reusable products, while *motivations* are the internal reasons for their use. An examination of these motivations reveals consumer priorities and decision-making processes, which in turn inform strategies to promote sustainable behaviour. An understanding of these motivations and their effective addressing can facilitate the wider adoption of reusable products. Collectively, these elements of the COM-B model influence individual behaviour.

Each type of reusable product relevant to the research is introduced, with a focus on its purpose, followed by an examination of participants' reactions. The enhancement of *opportunity* and *motivation* focuses on the practical and psychological factors that encourage consistent use of reusable products. To enhance clarity, relevance, and impact, only the most frequently mentioned reusable products by participants are analysed in depth (Table 4). This approach enables a greater understanding of the motivations and challenges encountered by participants, thus contributing to the development of sustainable behaviour change and the reduction of SUP consumption.

### 5.2.1. Reusable Bags

The utilisation of reusable bags serves to reduce the quantity of SUP waste generated and to promote sustainability. They are available in a variety of forms, including shopping bags, tote bags, reusable nylon bags, and mesh bags for produce that are designed for repeated use. These durable alternatives minimise the environmental impact by allowing consumers to carry items without relying on SUP bags. However, the environmental benefits of reusable bags depend on the frequency of reuse. For instance, polypropylene bags require 10-20 uses to be more sustainable than SUP bags, while cotton bags require 50-150 uses (Ekvall et al., 2020).

Among the 19 participants interviewed, the majority noted their adoption of reusable bags as a significant change in behaviour following the implementation of SUP regulations. Notably, two participants had already been using their own bags prior to the regulations' enforcement. The shift towards reusable bags was commonly attributed to the introduction of additional charges for plastic bags since the 1st of January 2016 or the unavailability of SUP bags at the fruit and vegetable section of supermarkets (Ministerie van Algemene Zaken, 2024b). In total, 12 of the 19 participants reported the regular use of some type of reusable bag.

#### 5.2.1.1. Opportunity

Participants in the study identified two *opportunities* for using reusable bags. Firstly, three participants appreciated the durable and diverse design of these bags, which are crafted to withstand extensive use and offer flexibility in carrying groceries and various items. This relates to the physical opportunity of using a reusable bag. Two participants in particular emphasised highlighted the long-lasting nature of reusable bags, stating, *"We just have these shoppers, you do infinitely with those, so you grab them and then you do your shopping (Emma)."* This recognition highlights the significance of the durable and diverse design of reusable bags, which meets users' demands for resilience, longevity, and versatility.

Secondly, two participants identified the availability of convenient and functional reusable products tailored to specific needs, comparable to the reusable bags for fruits and vegetables. Reusable bags designed for this purpose feature practical features such as mesh or drawstring closures, which facilitate the storage and transportation of fresh produce while minimising waste. One participant highlighted the usefulness of these bags, stating, *"There you have those handy little bags with the vegetables, so you can buy them, and afterwards take with you again. I find that ideal (Melissa)."* It is important to note the significance of developing reusable bags that are both convenient and functional for specific shopping needs. This enhances their usability and appeal to consumers. Furthermore, the high cost of disposable bags provides an *opportunity* to switch to more sustainable practices by making reusable bags a more attractive and rational choice.

#### 5.2.1.2. Motivation

The financial incentive to reuse bags is a *motivation* for participants. One participant highlighted this by stating, *"Because I actually find it absurd that a SUP bag costs 85 cents these days. I just have one with me now (Quinten)."* This aligns with the COM-B model, where the financial incentive drives behavioural change. By avoiding the repeated cost of buying bags, consumers are motivated to develop the habit of

carrying reusable bags. This cost-related motivation aligns with both the automatic and reflective processes within the COM-B model, where the financial benefit of reusing bags becomes an ingrained behaviour.

### 5.2.2. Reusable Containers

The term “reusable containers” encompasses a variety of products designed the storage and transportation of food items and other goods. Examples of such products include Tupperware, thermoses, and glass or stainless-steel containers. These containers represent a durable and reusable alternative to single-use packaging, thereby contributing to waste reduction efforts and environmental sustainability. Among the participants interviewed, 11 individuals indicates that they utilise their own reusable containers on a regular basis for a variety of purposes.

Seven participants reported utilising reusable containers primarily when commuting to work, thereby illustrating their practicality within the context of daily routines. Additionally, reusable containers were frequently employed during day trips, with participants preparing snacks and meals to be taken along. This practice not only minimises waste by providing a way to carry food without relying on SUP bags or wrappers, but also has the potential to reduce the environmental impact of food packaging. Finally, participants indicated that they utilise reusable containers as a storage system within their homes. Items such as leftovers, dry goods, and other food items were stored in containers made from glass or stainless steel.

#### 5.2.2.1. Opportunity

The participants provided a number of reasons for their use of reusable containers. One of the primary *opportunities* for using reusable containers, as presented by five participants, is their convenience and practicality. The use of reusable containers provides a secure and efficient solution for the storage of items, thereby preventing leaks and spills during transportation. Participants expressed appreciation for the ability to maintain the organisation and protection of their food items while on the move, *“I just like putting everything in my container better, that my bread at least doesn’t get squashed in my bag (Thijs).”* This preference serves to highlight the convenience and effectiveness of using reusable containers to ensure the integrity of items, particularly food, during transit.

The practicality of reusable containers is enhanced by the various conveniences they offer, as perceived by participants. The containers are microwave-safe, allowing users to reheat or cook food directly in the container, thus reducing the need for multiple dishes. One participant highlighted this point, stating, *“With a nice big container, you can just put a lot in there. You can also slide it into the microwave (Stefan).”* The spaciousness of these containers allows for the storage of substantial quantities of food, making them suitable for use in both professional and day-to-day contexts. Additionally, reusable containers have been found to extend the shelf-life and quality of food for longer periods, according to participants. Furthermore, they facilitate precision and portion control, enabling users to measure and portion out food accurately, thereby preventing waste. Collectively, these *opportunities* enhance the convenience and practicality of reusable containers.

The following section will examine the challenges and obstacles encountered by participants when utilising reusable containers, which has resulted in some participants refraining from doing so. The most significant barrier to the wider adoption of reusable containers identified by participants was the limited space available for such storage. Among the participants, five individuals expressed concerns about the practicality of using reusable containers. These concerns were primarily related to the containers’ size, with participants citing issues such as them not fitting in their bags due to containers being too large. As one participant remarked, *“The food often does not fit into my lunchbox, so really I should have a bigger one. However, with a bigger container, I end up wanting to take too much food with me. If I use a plastic*

*bag, my food just always fits (Luuk).”* This challenge demonstrates the practical difficulty of managing the appropriate container size while ensuring sufficient space for other necessities in participants’ work bags. Consequently, individuals have opted for SUP sandwich bags instead, which offer convenience.

Another challenge was the cleaning burden associated with reusable containers. Three participants expressed reluctance or aversion towards the additional effort and time required for cleaning reusable containers after use. One participant stated, *“I am quite busy. And I am not at all into cleaning and washing dishes. If I have a reusable container then you have to clean that. Whereas if you have it in a plastic bag or something similar, you can just throw it away (Quinten).”* This quote illustrates the perception among some users of the inconvenience associated with cleaning reusable containers. Such inconvenience may deter individuals from consistently using reusable containers despite the environmental benefits they can offer.

#### 5.2.2.2. Motivation

Among the participants, there was a notable variation in the duration of their use of reusable containers. While 11 participants indicated their regular use of reusable containers, they did not provide information regarding the duration of their incorporation into their daily routines. However, two participants had specified that they had adopted this practice prior to the implementation of Single-Use Plastic (SUP) regulations, *“I am actually kind of used to it from the old days. My father always took all his food with him in a Tupperware container (Isa)*,” thereby underscoring their early commitment to reusables. This comment can either be considered a reflective motivation*,* because it indicates that the participant has formed habitual behaviour over time, influenced by family practices. Alternatively, it can be regarded as an automatic motivation, whereby the participant’s utilisation of reusable containers is a pre-established behaviour, influenced by past habits and familial upbringing.

