



Perceived Effectiveness of Policy Instruments aimed at reducing the amount of Food Waste in the Municipality of Amsterdam

ROAPMAP TO A CIRCULAR CITY

Master thesis

ANNABEL OOSTERWIJK

Wageningen University

Annabel Oosterwijk (980820626110)

Environmental Economics and Natural Resources Group (ENR-80436)

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Supervisors: Dr. Hans-Peter Weikard & Dr. Joyce Delnoij

PERCEIVED EFFECTIVENESS OF POLICY INSTRUMENTS AIMED AT REDUCING THE AMOUNT OF FOOD WASTE IN THE MUNICIPALITY OF AMSTERDAM

Roadmap to a circular city

Chair Group Environmental Economics and Natural Resources

Department of Social Sciences

Wageningen University

Droevendaalsesteeg 3

6708 BP, Wageningen

The Netherlands

Submitted by: A.A.M. Oosterwijk (E-mail: annabel@oosterwijk.eu)

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Dr. H.P. (Hans-Peter) Weikard (supervisor)

Dr. J.M.J. (Joyce) Delnoij (supervisor)

Dr. C.P.A. (Coen) van Wagenberg (contact person Circularity by Design project)

O. (Oona) Morrow (contact person Circularity by Design project)



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ABSTRACT

Food waste is causing several unnecessary environmental impacts, therefore a large consensus is extant that food waste along the food supply chain needs to be reduced. The municipality of Amsterdam has the objective to be fully circular in 2050 and aims to reduce the amount of food waste by 50% by 2030. The municipality has developed the Amsterdam Circular Strategy 2020-2025, containing policy instruments aiming to reduce the amount of food waste in Amsterdam. However, there is no common understanding as to what are the most effective policy instruments aimed at reducing the amount of food waste. This insight can be a valuable understanding for a sustainable urban food system, including the relationship between the urban agenda and food waste management. This study explored which policy instruments, aimed at reducing the amount of food waste in the municipality Amsterdam, are perceived as effective by the stakeholders. The insights gained in this study can help the municipality of Amsterdam to prioritize effective policy instruments for specific stakeholders in the Amsterdam food supply chain.

A Delphi questionnaire was distributed among stakeholders in the Amsterdam food supply chain, divided into three categories (using the policy instruments, leveraging a wider impact and analysing the change) and three types (civil society, market and government). The stakeholders had to rate the policy instruments on their perceived effectiveness of them. Next to that, the stakeholders could give policy suggestions for future policies. The Delphi questionnaire consisted of two rounds, in which the stakeholders got to see whether their evaluation of the policy instrument aligns with the other stakeholders in round 2 and re-evaluate their opinion in round 2. This insight created a convergence, divergence or stability in the responses of the stakeholders reviews over the two rounds. The results show the perceived effectiveness of the policy instruments and the degree of consensus among the stakeholders.

The results show that the perceived effectiveness and the degree of consensus is different for the distinguished stages in the Amsterdam FSC, the types of stakeholders and the type of policy instruments. Regarding the FSC stages, it can be seen that the stakeholders analysing the change and leveraging a wider impact have a higher perceived effectiveness of the policy instruments than the stakeholders using the policy instruments. A similar observation is made when considering the types of stakeholders, namely a lower perceived effectiveness of the market, compared to civil society and the government. In consideration of the types of policy instruments, the economic policy instruments and the soft policy instruments aimed at increasing general awareness were perceived as most effective. The regulatory & legislative instruments and the soft instruments aimed at a specific target group are perceived as less effective and not scalable. These insights are an addition to the existing literature and can be used in practice by policy makers from the municipality of Amsterdam. The priorities of the municipality of Amsterdam should focus on increasing the awareness on all levels, involving stakeholders in the policy making process and enabling the food waste collection and sustainable reuse of it. On top of that, these results will contribute to the Circularity by Design project of WUR and the AMS institute.

Table of Contents

Acknowledgements	2
Abstract	3
List of Figures.....	5
List of Tables.....	5
List of Abbreviations.....	5
1. Introduction.....	6
1.1 Research objective and research questions.....	7
1.2 Overview of content.....	7
2. Background AMA and Municipality of Amsterdam.....	9
2.1 Research area Circularity by Design	9
2.2 Food supply chain Amsterdam.....	10
3. Literature review and theoretical framework.....	15
3.1 Literature review	15
3.2 Theoretical framework.....	16
4. Methodology	20
4.1 Delphi method.....	20
4.2 Research process Delphi questionnaire	22
5. Results	28
5.1 Sub-research question 1.....	28
5.2 Sub-research question 2.....	31
5.3 Sub-research question 3.....	34
5.4 Main research question.....	35
6. Discussion	39
Research results	39
Research limitations	40
References to previous research.....	41
Recommendations	42
7. Conclusion	44
References.....	46
Appendices	49
Appendix 1 Interview program manager food strategy municipality of Amsterdam	49
Appendix 2 Questionnaire rounds	52
Appendix 3 Round 1 38 respondents vs 21 respondents.....	66
Appendix 4 Drop-out percentage.....	67

Appendix 5 Policy suggestions by stakeholders	68
Appendix 6 Definition effectiveness by stakeholders	72
Appendix 7 Results round 1 and round 2	73
Appendix 8 Comments of stakeholders per policy instrument.....	74

LIST OF FIGURES

Figure 1 The Amsterdam Metropolitan Area (MRA, 2020b)	9
Figure 2 Household residual waste per resident in kilogram (MRA, 2020a).....	10
Figure 3 FSC stages and types of stakeholders.....	11
Figure 4 Food waste hierarchy (Teigiserova et al., 2020).....	17
Figure 5 Theory of planned behaviour (Ajzen, 1991).....	18
Figure 6 Extended theory of planned behaviour - adapted from (Wan et al., 2014)	19
Figure 7 Sub-research questions in design Delphi questionnaire	21
Figure 8 Methodological framework.....	21
Figure 9 Position stakeholders in the FSC	23
Figure 10 Relationship government, market and civil society - adapted from (Helleman, 2016)	24
Figure 11 Stakeholders in the Amsterdam FSC	28
Figure 12 Median per type of stakeholder.....	40

LIST OF TABLES

Table 1 Methodology per research question	20
Table 2 Participation stakeholders questionnaire.....	26
Table 3 Relationship FSC stages and types of stakeholder	29
Table 4 List of stakeholders.....	30
Table 5 Policy instruments municipality of Amsterdam	31
Table 6 Policy instruments action direction 5	32
Table 7 Policy instruments action direction 6	32
Table 8 Policy suggestions from round 1	33
Table 9 Efficacy policy instruments	35
Table 10 Consensus per FSC stage	37
Table 11 Consensus per type of stakeholder	37
Table 12 Consensus per type of policy instruments	38

LIST OF ABBREVIATIONS

AMA	Amsterdam Metropolitan Area
FSC	Food Supply Chain
TPB	Theory of Planned Behaviour
PPE	Perceived Policy Effectiveness

1. INTRODUCTION

The Dutch government has the long-term goal to be 100% circular in 2050. The Amsterdam Metropolitan Area (AMA) and the municipality of Amsterdam share this goal (Gemeente Amsterdam, 2020b). The AMA is the country's most robust economic region, consisting of 32 municipalities, two provinces and the Transport Authority Amsterdam (MRA, 2020b). Efforts are being made to strengthen the circular innovation ecosystem in the AMA, part of which is the AMA's strive for a healthy, social and sustainable food system. The municipality of Amsterdam put words into action and created the Amsterdam Circular Strategy 2020-2025, in which they elaborate on how they want to make Amsterdam circular. In the circular vision of the city of Amsterdam, pollution and waste do not exist and residues are reused. The Food & Organic Waste Streams value chain forms an important part of the circular strategy, therefore the courses of action for this value chain are specifically discussed. The municipality of Amsterdam sees their role not only in informing and activating Amsterdam's residents, but also in stimulating and facilitating circular initiatives. The ambition of the municipality of Amsterdam is to reduce food waste generated by consumers and businesses by 50% in 2030 (Gemeente Amsterdam, 2020a).

Food waste refers to food appropriate for human consumption being discarded, since it has been left to spoil or expire as a result of negligence by the actor (Bellù, 2017). Therefore, food waste refers to the edible parts of food, or avoidable losses (Nutrition centre, 2019). Food waste is part of food loss, which refers to a decrease in the quantity or quality of the food in the Food Supply Chain (FSC) (Bellù, 2017) being unavoidable, such as peels, egg-shells and tea bags (Nutrition centre, 2019).

The growing prosperity and urbanisation are causing rapid changes in the (urban) food systems (Berkum et al., 2018), introducing additional environmental challenges, such as resource scarcity and pollution (Vergragt et al., 2016). The generation of food waste specifically is very impactful, since it contributes to the generation of greenhouse gas emissions, soil utilization, depletion and water consumption e.g. (Diaz-Ruiz et al., 2019). This increases the need for sustainable urban food systems, including the relationship between the urban agenda and food waste management. A reduction in the amount of food waste generated will lead to a substantial reduction in the ecological footprint of the food supply in the municipality of Amsterdam (Gemeente Amsterdam, 2020a).

Since the food waste problem is a complex problem, it necessitates collaboration between stakeholders in the Amsterdam FSC. Based on their different roles in the FSC, the stakeholders can implement actions to reduce the amount of food waste (Mourad, 2016). Therefore, stakeholders can contribute to a great extent to the realization of the objective to reduce the amount of food waste. The stakeholder stages in the Amsterdam FSC are categorized into three categories 1) the stakeholders using the policy instruments, 2) the stakeholders leveraging a wider impact and sharing knowledge, and 3) the stakeholders analysing the change. The interplay of stakeholders in the implementation of the policy instruments suggests the need of the inclusion of a wide range of stakeholders along the Amsterdam FSC (Mourad, 2016).

There is a large consensus about the need to reduce food waste along the FSC (Diaz-Ruiz et al., 2019). However, to reduce food waste, there needs to be a common understanding as to what are the most effective policy instruments aimed at reducing the amount of food waste. This understanding is currently lacking and can differ depending on the stakeholder position in the FSC (Diaz-Ruiz et al., 2019). In order to achieve a common understanding of the most effective policy instruments aimed at reducing the amount of food waste, it is important to get an insight in the stakeholders' view on these policy instruments. The effectiveness of policy instruments is important, since this highlights to what extent the realization of the objective (reducing the amount of food waste in the municipality of Amsterdam) can be attributed to the specific policy instruments. How the stakeholders perceive the policy instruments on effectiveness is valuable information for policy makers, since an individual's behaviour can be associated to their perceived policy effectiveness (PPE) (Wan et al., 2014), it is important for policymakers to have an insight in the PPE of the stakeholders in the Amsterdam FSC. Hence,

not only receiving feedback on the effectiveness of the policy instruments aimed at reducing the amount of food waste, but also the insight in the perception of stakeholders is valuable for policy makers to design new policy instruments and support the stakeholders in the Amsterdam FSC in the transition towards a circular Amsterdam.

Mapping the governance structure aimed at reducing food waste in the AMA is a part of the Circularity by Design project work package 1 Framework & Governance. This work package aims to develop a conceptual framework for the transformation towards circular by design economies in urban areas, specifically the AMA, which is a frontrunner on circular economy (Prendeville et al., 2018). This framework can help to evaluate governance structures and policy instruments that can incentivize a transition towards a Circularity by Design economy. In the end this framework is used to identify and develop methods to support stakeholders in the AMA FSC towards applying Circularity by Design.

This exploratory thesis focusses on operationalising the PPE of the stakeholders in the Amsterdam FSC. The research area is the municipality of Amsterdam, one of which's strategies is to reduce the amount of food waste to become more circular. In Amsterdam there are a lot of policy instruments in place aiming to attain that, therefore it is interesting to explore these policy instruments and evaluate which ones are perceived as effective in reducing the amount of food waste in the municipality of Amsterdam, according to the main stakeholders. This explorative thesis describes a study, with qualitative and quantitative aspects, of the perceived effectiveness of stakeholders of the policy instruments aimed at reducing food waste in the Amsterdam FSC. The Delphi method was used in order to measure the perceived policy effectiveness of stakeholders in the Amsterdam FSC. The input of stakeholders provided useful insights and feedback on the policy instruments, which can help to prioritize effective policy instruments for specific stakeholders in the Amsterdam FSC and to support them in the transition to a circular Amsterdam in 2050.

1.1 RESEARCH OBJECTIVE AND RESEARCH QUESTIONS

For Amsterdam to be circular in 2050, the municipality needs to define their actions and goals in a framework. This framework needs to include effective policy instruments aimed at reducing the amount of food waste. In order to design this framework, the current policy instruments need to be reviewed and the insights of stakeholders in the Amsterdam FSC is very important. Therefore, this thesis has the objective:

To explore which policy instruments, aimed at reducing the amount of food waste in the municipality of Amsterdam, are perceived as effective, in order to prioritize effective policy instruments for specific stakeholders in the Amsterdam food supply chain.

In order to realize this research objective, the following research question was formulated:

What are perceived effective policy instruments aimed at reducing the amount of food waste in the municipality of Amsterdam food supply chain according to the stakeholders?

Sub-research question:

1. *Who are the main stakeholders in the Amsterdam food supply chain?*
2. *Which policy instruments aimed at reducing the amount of food waste in the municipality Amsterdam are currently in place or should be in place according to the stakeholders?*
3. *How is the effectiveness of policy instruments defined?*

1.2 OVERVIEW OF CONTENT

This report starts with a background chapter about the context of the municipality of Amsterdam in chapter 2. A literature review and theoretical framework is presented in chapter 3, which shows the theoretical context of this study. In chapter 4 the methodology is presented, in which the Delphi method and the case study design is explained. The results of the sub-research questions and the main research question are presented in chapter 5.

Chapter 6 presents the discussion, including an interpretation of the results, limitations and recommendations. Finally, the conclusion in chapter 7 presents the answer to the main research question and the insights of this study.

2. BACKGROUND AMA AND MUNICIPALITY OF AMSTERDAM

This chapter provides a basis for the remainder of this study by presenting a more detailed description of the research area of this study by giving a more detailed description of the food supply chain stages in this area.

2.1 RESEARCH AREA CIRCULARITY BY DESIGN

The case study area for the Circularity by Design project is the FSC in the AMA. The AMA is comprised of 32 municipalities over the province North-Holland, Flevoland and the Transport Authority Amsterdam, as depicted in Figure 1 (MRA, 2020b). This area is the home to about 2.5 million people, which is over 14% of the Dutch population (MRA, 2020b). There are seven sub-regions in the AMA; Amsterdam, Amstelland-Meerlanden, Zaanstreek-Waterland, Almere-Lelystad, Zuid-Kennemerland, Gooi en Vechtstreek and IJmond (MRA, 2020b). The AMA is the most robust economic region of the Netherlands (MRA, 2020b), an international competitive region and frontrunner on circular economy (Prendeville et al., 2018).

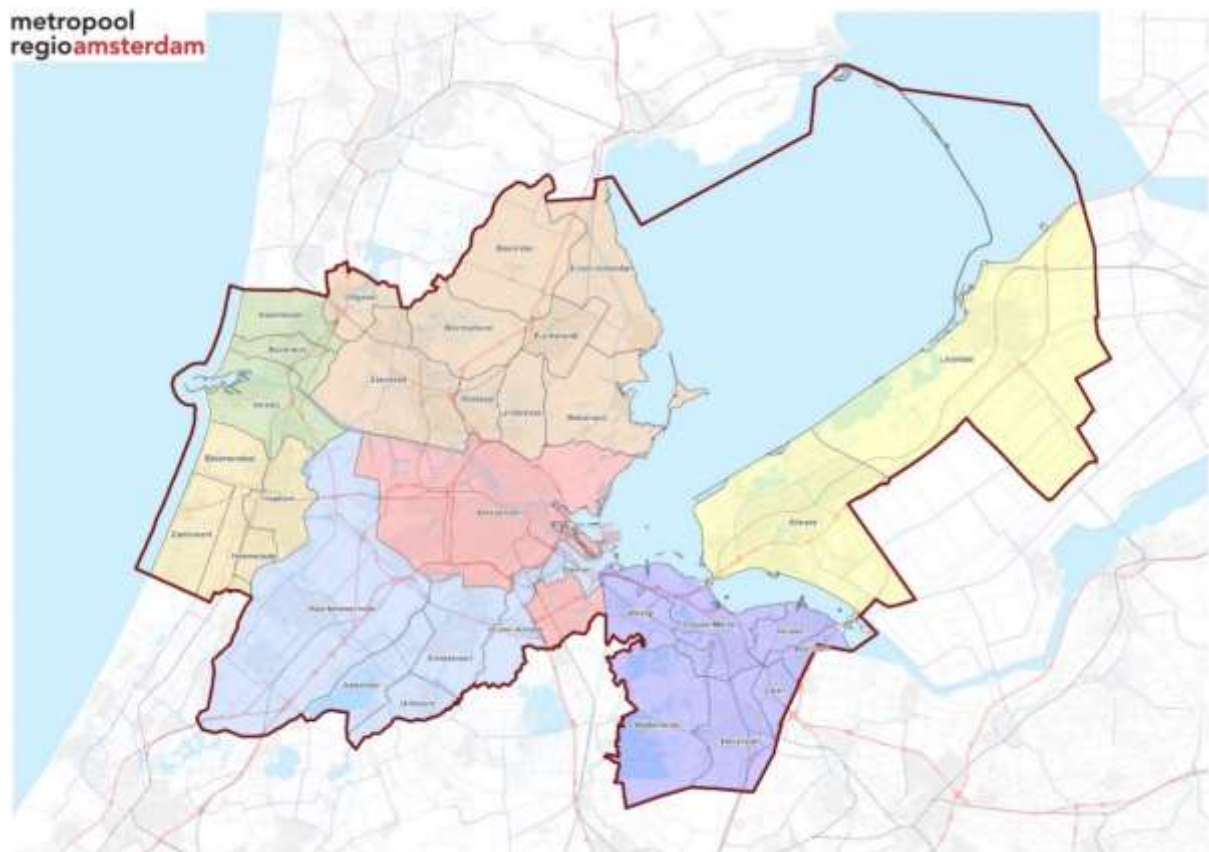


FIGURE 1 THE AMSTERDAM METROPOLITAN AREA (MRA, 2020B)

Within the AMA the municipality of Amsterdam is the only municipality that has a detailed strategy to reduce the amount of food waste in the FSC stages. In a circular economy no waste is produced and raw materials are used over and over again (MRA, 2020a). In the Netherlands the amount of food waste throughout the FSC was between 1814 and 2509 kilotons in 2017 (Nutrition centre, 2019). In the AMA regions the amount of household residual waste per capita is higher than the average in the Netherlands (Figure 2). Figure 2 also shows that the amount of household waste per capita in Amsterdam municipality is the highest of all AMA regions. Next to that, also the amount of avoidable waste in household waste was higher in Amsterdam (22,5%) than in the

Netherlands (13,1%) in 2019 (Steenhuisen, 2019). Since the amount of (avoidable) food waste in Amsterdam is highest compared to the other AMA regions and Amsterdam has a detailed strategy to reduce this amount, the municipality of Amsterdam was chosen as focus area for this study.