### 5.2.3. Reusable Beverage Containers

Reusable beverage containers, such as insulated thermos bottles, reusable coffee cups, and various types of reusable water bottles, represent an environmentally conscious alternative to single-use disposable cups. In addition to their use as containers for beverages, these containers maintain the temperature of drinks throughout the day, rendering them optimal for commutes. Nine participants reported regular use of these containers, which cannot only reduce waste but can also conserve resources by minimising the need for SUP bottles and paper or plastic cups.

#### 5.2.3.1. Opportunity

The ease of cleaning and overall functionality of reusable beverage containers significantly enhance their appeal. The participants expressed appreciation for the containers’ design, which facilitates quick and convenient washing. Two participants highlighted the ease of cleaning at their place of work as a key factor in their decision to use the beverage containers. This highlights the importance of practicality in the selection of reusable beverage containers, as cups that are easily cleaned reduce the effort and time commitment required. Additionally, their versatility enhances their appeal, as users can rely on a single cup for various beverages throughout the day. As one participant observed, *“My coffee goes in a reusable beverage container when I am commuting and then I use the same container again at work (Emma).”*

A noteworthy observation during the discussion of reusable beverage containers with participants was the visible trend in their usage. This trend is influenced by social factors, which fall under the o*pportunity* component, as they are external influences. One participant highlighted the social appeal of using reusable bottles like a Dopper, noting that it has become fashionable to carry one and that lacking such a reusable bottle could make someone seem out of touch. This observation is particularly noteworthy, as it was made by a participant who otherwise frequently used SUP bottles. The participant stated, *“I did not buy it myself, but just today I received a nice Dopper. And I have to say that in terms of corporate gifts,*

*you really do start to notice a switch. Five years ago, it was only the elderly people who had Doppers. And nowadays you see everyone with Doppers (Tessa)."* This observation serves to illustrate the significant social shift towards the use of reusable bottles, which is being driven by their growing popularity and acceptance in social and professional settings. The shift from SUP bottles to reusable alternatives, such as Doppers, exemplifies how social norms and trends can influence individual behaviours and promote more sustainable practices.

The sole negative comment regarding the *opportunity* of reusable beverage containers was related to the retention of odours. This was perceived as a source of discomfort by one participant, with the observation that certain reusable beverage containers retained odours from previous use. This is contrary to the view expressed by some participants mentioned that reusable cups are easy to clean. At least one individual found the odour retention to be unpleasant or off-putting, which may discourage their use due to concerns about hygiene or sensory discomfort, *"I find there is a smell to it, and I can't stand that very well (Eline)."*

#### 5.2.3.2. Motivation

The interviews did not yield any evidence of specific internal motivations for the use of reusable beverage containers. One participants indicated that their motivation for utilising reusable beverage containers was driven by their environmental concerns. Additionally, one participant indicated a preference for using their own material as a motivation for using reusable beverage containers, stating, *"Personally, I like having my own cup at the office or wherever I go (Isa)."* However, this sentiment was not mentioned by other participants. Consequently, this factor was not included in the analysis.

### 5.2.4. Reusable Straws

Reusable straws, which are typically made from hard plastic, glass, or metal, represent a reusable alternative to SUP straws. Among the participants, three individuals mentioned the use of reusable straws. Two of these individuals opted for dishwasher-safe hard plastic straws, while the third chose metal straws. These reusable options are valued for their durability and sustainability.

The ease of cleaning and the practical benefits of durable materials were identified as key *opportunities* of reusable straws. The participants expressed satisfaction with the ease of cleaning and reusability of dishwasher-safe hard plastic and metal straws, which they perceived as convenient for daily use. As one participant observed, the ability to simply dispose of the straws in the dishwasher contributed to their appeal. This ease of cleaning was a key motivator for this participant, as it reduced the effort required to maintain the reusable straws and ensured their readiness for future use.

A significant challenge appears to be the lack of awareness, which aligns with the participants' *capabilities*. Some participants had not previously considered the use of reusable straws prior to the discussion. Additionally, there is a preference for certain materials over others. Many participants expressed a strong dislike for paper straws. One participant observed, *"Those cardboard straws are a real disaster with children because they chew on them, making it impossible to drink from them any longer (Lotte)."* This sentiment was identified by four other participants, who either ceased using straws entirely or switched to reusable alternatives because paper straws became limp after a brief period of usage.

### 5.2.5. Reusable Tableware

Reusable tableware encompasses items such as reusable cutlery, plates, and dishes, which provide a sustainable alternative to conventional tableware. These items can be used for various occasions, including picnics, parties, and everyday use at work. Among the participants, three individuals highlighted their use of reusable tableware, emphasising one opportunity that facilitates its adoption.

The participants identified several *opportunities* for using reusable tableware. Convenience was also highlighted as a significant advantage, particularly in terms of ease of cleaning and reuse. The fact that these items are often dishwasher-safe adds to their practicality, as noted by one participant who appreciated the ability to simply *"put it in the dishwasher and next time it will be usable again (Emma)."* This convenience reduces the effort required to maintain reusable tableware, encouraging more consistent use. Additionally, durability and resilience were mentioned. These items can withstand everyday use and occasional accidents without significant damage, ensuring a longer lifespan for the products. Additionally, the reusability aspect was highlighted as a significant benefit, allowing participants to use the same items repeatedly without the need for frequent replacement.

The *motivation* for using reusable tableware, as noted by one participant, is the cost-effectiveness of such items. By eliminating the need for continuous purchasing of disposable items, individuals can save money over time. This economic advantage was a strong motivator, as one participant mentioned, *"It costs next to nothing and is a lot of fun (Emma),"* as this participant thrifted for reusable tableware to use when hosting parties or eating outside, keeping purchasing prices low and diversity high. Furthermore, the environmental benefits of using reusable tableware were a motivator for participants, as it reduces waste generation and promotes reuse. Participants expressed satisfaction with the positive environmental impact of their choices, with one individual stating that they were pleased that *"the old stuff gets reused (Emma),"* when thrifting for their reusable tableware, which minimises their waste by reusing old plates and dishes. This alignment with sustainable practices reinforces the participants' commitment to reducing their ecological footprint.

### 5.2.6. Additional Opportunities

It is noteworthy that, despite the challenges associated with reusable products, participants did not express a financial burden as a deterrent to investing in these products. The price of an initial purchase was never identified as a reason for not investing in reusable products, indicating that financial considerations do not significantly influence their decisions. Instead, the practical challenges associated with identifying plastic-free alternatives and the inconveniences of switching to reusable products were identified as the primary obstacles by participants.

In addition to the challenges associated with to the direct use of reusable products, participants identified significant difficulties in their purchasing behaviour, particularly in relation to the sustainability of products. One significant challenge is the lack of consumer knowledge regarding the sustainability of certain goods. This issue was particularly problematic for the eight participants who identified sustainability as a key motivation for their behaviour. These participants expressed frustration with the difficulty of finding reliable information about the environmental impact of products. They noted that it often takes considerable time and effort to determine the environmental impact of an item. As one participant stated, *"We do a lot regarding microplastics, but we still lack sufficient visibility on the issue. I miss having more information about microplastics, specifically regarding which products contain them and which do not (Sophie)."*

The study's participants also encountered significant challenges and obstacles when attempting to find plastic-free packaged alternatives for the products they desired to purchase. A total of 12 participants expressed frustration over the lack of SUP-free choices available for the products they needed. The limited availability of alternatives constituted a significant barrier to the participants' efforts to reduce plastic consumption and adopt more sustainable purchasing habits.

Additionally, two participants identified the limited availability of SUP-free products in stores as a further obstacle to the identification of sustainable alternatives. One participant remarked, *"Then I have to look for a store where you can but that. That then is a challenge (Pieter),"* highlighting that sourcing SUP-free

products is challenging in their local area. This can also be linked to the fact that the effort required to obtain more sustainable products, or in this case SUP-free products, is also increased. This represents an additional barrier to accessing these products, as highlighted by multiple participants who had to travel to a specific shop in order to obtain them. The inability to find SUP-free packaged alternatives was particularly evident across a wide range of products, including oat milk, meats, bread, potatoes, take-out food, self-care products, and technology products. The aforementioned examples demonstrate the extensive range of everyday items for which participants encountered difficulties in locating alternative packaging options. The scarcity of SUP-free alternatives hindered participants' ability to make environmentally conscious choices, thereby revealing a critical gap in the availability of sustainable options in the market.

## 5.3. Additional Charges SUP Products

These next two chapters (*5.3. and 5.4.*) presents the results of the two SUP regulations that were the subject of this research. The first area of investigation concerns additional charges levied on SUP products. The second area of investigation concerns the use of reusable tableware on location. The findings, based on participant interviews, examine behavioural changes before and after implementation, opinions on the regulations, and their effectiveness. By examining these three components, it is possible to identify potential behavioural changes resulting from the implementation of this SUP regulation. The opinions expressed on the regulations can then be used to gain a deeper understanding of their effectiveness. Each regulation is discussed separately due to the distinct reactions they elicited from participants. An overview of the findings on the SUP regulations their *capability, opportunity,* and *motivations* are presented in *Table 5*. By examining these regulations separately, this research identifies the varying levels of acceptance, behavioural change, and overall effectiveness. This provides valuable insights for future policy development and implementation strategies.

**Table 3: Overview of the different elements of the COM-B model as they relate to the SUP regulations, accompanied by the number of participants who discussed each determinant.**

| *SUP Regulation* | ***Capability (Psychological and Physical)*** | ***Opportunity (Physical and Social)*** | ***Motivation (Automatic and Reflective)*** |
|---|---|---|---|
| *Before Implementation* | Lack of awareness (10) | N/A | Environmental concern (1) |
| *Additional Charges SUP Products* | Increased awareness (5) | Lack of plastic-free alternatives (12) | N/A |
| | | Frustration about proceeds additional costs (3) | |
| *Reusable Tableware on Location* | Increased awareness (4) | Provision of reusable alternatives (6) | Environmental concern (6) |
| | | Lack of communication (2) | |
| | | Hygiene concern (1) | |

### 5.3.1. Behaviour Before and After Implementation

**Pre-Implementation Behaviour**

Prior to the implementation of the SUP regulation, which introduced charges for take-away SUP packaged food and beverages, participants exhibited varying levels of *capability* and *opportunity* to adopt sustainable behaviours. While some participants may have had the *capability* to bring their own reusable cups or containers, the *opportunity* to do so was constrained by factors such as convenience and social norms. Consequently, a significant proportion of participants continued to rely on disposable options for their takeaway food and beverages, which suggests that there was a lack of *motivation* to seek out alternative solutions.

The participants exhibited a range of behaviours concerning their use of SUPs. It is noteworthy that one participant demonstrated a proactive shift towards reducing their SUP consumption even before the regulation came into effect. This individual had already ceased the use of disposable cups and had adopted the practice of carrying a reusable beverage container. This decision was motivated by a personal commitment to minimise the use of single-use plastics. The individual stated, "*I no longer use plastic disposable cups. Instead, I bring my own beverage container, fill it with coffee at the station. By doing so I avoid using single-use plastics (Sophie).*" This individual's actions demonstrate a growing awareness of environmental sustainability, as evidenced by their avoidance of SUPs. This early adoption of reusable alternatives is indicative of a significant behavioural change that is motivated by environmental considerations rather than regulatory enforcement. The participant's decision to bring a reusable beverage container exemplifies a conscious effort to reduce waste and demonstrates the potential for individual actions to contribute to broader sustainability goals. This behaviour contrasts with the general tendency among other participants, who exhibited less awareness or concern about the environmental consequences of their consumption decisions prior to the introduction of the SUP regulation.

The majority of participants demonstrated a general lack of consideration for the environmental impact of packaging. The purchasing behaviour of the participants in supermarkets was primarily driven by the need to obtain specific products that met their needs, with little to no attention being given to the sustainability of the packaging. A tendency was observed among participants to gravitate towards familiar brands and products, which resulted in repeated purchases without the consideration of potential environmental harm caused by SUP packaging. This habitual behaviour indicates that convenience and brand loyalty played a significant role in participants' shopping decisions. The environmental consequences of their choices were not a primary concern, suggesting a gap in awareness or prioritisation of sustainable practices. Consequently, the prevalence of SUPs in participants' daily consumption patterns remained high, reinforcing the continued reliance on SUPs.

In addition to their shopping habits, some participants also engaged in takeout and coffee-to-go practices, which further exemplified their routine use of SUPs prior to the implementation of the regulation. The convenience of these services, coupled with the lack of additional charges for SUP containers, made SUPs a default option. The prevalence of these behaviours serves to illustrate the normalisation of SUP usage in everyday activities. The absence of financial disincentives allowed participants to continue their consumption of SUPs without reconsideration. The routine nature of these actions, from supermarket shopping to takeout and coffee purchases, serves to illustrate a broader cultural acceptance of SUPs and a lack of environmental consciousness in the context of daily consumer habits.

In summary, the behavioural patterns observed among the majority of participants prior to the implementation of the SUP regulation indicate a significant reliance on SUPs. This reliance was facilitated by convenience, brand loyalty, and the absence of additional charges associated with SUPs. The introduction of the SUP regulation aimed to disrupt these deeply entrenched habits by imposing

additional charges, thereby encouraging a shift towards more sustainable practices and heightened environmental awareness.

**Post-Implementation Behaviour**

Following the implementation of charges on SUP products, participants exhibited diverse responses, with the majority displaying minimal changes in their purchasing behaviour. Despite the implementation of charges, a significant proportion of participants continued to purchase the same products, largely unaffected by the additional charges. The decisions of the participants were primarily driven by convenience and brand preference, with little consideration given to the charges imposed. Participants demonstrated a willingness to pay the additional charges for products they regularly consumed or enjoyed, indicating a lack of significant avoidance in their purchasing decisions. As articulated by one participant, "*If I need it, I just buy it without even considering the additional charges (Frank).*" Similarly, when participants expressed a preference for specific types or brands, they were willing to pay the charge without hesitation, which suggests that their consumption patterns remained consistent.

In the context of takeout orders, the imposition of additional charges on packaging for food and drink items also had a minimal impact on participants' behaviour. While some individuals readily accepted the nominal charges, others were reluctant to alter their behaviour to avoid relatively small charges. Participants demonstrated a reluctance to inconvenience themselves or disrupt their routine for the sake of avoiding minor charges. For instance, when confronted with a nominal charge for disposable packaging, participants elected to proceed with their purchase rather than seeking alternative options or bringing their own containers. Nevertheless, instances where participants perceived the charges as excessive prompted them to re-evaluate their purchasing decisions. As one participant noted, "*When a plastic container for potato chips costs 55 cents, I either leave the chips or ask for them to be put in a paper bag. That affects my choice (Quinten).*" In such instances, individuals either requested alternative packaging or refrained from purchasing the item in question, demonstrating a sensitivity to the perceived value of the product relative to the associated costs.

Overall, the introduction of charges on SUP products elicited a diverse range of responses from participants, with many demonstrating a continued willingness to purchase items regardless of the additional fees. The factors of convenience, brand loyalty, and the perceived value of products remained significant influences on participants' purchasing behaviour. While some individuals were willing to pay the charges without hesitation, others exhibited a threshold for the acceptability of charges, prompting adjustments in their consumption choices when charges were perceived as excessive. The findings indicate the necessity of providing consumers with viable alternatives and addressing barriers to sustainable behaviour in order to achieve meaningful reductions in SUP consumption.

### 5.3.2. Opinions on SUP Regulation

The participants in the study held varying opinions regarding the implementation of charges on SUP food and drink items for takeout and instore. Six individuals shared their perspectives on this matter. Among the participants, three individuals expressed support for the charges, viewing them as a positive step towards raising awareness about SUP consumption and promoting more sustainable practices. The participants identified potential benefits of the charges in prompting consumers to re-evaluate their reliance on SUPs and seek out reusable alternatives. One participant remarked, "*It is good in itself that there is a charge on it, so that people become more aware of it (Pieter).*" This perspective suggests that the charges may serve as a catalyst for heightened consumer awareness regarding the environmental impact of SUPs, potentially leading to behavioural changes and increased adoption of sustainable alternatives. The interview showed that the awareness of the problem of plastic consumption had indeed increased for five participants after the implementation of this regulation.