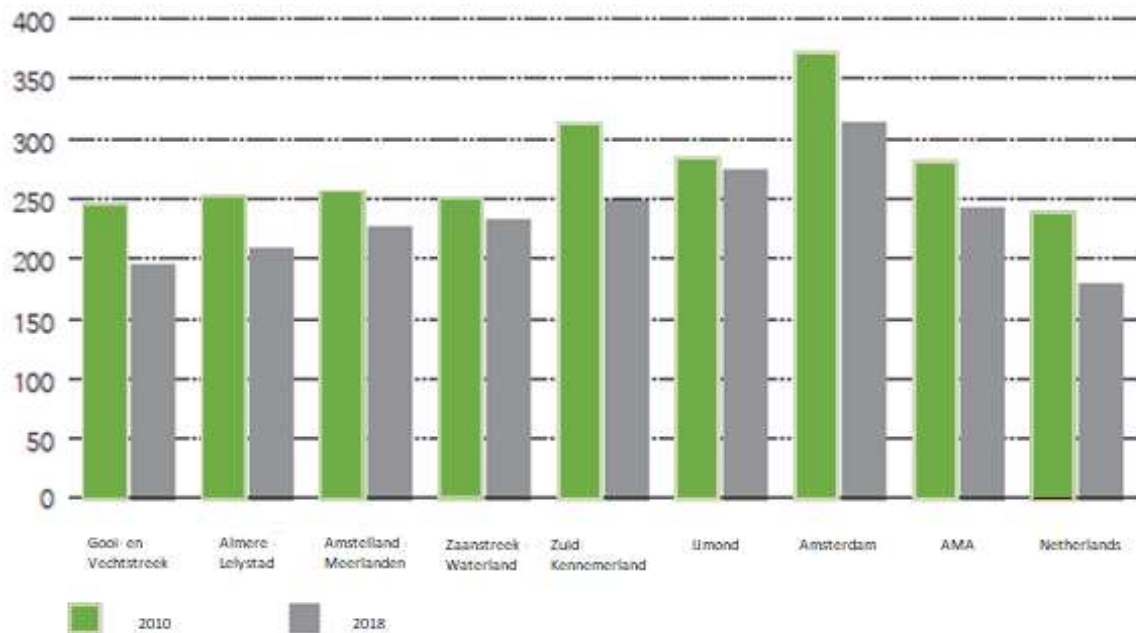


FIGURE 2 HOUSEHOLD RESIDUAL WASTE PER RESIDENT IN KILOGRAM (MRA, 2020A)

2.2 FOOD SUPPLY CHAIN AMSTERDAM

Amsterdam was the first city worldwide to develop a circular economy vision and accompanying roadmap in 2015. Their vision on the steps to take towards a city-wide circular economy has become (inter-)national leading and the city's circular economy programme and efforts to develop a policy for circular economy at an urban level have been rewarded with the World Smart City Award in 2017 (Circle Economy et al., 2018). In their Amsterdam Circular 2020-2025 Strategy the municipality focusses on three value chains, being: 1) Food & Organic Waste Streams, 2) Construction, and 3) Consumer Goods. These municipality selected these value chains because of their economic significance, environmental impact, and the possibility for the municipality to exert influence on these value chains (Gemeente Amsterdam, 2020b). The municipality of Amsterdam intends to reduce the ecological footprint of the city by creating opportunities for businesses in the field of circular entrepreneurship by gaining competitive advantage through circular innovation or by entering new collaborations in chains and sectors (Gemeente Amsterdam, 2020b).

Subsequently, the distinguished stages of the Amsterdam FSC are discussed, being: primary production, processing, distribution, retail, consumption, waste, knowledge transfer, partnership and governance. The stakeholders whom participated in this study are part of one or more of the Amsterdam FSC stages. The stakeholder stages in the Amsterdam FSC are categorized into three categories 1) the stakeholders using the policy instruments (primary production, processing, distribution, retail, consumption, waste), 2) the stakeholders leveraging a wider impact and sharing knowledge (knowledge transfer, partnership), and 3) the stakeholders analysing the change (governance). The stakeholders from these FSC stages are individuals, groups or organizations who have an interest (stake) and the potential to influence the actions and aims of an organization, project or policy direction (Brugha & Varvasovszky, 2000). The stakeholders using the policy instruments are the ones producing waste in their organizations and they have the ability to change their organizations actions and aims. The stakeholders analysing the change are key due to their role in formulating public policies and plans. On top of that, the stakeholders leveraging a wider impact are rooting for awareness and aiming to influence both organizations as policy directions. Next to that FSC stage, the stakeholders are also categorized between being

part of civil society, the market or the government, on which paragraph 4.2.1.1 elaborates. Figure 3 presents the FSC stages and the three types of stakeholders on the right.

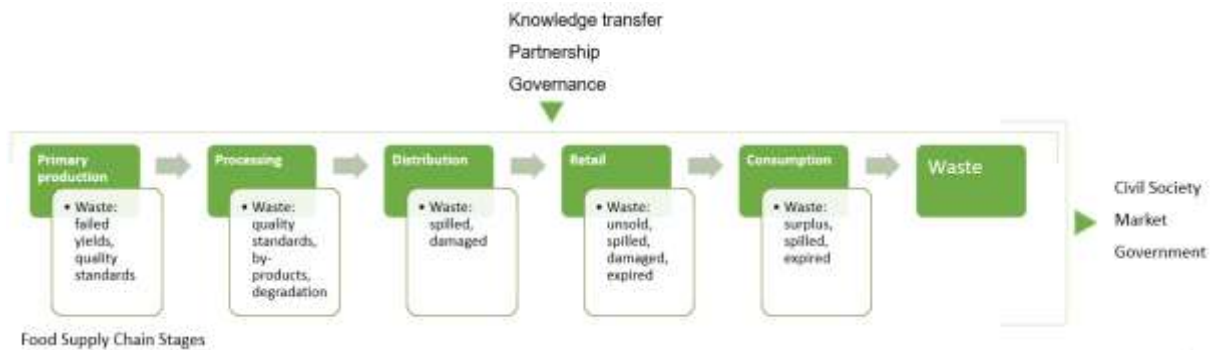


FIGURE 3 FSC STAGES AND TYPES OF STAKEHOLDERS

2.2.1. FOOD SUPPLY CHAIN STAGES USING POLICY INSTRUMENTS

PRIMARY PRODUCTION

Primary production of food in a city like Amsterdam is often called urban farming, which is the production of food in and around the city, such as in city farms, allotments and school gardens (Voedingscentrum, 2016). Urban farming can also have social functions, such as recreation and knowledge transfer (Voedingscentrum, 2016). Urban farming is stimulated by the municipality of Amsterdam and is increasingly popular in neighbourhoods and districts of Amsterdam (Gemeente Amsterdam, 2021). In and around the city of Amsterdam the social and commercial initiatives for the production of food for own use or for the regional market are increasing, just like the number of shops and restaurants that offer or process food products from the Amsterdam area directly for sale (Gemeente Amsterdam, 2021). Waste in the primary production stage is mainly caused by failed yields and unmet quality standards from supermarkets and consumers (Zhou et al., 2018), agricultural residues, animal waste and by-products of meat and cheese production (Viva et al., 2020).

PROCESSING

In the processing stage the agricultural products are processed into food products. Depending on the type of food and whether fresh food or food with a longer shelf life is processed, the process can vary widely and can involve other business actors and suppliers (Zhou et al., 2018). This also means that a diversity of economic relationships exists between businesses in a chain. The food processing stage in Amsterdam is mostly present in the industrial area in Amsterdam corresponding to the city district of Westpoort (Viva et al., 2020). Food products can be rejected due to rigorous quality standards concerning weight, size, shape and appearance of crops (FAO, 2011), by supermarkets or consumers. Other than that waste in the processing stage can also be caused by degradation or by-products in the processing process.

DISTRIBUTION

The distribution stage in Amsterdam can be identified as urban distribution, which is “the distribution of goods to companies and institutions in the city centre and the core shopping areas (shops, restaurants, offices and other business activities), including the collection of returned goods and waste from companies in the same area” (Gemeente Amsterdam, 2010). The municipality of Amsterdam wants to achieve a more sustainable supply of shops and catering companies and aims for cleaner, more efficient and faster urban freight transport and is therefore engaging with stakeholders to come to agreements (Gemeente Amsterdam, 2010). In the distribution stage food can get damaged or spilled, and thereby can lead to food waste.

RETAIL

The retail stage includes all locations where residents buy their food, such as supermarkets, wholesalers, local farmer markets and specialty stores (Zhou et al., 2018). The grocery expenses of Amsterdam residents in 2016

were spent mainly in supermarkets (73%) and some on the market (6%) (Gemeente Amsterdam, 2017). Consumers are increasingly opting for convenience and therefore prefer one-stop-shopping (Gemeente Amsterdam, 2017). Consumers visit the commodity market for conviviality, quality and variety in product range (Gemeente Amsterdam, 2017). The supermarkets and local specialty stores are benefiting from the pandemic, since consumers prefer cooking at home and avoid crowded places (MRA, 2020a). In the Amsterdam retail sector the supermarkets are growing larger in scale, while the number of traditional neighbourhood stores is decreasing (Gemeente Amsterdam, 2017). On average 1.7% of the food offered in supermarkets in the Netherlands does not reach the consumer and is therefore considered as food waste (WUR, 2020). Food waste in the retail stage is caused by either damage, expiration or spillage.

CONSUMPTION

The Dutch consumption behaviour is affecting the environment in many ways and is therefore not sustainable (Zhou et al., 2018). The majority (80%) of the consumption of food in the Netherlands takes place at home (Zhou et al., 2018). Just like in grocery shopping, the consumers are increasingly opting for convenience in their consumption by having a preference for ready-to-eat products and at home delivery (Gemeente Amsterdam, 2017). This corresponds with the increase in consumption of processed food and ready-to-eat meals (Zhou et al., 2018). The consumption stage includes consumption at household level or out of home, such as in the hospitality industry. Figure 2 shows the amount of household waste, which is higher than the average of both the Netherlands and the AMA. Next to the waste generated in households, also the hospitality industry is a significant source of food waste considering that a third of the food used is being wasted (Royal HaskoningDHV et al., 2018). The waste generated in the consumption stage can be related to surplus, spillage or expiration.

WASTE

The waste stage is the one that processes the food waste generated by the other stages in the FSC, which is on average 238 kilos residual waste per resident per year, 37% of which is organic waste (Gemeente Amsterdam, 2021). The challenge of separately collecting the different types of waste in urban areas is greater because of the lack of space for separate collection in the high-rise buildings (MRA, 2020a). The waste infrastructure is very different in different areas within the municipality of Amsterdam. For example, in the city centre there is a lack of waste collection infrastructure, while in other residential areas, just outside the city centre, there are sufficient waste collection infrastructures (Viva et al., 2020). In the study of Viva et al. (2020) the majority of the respondents recognized organic waste as a valuable waste stream, which these residents would separate if given the opportunity. The organic waste streams is currently used at its lowest value, but if the organic waste in Amsterdam would be treated properly it would allow for the production of renewable energy and the creation of valuable materials (Viva et al., 2020).

If source separation becomes difficult, subsequent separation can be an effective method. The municipality of Amsterdam has decided to stop the separate collection of plastic and beverage cartons from 2021 and leave the separation to the post-separation plant (MRA, 2020a). Contradictory, the municipality of Amsterdam introduced separate delivery of organic waste from 2020 onwards (Gemeente Amsterdam, 2021), leading to a reduction of 10 kilos of organic waste per resident in 2025 (Gemeente Amsterdam, 2020c). The separate collection might be more challenging for high-rise buildings and therefore the municipality of Amsterdam is doing a promising pilot study using grinders in high-rise buildings (Gemeente Amsterdam, 2020c).

Stakeholders in the waste sector are companies handling the food waste generated in the Amsterdam FSC via a few management types, such as landfill, fermentation, animal feed, composting and incineration, resulting in various output types (Zhou et al., 2018). The main share of waste in the AMA is still incinerated or landfilled and residual flows are used to a limited extent (MRA, 2020a). Next to these waste management facilities, there are also organic waste initiatives (by residents), like worm hotels, bread bins and garden baskets across the city (Gemeente Amsterdam, 2021).

2.2.2. FOOD SUPPLY CHAIN STAGES LEVERAGING A WIDER IMPACT

KNOWLEDGE TRANSFER

Stakeholders in the stage knowledge transfer are crucial to spread awareness regarding sustainability and food waste. Educational institutes, such as universities and schools, play an important role in almost all FSC stages by creating awareness on food by conducting researches (Zhou et al., 2018) and teaching residents about food quality, food safety and how to reduce the amount of food waste generated. Schools have a high potential in the education process and in the amplification of the impact. Students are likely spread their gained knowledge in their surroundings and trigger their parents to change their behaviour towards organic waste (Viva et al., 2020).

There is a movement towards more food education in primary schools, with a focus on promoting healthy nutrition and food quality. For example Wageningen University worked together with scientists, primary school teachers and students to develop educational materials, in order to achieve various goals, such as wasting less food, eating less meat, purchasing sources of plant-based protein and only eating what is needed (Zhou et al., 2018). Next to the educational institutes, there are several civil society initiatives, such as city farms and foundations with the objective of food education for local schools, neighbours or nature lovers. Erik Koldenhof from the municipality of Amsterdam said that there should be a bigger focus on educating residents to increase the awareness on food waste, see [Appendix 1](#).

PARTNERSHIP

There are several organisations in Amsterdam actively engaged in creating partnerships or connecting initiatives. There are several online and offline platforms where entrepreneurs can share their story, meet other people and thereby try to combat food waste together, while increasing awareness. The importance of cooperation between stakeholders is recognized and offers exciting prospects (MRA, 2020a). The urban community perception on the waste management system is valuable, since the community's response maps the social engagement and acceptance towards the waste stream of interest, which is a key factor in the success of any waste management strategy (Viva et al., 2020). It appears that in several Amsterdam FSC stages this community sense to carry on the transition towards sustainable waste management is lacking (Viva et al., 2020). For example, in the primary production stage potential resistance of farmers in using organic waste recycling products might occur, while in the processing stage there is a weak community sense and in the consumption stage there are fewer social relations in both high-rise buildings and single houses, resulting in a weak sense of community (Viva et al., 2020).

2.2.3. FOOD SUPPLY CHAIN STAGE ANALYSING THE CHANGE

GOVERNANCE

The hierarchic structure of the governance in this research area is first the European Union (EU), followed by the Dutch government, the province and the municipality of Amsterdam (Zhou et al., 2018). The EU has a more regulating role, while the municipality of Amsterdam has an executive role. These governing bodies have all subscribed to the objective of reducing food waste. However the Government of the Netherlands (2016) states that it is up to businesses and consumers to reduce the amount of food waste generated, and that the government can only encourage these efforts. Governing bodies can also play a role in connecting with education, innovation industries and technology businesses (Zhou et al., 2018).

The municipality of Amsterdam is the only municipality in the AMA to have drawn up a detailed strategy (Gemeente Amsterdam, 2020b) and accompanying implementation program (Gemeente Amsterdam, 2020a) to incentivize a transition towards a circular Food & Organic Waste Streams value chain. In the Innovation and Implementation program 2020-2021 the three ambitions, accompanying action directions and policy instruments for the Food & Organic Waste Streams value chain are presented (Gemeente Amsterdam, 2020a). These action directions are built upon exiting initiatives, activities, and strategies that have been pursued over the past years in Amsterdam.

To successfully realise the action directions, levers and policy instruments can be used to support the realisation. Levers are elements facilitating the transition to a circular economy, such as innovation networks, systems thinking, jobs, etc. and they apply to all actors in the circular economy (Circle Economy & City of Amsterdam, 2019). Policy instruments are used by the municipality to stimulate the transition towards a circular economy. Since this study focusses on the Amsterdam FSC, only policy instruments are considered, since these have a more direct effect on the Amsterdam FSC. The policy instrument are divided into three categories: regulatory & legislative instruments, economic instruments and soft instruments (Gemeente Amsterdam, 2020b).

TYPES OF POLICY INSTRUMENTS

REGULATORY & LEGISLATIVE INSTRUMENTS

Regulations can be used by the municipality to set requirements for residents and businesses, and thereby steering and monitoring their actions (Circle Economy & City of Amsterdam, 2019). *Legislations* are laws which have the ability to stimulate behaviour towards a circular economy, for example by making standards for labelling or remove barriers (Circle Economy & City of Amsterdam, 2019).

ECONOMIC INSTRUMENTS

Economic instruments which the municipality can use are fiscal frameworks, direct financial support and economic frameworks (Gemeente Amsterdam, 2020b). *Fiscal frameworks* are incentives (positive or negative) to stimulate the circular economy, for example tax exemptions or levies (Circle Economy & City of Amsterdam, 2019). *Direct financial support* can be used to support project, businesses and programmes through debt financing and circular procurement (Circle Economy & City of Amsterdam, 2019). *Economic frameworks* can be used to guide the market towards circularity by holding manufacturers and importers responsible for the treatment of their products (Circle Economy & City of Amsterdam, 2019).

SOFT INSTRUMENTS

Soft instruments are knowledge, advice & awareness, collaboration platforms & infrastructure and governance (Gemeente Amsterdam, 2020b). *Knowledge, advice & information* is used to initiate education programmes and thereby creating knowledge (Circle Economy & City of Amsterdam, 2019). *Collaboration platforms & infrastructure* are used to enable knowledge sharing amongst stakeholders, such as by living labs, participation platforms and data and information exchange platforms (Circle Economy & City of Amsterdam, 2019). Lastly, *governance* can shape decision-making and actions, for example by lobbying (Circle Economy & City of Amsterdam, 2019).

In [Appendix 1](#) the interview with Erik Koldenhof, program manager food strategy from the municipality of Amsterdam, is included. In this interview Erik elaborated on some current food waste policy instruments and enounced more detail about which direction he envisions is most promising for the municipality of Amsterdam.

3. LITERATURE REVIEW AND THEORETICAL FRAMEWORK

In this chapter the main concepts and theories are presented. The literature review explains the broader concepts of this study and points out the knowledge gaps within literature. In the theoretical framework the key concepts are explained and their contribution to addressing the knowledge gaps is indicated.

3.1 LITERATURE REVIEW

The municipality of Amsterdam sees their role in stimulating and facilitating circular initiatives. In order to facilitate circular initiatives, it is vital to have a clear understanding of what it means to apply the circular economy concept to a city. Since applying these circular city practices requires partnership with the city's stakeholders (Predeville et al., 2018). Policy instruments can facilitate pro-environmental behaviour of a city's stakeholders (Steg & Vlek, 2009), since the changing governance practices and business models of urban utilities can facilitate changes in urban lifestyles and consumption patterns (Fratini et al., 2019). In order to show the position and relevance of this research in literature, relevant studies are discussed and knowledge gaps are highlighted. This literature review discusses two broader concepts of this study, being 'circular cities' and 'pro-environmental behaviour'.

3.1.1 CIRCULAR CITIES

Circular cities are potential engines of the transition towards a circular economy, which is an economic system that replaces the 'end-of-life' concept with reducing, reusing, recycling and recovering materials (Kirchherr et al., 2017). Circular economy is a widely popular concept, which is picked up by businesses and embraced by policy makers (Fratini et al., 2019).

In parallel to the increasing interest and use of the circular economy concept by policymakers, the attention on the role of cities in facilitating more sustainable practices is increasing rapidly (Predeville et al., 2018; Vergragt et al., 2016). However, there is a lack of research on the circular economy concept in urban areas (Predeville et al., 2018). Cities are engines of economic growth and if not properly monitored, this can lead to unsustainable development. The rapid economic growth in cities is usually associated with urban population growth, which leads to additional environmental challenges, e.g. resource scarcity and pollution (Vergragt et al., 2016). This increases the need for urban sustainability transitions, however there is a lack in the understanding of the interrelationships with the circular economy (Fratini et al., 2019), which is necessary to gain more insights into the opportunities and challenges of working with circular economy in cities (Fratini et al., 2019).

Williams (2019) argues that the current conceptualisation for a circular economy is not sufficient when applied to a city, since the current framework is designed for an economic system rather than an urban ecosystem. The city is an urban ecosystem in which resources are produced and consumed by interdependent actors across several sectors, using materials, water, energy, land and infrastructure (Williams, 2019). A circular city is not only about creating a circular economy and circular business models, it is about the regeneration and renewal of complex urban ecosystems (Williams, 2019). In an urban context there are over-arching dimensions, such as consumption, scale and complexity, which are missing in the current conceptualisation of an urban circular economy (Williams, 2019). To reach a circular city there has to be a circular approach to resource management in cities, in order to reduce resource consumption and waste (Williams, 2019).

There is a need for an European perspective on urban circular economy, since the understanding of the local context is very important to make effective policies, as stated by Bueren & Heuvelhof (2005) and Geng et al. (2009) in (Predeville et al., 2018, p. 176). Since the circular economy is hardly discussed from an implementation angle (Lieder & Rashid, 2016) and there is a need for empirical data of circular cities (Predeville et al., 2018) a

study has to be conducted on how cities are adopting circular economy in their strategies. The city of Amsterdam is one of the several cities that has adopted the circular economy concepts as an aspirational concept (Prendeville et al., 2018), this study helps to fill the knowledge gap of the understanding of the interrelationship between the role of cities and the circular economy concept, by presenting the case of circular Amsterdam in paragraph 3.2.1.

3.1.2 PRO-ENVIRONMENTAL BEHAVIOUR

A circular city necessitates collaboration with the city's stakeholders to make the transition towards sustainable practices (Fratini et al., 2019). This transition can only be achieved if it reaches a wider audience, ranging from urban planners, across businesses, educators to the individual 'consumers' in cities (Fratini et al., 2019). To reach this wider audience, it is important for policymakers to have a better insight in the pro-environmental behaviour of individuals. Many of the environmental problems that pose a threat to environmental sustainability are rooted in human behaviour and can thus be managed by changing the relevant behaviour to reduce its environmental impacts (Steg & Vlek, 2009). Pro-environmental behaviour is understood as behaviour that harms the environment as little as possible, or even benefits the environment (Steg & Vlek, 2009). Healthy and sustainable food consumption is ultimately a choice of the Amsterdam residents, but the municipality of Amsterdam wants to achieve a behavioural change by raising awareness on sustainability and making pro-environmental behaviour easier for residents (Gemeente Amsterdam, 2020b).

The basis of pro-environmental behaviour of individuals, lies in behavioural theories. A theory aiming to explain how an individual's intention to perform a certain behaviour is influenced is the Theory of Planned Behaviour (TPB) by Icek Ajzen. The TPB can be applied to all kinds of social behaviours (Ajzen, 1991) and has proven to be successful in explaining various types of environmental behaviour (Steg & Vlek, 2009). Prior studies investigating the effect of policy instruments on an individual's behaviour have been performed, however limited research has been performed into how PPE can be a motivational factor to perform pro-environmental behaviour, while PPE is expected to correlate with behavioural intentions (Wan et al., 2014). Therefore, Wan et al. (2014) formulated the research gap of PPE in TPB and in their study they included PPE as a factor in the TPB as a predictor of the individual's behaviour (Wan et al., 2014). The association between an individual's behaviour and policy instruments is very important to understand for policymakers (Wan et al., 2014), therefore paragraph 3.2.2 explains how PPE can extend the TPB.

3.2 THEORETICAL FRAMEWORK

In the theoretical framework it is elaborated which position in literature this study holds and how this study addresses the knowledge gaps. The broader concepts 'circular cities' and 'pro-environmental behaviour' are translated in key concepts for this case study and relevant theories are presented.

3.2.1 CIRCULAR CITY OF AMSTERDAM

The transition to a circular economy requires a system change, in which not only new partnerships and collaborations throughout the entire value chain have to be forged, but also across the borders of the value chain. The realization of a circular economy is important for cities, because the local economy is strengthened through the closure of product and material cycles on the smallest scale possible. This increases the local transactions of products, parts and materials, employment and the environmental impact of the city will decrease. This study focusses on the Food & Organic Waste Streams value chain, therefore the Amsterdam Food System is considered subsequently.

3.2.1.1 AMSTERDAM FOOD SYSTEM

The food waste hierarchy pyramid, presented in Figure 4, shows that prevention is found on top, indicating that greatest efforts are to be placed on keeping edible food edible. In order to reduce the amount of food waste in the municipality of Amsterdam, it is important to understand the role of a city in a food system. A city region food system (CRFS) approach offers a lens through which the coherence across policies on territorial dimensions

of the food systems (such as nutrition, health, agriculture, environmental management) can be seen and in which the rural and urban communities can be linked (FAO, RUAZ, GIZ, 2016). The approach has a clear focus on sustainability of the food system in a holistic way and aims for nutritional security for the residents and new governance structures incorporating all food system stakeholders (Dubbeling et al., 2017). CRFS is very context dependent and can support policy transformation and implementation. Local governments and policy makers can use the CRFS as an approach to make informed decisions and evolve policy instruments in order to improve the sustainability of urban-region food systems and territories. The ambition of the municipality of Amsterdam is to initiate a system change striving towards a robust regional food system (Gemeente Amsterdam, 2020b).

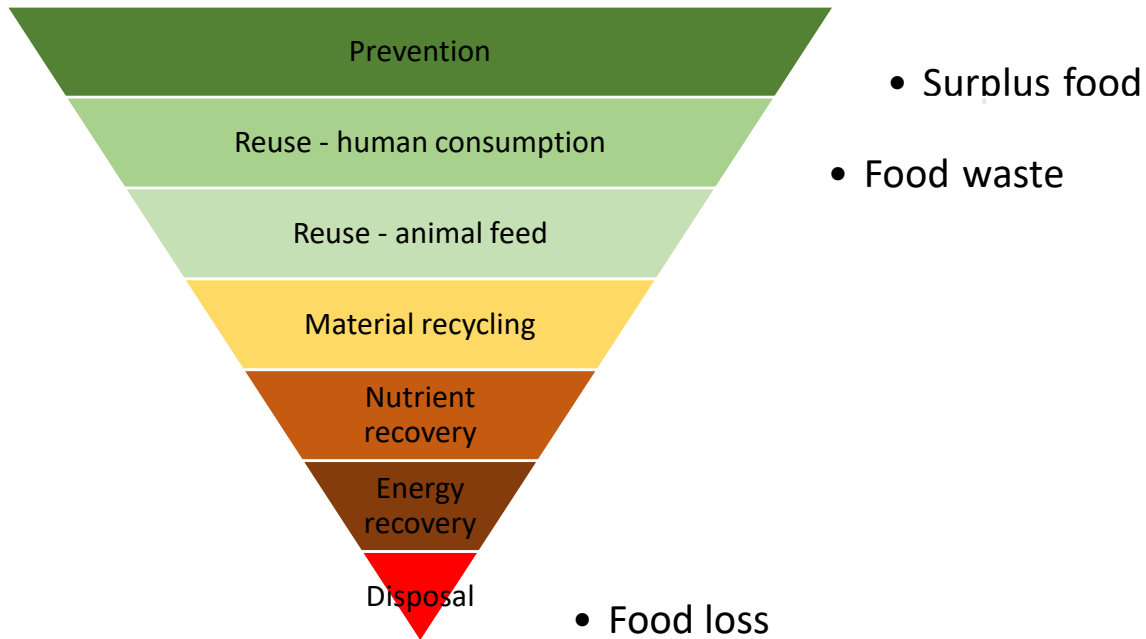


FIGURE 4 FOOD WASTE HIERARCHY (TEIGISEROVA ET AL., 2020)

In urban food policies, metropolitan regions or cities set up their own food strategy to coordinate and implement the urban food strategy. Cities implement food policies to improve their local food systems (Tegoni & Licomati, 2017), therefore every urban food policy has its own local nuances. Food is not only seen as a product, but also as a process linking environmental pollution, environmental quality, social (in)equality, public health, employment, education, etc. in urban food policies (Sonnino, 2016).

In order to make urban food policies and highlight policy pathways, a food systems approach (FSA) can help to identify the main interactions and feedback in the FSC. A FSA is looking at the relationships between all the elements in a food system, ranging from producing, processing, packaging, distributing, retailing to consuming of food and all actors, activities, resources, and environments that produce and provide food. The food system can be studied from the perspective of several disciplines, such as economics, geography, sociology and anthropology (Berkum et al., 2018) and various factors, such as environmental, social, political and economic, are influencing the activities in the food system (Rotz & Fraser, 2015). The broader view of the impact of policies also helps in the weighing-up of particular policy choices, which create an insight in opportunities for effective entry points for longer-term policy (Berkum et al., 2018).

The food systems approach can be used to look for sustainable solutions for a sufficient supply of healthy food. 30% of the food produced in the FSC is lost, either through the production chain or at the consumer stage at the end of the FSC (Berkum et al., 2018). For food which is wasted in the production chain, the government can ensure an effective infrastructure to improve the storage, processing and transports of food products in the chain (Berkum et al., 2018). But also at the consumer side the government can intervene to reach less food waste, mainly by increasing consumer awareness on purchasing and consumption behaviour.

In paragraph 3.1.1 it is mentioned that there is a need for more empirical data to research how cities are adopting circular economy in their strategies, since this was rarely discussed from an implementation angle. In order to reduce food waste, the City of Amsterdam developed specific courses of action within the ‘Amsterdam Circular 2020-2025 Strategy’ and the ‘Amsterdam Circular 2020-2025 Innovation and Implementation program 2020-2021’. This study therefore evaluates the implemented policy instruments on effectiveness, in order to add to the knowledge of the implemented actions towards a circular city.

3.2.2. THEORY OF PLANNED BEHAVIOUR

As formulated in paragraph 3.1.2, there is a research gap regarding the role of PPE in TPB, as a determinant of the intention to perform a certain behaviour. The TPB suggests that the intention to perform a certain behaviour is influenced by three independent determinants, being attitude, subjective norms and perceived behavioural control, as can be seen in the systematic framework in Figure 5. The attitude is to a degree the favourable/unfavourable appraisal towards the behaviour (Ajzen, 1991). The subjective norm indicates the experienced social pressure (not) to perform the behaviour (Ajzen, 1991). Lastly, the perceived behavioural control reflects the perceived ease/difficulty to perform the behaviour, based on past experiences, impediments and obstacles (Ajzen, 1991).

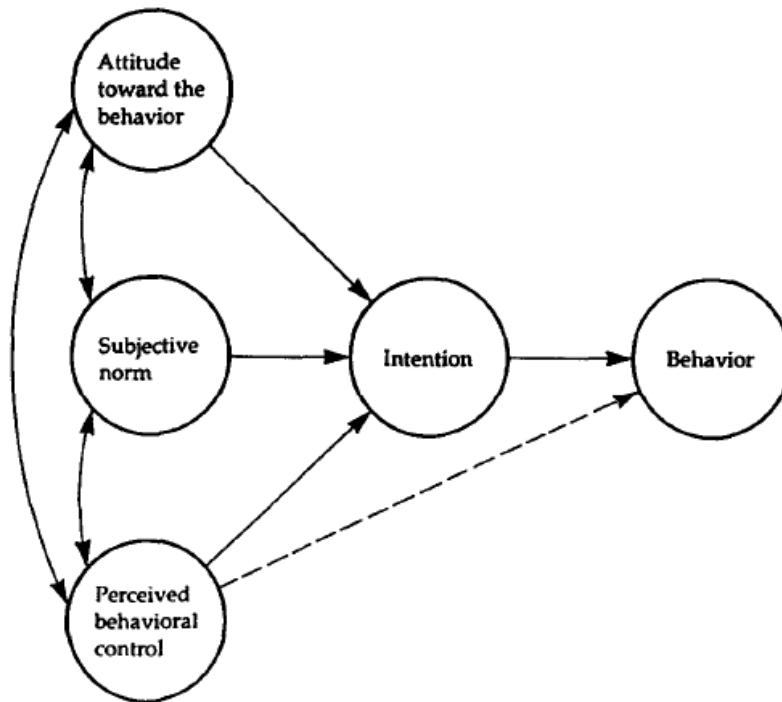


FIGURE 5 THEORY OF PLANNED BEHAVIOUR (AJZEN, 1991)

PPE is a measure of an individual’s favourable or unfavourable perception of a specific policy measure (Wan et al., 2014). The extended theory of planned behaviour (ETPB) in Figure 6 shows the inclusion of PPE in the TPB. In the ETPB the desired behaviour is influenced by the intention to reduce the amount of food waste generated by the individual. The intention is influenced by the attitude towards reducing food waste, for example the attitude towards cooking with leftovers, buying products close to the best before date. The subjective norm indicates the experienced social pressure to reduce the amount of food waste. The perceived behavioural control refers to the perceived ease or difficulty the individual experiences towards reducing the amount of food waste. On top these, the PPE is said to influence the intention to reduce the amount of food waste. The PPE of an individual can be a motivational factor to reduce the amount of food waste (Wan et al., 2014). Wan et al. (2014) conclude that the main effects of PPE should be included in the intention equation as an independent variable, just like attitude, subjective norms and perceived behavioural control.

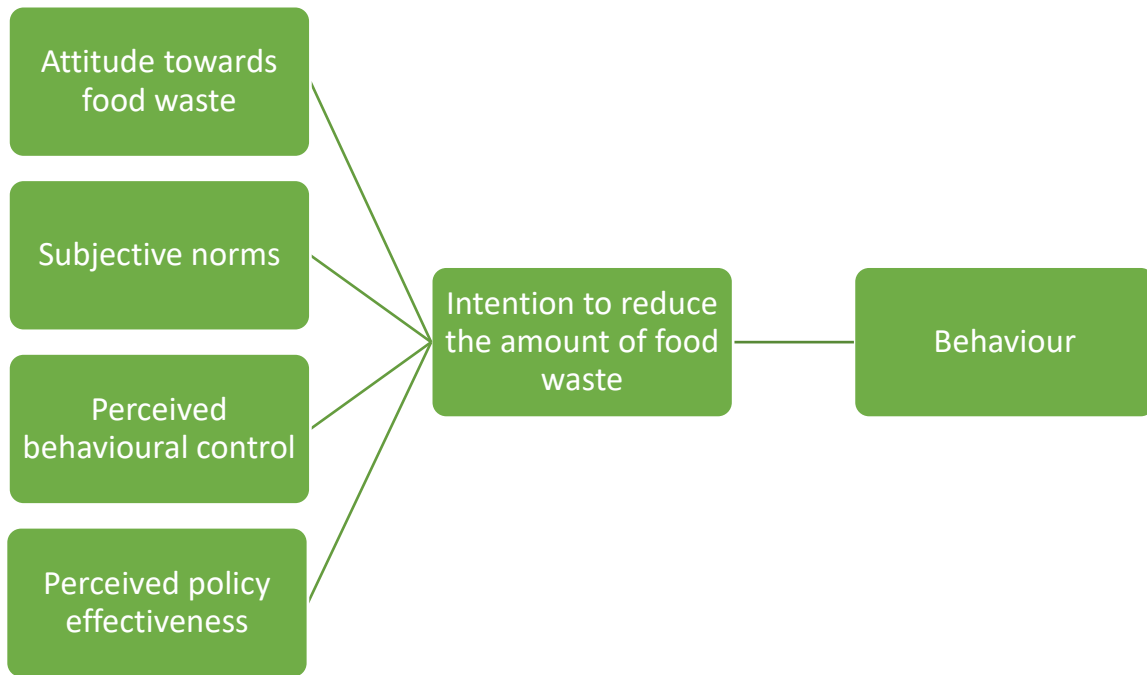


FIGURE 6 EXTENDED THEORY OF PLANNED BEHAVIOUR - ADAPTED FROM (WAN ET AL., 2014)

This study assesses PPE as an independent indicator for the intention to reduce the amount of food waste in the municipality Amsterdam. This exploratory study focusses on operationalising the PPE of the stakeholders in the Amsterdam FSC, which can be done by asking stakeholders about their feelings on effectiveness on certain policy instruments (Wan et al., 2014). The TPB is used to show the relevance of this information and the contribution to literature. Explanatory studies, using the TPB, can use these results to evaluate the behaviour of individuals in reducing food waste. A complete overview of the determinants of an individual's food waste behaviour is important for policymakers in order to make targeted policy instruments.