In contrast, three participants expressed opposition to the regulation, citing various concerns and challenges associated with its implementation. A primary point of disagreement concerned the perceived price increase resulting from the charges, with participants expressing frustration about the added financial burden on consumers. One participant remarked, "*You can put charges on everything. That is not a good thing. Everything is already getting more expensive (Quinten).*" This sentiment reflects broader concerns about rising costs and the potential injustice associated with imposing additional charges on consumers without addressing underlying affordability issues. This heterogenous response reflects the complex nature of addressing SUP consumption, given the diverse attitudes among participants.

Furthermore, participants also expressed frustration with the perceived lack of more sustainably packaged alternatives, noting that the absence of viable options forces consumers to either pay for SUP packaged goods or forgo purchasing the product altogether. The lack or absence of plastic-free packaged products was recognised by as many as 12 participants. Participants opposed to this regulation expressed frustration with having to pay extra for products when no alternatives were readily available, "*I feel that consumers are not being punished, but have to pay for something because there is not other alternative yet (Isa),*" emphasising the need for producers to address this issue by developing more eco-friendly packaging materials. The absence of alternative options led to feelings of frustration and discontent among participants, who perceived the charges as an additional financial burden without corresponding benefits. As one participant articulated this sentiment, *"With shopping, you see the surcharges on the receipt. All you do is pay extra, but you get nothing in return (Frank)."*

Participants expressed greater dissatisfaction with the SUP charges imposed on products purchased from supermarkets. In contrast to the to-go cups, where the options of bringing one's own cup provided an alternative to paying the additional charges, participants faced limited options when it came to supermarket purchases. The absence of comparable products without SUP charges meant that participants were left with the choice of either paying the additional charge or foregoing the purchase. The limited number of alternatives available to participants resulted in a reduction in the *capability* and *opportunity* to adopt sustainable behaviour.

Furthermore, participants highlighted the issue of unnecessary packaging, particularly for fruits and vegetables in plastic containers, within retail settings. They expressed a preference for more sustainable packaging options or no packaging at all, underscoring the need for supermarkets to adopt environmentally friendly practices. As one participant observed, "*It is unnecessary to pre-package fruit in plastic containers in the supermarkets (Pieter).*" This critique reflects a broader concern among consumers regarding the prevalence of unnecessary packaging and the need for retailers to prioritise more sustainable packaging practices.

Participants emphasised the importance of collaboration between industry stakeholders and policymakers to develop more eco-friendly packaging materials and make sustainable solutions more affordable and accessible to consumers. Some participants also expressed concerns regarding the lack of transparency surrounding the allocation of charges and their contribution to reducing SUP consumption, "*I think it actually serves as an extra revenue stream for companies. There is also no clear regulation on how much the charge should be. It feels like companies are pocketing the extra money (Frank).*" This highlights the lack of transparency between different stakeholders.

### 5.3.3. Regulation Effectiveness

The introduction of additional charges on SUP products introduced a new incentive structure that altered the decision-making processes of participants. However, the effectiveness of this incentive was contingent upon the context. Despite the implementation of SUP charges on food and drink items for takeaway, a significant proportion of participants indicated that their purchasing behaviour remained largely unaffected. The majority of participants (n=17) indicated that they continued to purchase their

preferred products regardless of the additional charge. This dedication to their preferred items suggests that the SUP charges may not be sufficient to prompt changes in consumer purchasing behaviour.

The implementation of additional charges did not result in a notable increase in the use of reusable products among participants. Prior to the implementation of the regulation, only a small number of participants indicated that they purchased coffee to go or opted for takeaway meals somewhat regularly. It is noteworthy that the introduction of a nominal charge for the to-go cup did not deter participants, with many expressing a willingness to pay the additional fee. This may be attributed to the option of bringing one's own cup as an alternative to paying the charge. Those who opted not to bring their own cup accepted the charge as a reasonable consequence of their decision. As a consequence, no evidence of frustration was found regarding this aspect of the regulation. Nevertheless, there is no substantial evidence that consumers have begun utilising reusable beverage containers more frequently as a consequence of the surcharges on to-go packaging, and further research will be necessary to either confirm or deny this hypothesis.

A small proportion of participants had already demonstrated environmentally conscious behaviour by utilising reusable products prior to the implementation of this regulation. The majority of participants exhibited limited interest in such practices. This imbalance highlights the necessity for targeted efforts to enhance the efficacy of the regulation in prompting sustainable consumer behaviour. Despite the lack of significant changes in purchasing behaviour, six participants reported an increase in their awareness of the plastic problem following the implementation of this SUP regulation. While the regulation encouraged the use of reusable cups for takeaway beverages, its effectiveness was constrained by the availability of alternatives in other contexts, such as supermarket purchases. Although the regulation did not result in immediate behavioural changes, it did play a role in raising awareness about the environmental impact of SUPs among participants, thereby improving their *capability* towards behavioural change.

## 5.4. Reusable Tableware on Location

### 5.4.1. Behaviour Before and After Implementation

**Pre-Implementation Behaviour**

Prior to the implementation of the regulation requiring the use of reusable tableware for eating and drinking on site, the responsibility for providing utensils and tableware often varied across different work settings. In workplaces with catering services or cafeterias, employees typically selected their meals and beverages from a range of options and used the provided tableware. In offices without such facilities, employees usually brought their own meals, often relying on disposable utensils and containers for convenience.

In office settings, particularly in the vicinity of coffee machines, disposable cups were commonly the norm. These cups were readily available and could be taken by employees whenever they desired a drink from the machine. The convenience of these disposable cups facilitated their widespread use, resulting in substantial waste. Typically, the disposable cups were only used once before discarding. This habitual reliance on single-use items highlights a broader cultural acceptance of disposables, reinforcing unsustainable consumption patterns in the workplace. A similar pattern was observed when dining out at fast-food establishments. Meals and beverages were served in to-go cups and with disposable cutlery. While plastic straws had already been replaced by paper ones since 3 July 2021, the overall reliance on disposable tableware remained prevalent (Ministerie van Algemene Zaken, 2024a). The pervasive use of disposables at fast-food establishments served to reinforce the norm of single-use items, which is currently impeding the transition to more sustainable practices.

Overall, the pre-implementation period was characterised by a significant reliance on single-use tableware across various settings, including the workplace and fast-food establishments. The pervasive use of disposables, driven by convenience and established habits, contributed to a substantial amount of SUP waste. This highlights the need for regulatory intervention to promote more sustainable consumer behaviour. The regulation mandating the use of reusable tableware for on-site dining aimed to address these issues by shifting the norm towards more sustainable practices.

**Post-Implementation Behaviour**

Following the implementation of the regulation, there was a notable shift in the behavioural patterns of the participants. In workplaces where disposable tableware was previously the norm, employees were required to adapt to using reusable tableware provided by their employers or to bring their own reusable items. This transition necessitated a cultural and habitual adjustment, yet the majority of participants adapted smoothly, with six participants appreciating the environmental benefits associated with the change. As the provision of disposable alternatives ceased, employees rapidly adopted into the routine of utilising the available reusable tableware or ensuring the availability of their own reusable items for meals and beverages.

The COM-B model posits that behaviour change is influenced by three key factors: *capability*, *opportunity*, and *motivation*. In this context, the implementation of the regulation enhanced the physical and psychological capability of participants, as they were confronted with the change as soon as the regulation was implemented. The absence of disposable alternatives prompted consumers to alter their behaviour almost immediately. It was observed during the interviews that not all participants were aware of the change in advance and were therefore surprised by the changes regarding this regulation. The *opportunity* component of the COM-B model was addressed by the regulation's mandate itself, which removed disposable products from the equation and replaced them with reusable alternatives. This change created an environment in which the use of reusables became the default option. For example, nine participants reported regularly using their own mugs and cups at the workplace. Six of these individuals explicitly stated that they started this practice after the regulation's implementation.