4. METHODOLOGY

This chapter elaborates on the Delphi method, which is the method used in this study. The methodological framework and the research process are presented, followed by an explanation of the result analysis.

4.1 DELPHI METHOD

To identify which policy instruments are perceived as effective by stakeholders in the municipality of Amsterdam, the Delphi method was used. The Delphi method is a consensus tool to enhance effective decision-making (Hasson et al., 2000), by giving stakeholders the opportunity to communicate their opinions about a complex problem anonymously (Kennedy, 2004). The respondents can observe whether their evaluation of the issue, i.e. the policy instrument, aligns with the other stakeholders and after reconsideration of the evaluations get the chance to change their opinions (Kennedy, 2004). Hence, the Delphi method is a group facilitation technique, which transforms opinions into group consensus through an iterative multistage process (Hasson et al., 2000).

In this study the Delphi method was used in the form of a two-round questionnaire. This questionnaire collected information of the respondents. The respondents were the stakeholders in the Amsterdam FSC, whom were considered 'experts' in the Delphi method, since they have knowledge on this specific research topic (Hasson et al., 2000). The data collected in the questionnaire was used to analyse the PPE of the policy instruments aimed at reducing the amount of food waste in the municipality of Amsterdam by the identified stakeholders. The Delphi method helped to analyse the level of agreement of the stakeholders, by resulting in a consensus/no consensus regarding which policy instrument is perceived as the most effective in addressing food waste in the Amsterdam FSC.

In Table 1 the methods to answer the research questions are described. In order to answer the main research question a two-round Delphi questionnaire was conducted. The information collected from the 3 sub-research questions was used to design the questionnaire. The questionnaire was sent to the stakeholders identified in sub-research question 1, whom evaluated the policy instruments identified in sub-research question 2, based on their perception of the definition of effectiveness of policy instruments as described in sub-research question 3.

TABLE 1 METHODOLOGY PER RESEARCH QUESTION

Main research question	Method	Data type	Type of Analysis	Analysis
What are perceived effective policy instruments aimed at reducing the amount of food waste in the municipality Amsterdam?	Questionnaire	Quantitative data	Data analysis	Delphi method
1. Who are the main stakeholders in the Amsterdam food supply chain?	Literature study	Qualitative data	Content analysis	Stakeholder analysis
2. Which policy instruments aimed at reducing the amount of food waste in the municipality Amsterdam are currently in place or should be in place according to the stakeholders?	Literature study and policy documents Interview policy maker	Qualitative data	Content analysis	Governance structure analysis
3. How is the effectiveness of policy instruments defined?	Literature study	Qualitative data	Content analysis	Literature analysis

The aim of the first sub-research question was to generate a list of the main stakeholders in the Amsterdam FSC. The second sub-research question aims to get an overview of all policy instruments aimed at reducing the amount of food waste in the municipality of Amsterdam by creating a list. The third sub-research question aims to define the term ‘effectiveness’ of policy instruments.

In Figure 7 the relationship between the different analysis are presented. The three sub-research questions form the basis for the design of the Delphi method, which aims to answer the main research question.

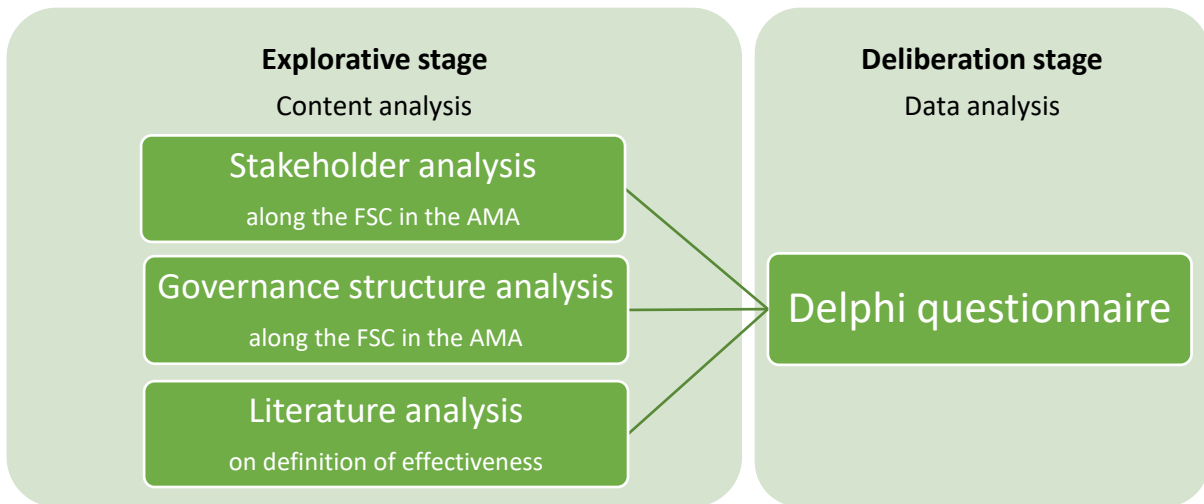


FIGURE 7 SUB-RESEARCH QUESTIONS IN DESIGN DELPHI QUESTIONNAIRE

Figure 88 presents the methodological framework. The methodological framework is divided in two stages, the explorative stage and the deliberation stage. As presented in Figure 7 and 8, a stakeholder analysis, a governance structure analysis and a literature analysis were conducted in the explorative stage, forming the qualitative part of this study. The aim of the explorative stage is to generate both a list of the main stakeholders in the Amsterdam FSC to involve in the Delphi questionnaire, and list of the policy instruments aimed at reducing the amount of food waste in the municipality Amsterdam, as well as defining the term effectiveness of policy instruments. A Delphi questionnaire was designed based on the results of the explorative stage. The deliberation stage forms the more quantitative part of this study, in which the results of the Delphi questionnaire are analysed. A more detailed description of the research process is presented in paragraph 4.2.

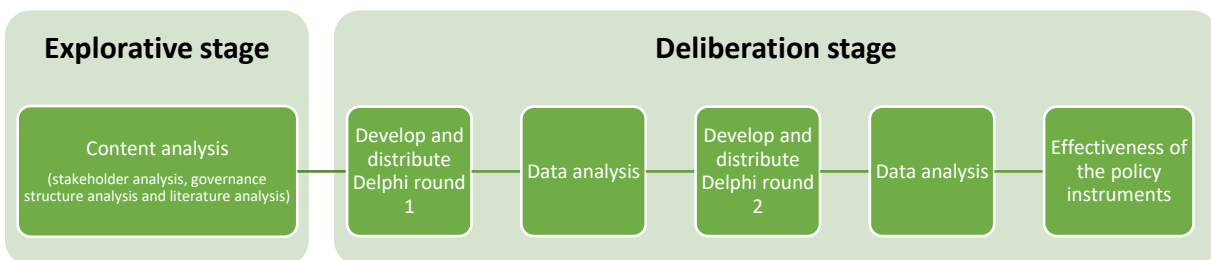


FIGURE 8 METHODOLOGICAL FRAMEWORK

4.1.1 RELIABILITY AND VALIDITY

The reliability of a method refers to the extent to which a procedure produces similar results under constant conditions in all occasions. The reliability of a Delphi method is very dependent on the stakeholder panel, since there is no guarantee that if the same questionnaire is presented to another stakeholder panel the same results

are obtained (Selfe & Walker, 1996). This stresses the importance of the selection of stakeholders with relevant knowledge and experience, see paragraph 4.2.1.

The validity of the research refers to the degree to which a measurement measures what it purports to measure. The validity may be threatened when the questions in the Delphi questionnaire are not well phrased and definitive (Keeney et al., 2001). Therefore, the respondents are given the ability to use the comment box for every question, in case a question caused confusion. On top of that, the validity of the results depends on the competence and knowledge of the stakeholder panel. The (potential) policy instruments in the questionnaire were drawn upon the policy framework of the local authority where the respondents reside, namely the municipality of Amsterdam, which enhances the relevance of the questionnaire and the validity of the results (Wan et al., 2014). If the stakeholder panel participating in the study are representative of the group or the area of knowledge, then content validity can be assumed (Goodman, 1987).

4.2 RESEARCH PROCESS DELPHI QUESTIONNAIRE

4.2.1 STAKEHOLDER PANEL SELECTION

The aim of sub-research question 1 *“Who are the main stakeholders in the Amsterdam food supply chain?”* is to generate a list of the main stakeholders in the Amsterdam FSC. In order to do so, the types of stakeholders and the stages of the FSC have to be clear. This paragraph elaborates on the types of stakeholders considered, and paragraph 5.1 lists the stakeholders that participated in this study.

Stakeholders are individuals, groups and organizations who have an interest (stake) and the potential to influence the actions and aims of an organization, project or policy direction (Brugha & Varvasovszky, 2000). In order to answer this sub-research question a stakeholder analysis was carried out. Stakeholder analysis is seen as a way of understanding behaviour, interests, agendas and the influence on decision-making process of the relevant actions (Brugha & Varvasovszky, 2000). The target group of the Delphi questionnaire were the stakeholders using the policy instruments, the stakeholders leveraging a wider impact and sharing knowledge and the stakeholders analysing the change. Stakeholders with an heterogeneous profile were identified, as recommended by (Kennedy, 2004).

In order to have a successful Delphi research, the selection of committed stakeholders, who are willing and able to make valid contribution to this study is very important (Hasson et al., 2000). Since Delphi researches consist of multiple rounds, it is common to have some drop-outs. To prevent drop-outs it is crucial to have good communication with the stakeholders. All stakeholders received various emails elaborating what is expected from them. The stakeholders who did not respond to the emails received a phone call and received more information regarding the project.

A content analysis was conducted to identify the main stakeholders in the Amsterdam FSC, idem sub-research question 1. Figure 9 gives a visual representation of the stages in the FSC and the types of stakeholders considered in this study, paragraph 2.2 elaborates on the FSC stages specifically in the municipality of Amsterdam. Some stakeholders in the AMA were also asked to fill in the questionnaire, however these responses were not considered in the final result analysis. The list of the final stakeholder panel can be found in paragraph 5.1, including the distinction between Amsterdam and AMA respondents.



FIGURE 9 POSITION STAKEHOLDERS IN THE FSC

4.2.1.1 TYPES OF STAKEHOLDERS

The stakeholders are categorized between being part of civil society, market or the government. The stakeholders were asked to fill in this information in questionnaire round 1.

CIVIL SOCIETY

“Civil society is a sphere of social interaction between economy and state, composed above all of the intimate sphere (especially the family), the sphere of associations (especially voluntary associations), social movements, and forms of public communication.” (Baynes, 1993, p. 544). Individuals can derive their individual and collective identity from the different communities in all sizes and forms – on the basis of interests, values, loyalty, etc. (Helleman, 2016). Increasingly, the views of civil society groups have also been solicited and there is growing appreciation of the importance of ‘political will’ (Brugha & Varvasovszky, 2000). This study examines civil society communities that are rooting for sustainability awareness and cooperation in the Amsterdam FSC, such as social enterprises, cooperatives and foundations.

MARKET

The market, also private, is known for its entrepreneurship, efficiency, innovation, economies of scale, mutual competition and commercial interests (Helleman, 2016). In view of economic importance, the market is looking for efficient and effective work by offering cheap and effective solutions to problems and needs of government or residents (Helleman, 2016). This study examines the market as businesses in the Amsterdam FSC, providing products and services, while adhering to the policy instruments created by the government.

GOVERNMENT

The government (state, province, municipality), also public, is known for its laws, rules, procedures, allowances, benefits, facilities and equality principles (Helleman, 2016). The main value of government is that it ensures through politics that the divided individual interests that prevail in society are transformed into a more or less shared public interest (Helleman, 2016). This study examines stakeholders from the municipality of Amsterdam, working on related governance fields, including education.

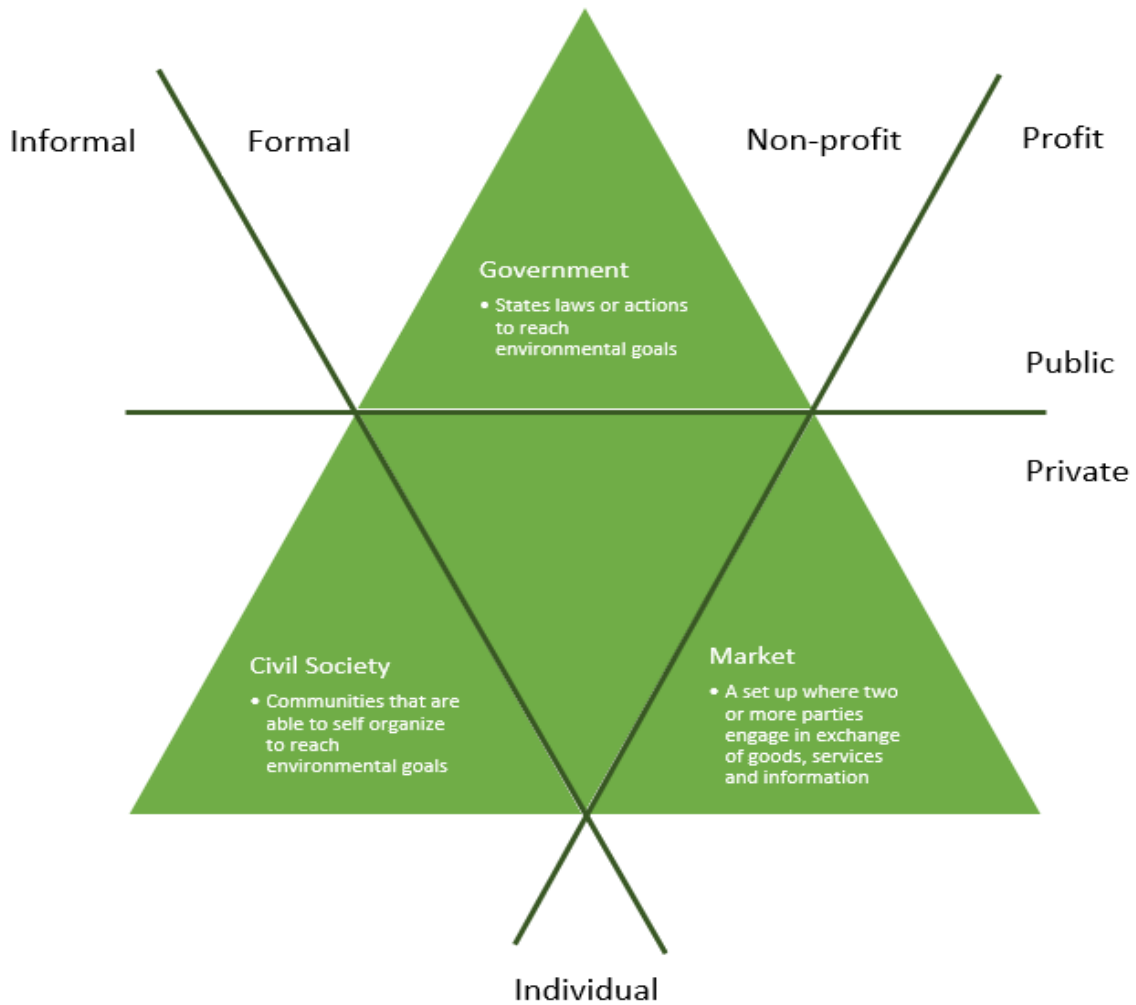


FIGURE 10 RELATIONSHIP GOVERNMENT, MARKET AND CIVIL SOCIETY - ADAPTED FROM (HELLEMAN, 2016)

Figure 10 shows how civil society, the market and the government relate to each other, since they do not exist independently and always mix with each other to a great or lesser extent (Helleman, 2016). Depending on political and social developments, tasks, roles and responsibilities shift between these perspectives, indicating that these are constantly on move (Helleman, 2016). In practice, you see that organizations are located at different times in different places within the triangle (Helleman, 2016).

4.2.2 DELPHI QUESTIONNAIRE

4.2.2.1 DELPHI ROUND 1

In order to design round 1 of the Delphi questionnaire, a content analysis was conducted to identify a list of policy instruments aimed at reducing the amount of food waste in the municipality Amsterdam, idem sub-research question 2. Policy documents and reports were analysed to identify policy instruments that were implemented to reduce the amount of food waste in the municipality Amsterdam. The policy instruments that focussed the most on reducing of food waste were included in the questionnaire, paragraph 5.2 includes a more detailed description of the content analysis. The scoping study was supplemented with an interview with the program manager Food Strategy of the municipality of Amsterdam, attached in [Appendix 1](#), who had a good overview of the food waste policy instruments in place in Amsterdam.

This list of policy instruments aimed at reducing the amount of food waste in the municipality Amsterdam was evaluated by the stakeholder panel on perceived effectiveness in Delphi round 1. The respondents were asked

to share their thoughts on the definition of effective policy, in order to be aware of the different perceptions of this definition. However, for this questionnaire, it was important that the stakeholders had the same perception of policy effectiveness. Therefore, the term 'effectiveness' of policy instruments was defined by means of a literature study, idem the sub-research question 3. This definition was shared with the respondents at the beginning of the questionnaire. It is important to note that this study analysed 'perceived effectiveness', since the level of effectiveness is based on the stakeholders evaluation of the policy instrument. PPE is an individual's (un)favourable evaluation on the effects of the policy instruments (Wan & Shen, 2013). PPE might be a determinant of the intention to perform certain pro-environmental behaviour, see paragraph 3.2.2. Next to that, the framing of the policy instruments can influence the stakeholders perceptions.