The transition away from disposable cups at office coffee machines necessitated additional adjustment. A significant proportion of the participants' workplaces introduced systems of "borrow cups," whereby employees could utilise a reusable cup provided by the workplace, which could then be discarded in designated areas for washing and reuse. This system was particularly well-received, offering a convenient alternative for those who might forget their own mugs. As one participant mentioned, "*You already have your own cup and for guests or people who have forgotten theirs, we have cups you may borrow downstairs. Which you can return at the end of the day (Thijs).*" In offices that did not have this system in place, employees were expected to use their own reusable cups and were often provided with the necessary cleaning supplies to maintain hygiene standards. This was also a welcome addition, as one participant noted, "*They have also introduced paper towels at the coffee machines to wipe your mug dry, so you can take it home clean. Well, I think that is very neat and then it is not really a barrier anymore (Nick).*" The majority of participants found this change in policy to be manageable and quickly incorporated the use of their own cups into their daily routines. This reflected a positive shift towards more sustainable practices.

In terms of *motivation*, this regulation resonated with participants' intrinsic and extrinsic motivations to reduce waste and contribute to environmental sustainability. The majority of participants viewed the regulation in a positive light. One participant stated, *"At my workplace they use I do not know how many millions of cups a year. So when you consider that this falls away, it is just a super good rule (Emma)."* This sentiment reflects a broader societal acceptance and support for sustainable practices. It is driven by an understanding of the environmental benefits and a sense of responsibility towards reducing waste.

The post-implementation period demonstrated a notable shift towards more sustainable behaviours among participants, driven by the regulatory requirements. The convenience and accessibility of reusable options in both the workplace and fast-food settings facilitated this transition, demonstrating that regulatory measures, when properly implemented and supported, can significantly influence consumer behaviour towards more sustainable practices.

### 5.4.2. Opinions on SUP Regulation

The implementation of the mandatory reusable tableware regulation has been met with a largely positive response from participants. In the course of the interviews, the eight individuals interviewed were asked to comment on the regulation om question. Seven of them expressed support for the regulation, while one remained neutral. Notably, no one expressed opposition to the regulation, indicating a broad consensus in favour of this environmental measure.

Those in favour of the regulation identified a number of key reasons for their endorsement. A primary factor was the significant reduction in waste generation from SUP cups in the workplace. It was observed by participants that the regulation had effectively curtailed the excessive consumption of disposable items, which had previously been a common practice. One participant noted, "*I think it is a good development. If you look at the company I work for, and how many plastic cups they used to go through every day (Tessa).*" This sentiment reflects an awareness of the environmental impact of SUPs and an appreciation for the regulation's role in mitigating this issue. Additionally, a considerable number of participants reported a seamless transition to the use of reusable tableware, indicating that the adjustment was manageable and did not disrupt their routines. This positive adaptation served to reinforce their support for the regulation. The ease with which they integrated reusable options into their daily habits serves as an illustration of the regulation's practicality and the readiness of individuals to embrace sustainable practices, provided that the necessary resources and infrastructure are made available to them.

The neutral participant acknowledged the positive intent behind the regulation but also highlighted practical challenges related to the implementation of the reusable deposit system. This participant observed, "*The idea is nice, only in practice and in implementation you sometimes run into practical issues that are not so convenient (Tessa).*" This feedback indicates a potential area for improvement, suggesting that while the regulation's concept is sound, the execution, particularly regarding the refunding process for reusable items, could be refined to enhance user convenience and effectiveness.

In the context of fast-food restaurants, the implementation of reusable cups has been met with a mixed response. Some fast-food restaurants now provide reusable cups for a deposit fee, which is refunded upon the return of the cup. While regular customers adapted to this change with relative ease, those who visited fast-food establishments less frequently expressed some inconvenience. The process of handling and returning reusable cups was found to be slightly confusing, particularly for those who were not accustomed to the new system. Nevertheless, the prevailing sentiment among participants was one of understanding and acceptance of the necessity for such measures to reduce SUP waste.

The transition to the use of reusable tableware in the workplace was generally well-accepted by participants, but the implementation of a similar system in fast-food restaurants presented some challenges. Some participants expressed frustration with the process of refunding reusable cups, highlighting the inconvenience of queuing to get their deposits back. As one participant remarked, *"Because you have to pay 1 euro upfront, then after you finish eating, you have to queue again to get your euro back (Tessa)."* This indicates that while the intention behind the regulation was well-received, its practical execution in certain contexts requires refinement to reduce inconvenience and enhance the user experience. Additionally, one participant who works for a company specialising in the washing of hospitality-related products highlighted a new area of concern, *"I know how dirty those cups can get and how difficult they are, especially at home, garden, and kitchen level to get clean properly. If a cup goes*

*unused for a week, not cleaned and dried properly, I do not know how many bacteria develop (Lenno)."* Although this concern was only briefly mentioned, it cannot be ignored as it may potentially become a significant issue, particularly in environments lacking adequate cleaning facilities, such as sports centres and small office buildings.

The overwhelming support for the regulation among participants reflects a growing awareness and acceptance of sustainable practices in everyday settings. The success of the regulation in reducing SUP waste and the ease of adaptation reported by participants demonstrate its positive impact. Nevertheless, the feedback regarding practical implications also offers valuable insights for further enhancing the regulation's effectiveness and user experience.

### 5.4.3. Regulation Effectiveness

The implementation of this SUP regulation has been demonstrated to be an effective measure in promoting sustainable behaviour among participants, particularly in workplace settings. The regulation has led to a notable increase in the use of reusable cups, indicating a successful shift away from SUPs. Awareness of the consumption of SUPs and compliance with the regulation has been notably high among participants. Many workplaces have actively supported the transition by providing resources and facilities. The availability of reusable plates and cutlery, either through personal ownership or borrowing options facilitated by the workplace, further supported this behavioural shift by providing the necessary resources, such as reusable tableware and on-site cleaning facilities. However, the manner in which this regulation was introduced to consumers could have been more effective.

The transition to reusables was facilitated by the majority of workplaces, which offered either cleaning services or supplies for personal cleaning. Consequently, participants were able to make the switch without significant difficulty. A significant proportion of participants reported utilising their own reusable cups in addition to the reusables provided by their workplace. Four participants reported that their employers either provided a budget or gifted a reusable beverage container, which they perceived to have promoted a culture of sustainability within the office. The provision of these items effectively reduced the obstacles to the adoption of reusable items, facilitating their integration into the daily routines of participants.

In some instances, participants were not informed of the change in advance, which resulted in confusion during the initial period following the implementation. Two participants indicated that the introduction of the new regulation without sufficient prior guidelines left them unaware of the new requirements and how they would be enforced. One participant stated, *"It was my first time and I had to look for a place to return it. I thought what should I do with this cup? I did see that it had a QR code on it. Then you start looking around and then I saw a machine. What is that thing? (Sophie)."* The presence of a QR code on the cup was not immediately helpful, indicating that supplementary information or signage was necessary to direct consumers to return mechanisms, such as the machine mentioned. The absence of pre-emptive communication impeded a seamless transition and adaptation period, suggesting that while the infrastructure for returning reusable cups was in place, the process could have been more effectively communicated to encourage a more streamlined user experience and greater compliance. This suggests that enhanced communication could facilitate the implementation of regulations, thereby enhancing consumers' *capability*. By providing them with information at an early stage about the forthcoming adjustments, thus equipping them with the knowledge needed to adhere to the regulations.

The impact of the regulation on reducing SUP cup waste is substantial, as evidenced by the experiences of the participants. The increased utilisation of reusable cups has resulted in a notable reduction in the volume of waste generated from disposable cups. Furthermore, four participants indicated that the regulation has prompted them to become more aware of their environmental behaviour. The implementation of the SUP regulation for reusable tableware on location has led to significant changes in consumer behaviour. Prior to the implementation of the regulation, participants predominantly utilised

disposable cups and utensils provided by their respective workplaces. The lack of viable alternatives resulted in the limited adoption of reusable products. Nonetheless, the regulation has prompted a shift towards more sustainable practices, particularly within the workplace. Participants have adapted to using reusable mugs and tableware. The influence of the regulation on the use of reusable containers appears to be limited. It can be argued that participants' preference for using reusable containers is more related to personal convenience and the practicalities of carrying food, rather than being directly influenced by the regulation. This indicates that while the regulation effectively encourages the use of reusable beverage containers and tableware, additional strategies may be required to promote the broader use of reusable containers for food.

The regulation requiring the use of reusable tableware on location has effectively fostered sustainable behaviour among participants, particularly in the context of the workplace. The regulation has notably increased the adoption of reusable cups, which has significantly reduced the amount of SUP waste. The heightened awareness of participants regarding their consumption of SUPs and their compliance with the regulation serves to illustrate the positive impact of the aforementioned regulation. Furthermore, the provision of reusable options and access to cleaning facilities in the workplace have contributed to this behavioural shift. Nevertheless, the absence of transparent communication regarding return procedures led to confusion, underscoring the necessity for more effective implementation strategies to enhance consumer capability and compliance.

# 6. Discussion

## 6.1. Discussion

In order to answer the main research question: "How have the regulations on single-use plastic (SUP) in the Netherlands affected consumer behaviour, particularly with regard to purchase decisions, and what factors are most influential in shaping this behaviour?," two research objectives were determined:

1. To study the impact of the single-use plastic (SUP) regulations on consumer behaviour and on their purchase decisions.
2. To assess the effectiveness of single-use plastic (SUP) regulations in promoting sustainable practices by consumers in the Netherlands.

The research examines the influence of SUP regulations on consumer behaviour and purchasing decisions. Furthermore, the research seeks to identify the extent to which SUP regulations facilitate the adoption of reusable products in the Netherlands. The research examines which SUP regulations have shaped consumer behaviour and choices. This is achieved by first examining the level of consumer awareness and understanding of these regulations, with the use of the COM-B model to assess consumers' *capabilities*. This in-depth analysis involves exploring the knowledge and cognitive factors that influence consumer behaviour. Additionally, the study examines changes in purchasing decisions since the implementation of SUP regulations, with the objective of evaluating the effectiveness of these measures.

It is crucial to enhance consumer awareness about the sustainability of different products and to promote the utilisation of reusables in order to ensure compliance with SUP regulations and to encourage environmentally friendly behaviours. Additionally, participants demonstrated a lack of awareness regarding the availability of sustainable alternatives to SUP products, further underscoring the gap in their knowledge regarding reusable alternatives. Awareness in the context of this research can also

be described as environmental consciousness, which plays an important role in explaining the behaviour of purchasing environmentally friendly products, such as reusable products *(Mataracı & Kurtuluş, 2020).* Environmental consciousness encompasses knowledge, attitude, and behaviour, which are essential for the promotion of sustainable consumer practices. The absence of awareness regarding sustainable options, as evidenced by the findings of this research, represents a missed opportunity for individuals to engage in more environmentally conscious behaviours. This is due to a lack of knowledge and skills in identifying and adopting alternative behaviours.

Furthermore, seven participants identified forgetfulness as a significant barrier to the consistent use of reusable cups and bags. Participants reported forgetting to carry their reusable bags or cups, which resulted in the unintended use of single-use plastics (SUPs) or disposables. Research conducted by a PhD student in Belgium reached a similar conclusion, with the inconvenience of forgetting reusable beverage containers emerging as the greatest challenge to consumers (Herweyers, 2024). This indicates the need for strategies to assist consumers in remembering their reusable items. Putnam-Farr et al. (2023) also identified this problem, writing an article on how to overcome forgetfulness of reusable beverage containers and bags. Proposing ideas to prevent forgetfulness by playing into the concept of planned behaviour, which will be discussed in more detail in the recommendations (section 6.3.3.). By doing so, the challenge caused by forgetfulness can be bridged and contribute to the increased use of reusable products by consumers. Interestingly, this issue was not mentioned concerning reusable containers, suggesting a different behavioural pattern or habit formation for these items. The interviews indicate that participants have integrated the use of reusable containers more effectively into their routines than with reusable beverage containers or bags, such as for meal preparation or packed lunches. To substantiate this hypothesis, further research is required.

The second objective is to assess the effectiveness of SUP regulations on the promotion of sustainable practices. This entails examining consumer preferences for reusable products and the rate at which these products are being adopted post-implementation. The study identifies the motivations behind consumer behaviour and the obstacles they face in adapting to SUP regulations, particularly in relation to the *opportunities* and *motivations* within the COM-B model framework.

The trend of reusable cups, particularly those seen with Doppers, has been gaining traction among various demographics (Dopper, 2023). This observation is consistent with findings reported in an article from The Spinoff, which confirms the growing popularity of specific brands of reusable beverage containers. However, Rykers (2024) additionally identifies a significant concern regarding overconsumption. Despite the increased popularity of reusable cups, there is a tendency for consumers to purchase these items in excessive quantities. It is also important to consider the resources required to produce these items. Overconsumption of reusables can therefore lead to a new problem, namely the depletion of resources. A payback period must be considered after the purchase of a reusable product. The duration of this payback period is dependent on both the quantity and type of material utilised in the production process, with a utilisation period of several months to years typically required before the product can be considered more sustainable than the disposable alternative (Livingston, 2024). In the Netherlands alone, approximately 19 million disposable cups and food containers are discarded on a daily basis (Milieu Service Nederland, 2023). The potential environmental benefits of reusable cups are considerable, yet the issue of overconsumption of reusable beverage containers and other reusable products must be considered as an environmental concern in its own right.

Furthermore, concerns were raised about the hygiene and health safety of shared reusable items. The use of reusable products can pose a health hazard if the necessary precautions are not taken. The failure to clean reusable products adequately can result in the transmission of food-borne illnesses, allergies, and a range of other health concerns. Consequently, it is vital to keep reusable products hygienically clean and, in the event that this is no longer feasible due to the product sustaining damage, it is

necessary to replace the item in order to prevent contamination (Eco Clicky, 2023). It is recommended that users be held responsible for this themselves, given that many work environments lack the proper materials for cleaning reusable products after use (CSU, 2023). This is known as the 'bring-your-own' policy, which a number of participants also indicated was the norm in their work environment.

The participants in the study identified a number of internal *motivations* that influenced their adoption of sustainable behaviours. On 1 January 2016, a ban on the free distribution of plastic carrier bags was implemented, which formed the motivation for many participants according to this research. This resulted in a notable 71% reduction in the use of SUP bags compared to the previous year (Hillhorst et al., 2022). The aforementioned figures demonstrate that imposing a charge for SUP bags has led to a considerable reduction in their usage by consumers. It is noteworthy that this study on the effectiveness of two SUP regulations indicates that charging for SUP packaged products for takeaway is not an effective means of reducing SUP consumption among consumers, in contrast to the success of charging for SUP bags in the past. The participants indicated that they did not alter their purchasing behaviour in response to this regulation, and in many cases expressed frustration about the destination of the contribution.

A number of factors may be attributed to the apparent lack of success from the SUP regulations discussed in this research. The primary cause identified in this study is the difficulty in identifying viable alternatives. Participants indicated that there was often no SUP-free alternative available next to the product on which the additional charge was levied, forcing consumers to purchase the product with surcharges or to cease purchasing the product altogether. This was also evident from an article by LevensmiddelenKrant published three months after the implementation of this regulation, in which consumers expressed frustration at the amount of unnecessary packaging around food products (Pol, 2023). For products that were SUP-free, participants indicated that the travel time increased or that they were more difficult to find. It appears that the barrier to compliance was lower when consumers were required to pay for SUP bags, as they were able to bring their own bags for purchases without much difficulty or agree to purchase a SUP bag for a small fee. The presence of a consumer alternative appears to be a crucial factor in the effectiveness of this SUP regulation compared to past success. However, to validate these results, further research is necessary. Nevertheless, it appeared to be effective in increasing consumer awareness of the sustainability issues associated with SUP consumption.