Other than the policy instruments that were already in place, it could be of added value to include other options for policy instruments. In Delphi studies it is most common to include potential policy instruments suggested by stakeholders themselves. Therefore, at the end of the questionnaire an open question asked the stakeholders suggestions for potential policy instruments to reduce food waste in the municipality of Amsterdam. The suggestions of the stakeholders regarding future policy instruments were used as an input for round 2 of the Delphi questionnaire, as suggested by Hjarnø et al. (2007).

4.2.2.2 DELPHI ROUND 2

Delphi round 2 was based on the results and comments of the stakeholders in round 1. The respondents' comments were used to analyse whether the questions caused confusion, and therefore needed to be rephrased or deleted (Hjarnø et al., 2007). This was not the case and therefore all statements in round 1 were included in round 2. Although some researches do not include the questions which had reached consensus in the round 1 (Hjarnø et al., 2007), this study includes all questions in round 2. Not including the statements which reached a consensus would have removed the opportunity for the stakeholders to reconsider their scores in light of the controlled feedback. Stability is achieved when the interquartile range (IQR) has changed between round 1 and round 2 by less than or equal to 0.5 in either direction (Clibbens et al., 2012). This way it is ensured that all statements are subjected to iteration.

The stakeholders reviewed the policy instruments aimed at reducing the amount of food waste in the municipality Amsterdam, having an insights in the results of round 1. The results were presented in a figure showing a boxplot figure with the mean and the coefficient of variation. Presenting the results of the previous round by only showing percentages to indicate the majority agreement is criticised (Dajani et al., 1979), because it does not indicate the stability of response. The figure including the boxplot, the mean and the coefficient of variation visualizes the stability of the responses. An explanation of the figure was given, so the respondents would interpret the results in a correct way. By providing the participants with information about the collected opinion, they could see where their response stands in relation to that of the group. The figure is included in the questionnaire in [Appendix 2](#).

The policy suggestions of the respondents given in the first questionnaire, were analysed, merged and assessed, in order to include the ones with the most potential in round 2. The suggestions were merged based on similarity and overlap. In order to select the suggestions with the most potential to be implemented by the municipality of Amsterdam, two experts were asked to rate the suggestions. The suggestions were rated based on potential to be implemented in the municipality of Amsterdam, whether a similar policy instruments is already in place or whether the policy suggestions is out of scope. The two experts had an accurate view on the current trends, innovative ideas and local nuances of the municipality of Amsterdam, since they were from the municipality of Amsterdam and from a research institute. The suggestions that were not already in place in the municipality of Amsterdam nor out of scope, were rated based on the ranking of the experts. Five policy suggestions that ended up having the highest rating in terms of potential to be implemented in the municipality of Amsterdam were included in Delphi questionnaire 2.

4.2.2.3 QUESTIONNAIRE DESIGN

The stakeholders used a seven-point ordinal scale to assess to what extent they perceive the policy instruments to be effective. A Likert scale is mostly well understood among the participants, since it is easy to interpret. Next to that, a seven-point Likert scale is easy to produce. A Likert scale is preferred over a visual analogue scale since Clibbens et al. (2012) state that the use of a visual analogue scale does not offer a greater depth of analysis than the ordinal scale. On top of that, a visual analogue scale is not often used in Delphi research.

In order to clarify the meaning of the different scale points, the questions were provided with fully-labelled scales. The stakeholders could review the policy instruments aimed at reducing the amount of food waste from (1) very ineffective to (7) very effective. Labelling all points in the scale has a positive impact on the reliability of the study and reduces ambiguity (Alwin & Krosnick, 1991). In the questionnaire a skip option was not offered, since many authors argue that when the 'don't know' is provided this leads to incomplete, less valid and less informative data (Alwin & Krosnick, 1991).

Every question in the questionnaire offers a comment box, in order to get more insight in the choices made by the stakeholders. The comments along with the data analysis results were used to formulate round 2 of the Delphi questionnaire. The questionnaire designs of Delphi round 1 and round 2 is presented in [Appendix 2](#).

4.2.3 RESPONSES COLLECTION AND RESULT ANALYSIS

Table 2 presents the amount of responses for both rounds of the Delphi questionnaire. Only the responses to both rounds can be used for result analysis. Unfortunately, this study was held during the Covid-19 pandemic and the lockdown in the Netherlands, which affected the response rate. Round 1, which was held in December, collected 38 respondents. Delphi round 2, which was held in January, had an attrition rate of 56%. Unfortunately a big share of the respondents of round 1 had announced that they could not find spare time to fill in the second questionnaire due to the lockdown during round 2. [Appendix 3](#) shows the effect on the data of the attrition of 45% of the respondents in round 2 by comparing the results of round 1 from the 38 respondents to the 21 respondents that also filled in round 2. It appeared that most of the results did not differ by leaving out the 17 respondents who did not fill in the second questionnaire. Only three of the 18 policy instruments are subject to a change in the median and/or the IQR. Therefore, the group of 21 is representing the results of the 38 stakeholders in round 1 well. Since all FSC stages are well represented by the respondents in both round 1 and round 2 (N=21) the result analysis is done only on the responses of the 21 stakeholders who completed the study by participating in both questionnaire rounds. An overview of the drop-out rates per stage in the Amsterdam FSC can be found in [Appendix 4](#).

Next to the respondents from the municipality of Amsterdam, also residents from the AMA (outside of the municipality of Amsterdam) were invited to participate in this study. In round 1 47 respondents participated, 9 out the AMA. In round 2 25 stakeholders participated, 4 responses from stakeholders in the AMA were received. However, these are not included in the result analysis, since they are not affected by the policy instruments of the municipality of Amsterdam.

TABLE 2 PARTICIPATION STAKEHOLDERS QUESTIONNAIRE

Invited to participate	Respondents round 1	Respondents round 2	Study completion
196	38 (19%)	21 (55%)	11%

After Delphi round 2, there can be a consensus regarding the policy instruments aimed at reducing the amount of food waste in the municipality of Amsterdam which are perceived (not) to be effective. The IQR was used to look at the level of agreement among the stakeholders. A consensus is reached when the IQR is 1.0 or less (Clibbens et al., 2012). What the stakeholders agreed on, can be seen in the median. The median indicates the

level of effectiveness, being (1) very ineffective, (2.0) ineffective, (3.0) fairly ineffective, (4.0) neither effective nor ineffective, (5.0) fairly effective, (6.0) effective and (7.0) very effective. These are the same as the labels used in the seven-point Likert scale.

Over the two rounds, stability, convergence and divergence can be observed. Stability is observed when the IQR has changed between the two Delphi rounds by less than or equal to 0.5 in either direction (Clibbens et al., 2012). A convergence is observed when the IQR has changed between towards zero by more than 0.5 and a divergence is observed when the IQR changes away from zero by more than 0.5 (Clibbens et al., 2012).

The main research question was answered by a table listing all the policy instruments, and presenting the IQR, the mean, the standard variation and the median. The IQR shows whether there is a consensus or not and the median indicates the level of effectiveness. The interpretation of these results can be very useful for policymakers, since having an insight in the perceived effectiveness of stakeholders in the Amsterdam FSC gives an insight in this determinant of pro-environmental behaviour. Policy instruments with a high perceived effectiveness should be prioritised. Next to that, the results are analysed per stage of the FSC, per type of stakeholder or per type of policy instrument. This will help policymakers to better target a specific group with certain policy instruments that are perceived as effective. Next to the use of the results for policymakers in the municipality of Amsterdam, the results will help to identify similarities in other geo-graphical contexts, which can help to determine common measures worldwide or in Europe (Diaz-Ruiz et al., 2019).

5. RESULTS

This chapter presents the results per sub-research question and for the main research question.

5.1 SUB-RESEARCH QUESTION 1

The aim of sub-research question 1 “*Who are the main stakeholders in the Amsterdam food supply chain?*” is to scope the Amsterdam FSC and identify the stakeholders in the stages of the FSC. This sub-research question is answered by listing the stakeholders in the Amsterdam FSC who participated in this study. Therefore, this sub-research question presents a list of the main stakeholders in the Amsterdam FSC, whom participated in this study.

The stakeholder stages in the Amsterdam FSC are depicted in Figure 11 and can be categorized into three categories 1) the stakeholders using the policy instruments (primary production, processing, distribution, retail, consumption, waste), 2) the stakeholders leveraging a wider impact and sharing knowledge (knowledge transfer, partnership), and 3) the stakeholders analysing the change (governance). The types of stakeholders considered in this study are civil society, market and government. The civil society organisations are rooting for sustainability awareness and cooperation in the Amsterdam FSC. The market are organisations in the Amsterdam FSC providing food products. The government stakeholders are working on making regulations and laws in order to reduce the amount of food waste in this study.

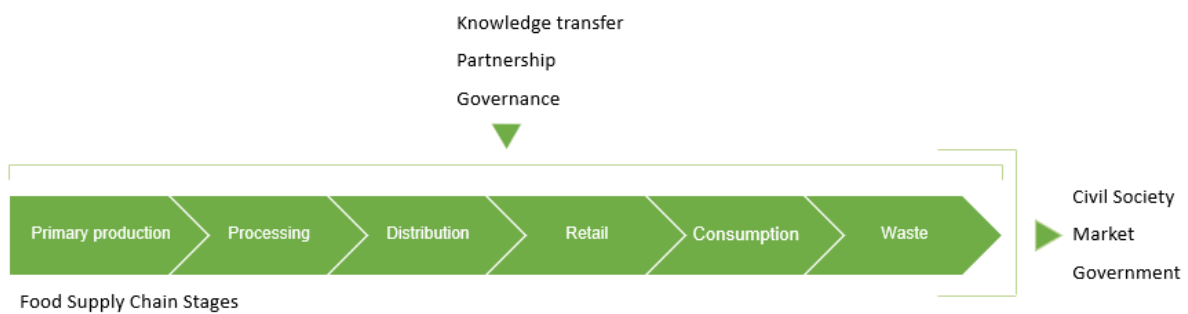


FIGURE 11 STAKEHOLDERS IN THE AMSTERDAM FSC

The stakeholders in the Amsterdam FSC stages are the persons working in an organization in a certain stage. The FSC stages in the Amsterdam context are described in paragraph 2.2 and the types of stakeholders in general are described in paragraph 4.2.1.1. Subsequently a short recap and introduction of the stakeholders participating in this study is given.

A stakeholder from the primary production stage in the Amsterdam FSC is often an urban farmer. The urban farmers participating in this study are next to primary producers also working on knowledge transfer by partnering with education and involving residents. The stakeholders in the processing stage are organizations whom are processing (agricultural) products into food products, just like the stakeholders whom are participating in this study. Stakeholders from the distribution stage are companies that are distributing the food from the processors to the retailers. In this study the distributors are also present in other stages, such as primary production or processing. Stakeholders from retail are organisations whom are selling food products. In this study stakeholders from retail are often also producers or processors themselves. Stakeholders from consumption stage are restaurants, schools, or other organizations whom facilitate some sort of catering or a place to consume food. In the waste stage are organisations processing food waste. The stakeholders in this study are either processing the food waste into new food ingredients (and are therefore also food processors) or are processing food waste into other products. Stakeholders from knowledge transfer are organisations trying to spread awareness regarding sustainability and food waste. The stakeholders participating in this study are mostly also

present in other stages and are therefore trying to inform residents on the implications of food production or consumption. Stakeholders from partnership are platforms offering a place to share stories, cooperate and/or inspire others. The stakeholders participating are sometimes only a platform and in other cases also spreading awareness on sustainability themselves. Lastly, stakeholders from the governance stage are from the municipality of Amsterdam, making policy instruments in order to reduce food waste in Amsterdam, just like the stakeholders participating in this study.

Table 3 presents the crosstab of the FSC stages and the types of stakeholders. It appears that most of the stakeholders using the policy instruments are market organisations, while the stakeholders leveraging a wider impact are predominantly civil society organisations and stakeholders analysing the change are exclusively a governmental organisation.

TABLE 3 RELATIONSHIP FSC STAGES AND TYPES OF STAKEHOLDER

Categories of stakeholders	FSC stages	Civil society	Market	Government	Total
Using the policy instruments	Primary production	3	2	0	5
	Processing	1	3	0	4
	Distribution	2	1	0	3
	Retail	2	4	0	6
	Consumption	4	2	1	7
	Waste	0	2	0	2
Leveraging a wider impact	Knowledge transfer	4	3	3	10
	Partnership	3	2	0	5
Analysing the change	Governance	0	0	2	2
Total		19	19	6	44

Table 4 presents the list of stakeholders whom participated in this study.

TABLE 4 LIST OF STAKEHOLDERS

Stakeholder	Type of stakeholder			Stage in the food supply chain								
	Civil Society	Market	Government	Primary production	Processing	Distribution	Retail	Consumption	Waste	Knowledge transfer	Partnership	Governance
Educational organization sustainability			X							X		
Food processor		X			X		X	X				
Educational organization food systems		X								X	X	
Educational organization sustainable collaboration	X										X	
Farmers' cooperative organization	X	X					X					
Municipality of Amsterdam			X									X
Municipality of Amsterdam			X									X
Educational institute	X							X		X		
Educational institute			X							X		
Educational institute			X					X		X		
Social enterprise	X			X		X		X		X	X	
Food producer		X		X			X			X		
Industry	X	X			X	X	X					
Partnership organization		X									X	
Food processor		X			X				X			
Restaurant	X							X				
Food producer	X			X						X		
City farm	X	X		X						X		
Restaurant	X	X						X				
Social enterprise	X										X	
Food waste processor		X							X			

5.2 SUB-RESEARCH QUESTION 2

The aim of sub-research question 2 “Which policy instruments aimed at reducing the amount of food waste in the municipality Amsterdam are currently in place or should be in place according to the stakeholders?” is to get an overview of all policy instruments aimed at reducing the amount of food waste in the municipality Amsterdam.

5.2.1 POLICY INSTRUMENTS IN PLACE

In the Innovation and Implementation Program 2020-2021 by the municipality of Amsterdam (2020a) the three ambitions within the Food & Organic Waste Streams value chain are presented, accompanied by the action directions. With regard to the Food & Organic Waste Streams value chain, the municipality formulated the following three ambitions:

1. Short food chains provide a robust sustainable food system
2. Healthy and sustainable food for the people of Amsterdam
3. High-quality processing of organic waste streams

Table 5 presents the three ambitions, the accompanied 10 action directions and the policy instruments used by the municipality of Amsterdam to incentivize a transition towards a circular Food & Organic Waste Streams value chain (Gemeente Amsterdam, 2020b).

TABLE 5 POLICY INSTRUMENTS MUNICIPALITY OF AMSTERDAM

Ambition	Action direction	Policy instruments
Short food chains provide a robust sustainable food system	1. Food production will have a place in the city	Spatial planning, collaboration platforms & infrastructure
	2. The City purchases regionally produced food	Direct financial support
	3. Sustainable chain parties will collaborate more in order to increase the consumption of regional food	Collaboration platforms & infrastructure
Healthy and sustainable food for the people of Amsterdam	4. The people of Amsterdam change their eating habits	Knowledge, advice & awareness
	5. The City is committed to reducing food waste	Regulation, economic frameworks, knowledge, advice & awareness
	6. Initiatives against food waste and for more efficient production of food will be supported	Fiscal frameworks, direct financial support, knowledge, advice & awareness, collaboration platforms & infrastructure
High-quality processing of organic waste streams	7. Working together to ensure the best approach for each city district	Regulations, spatial planning, direct financial support, knowledge, advice & awareness-raising, collaborative platforms and infrastructure
	8. The City sets the right example	Direct financial support
	9. The people of Amsterdam are made aware of the importance of separating waste for uncontaminated waste streams	Knowledge, advice & awareness
	10. Amsterdam creates room and regenerates opportunities for reusing waste streams	Spatial planning, direct financial support, economic frameworks, collaborative platforms and infrastructure

Out of the 10 actions directions, action direction 5 and 6 focus the most on direct reduction of food waste. Therefore, these action directions and accompanied policy instruments were presented in the questionnaire. A more detailed description of the policy instruments can be found in [Appendix 2](#). The first action direction is number 5: “*The City is committed to reducing food waste*”. The instruments used for this action direction are regulation, economic frameworks, knowledge, advice & awareness. In Table 6 the policy instruments are presented, accompanied by the used instruments.

TABLE 6 POLICY INSTRUMENTS ACTION DIRECTION 5

The City is committed to reducing food waste	Regulatory & legislative instrument	Economic instrument	Soft instrument
	Regulation	Economic frameworks	Knowledge, advice & awareness
Fast food food waste and packaging (1)	X		
Dynamic pricing (2)		X	
Food Centre against food waste (3)			X
Buurtbuik (4)			X
Amsterdam waste-free (5)			X
Waste-free week (6)			X
Research into ‘avoidable waste’ (7)			X

In Table 7 the policy instruments to achieve action direction 6: “*Initiatives against food waste and for more efficient production of food will be supported*” are presented. The instruments used for this action direction are fiscal frameworks, direct financial support, knowledge, advice & awareness and collaboration platforms & infrastructure.

TABLE 7 POLICY INSTRUMENTS ACTION DIRECTION 6

Initiatives against food waste and for more efficient production of food will be supported	Economic instrument		Soft instrument	
	Fiscal frameworks	Direct financial support	Knowledge, advice & awareness	Collaboration platforms & infrastructure
Amsterdam Foodcapital (8)			X	X
Collaboration Koninklijke Horeca NL (9)			X	X
Food Rescue Centre (10)				X
Promotion entrepreneurial initiatives with leftover fresh produce (11)		X		
Promotion foody bag (12)		X	X	
‘Don’t waste me’ bin in supermarkets (13)	X			
Learning to cook with products from the food bank (14)		X	X	
Research programs of national and international pathways to the prevention of food waste and reuse (15)			X	
Support your locals (16)				X
Slow Food Youth Network (17)				X
Boeren voor Buren (18)		X		X

The 18 policy instruments presented in Table 6 and Table 7 can be categorized as being regulatory, economic and/or soft instruments. For example, to reach action direction #12, both economic and soft instruments are used. For the 18 action directions, in total 21 policy instruments are used, of which 14 soft instruments, 6 economic instruments and 1 regulatory instrument. The majority of the policy instruments in place are therefore soft instruments (61%).