A final motivation that may prove to be of interest is mentioned by one participant, who cites their regular use of reusable containers during their upbringing. This motivation relates to the social or familial norms that encourage this behaviour. This familial norm indicates a positive development that could be further promoted in order to enhance sustainable practices. The influence of social norms suggests that participants who adhere to the early use of reusable cups and containers likely grew up in households where these practices were valued. This early exposure resulted in the adoption of reusables as a natural and ingrained part of daily life. Previous research has demonstrated the importance of social norms in motivating sustainable actions (Saracevic & Schlegelmilch, 2021). Social norms can be defined as: "Informal and shared behavioural rules that prescribe what one ought or ought not to do that people comply with because of social expectation and potential social sanctions" (Andrighetto & Vriens, 2022).

In contrast, the necessity for the use of reusable bags is a more recent phenomenon compared to reusable cups and containers, which have been common in households for longer periods of time. The emphasis on reusable bags has gained prominence relatively recently, spurred by an increased awareness of plastic pollution and legislative measures. Consequently, it is possible that participants did not inherit the practice of bringing reusable bags from home. This underscores the significance of not only advocating for the adoption of new sustainable practices but also integrating them into the norms and routines of everyday life (Saracevic & Schlegelmilch, 2021). This ensures that future generations will have these practices as an inherent part of their daily lives.

## 6.2. Limitations

This section presents a critical analysis of the most significant limitations of this research. The methodology employed in this research revealed certain limitations that must be acknowledged. Firstly, there was no differentiation in the selection of participants based on income or educational level for the purpose of conducting the interviews. Due to concerns regarding participant confidentiality, these factors were not included in the analysis, and thus, their potential influence on the results was not considered. The participants vary in age between 27 and 64 years and come from various backgrounds. However, there were no participants with a very low or high income, nor were there any participants with a very low or exceptionally high level of education. This limitation must be acknowledged, given that there is a relationship between higher education levels and exhibiting more sustainable behaviour, as presented by Piao & Managi (2023). The study, which surveyed approximately 100,000 participants from 37 countries, found that individuals with higher education levels were more likely to use recycled products, energy-efficient white goods, and to segregate waste than those with lower education levels.

However, it should be noted that the research did not consider the full range of income levels within the Netherlands, which could influence how SUP regulations are perceived. For instance, individuals with higher incomes may be more able to bear the additional costs associated with SUP charges, whereas those with lower incomes may be more sensitive to these changes. A conscious decision was made to focus on the average Dutch consumer for this study. This is because the sample size is limited in order to identify potential correlations between the use of reusable products and SUP regulations in the Netherlands. The average Dutch consumer has a net income of €2,930 per month (Zwart, 2023), which is comparable to the estimated income of the participants who completed the interview questions. For future research, it would be beneficial to consider this distinction based on education level and income. This could provide more comprehensive insights and help tailor SUP regulations to different demographic groups.

The final limitation inherent to the method is the exclusive use of semi-structured interviews, which resulted in not all participants being asked the same questions. This inconsistency raises questions about the representativeness of the findings for the entire sample. It is possible that some opinions may not have been captured comprehensively, given that not all participants answered the same questions. The limited number of participants in the study amplifies this limitation, resulting in the study being exploratory rather than definitive. Due to the limited number of participants, the findings can not be generalised to the average Dutch consumer. Given the small sample size, the results should be interpreted with caution. A future large-scale study would ensure the reliability and applicability of the results, thereby facilitating a more comprehensive understanding of consumer behaviour within the Netherlands regarding the SUP regulations and SUP consumption.

It is also important to note that limitations have emerged within the results of this study. Firstly, the use of a semi-structured interview approach may have resulted in a degree of underrepresentation of the answers provided by the participants. This is because no suggestions or prompts are employed to suggest an answer; the answer must therefore be entirely the participant's own. This approach may have resulted in participants failing to express opinions because they did not consider them at the time, rather than because they did not hold them. Consequently, the number of participants who hold a particular opinion may be greater than what was observed in this study. A follow-up research project could involve a survey to assess consumer awareness of SUP regulations. The use of a Likert scale may serve to validate a shared opinion amongst participants, as it directly prompts them to express their level of agreement or disagreement.

Secondly, the specific nature of this research presents a limitation due to the scarcity of secondary literature on the subject. The SUP regulations under investigation have been recently implemented (in July 2023 and January 2024). This means that there is currently limited research available that can be

used to compare the results obtained in the present study with another published research. This context frames the current study as exploratory, emphasising the need for further research to validate its findings on a larger scale. The recommendations for further research, as outlined in this study, therefore become crucial steps for confirming and refining the insights provided before any definitive adjustments to the current SUP regulations are made.

Although this study offers valuable initial insights into consumer behaviour and attitudes towards SUP regulations, it is important to note that the limitations discussed above should be addressed in future studies. Additionally, through more extensive and structured studies, stakeholders can better tailor SUP regulations to promote sustainable behaviour across all segments of the population.

## 6.3. Recommendations

To address the challenges identified in this research, it will be necessary for policymakers, companies, and consumers to collaborate in order to develop comprehensive solutions that prioritise environmental sustainability while meeting consumer needs and preferences. The following section presents a detailed analysis of the recommendations for each of the stakeholders.

### 6.3.1. For Policymakers

The primary issue in consumers' *capability* to adhere to SUP regulations is a lack of awareness of the SUP regulations. Education can enhance consumers' understanding. Currently, information is often received passively, suggesting the need for a more proactive approach. Policymakers should distribute information across multiple channels, including social media, television, radio, and public spaces. Training programmes, such as workshops or demonstrations can further boost consumer *capability*. Enhanced educational initiatives can facilitate the distribution of knowledge, thereby enhancing compliance and support for sustainable practices (Buerke et al., 2017). The promotion of awareness and understanding of SUP regulations and sustainable alternatives is crucial for fostering an environmentally conscious society and driving meaningful behavioural change.

To enhance consumers' *opportunity* to adhere to SUP regulations, policymakers should focus on reducing the inconvenience of bringing reusable containers. Research indicates that the additional costs of disposables to-go products are perceived as inconvenient, while reusable products available on-site are well-received. This suggests that transporting reusable products is a perceived hindrance, despite a willingness to use them. The implementation of a large-scale borrowable reusable container system, similar to the BillieCup used mostly at universities (Wanningen, 2024), could reduce reliance on disposables. Additionally, the normalisation of the act of bringing reusable products could address feelings of embarrassment and the desire not to stand out. The creation of environments where the use of reusable products is the norm encourage sustainable behaviours. The addressing of convenience and the implementation of effective incentives could enhance the impacts of reusable beverage containers and mitigate overconsumption. A balanced approach combining convenience with sustainability is crucial for fostering long-term behavioural change intervention and reducing reliance on SUPs (Crocker et al., 2021).

To enhance consumer *motivation* to adhere to SUP regulations, policymakers should focus on the visible, immediate benefits of reduced SUP use. Participants were motivated by waste reduction in their environment, such as the successful transition to reusable beverage containers at work. Facilitating this transition through loan cups or encouraging personal containers can help. Emphasising environmental benefits and individual contributions fosters a sense of responsibility. Furthermore, informative campaigns that demonstrate the tangible impact of reduced SUP use and feature testimonials from individuals who have successfully adopted reusable alternatives can also be effective in enhancing consumer *motivation*.

#### 6.3.1.1. Together with Companies

Policymakers can collaborate with companies to enhance consumer compliance with SUP regulations and increase the use of reusables by addressing key barriers and improving communication and awareness. One barrier to the use of reusable containers for takeout food is the perceived inconvenience and social stigma associated with doing so. In order to normalise this practice, companies can implement incentives and staff endorsement strategies, thereby making it a standard and socially acceptable practice. It is similarly important to improve communication and processes in the restaurant setting where reusables are used. The provision of clear instructions and enhanced communication can reduce confusion and streamline the process, thereby facilitating consumer compliance. Simplifying the refund process for reusable items, particularly in fast-food settings, can further encourage the use of reusable products. Finally, by raising awareness about less popular reusable items, such as alternative material straws, through targeted campaigns, their adoption can be increased. By emphasising the advantages and simplicity of these alternatives, policymakers and companies can further reduce the consumption of SUPs. By implementing these combined strategies focusing on behaviour change intervention, policymakers and companies can effectively promote compliance with SUP regulations.