5.2.2 STAKEHOLDER SUGGESTIONS FOR ADDITIONAL POLICY INSTRUMENTS

The stakeholders were asked in Delphi round 1 to give policy suggestions. In the end 38 policy suggestions were given, which are presented in [Appendix 5](#). These policy suggestions were merged based on similarity and overlap. Two experts analysed the policy suggestions, based on potential (high/low), out of scope and already in place, as described in paragraph 4.2.2.2. The merged suggestions, the answers of the two experts and whether the policy suggestions were included in Delphi round 2 is presented in Table 8. A more detailed description of the policy instruments can be found in [Appendix 2](#).

TABLE 8 POLICY SUGGESTIONS FROM ROUND 1

Policy suggestions round 1	Expert 1 (municipality of Amsterdam)	Expert two (researcher)	Included in the round 2
Waste rates for supermarkets	Out of scope	High potential	No
Oblige supermarkets to do something social with their leftover products	Out of scope	Low potential	No
Stimulating local cooperation	Out of scope	Out of scope	No
Financing food revaluation plant	High potential	Out of scope	Yes (merged)
Research food revaluation	High potential	Already in place	
Cooking program with leftovers	High potential	High potential	Yes
Consumer awareness food price	Out of scope	High potential	Yes (merged)
Consumer awareness on (the amount of) food waste	High potential	Less potential	
Consumer awareness best before date on packaging	High potential	Already in place	Yes
Reward for companies that reduce their food waste	Less potential	Less potential	No
Organic waste bin in Amsterdam	Less potential	High potential	No
Running monitor to track food waste	High potential	Less potential	No
Sustainable purchasing in a CSR policy	High potential	Already in place	Yes
Blockchain	High potential	Out of scope	No
Financing short food chains	Already in place	Already in place	No

5.3 SUB-RESEARCH QUESTION 3

The aim of the third sub-research question “*How is the effectiveness of policy instruments defined?*” is to define the term ‘effectiveness’ of policy instruments. This is done by examining how effectiveness is defined in literature. Next to that, the definition that is used in this study is compared to the definitions given by the stakeholders participating in the Delphi questionnaire.

There are several criteria in order to assess policy instruments, from legal studies (legal certainty and fairness), political science (legitimacy and accountability) and economics (efficiency and effectiveness) (Crabb & Leroy, 2012; Nelissen, 2002). This study focusses on assessing the effectiveness of policy instruments. To bring greater clarity to the debate about food waste policy effectiveness, the term policy effectiveness in general needs to be defined. In literature policy effectiveness is rather undefined (Brainard, 1967). Brainard (Brainard, 1967) mentions that there is an absence of any clear notion of what “effectiveness” is, while Perrels (2001) states that there is confusion in discussion since there is a variation in the understanding of what effectiveness of policy instruments actually constitute.

From the economic criteria perspective, effectiveness is commonly understood as “the extent to which an instrument is expected to achieve the environmental goals” (as cited by Braathen, Kosonen and Nicodème, and Perman et al. in (Dijk, 2015, p. 24)). This corresponds to the definition of Brainard (1967, p. 411) being: “How large a change in some crucial variable results from a given change in a policy variable”.

Based on the preceding definitions in literature, the definition used in this study was formed. In this study the term ‘effectiveness’ of policy instruments is assessed on the basis of: to what extent can the realization of the objectives (reducing the amount of food waste in the municipality of Amsterdam) be attributed to the policy pursued and the instruments used. The definition used in this study was shared with the respondents in the questionnaire before they would rate the policy instruments according to their perceived effectiveness. It is important that the stakeholders have the same perception of the term effectiveness when they fill in the questionnaire.

Before the definition used in this study was shared with the respondents, they were asked for their definition of the term effectiveness. Since, the ideas of the stakeholders on the definition of effectiveness might be interesting. The stakeholders definitions of effectiveness gave an insight in the different perspectives of stakeholders and these can be found in [Appendix 6](#). Most of the stakeholders defined effectiveness as reaching a certain target or goal (within a specified timeframe). Other stakeholders defined a policy as effective when it has a measurable impact, such as a reduction in food waste. A minority of the stakeholders referred to increased awareness and cooperation in the FSC resulting in less food waste.

Concluding, the definition of effectiveness of policy instruments both in literature and according to the stakeholders corresponds with achieving the goal that the policy instrument intends to achieve. The extent to which this goal is reached by this policy instruments indicates the level of effectiveness. In this study the goal of the policy instruments is reducing the amount of food waste in the municipality Amsterdam. So, the effectiveness of policy instruments in this study indicates to what extent the reduction of food waste in the municipality of Amsterdam can be attributed to the selected policy instruments. It has to be noted that this study does not measure the effectiveness of the policy instruments, but the effectiveness perceived by the stakeholders participating in this study.

5.4 MAIN RESEARCH QUESTION

The aim of the main research question “*What are perceived effective policy instruments aimed at reducing the amount of food waste in the Amsterdam food supply chain?*” is to explore which policy instruments, aimed at reducing the amount of food waste in the municipality Amsterdam, are perceived as effective, in order to prioritize effective policy instruments for specific stakeholders in the Amsterdam FSC.

This sub-chapter presents the results of the Delphi questionnaire by indicating the stakeholders’ perceived effectiveness as well as the degree of consensus among them. The perceived effectiveness of each policy instrument in preventing and reducing the volume of food waste in the Amsterdam FSC is shown in Table 9. This outlines the mean score for the effectiveness of each measure, the standard deviation, the median and the IQR. The 23 policy instruments are classified according to their efficacy, which is based on the median.¹ The policy instruments in bold indicate the policy instruments that have reached a consensus.² The last column presents whether there has been a convergence, divergence or stability over the two rounds.³ The policy suggestions (#19-#23) can not be assessed on the changes between the rounds, since these have been added in round 2. A more detailed overview of the difference between round 1 and round 2 is presented in [Appendix 7](#).

In Table 9 it can be seen that on 12 out of the 23 policy instruments a consensus has been reached. 2 are considered to be effective, 7 fairly effective and 3 neither effective nor ineffective. 5 of the policy instruments which reached a consensus were stable, indicating that those were already a consensus in round 1. Another 5 policy instruments had a convergence, indicating that the stakeholders agreed with each other based on the results of round 1. The other two consensus that were reached could not be tested on stability, convergence or divergence, since these concern policy suggestions whom were only presented in round 2. The final results show only three of the seven ‘efficacy rates’, in absence of the ineffective and very effective perceptions.

TABLE 9 EFFICACY POLICY INSTRUMENTS

Efficacy	Policy instrument	Median	IQR	Mean	Standard deviation	Round 1 to round 2
Effective	‘Don’t waste me’ bin in supermarkets (13)	6,0	1,0	5,4	1,2	Convergence
	Consumer awareness best before date on packaging (21)	6,0	1,0	5,6	0,9	x
Fairly effective	Dynamic pricing (2)	5,0	2,0	4,9	1,4	Stable
	Food Centre against food waste (3)	5,0	1,0	4,8	0,9	Convergence
	Buurtbuik (4)	5,0	1,0	4,7	1,2	Convergence
	Research into ‘avoidable waste’ (7)	5,0	1,0	4,6	0,9	Stable
	Collaboration Koninklijke Horeca NL (9)	5,0	2,0	5,3	1,0	Stable
	Food Rescue Centre (10)	5,0	2,0	5,1	0,8	Divergence
	Promotion entrepreneurial initiatives with leftover fresh produce (11)	5,0	2,0	4,7	1,2	Divergence
	Promotion foody bag (12)	5,0	2,0	4,9	1,2	Stable

¹ Median indicates efficacy: being (1) very ineffective, (2.0) ineffective, (3.0) fairly ineffective, (4.0) neither effective nor ineffective, (5.0) fairly effective, (6.0) effective and (7.0) very effective

² A consensus (bold) is reached when the IQR is 1.0 or less (Clibbens et al., 2012)

³ Convergence (IQR moved towards zero by more than 0.5), divergence (IQR changed away from zero by more than 0.5), stability (IQR has changed by less than or equal to 0.5 in either direction) between round 1 and round 2 (Clibbens et al., 2012)

	Learning to cook with products from the food bank (14)	5,0	1,0	4,6	0,7	Convergence
	Research programs of national and international pathways to the prevention of food waste and reuse (15)	5,0	1,0	4,9	0,8	Stable
	Support your locals (16)	5,0	2,0	4,9	1,4	Stable
	Slow Food Youth Network (17)	5,0	1,0	4,4	1,0	Stable
	Boeren voor Buren (18)	5,0	2,0	5,0	1,4	Divergence
	Cooking program with leftovers (19)	5,0	2,0	4,9	1,1	x
	Sustainable purchasing in a CSR policy (20)	5,0	1,0	5,2	1,1	x
	Research and financing food revaluation plant (22)	5,0	2,0	5,3	1,0	x
	Consumer awareness food waste and food price (23)	5,0	2,0	5,1	1,4	x
Neither effective nor ineffective	Fast food food waste and packaging (1)	4,0	1,0	4,4	1,0	Stable
	Amsterdam waste-free (5)	4,0	1,0	4,1	1,0	Convergence
	Waste-free week (6)	4,0	1,0	4,2	1,2	Stable
	Amsterdam Foodcapital (8)	4,0	2,0	4,0	1,2	Stable

In order to prioritize the policy instruments, the results in Table 9 have to be analysed at different levels, such as per stage of the Amsterdam FSC, per type of stakeholder and per type of policy instrument.

Looking at the results per stage of the FSC in Table 10 it stands out that especially partnership and governance have a really high amount of consensus (96%) and the main share of these consensus is regarding the policy instrument being effective. Contradicting, the stages 'in' the FSC, from primary production to waste there is less agreement among the stakeholders on the effectiveness of the policy instruments. In the case that the stakeholders reached a consensus, their perceived effectiveness ranges between neither effective nor ineffective and effective. The stages processing and retail stand out, since these stakeholders agree on the majority of the policy instrument not being effective (median <5).

TABLE 10 CONSENSUS PER FSC STAGE

Stakeholders FSC	Number of respondents	Amount of consensus out of the 23 policy instruments (% of total)	Ineffective (% of amount of consensus)	Neither effective nor ineffective (% of amount of consensus)	Fairly effective (% of amount of consensus)	Effective (% of amount of consensus)	Very effective (% of amount of consensus)
Primary production	4	14 (61%)	0 (0%)	3 (21%)	11 (79%)	0 (0%)	0 (0%)
Processing	3	13 (57%)	1 (8%)	9 (69%)	1 (8%)	2 (15%)	0 (0%)
Distribution	2	20 (87%)	0 (0%)	6 (30%)	10 (45%)	5 (23%)	0 (0%)
Retail	4	14 (61%)	0 (0%)	11 (79%)	1 (7%)	2 (14%)	0 (0%)
Consumption	6	12 (52%)	1 (8%)	0 (0%)	10 (83%)	1 (8%)	0 (0%)
Waste	2	15 (65%)	3 (20%)	3 (20%)	4 (27%)	4 (27%)	1 (7%)
Knowledge transfer	9	15 (65%)	0 (0%)	0 (0%)	14 (93%)	1 (7%)	0 (0%)
Partnership	5	22 (96%)	0 (0%)	3 (14%)	15 (68%)	4 (18%)	0 (0%)
Governance	2	22 (96%)	0 (0%)	2 (9%)	7 (32%)	12 (55%)	1 (5%)
Average results	21	12 (52%)	0 (0%)	3 (25%)	7 (58%)	2 (17%)	0 (0%)

Looking at the results per type of stakeholder in Table 11 it can be seen that the government reaches more consensus than both the civil society and the market. The type of stakeholders that perceives the policy instruments as most effective is the government. The civil society perceives the majority of the policy instruments as fairly effective, while the market is very divided in their perceived effectiveness.

TABLE 11 CONSENSUS PER TYPE OF STAKEHOLDER

Stakeholders FSC	Number of respondents	Amount of consensus out of the 23 policy instruments (% of total)	Ineffective (% of amount of consensus)	Neither effective nor ineffective (% of amount of consensus)	Fairly effective (% of amount of consensus)	Effective (% of amount of consensus)	Very effective (% of amount of consensus)
Civil society	10	15 (65%)	0 (0%)	1 (7%)	13 (87%)	1 (7%)	0 (0%)
Market	10	11 (48%)	0 (0%)	3 (27%)	6 (55%)	2 (18%)	0 (0%)
Government	5	18 (78%)	0 (0%)	1 (6%)	11 (61%)	6 (33%)	0 (0%)
Average results	21	12 (52%)	0 (0%)	3 (25%)	7 (58%)	2 (17%)	0 (0%)

The results from Table 10 and Table 11 correspond to some extent, caused by the relationship between the stages in the Amsterdam FSC and the types of stakeholders, as can be seen in Table 3. A clear distinction can be seen between the stakeholders using the policy instruments (primary production, processing, distribution, retail,

consumption, waste), those leveraging a wider impact and sharing knowledge (knowledge transfer, partnership) and the stakeholders analysing the change (governance).

The types of policy instruments that have been assessed in the questionnaire are regulatory & legislative instruments, economic instruments and soft instruments. In paragraph 2.2 the types of policy instruments are explained. Table 12 presents the amount of consensus and the perceived effectiveness on those types of policy instruments. The 18 policy instruments that are already in place in the municipality of Amsterdam, are categorized by types of policy instruments, three of which can be found in two categories, as can be seen in Table 6 and Table 7 (resulting in 21 types of policy instruments). The policy suggestions from the stakeholders are left out of scope, since these are not defined in type of instruments.

Table 12 shows that not on all soft instruments a consensus was reached. In the cases the stakeholders agreed upon a policy instrument, they were mostly considered to be fairly effective (58%). The stakeholders reached a consensus on the regulatory & legislative instruments being neither effective nor ineffective. On the economic instruments only 33% agreement was reached, being that these 2 policy instruments are perceived as effective.

TABLE 12 CONSENSUS PER TYPE OF POLICY INSTRUMENTS

Stakeholders FSC	Number of policy instruments	Amount of consensus out of the number of policy instruments (% of total)	Ineffective (% of amount of consensus)	Neither effective nor ineffective (% of amount of consensus)	Fairly effective (% of amount of consensus)	Effective (% of amount of consensus)	Very effective (% of amount of consensus)
Regulatory & legislative instruments	1	1 (100%)	0 (0%)	1 (100%)	0 (0%)	0 (0%)	0 (0%)
Economic instruments	6	2 (33%)	0 (0%)	0 (0%)	1 (50%)	1 (50%)	0 (0%)
Soft instruments	14	8 (57%)	0 (0%)	2 (25%)	6 (75%)	0 (0%)	0 (0%)
Average results	21	12 (52%)	0 (0%)	3 (25%)	7 (58%)	2 (17%)	0 (0%)

6. DISCUSSION

This chapter presents the research interpretations and implications. Additionally, the method used and the results of this study are discussed, followed by the research limitations and recommendations.

RESEARCH RESULTS

This study has the objective to explore which policy instruments, aimed at reducing the amount of food waste in the municipality Amsterdam, are perceived as effective, in order to prioritize effective policy instruments for specific stakeholders in the Amsterdam FSC. This study focusses on the geographical area of the municipality of Amsterdam and the results are therefore only applicable to this area. This study adds on the already existing literature and identifies the specific focus points for the municipality of Amsterdam. The results are analysed per stage of the FSC, per type of stakeholder or per type of policy instrument, which are discussed below.

First, considering the results per stage of the Amsterdam FSC it can be seen that the stakeholders in the categories analysing the change and leveraging a wider impact perceive the policy instruments as more effective than stakeholders using the policy instruments. An explanation could be that the stakeholders analysing the change and leveraging a wider impact are generally more actively rooting for a reduction in the amount of food waste and are engaged in the projects or actions aiming to do so. Whereas the stakeholders using the policy instruments in this study have a completely different objective usually, more related to their the production or distribution of their food products e.g. than on reducing the amount of food waste.

Second, this study shows that there is a discrepancy between the perceived effectiveness of the stakeholders from government and the stakeholders from both civil society and the market. It is important for the municipality of Amsterdam to be aware of the gap in perceived effectiveness between the different types of stakeholders considered, as visualized in Figure 12. Figure 12 shows that the government tends to have a higher perceived effectiveness of the policy instruments. This observation can be elucidated by the assumption that the government predominantly designs policy instruments they perceive as effective. These results correspond to the results per stage of the FSC, since the stages of the FSC and the type of stakeholders correlate with each other, as is presented in Table 3. The lowest perceived effectiveness is seen in the market, probably since an implementation of a lot of measures would clearly affect the private sector. The civil society stakeholders are in between the government and the market, which can be explained by the fact that civil society is less affected by the policy instruments than the market, and is looking through a critical lens to the policy instruments initiated by the government.

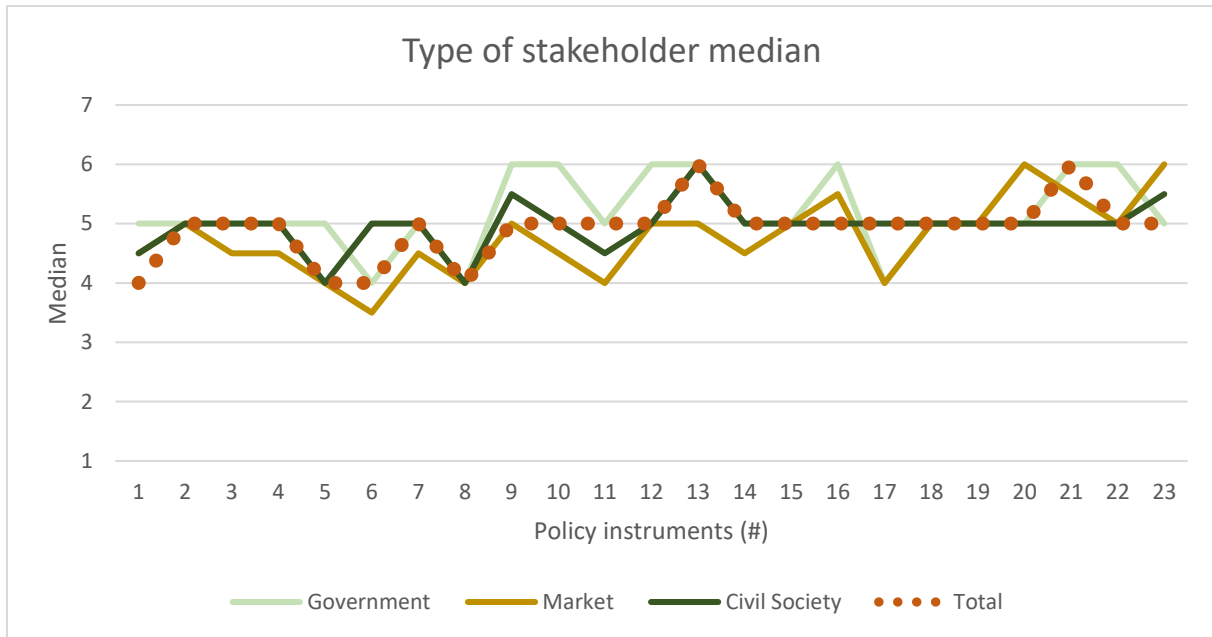


FIGURE 12 MEDIAN PER TYPE OF STAKEHOLDER

Third, considering the types of policy instruments it can be seen that especially economic instruments and soft instruments with a broad target group are perceived to be effective by the stakeholders in the Amsterdam FSC. The regulatory & legislative instruments and the soft instruments aimed at a specific target group are perceived as less effective. This indicates that the Amsterdam residents are sensitive to price incentives and initiatives that are scalable and available for a wide range of residents. The comments of the stakeholder confirm this interpretation and emphasize the effectiveness of discounts and price incentives. A combination of economic incentives to minimize food waste and increasing the overall awareness on the importance of food waste reduction seem to be perceived as most effective policy instruments.

RESEARCH LIMITATIONS

The Delphi method was used to explore the view of stakeholders on the Amsterdam FSC policy instruments. There are endless varieties in Delphi research, varying in the number of rounds, in a mix between in-depth interviews and questionnaires, etc. A Delphi research consists of minimum two rounds, since the stakeholder panel needs to have insight into the results of round 1. The higher the amount of rounds, the more accurate the data will be. Delphi researches occur consisting of only questionnaires or of a combination of in-depth interviews and Delphi questionnaire rounds. In this study a two round Delphi questionnaire research was chosen, including the possibility to give policy suggestions in the questionnaire. Including more Delphi questionnaire rounds would gain more insight into the stability of the results and including an in-depth interview with the stakeholders could give more insight into the reasoning of the choices of the respondents. Due to time restrictions, a two round Delphi questionnaire was considered to be sufficient to gain an insight into the stability of the results and including the comment box in the questionnaire is a commonly used option to ask respondents to substantiate their choices, instead of via in-depth interviews.

The last question of round 1 asked the stakeholders whether there were unclarities in the method or in the questions presenting the policy instruments, as stated in the methodology. There was no comment regarding unclarity of a question, therefore the same questions were included in round 2. The results of round 1 were presented in round 2 by means of a figure including a boxplot, coefficient of variation and median. Some respondents perceived some unclarities while reading this figure, although there was a description on how to read the figure. Therefore, some extra guidance was given via email for those who asked for it.

The reliability of this study is impacted by stakeholders participating in this study and the policy instruments in place at time of this study. As explained in the methodological section, the Delphi study requires a non-probabilistic sampling to gather as much heterogeneity of stakeholders as possible. Therefore, it is acknowledged that the results found from the Delphi questionnaire are linked to the composition of the stakeholder panel and the situation in the region at the time this study was done. In order to gather as much heterogeneity of stakeholders as possible the FSC in the region of Amsterdam was mapped. Second, the heterogeneity of representatives was ensured by dividing the Amsterdam FSC in several stages and contacting a broad range of stakeholders active in this stage. Every stage in the Amsterdam FSC is represented by 2 or more stakeholders.

The internal validity is covered by making use of labels in the questionnaire, assuring that it is clear for the stakeholders what they are rating the policy instruments at. A threat to the internal validity could be voting in extremes, e.g. respondents dissenting the results of round 1 and therefore voting really high or low. This did not occur in this study, but some divergence and convergence was observed. The stakeholders reached a consensus on almost half of the policy instruments and overall most policy instruments were perceived as 'fairly effective'. None of the policy instruments is perceived as ineffective, which indicates an attitude among the stakeholders of 'every bit helps', so every policy instruments is a positive contribution to the aim of a reduction in the amount of food waste.

The external validity is threatened by the applicability of the results to only the geographical area of the municipality of Amsterdam and by the response rate of the Delphi questionnaire, i.e. the stakeholders participating in this study. Regarding the types of stakeholders participating in this study, it can be seen that there is a bigger presence and lower drop-out rate from stakeholders leveraging a wider impact (knowledge transfer and partnership) than of stakeholders analysing the change and the stakeholders using the policy instruments, as shown in [Appendix 4](#). This can be explained by the characteristics of this type of stakeholders being activists for spreading knowledge and generally having a higher motivation to participate in studies aiming to research food waste. Next to their increased participation, they might be more tensed to perceive the policy instruments as effective, just like the stakeholders analysing the change, since this is what they are working on/for. Within the stakeholders using the policy instruments, there is also inequality in the amount of stakeholders per stage in the Amsterdam FSC, i.e. the consumption stage is well represented, while the more industrial stages are less represented. It is very important to be aware of this response bias and the impact this has on the generalizability of this study.

Despite the recognized limitations, the methodological framework used in this study, based on the combination of a participatory tool and a multi-actor approach, can give valuable insights for policymakers to define their priorities and guidelines in order to reduce the amount of food waste in Amsterdam by 2030 to 50%.

REFERENCES TO PREVIOUS RESEARCH

Considering the different types of stakeholders and their presence in certain FSC stages, similarities can be observed when comparing this study with other studies. In the study of Diaz et al. (2019) it can also be seen that the market type of stakeholders have a lower perceived effectiveness compared to the other two types of stakeholders, since the implementation of some measures would clearly affect the market stakeholders, but should be regulated by the government. Diaz et al. (2019) also mentions the importance to differentiate where the food waste is generated and the actor responsible for this volume. This study found that in Amsterdam the data of the amount of food waste generated per stage of the FSC is not available, however some research institutes are currently working on this. Consequently, in order to implement a food waste prevention measure, not only the main stage of the FSC in which the reduction will take place should be identified, but also the necessary stages and stakeholders that should be considered to make a measure effective.

Next to that, Diaz et al. (2019) mentions the link between the perceived effectiveness of the stakeholders and the type of stakeholders that should lead the implementation of a specific policy instruments (market,

government or both jointly). Diaz et al. (2019) found that in general regulatory and policy measures would need to be pushed by public bodies, i.e. the government in this study, while economic and business-oriented solutions would involve the leadership of the market types of the private sector, i.e. the market in this study.

Similarly to this study, the perceived effectiveness of the policy instruments in the study of Diaz et al. (2019) is high in general. However, looking at the differences per type of policy instrument (being regulatory & legislative instruments, economic instruments and soft instruments), the results can be compared to the study of Dijk (2015). In his study it appears that regulatory & legislative instruments score high in effectiveness, since these are coercive in nature (Dijk, 2015). Economic policy instruments hold the middle ground for effectiveness and the soft instruments score low in effectiveness (Dijk, 2015). These results do not fully correspond with the results of this study, especially since the regulatory & legislative instruments presented in this study was perceived to be neither effective nor ineffective. However, regarding the economic and the soft instruments some similarities can be seen. The economic instruments are perceived as more effective than the soft instruments, according to the comments of the stakeholders due to a trigger by discounts on food products in the geographical area considered. Dijk (2015) mentions the potential shortcoming of communication instruments is their ineffectiveness, since educating and informing agents about the benefits of environmental services does not guarantee that agents will actually increase the provision of these services.

RECOMMENDATIONS

Food waste is a burgeoning area of research and there are still big gaps in knowledge. The results of this study can be very helpful for both the general knowledge and existing literature, as in practice for policymakers from the municipality of Amsterdam.

Future research should undertake similar studies in other geographical areas to check whether common measures can be identified. A similar study has been undertaken by (Diaz-Ruiz et al., 2019) in the metropolitan region of Barcelona, however the more regional contexts are considered, the better the results can be identified and clarified. In this case common measures can be identified worldwide or in European context.

To further add to this study, in context of Amsterdam, a few links related to the perceived effectiveness can be further investigated, such as which stakeholders should lead the implementation of a specific measure and the stakeholders that should be considered to make a measure effective. On top of that, In the literature review it appeared that in context of the municipality of Amsterdam there was no data available on the amount of food waste generated by the stages in the FSC, which might be very helpful in order to further prioritize specific policy instruments to prevent food waste.

The municipality should use these results in order to re-examine the focus of their policy instruments to reduce the amount of food waste. It is important for the municipality to be aware of the opinion of the stakeholders whom are affected by the policy instruments. The disconnection between the perceived effectiveness of the stakeholders analysing the change and the stakeholders using the policy instruments should be further examined. The stakeholder suggestions can help to gain insight into the stakeholder perspective. Their policy suggestions mainly concern soft instruments aiming to increase consumer awareness and to have more research done into the revaluation of food waste. The feasibility of a possible implementation of these policy suggestions should be assessed by the municipality of Amsterdam. Further research is needed to investigate the perceived effectiveness of these suggestions, since the stability could not be tested in just one round.

In the areas where, in general, most food waste is generated, in the consumption stage, a good waste infrastructure is lacking (Viva et al., 2020). The priorities of the municipality of Amsterdam should focus on increasing the awareness on all levels, involve stakeholders in the policy making process and enable the food waste collection and sustainable reuse.

The results will contribute to the Circularity by Design project work package Framework & Governance, which aims to develop a conceptual framework for the transformation towards circular by design economies in urban areas. This framework will be used to support stakeholders in the Amsterdam FSC towards applying Circularity by Design. These outcomes are an addition to the existing literature and can be used in practice by policy makers from the municipality of Amsterdam.

7. CONCLUSION

This chapter presents a reflection of the research, the results of the main research question and elaborates on the insights of the research.

This study has the objective to explore which policy instruments, aimed at reducing the amount of food waste in the municipality Amsterdam, are perceived as effective, in order to prioritize effective policy instruments for specific stakeholders in the Amsterdam FSC. This is executed by combining the stakeholders' perceived effectiveness of the different policy instruments with the degree of consensus reached among the stakeholders. Priorities have been assessed to the distinction of the FSC stages, the types of stakeholders and the type of policy instruments. The comments given by the stakeholders per policy instrument in round 1 are used as for interpretation of the results and are included in [Appendix 8](#). Subsequently the results of the three analysis approaches are presented.

First, considering the Amsterdam FSC stages there is a striking difference between the stakeholder categories of using the policy instruments (primary production, processing, distribution, retail, consumption, waste), the stakeholders leveraging a wider impact and sharing knowledge (knowledge transfer, partnership), and the stakeholders analysing the change (governance). Overall, the perceived effectiveness of the stakeholders using the policy instruments is lower compared to the perceived effectiveness perceived by stakeholders analysing the change and leveraging a wider impact. The processing and the retail stage agreed upon the majority of the policy instruments being neither effective nor ineffective, while the stakeholders in the primary production, distribution, consumption and waste agree upon the majority policy instruments being fairly effective. None of the stakeholders using the policy instruments agreed upon the majority of the policy instruments being either effective or very effective. Considering the stakeholders leveraging a wider impact the stakeholders perceive most of the policy instruments to be fairly effective and the stakeholders analysing the change perceive the majority of policy instruments to be effective. So, the latter two stakeholders groups perceive more policy instruments as effective than the stakeholders using the policy instruments.

Second, the results for the different types of stakeholders shows a difference in perceived effectiveness of especially the market. Although all three types of stakeholders perceive the majority of the policy instruments to be fairly effective, a difference can be seen in the distribution of the results. Both government and civil society perceive over 90% of the policy instruments that have reached a consensus to be effective (both fairly effective and effective). While for the stakeholders in the market also 27% is considered to be neither effective nor ineffective. This is probably caused by the fact that the governance makes those policy instruments.

Third, in view of the types of policy instruments it appears that the economic policy instruments are perceived as most effective, compared to the regulatory and soft instruments. The perceived effectiveness regarding soft instruments varies a lot, since the majority is considered to be fairly effective and some are considered to be neither effective nor ineffective. The only regulatory & legislative instruments is perceived as neither effective nor ineffective. Looking at the comment of the stakeholders, it appears that their explanation for their high perceived effectiveness for economic instruments is that they consider Amsterdam consumers to be fan of price reduction of food products. Therefore, a discount of products with a short shelf life (such as policy instruments #2 and #13) are perceived as effective. Regarding the soft instruments the opinions of the stakeholders are divided. Soft policy instruments aimed at the 'general' consumer are mostly perceived as more effective than those aiming at a specific target group, since these target groups might have other objectives (#14). The stakeholders also mention the importance of initiatives being scalable, if the instruments are focussed too much on a specific target group, geographical area, etc. that is a limitation (#4 and #5). Policy instruments trying to set an example are perceived as neither effective nor ineffective (#5, #6 and #8). Overall research programs are considered to be fairly effective (#7 and #15), stakeholders mentioned that it is important to know what we are talking about and to map the amount of food waste stemming from where. Some stakeholders also mention the

importance of tackling the food waste problem at the source, rather than dealing with the situation and giving food waste a second life (such as #9 and #10 instead of #12).

To summarize the three paragraphs above, it becomes apparent that the perceived effectiveness is highest among the stakeholders analysing the policy instruments and leveraging a wider impact and that especially the economic instruments are perceived as effective. Since, the municipality of Amsterdam to move towards a circular food system it is important to make a better connection with the stakeholders in the market, i.e. the stakeholders using the policy instruments. Their perceived effectiveness of the policy instruments affects their intention to perform pro-environmental behaviour and the policy they pursue in their organisation. The comments of the stakeholders indicate that a discount or economic incentive is very effective, and soft instruments focussing on general awareness are perceived as effective.

Taking into account the objective of this study, the municipality of Amsterdam should prioritize economic instruments and focus on decreasing the gap between the stakeholders using the policy instruments and the stakeholders analysing the policy instruments and leveraging a wider impact. There is a large consensus about the need to reduce food waste along the FSC (Diaz-Ruiz et al., 2019). In order for the municipality of Amsterdam to make a better connection with the market it might be good to follow up on the policy suggestions the stakeholders gave. This will include those stakeholders in the process of making policy instruments and increase their awareness. The types of policy instruments that are perceived as most effective, and should therefore be a priority for the municipality of Amsterdam, are the economic instruments and soft instruments which are scalable and not targeted at a specific target group.

REFERENCES

- Ajzen, I. (1991). The Theory of Planned Behavior. *Organizational Behavior and Human Decision Processes*, 50, 179–211.
- Alwin, D. F., & Krosnick, J. A. (1991). The Reliability of Survey Attitude Measurement. *Sociological Methods & Research*, 20(1), 139–181.
- Baynes, K. (1993). Civil Society and Political Theory by Jean Cohen and Andrew Arato Review. *Political Theory*, 21(3), 544–547.
- Bellù, L. G. (2017). Food losses and waste issues and policy options. *FAO, Rome*, 18.
- Berkum, S. Van, Dengerink, J., & Ruben, R. (2018). *The food systems approach: sustainable solutions for a sufficient supply of healthy food*. <https://doi.org/https://doi.org/10.18174/451505>
- Brainard, W. C. (1967). Uncertainty and the Effectiveness of Policy. *The American Economic Review*, 57(2), 411–425.
- Brugha, R., & Varvasovszky, Z. (2000). Stakeholder analysis: a review. *Health Policy and Planning*, 15(3), 239–246.
- Circle Economy, & City of Amsterdam. (2019). *Building Blocks for the New Strategy Amsterdam Circular 2020-2025*.
- Circle Economy, Copper 8, & City of Amsterdam. (2018). *Amsterdam Circular - Evaluation and Action Perspectives*. <https://www.circle-economy.com/resources/amsterdam-circular-evaluation-and-action-perspectives>
- Clibbens, N., Walters, S., & Baird, W. (2012). Delphi research: Issues raised by a pilot study. *Nurse Researcher*, 19(2), 37–43. <https://doi.org/10.7748/nr2012.01.19.2.37.c8907>
- Crabb, A., & Leroy, P. (2012). The Handbook of Environmental Policy Evaluation. *The Handbook of Environmental Policy Evaluation, March*, 1–3. <https://doi.org/10.4324/9781849773072>
- Dajani, J. S., Sincoff, M. Z., & Talley, W. K. (1979). Stability and agreement criteria for the termination of Delphi studies. *Technological Forecasting and Social Change*, 13(1), 83–90. [https://doi.org/10.1016/0040-1625\(79\)90007-6](https://doi.org/10.1016/0040-1625(79)90007-6)
- Diaz-Ruiz, R., Costa-Font, M., López-i-Gelats, F., & Gil, J. M. (2019). Food waste prevention along the food supply chain: A multi-actor approach to identify effective solutions. *Resources, Conservation and Recycling*, 149(October 2018), 249–260. <https://doi.org/10.1016/j.resconrec.2019.05.031>
- Dijk, J. J. (2015). *On the Efficiency and Effectiveness of Policy Instruments for the Procurement of Environmental Services*. VU University.
- Dubbeling, M., Santini, G., Renting, H., Taguchi, M., Lançon, L., Zuluaga, J., de Paoli, L., Rodriguez, A., & Andino, V. (2017). *Assessing and Planning Sustainable City Region Food Systems: Insights from Two Latin American Cities*. 9(8), 1455. <https://doi.org/10.3390/su9081455>
- FAO, RUAZ, GIZ. (2016). *City Region Food Systems and Food Waste Management*. FAO.
- FAO. (2011). *Global food losses and food waste - Extent, causes and prevention*.
- Fratini, C. F., Georg, S., & Jørgensen, M. S. (2019). Exploring circular economy imaginaries in European cities: A research agenda for the governance of urban sustainability transitions. *Journal of Cleaner Production*, 228, 974–989. <https://doi.org/10.1016/j.jclepro.2019.04.193>
- Gemeente Amsterdam. (2010). *Actieplan Slimme en Schone Stedelijke Distributie Amsterdam*.