### 6.3.2. For Companies

In order to promote the use of reusable products among consumers, companies should focus on product development, provide sustainable alternatives in stores, and leverage social influence. To encourage the adoption and compliance with SUP regulations, companies could address challenges such as odour retention and forgetfulness through better product design. This could involve developing reusable cups with materials that resist odour and are easy to clean. Furthermore, the promotion of cleaning accessories and techniques can enhance user satisfaction, while educational campaigns highlighting the environmental benefits of reusable products and the importance of consistent habits can reinforce desired behaviours. Finally, social influence, such as marketing campaigns and workplace initiatives, can further drive the adoption of reusable products. The implementation of these strategies will result in a significant reduction in consumer reliance on SUPs.

### 6.3.3. For Consumers

Consumers may wish to take proactive measures to educate themselves about the regulatory framework governing SUPs and their environmental impacts. One can investigate the allocation of additional costs associated with SUP products and the intentions behind the regulations. Consequently, frustration can be mitigated. It is advisable for consumers to consult reliable sources of information, such as government websites, environmental organisations and educational campaigns, in order to remain adequately informed. In addition, consumers can implement reminder systems and develop habits that reinforce the use of reusables. This issue of forgetfulness has been recognised by Putnam-Farr et al. (2023), who propose strategies that leverage planned behaviour. These strategies emphasise the use of early reminders and contextual triggers in order to facilitate the formation of habits, thereby preventing feelings of aversion or guilt from being experienced as a result of forgetting reusable items. The provision of positive reinforcement through the use of early reminders serves to foster feelings of accomplishment and self-efficacy. By implementing these strategies, consumers can also help reduce the reliance on SUPs.

# 7. Conclusion

Despite the introduction of regulations by the Dutch government to reduce the use of single-use plastics (SUPs), many consumers find it challenging to comply due to a lack of awareness, perceived inconvenience, and social stigma associated with using reusable alternatives. This research examines the underlying psychological and social factors that contribute to the compliance gap. In order to achieve this, the COM-B model is employed, which is centred upon on the capabilities, opportunities, and motivations of consumers, and which collectively shape their behaviour. By focusing on these elements, the effectiveness of single-use plastic (SUP) regulations can be determined. The study aims to enhance consumer adherence to SUP regulations and promote sustainable behaviours by identifying and addressing points for improvement presented by participants. This will contribute to a reduction in SUP waste and an increase in their environmental impact.

The introduction of additional charges on SUP products from 1 July 2023 has not resulted in any substantial changes in consumer purchasing decisions. Nevertheless, the impact of the charges has been variable. For example, the additional charges did not result in a significant increase in the use of reusable products among participants. The majority of consumers did not significantly alter their purchasing behaviour in response to the additional charges, indicating a willingness to pay for convenience. However, the majority of participants expressed frustration about the lack of plastic-free alternatives to avoid paying the surcharges. This frustration was further enhanced when they were uncertain about how the collected funds were utilised. Despite the mixed responses, there was a heightened awareness of SUP consumption. Overall, the impact of the effectiveness of charges on reducing SUP consumption has been limited, indicating a need for more targeted communication, incentives, and support to drive more substantial behavioural change.

The primary challenges encountered by consumers in adhering to the SUP regulations set by the Dutch government include a lack of awareness, perceived inconvenience, social stigma, lack of clear communication, and forgetfulness. Prior to the implementation of the regulations, a significant proportion of consumers were unaware of them, which led to confusion and non-compliance. It can be concluded that consumers become passively informed about SUP regulations through the media or by experiencing the changes in their daily lives after implementation. One significant barrier to consistent use of reusable (beverage) containers is the inconvenience of bringing them. Furthermore, social stigma serves to discourage consumers from utilising reusable containers for takeaway, thereby limiting the success of promoting consumer to bring their own reusable containers. Additionally, the lack of information and unclear communication about the regulations and refund processes in specifically fast-food restaurants also contributed to confusion. Finally, the issue of forgetfulness highlights the necessity for the implementation of strategies designed to assist consumers in remembering their reusable products.

Overall, there is considerable support for the concept of borrowable reusable products, indicating a preference for systems that reduce the inconvenience of remembering personal reusables. Nevertheless, there is still a reluctance to utilise personal containers for takeout, which is perceived to be inconvenient and socially stigmatising. Social norms play a pivotal role in this context, with items such as the Dopper bottles driving wider adoption due to their social appeal. There has been a notable increase in the adoption of reusable beverage containers, particularly in workplaces where they are either provided or encouraged to be used now that disposable alternatives are no longer available. This suggests that when infrastructure enables sustainable choices, consumer behaviour is likely to follow suit.

In conclusion, this research highlights the obstacles and motivations influencing consumer adherence to SUP regulations in the Netherlands. It is evident that a multifaceted approach, incorporating increased

awareness, innovative product design, social influence, and convenient access to reusables, is essential to drive this movement. Policymakers, companies, and consumers can collaborate to address these challenges. By providing clear information, fostering a supportive environment for reusables, and normalising their use through strategic interventions, sustainable behaviour will be promoted.

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# Appendix A – Consumer In-Depth Interviews

**Introduction and Warm-Up**

- Greet the participant and thank them for participating.
- Briefly explain the purpose of the interview and assure confidentiality (No names will be included in the final report). Ask permission to be recorded (inform participants beforehand that this will be a necessary step to the research. Also have them sign the consent form beforehand.

**Awareness and Understanding of SUP Regulations**

1. "What is your understanding of and experience with Single-Use Plastic (SUP) regulations in the Netherlands?"

- How did you become aware of these regulations?
- What are your thoughts and opinions on these regulations?
- What factors or considerations motivate you to support or comply with SUP regulations?
- Have you encountered any challenges or confusion regarding these regulations?

**Changes in Purchasing Choices**

2. Can you recall a recent purchase that involved reusable packaging? Please tell me about this purchase and the situation.

- What motivated you to choose reusable packaging over single-use options during that purchase?
- Have you encountered any challenges or obstacles in using this item, and if so, how did you overcome them?
- How often do you still gravitate towards using this item?
- Do you have another example of a recent purchase that involved reusable packaging?

3. Can you recall a recent purchase that involved single-use plastic? Please tell me more about this purchase and the situation.

- What motivated you to buy this item over a potentially more sustainable option during that purchase?
- How did you dispose of this item?
- Have you encountered any challenges or obstacles in avoiding single-use plastic, and if so, how do you navigate them?
- Do you have another example of a recent purchase that involved reusable packaging?

**Preferences for Alternative Packaging Materials**

4. How have the Single-Use Plastic (SUP) regulations in the Netherlands influenced your consumption habits and preferences?

- Have you found yourself preferring alternative packaging materials or reusable products more since the SUP regulations were implemented?
- Can you discuss any efforts you have made personally to reduce your consumption of single-use plastics in response to the latest SUP regulations?

5. Specifically, how have these regulations impacted your choice of packaging materials and products used during your daily commute or regular activities?

- Can you describe the types of single-use plastic products you typically use during your commute to and from work (or school)?

- What factors and challenges do you encounter that prevent you from using reusable or more sustainable alternatives instead of single-use plastics during your commute?

**Challenges and Obstacles in Adhering to SUP regulations**

6. Why did you opt for reusable packaging / single use plastic in this case?
- What are the primary challenges and obstacles you face in adhering to SUP regulations set by the Dutch Government?
- Can you provide examples of specific instances where these challenges or obstacles have affected your daily routines or purchasing decisions?
- Have you sought out any solutions or alternatives to overcome these obstacles?
7. What prevents you from using reusable packaging?
- How do you think SUP regulations could be improved or strengthened to further encourage sustainable consumer behaviour?
- Can you elaborate on any specific aspects of the current SUP regulations that you believe are ineffective or could be enhanced?
- Do you have any suggestions or ideas for potential improvements to the existing regulations that could better support sustainable consumer behaviour?

**Additional Questions and Closing**

8. Is there anything else you would like to share about you experiences with SUP regulations?
9. Would you be comfortable connecting me to anyone in your social or professional circles who you think might have interest in contributing to my research?
- Thank the participant for their time and participation.
- Offer the opportunity for any final comments or questions from the participant.
- Inform the participant of the next steps in the research process.