https://d2aye3ggtndtn5.cloudfront.net/app/uploads/2015/04/attachment-008_logistiek-download-LOGNWS109712D01.pdf

- Gemeente Amsterdam. (2017). *Detailhandelsbeleid Amsterdam 2018-2022*. https://assets.amsterdam.nl/publish/pages/445928/detailhandelsbeleid_2018-2022.pdf
- Gemeente Amsterdam. (2020a). *Amsterdam Circulair 2020-2025 Innovatie- en Uitvoeringsprogramma 2020-2021*.
- Gemeente Amsterdam. (2020b). *Amsterdam Circular 2020-2025 Strategy*. <https://www.amsterdam.nl/bestuur-organisatie/volg-beleid/ambities/gezonde-duurzame-stad/amsterdam-circulair-2020-2025/>
- Gemeente Amsterdam. (2020c). *Uitvoeringsprogramma afval en grondstoffen 2020-2025*.
- Gemeente Amsterdam. (2021). *Stadslandbouw*. <https://www.amsterdam.nl/wonen-leefomgeving/medebeheer/stadslandbouw/>
- Goodman, C. M. (1987). The Delphi technique : a critique. *Journal of Advanced Nursing*, 12, 729–734.
- Government of the Netherlands. (2016). *Cutting down on food waste*. <https://www.government.nl/topics/food/cutting-down-on-food-waste>
- Hasson, F., Keeney, S., & McKenna, H. (2000). Research guidelines for the Delphi survey technique. *Journal of Advanced Nursing*, 32(4), 1008–1015. <https://doi.org/10.1046/j.1365-2648.2000.t01-1-01567.x>
- Helleman, G. (2016). *De driehoek: veranderende posities van organisaties*. <https://stadslente.blogspot.com/2016/01/de-driehoek-veranderende-posities-van.html>
- Hjarnø, L., Syed, A., & Aro, A. R. (2007). *Report of Interview summaries and Delphi rounds*.
- Keeney, S., Hasson, F., & McKenna, H. P. (2001). A critical review of the Delphi technique as a research methodology for nursing. *International Journal of Nursing Studies*, 38(2), 195–200. [https://doi.org/10.1016/S0020-7489\(00\)00044-4](https://doi.org/10.1016/S0020-7489(00)00044-4)
- Kennedy, H. P. (2004). Enhancing Delphi research: Methods and results. *Journal of Advanced Nursing*, 45(5), 504–511. <https://doi.org/10.1046/j.1365-2648.2003.02933.x>
- Kirchherr, J., Reike, D., & Hekkert, M. (2017). Conceptualizing the circular economy: An analysis of 114 definitions. *Resources, Conservation and Recycling*, 127(September), 221–232. <https://doi.org/10.1016/j.resconrec.2017.09.005>
- Lieder, M., & Rashid, A. (2016). Towards circular economy implementation: A comprehensive review in context of manufacturing industry. *Journal of Cleaner Production*, 115, 36–51. <https://doi.org/10.1016/j.jclepro.2015.12.042>
- Mourad, M. (2016). Recycling , recovering and preventing “ food waste ” : competing solutions for food systems sustainability in the United States and France. *Journal of Cleaner Production*, 126, 461–477. <https://doi.org/10.1016/j.jclepro.2016.03.084>
- MRA. (2020a). *Economische Verkenningen Metropoolregio Amsterdam 2020*.
- MRA. (2020b, January 31). *About the Metropolitan Region Amsterdam*. <https://www.metropoolregioamsterdam.nl/about-mra/>
- Nelissen, N. (2002). The Administrative Capacity of New Types of Governance. In *Public Organization Review* (Vol. 2, Issue 1, pp. 5–22). <https://doi.org/10.1023/A:1016019302732>
- Nutrition centre. (2019). *Synthesis report on Food Waste in Dutch Households in 2019*. <https://www.voedingscentrum.nl/nl/pers/persmappen/voedselverspilling.aspx>

- Perrels, A. (2001). Efficiency and Effectiveness of Policy Instruments: Concepts and Practice. In *Workshop on Good Practices in Policies and Measures* (Issue October, pp. 8–10).
- Prendeville, S., Cherim, E., & Bocken, N. (2018). Circular Cities: Mapping Six Cities in Transition. *Environmental Innovation and Societal Transitions*, 26, 171–194. <https://doi.org/10.1016/j.eist.2017.03.002>
- Rotz, S., & Fraser, E. D. G. (2015). Resilience and the industrial food system: analyzing the impacts of agricultural industrialization on food system vulnerability. *Journal of Environmental Studies and Sciences*, 5(3), 459–473. <https://doi.org/10.1007/s13412-015-0277-1>
- Royal HaskoningDHV, Circle Economy, & FABRICations. (2018). *Grondstoffenatlas*.
- Selke, J., & Walker, A. M. (1996). The Delphi method : A useful tool for the allied health researcher. *British Journal of Therapy and Rehabilitation*, 3(12). <https://doi.org/10.12968/bjtr.1996.3.12.14731>
- Sonnino, R. (2016). The new geography of food security: exploring the potential of urban food strategies. *The Geographical Journal*, 182(2), 190–200. <https://doi.org/10.1111/geoj.12129>
- Steenhuisen, F. (2019). *Voedselverspilling in Fijn huishoudelijk restafval en GFT-afval, Nederland 2019*. <https://www.milieucentraal.nl/media/00yfhom4/voedselverspilling-via-huishoudelijk-afval-2019.pdf>
- Steg, L., & Vlek, C. (2009). Encouraging pro-environmental behaviour: An integrative review and research agenda. *Journal of Environmental Psychology*, 29(3), 309–317. <https://doi.org/10.1016/j.jenvp.2008.10.004>
- Tegoni, C., & Licomati, S. (2017). The Milan Urban Food Policy Pact: The Potential of Food and the Key Role of Cities in Localizing SDGS. *Journal of Universities and International Development Cooperation*, 372–378.
- Teigiserova, D. A., Hamelin, L., & Thomsen, M. (2020). Science of the Total Environment Towards transparent valorization of food surplus , waste and loss : Clarifying de fi nitions , food waste hierarchy , and role in the circular economy. *Science of the Total Environment*, 706, 136033. <https://doi.org/10.1016/j.scitotenv.2019.136033>
- Vergragt, P. J., Dendler, L., de Jong, M., & Matus, K. (2016). Transitions to sustainable consumption and production in cities. *Journal of Cleaner Production*, 134(Part A), 1–12. <https://doi.org/10.1016/j.jclepro.2016.05.050>
- Viva, L., Ciulli, F., Kolk, A., & Rothenberg, G. (2020). Designing Circular Waste Management Strategies : The Case of Organic Waste in Amsterdam. *Advanced Sustainable Systems*, 2000023(4), 1–17. <https://doi.org/10.1002/adsu.202000023>
- Voedingscentrum. (2016). *Stadslandbouw (urban farming)*. <https://www.voedingscentrum.nl/encyclopedie/stadslandbouw-urban-farming-.aspx>
- Wan, C., & Shen, G. Q. (2013). Perceived policy effectiveness and recycling behaviour: The missing link. *Waste Management*, 33(4), 783–784. <https://doi.org/10.1016/j.wasman.2013.02.001>
- Wan, C., Shen, G. Q., & Yu, A. (2014). Resources , Conservation and Recycling The role of perceived effectiveness of policy measures in predicting recycling behaviour in Hong Kong. *Resources, Conservation and Recycling*, 83, 141–151. <https://doi.org/10.1016/j.resconrec.2013.12.009>
- Williams, J. (2019). Circular cities. *Urban Studies*, 56(13), 2746–2762. <https://doi.org/10.1177/0042098018806133>
- WUR. (2020). *Dutch supermarkets provide insights into food waste*. <https://www.wur.nl/en/Research-Results/Research-Institutes/food-biobased-research/show-fbr/Dutch-supermarkets-provide-insights-into-food-waste-F00DWa5.htm>
- Zhou, Y., Leung, R., Rodriguez, C., von Meijenfildt, C., & van Marrewijk, F. (2018). *Creating a Resilient Food System for the AMA*. <http://resolver.tudelft.nl/uuid:96966266-d7ce-41bf-9521-c7a7a5046e35>

APPENDICES

APPENDIX 1 INTERVIEW PROGRAM MANAGER FOOD STRATEGY MUNICIPALITY OF AMSTERDAM

Interview Drs. Erik Koldenhof (12 November 2020)

Hi Erik, thank you for being here! My name is Annabel I will tell you something about my research. As you probably read in my email, I will conduct a research on the perceived effectiveness of policy instruments aimed at reducing the amount of food waste in the AMA. I contacted the councillor Laurens Ivens and I was referred to you. Can you tell me something about yourself?

My name is Erik Koldenhof and I am program manager Food Strategy in the municipality of Amsterdam. Busy with topics related to food waste in the municipality of Amsterdam. I have worked a lot with Willie van den Broek from AMS Institute. Do you know him?

Yes, I spoke to Willie about my research a few weeks ago!

Currently I am analysing policy documents, in order to get a good overview of policy instruments aimed at reducing the amount of food waste in the AMA. In the document Amsterdam Circular 2020-2025 Innovation and Implementation Program 2020-2021 the municipality of Amsterdam lists a few actions points and some tools to reach them. Is this the complete overview of policy instruments focussed on reducing food waste in Amsterdam?

Yes it is. However I have a more recent version (July 2020) in which the projects are described in more detail. I will send this to you. You have to look no further, that is the most recent and up to date overview of all the policy instruments aimed at reducing the amount of food waste in the municipality of Amsterdam.

Can you tell me more about the policy instruments that are already in place in the municipality of Amsterdam?

Yes of course. Currently, there is a focus on education and communication in the policy instruments. I will give you some examples.

In Amsterdam we organized school gardens, in order to make children more aware of food waste. We distributed stickers and refrigerator magnets among them, so hopefully they would take the message home with them. The effect was not as big as we hoped/expected. We also distributed stickers in the city hall. In this way you can influence people and make them more aware.

What else can you do as a municipality? We should do more things like cooking classes. A big share of the residents does not know how to cook something. In big cities like Amsterdam a lot of people consume take away meals and ready-made meals. Simple things, like heating it up in the microwave or baking a hamburger is fine for most people. However, how to prepare some vegetables is not familiar for a lot of people. Who knows that you can eat the stump of broccoli? That is a simple example, which causes a lot of food waste, since you can just eat it. If people do not know this and do not know how to prepare this, they won't do it.

Can you say most policy instruments are focussed on creating awareness/education of consumers?

Should be more! We subsidize healthcare institutions, so it is indirect. If the care institutions would also teach sustainable and healthy cooking in their range of activities in the neighbourhoods, then you could achieve something. If they don't offer that, people don't know.

Example: very poor neighbourhood south-east. Got many packages from the food bank. People with a multicultural background have no idea how to prepare this. This is how a food bank works, offering what is left. That's a nice principle, but if you don't know how to prepare the food, you can throw it away.

There they received a course 'learning to cook with the products of the food bank'. That was a success in itself, but because there were many people who could not go here because they had children at home. That's why they recorded a vlog. The mothers can then learn from the couch how to prepare the food from the food bank. This increases your reach. As a municipality you can achieve a lot with such small-scale projects through welfare institutions.

So a focus on local issues is best?

Very small-scale and aimed at a specific focus group. In countries such as Denmark they are also very actively involved in this. They organize cooking courses for families, including children. I don't know the range of this, I haven't seen any numbers. I think it costs a lot of money if you want to do it all in such a finely meshed way.

In addition, we (municipality of Amsterdam) also want to start a project with grinders. For this we want to apply for a European subsidy. Those are food grinders in a counter. This is especially common in America. There, the ground food does end up in the sewer. We want to build it here in such a way that it is collected in a separate stream in an apartment building. The only request from the European Commission is that you must also develop a program on food waste. Which is a bit contradictory because if you don't have any food waste then you don't need a grinder either. Then the question is: what is cutting waste and what is still edible? We want to do research on this in collaboration with a university. We want to gain insights into the knowledge and behaviour of users in order to be able to set up guidance. In any case, the users must learn to handle a grinder, what is allowed and what is not allowed. An avocado pit is not allowed, but the skin is. Cut flowers are also allowed, but that is not food. How do you measure the weight of the wasted food? That is complex matter. We are now working with such instruments, so we mainly focus on the consumer. So really the food waste in and around the house.

Is that also the group that produces the most waste?

That is the only group that we have influence on / have contact with. If you go further back in the chain, you will encounter the company Greendish, for example.

Greendish is an organization that advises restaurants to cook more sustainably and healthily. The package they offer also prevents some food waste. If interested restaurants are found for this, the municipality of Amsterdam will subsidize this. If you look at the stratification of policy instruments in the municipality, on the one hand that is regulations (drawing up rules, orders, prohibitions, etc.), but I think that is very difficult with food waste. You can also look at stimulating less food waste. You can stimulate through communication or with money (or paid activities). You try to get a movement going with a subsidy. As a municipality, we are seriously thinking about what else we can do and where we should start. It is often not so structured; you start somewhere and then you see if it will be a success.

This mainly concerns the policy documents of Amsterdam. I also viewed policy documents from the municipality of Almere, Lelystad, etc. Here I can find very little about food waste. Is it also true that the municipality of Amsterdam is a forerunner in this?

Yes, it is something that the municipality finds it difficult to determine whether or not it is about this. It is also difficult, of course, because the municipality is not about what goes on behind the front door or what a restaurant does. If a restaurant has a catering permit, then they can do their thing. The only thing you could do in the future is that you set conditions (real regulations) to the permit. Then you would have in the catering license or in the exploitation license that the business operations must meet minimum guidelines in the field of food waste. But this will be very difficult and extremely complex.

There is also a restriction on the transfer of food waste from restaurants, this has to do with the HACCP regulations in the field of food safety. This therefore concerns the rules regarding food safety for catering businesses, but also for the distributor to the catering industry (the wholesaler). They all have to comply with extremely strict food safety rules in terms of hygiene (refrigeration, packaging, certain products are not allowed together). This applies not only to transport, but also to the restaurant kitchen itself and storage. This also applies when you receive a doggy bag from a restaurant. When you have had a dish and you take the leftovers home and this you heat up again, for example, and you get sick; then the restaurant owner is liable. While you wanted to take it home yourself. A catering entrepreneur does not want to run that risk, they would rather throw it away than offer a doggy bag. So you have to do something with this in terms of regulations. For example, if it is taken home that a sticker is placed on the doggy bag: from now on you are responsible for what you do with this food. The municipality cannot do such a thing, it must come from the government. You could take a look at documents from the municipality of Haarlem. As a city they have developed a doggy bag principle themselves. They are further ahead than Amsterdam in this area.

I hope I was able to give you some inspiration about food waste and I would be happy to help you by completing your questionnaire!

Thank you very much for all the information. I hope to send you my questionnaire at the beginning of December.

APPENDIX 2 QUESTIONNAIRE ROUNDS

2.1 QUESTIONNAIRE ROUND 1

Q1 Beste participant,

Aangezien u een belanghebbende (stakeholder) bent in de voedselketen van de metropoolregio Amsterdam (MRA) heb ik u uitgenodigd om deze vragenlijst in te vullen.

Voor mijn Master Thesis aan de Wageningen University werk ik mee aan het Circularity by Design project. Het doel van dit onderzoek is om inzicht te krijgen in de mening van belanghebbenden, zoals u, met betrekking tot de effectiviteit van beleidsinstrumenten die worden ingezet om voedselverspilling in de MRA te verminderen. Deze inzichten zijn van belang voor de transitie naar een circulaire economie, het doel van de gemeente Amsterdam in 2050.

De eerste vragen gaan over de rol van uw organisatie in de voedselketen. Vervolgens zult u verschillende anti-voedselverspillingsinitiatieven en -activiteiten moeten beoordelen op effectiviteit op een schaal van 1 tot 7. In het opmerkingenveld kunt u uw antwoord beargumenteren, zodat wij nog meer inzicht krijgen in uw mening. Indien u geen argument of opmerking omtrent uw keuze heeft, kunt u een 'X' plaatsen in het opmerkingenveld.

Het gehele (Delphi) onderzoek zal bestaan uit twee soortgelijke vragenlijsten, waarvan dit de eerste is. Het invullen van de vragenlijst zal ongeveer 15 minuten van uw tijd in beslag nemen. Er zal betrouwbaar met uw gegevens worden omgegaan. Nadat de resultaten van deze vragenlijst geanalyseerd zijn, zult u (in januari) de tweede vragenlijst ontvangen. Het verschil in de resultaten van de eerste en tweede vragenlijst is cruciaal voor het onderzoek.

Mocht u nog vragen of opmerkingen hebben over het onderzoek, neem dan contact met mij op via annabel.oosterwijk@wur.nl

Met vriendelijke groet,
Annabel Oosterwijk

Q2 Wat is de naam van uw organisatie?

Q3 In welke gemeente bevindt uw organisatie zich?

Q4 Als onderdeel van welke schakel(s) in de voedselketen zou u uw organisatie kenmerken?

- Primaire productie
 - Verwerkende industrie
 - Groothandel
 - Retail
 - Distributie
 - Catering
 - Consumenten
 - Gemeente
 - Educatie
 - Afval sector
 - Anders, namelijk: _____
-

Q5 Welke vorm heeft uw organisatie?

- Burgermaatschappij** (civil society): De sfeer of het domein waarin burgers zich door betrokkenheid en verbondenheid met de medemens geroepen voelen om vrijwillig acties te ondernemen die ook als taken van de overheid gezien kunnen worden.
 - Markt** (economie): Vanuit een economisch belang op zoek naar efficiënt en doelmatig werken door goedkope en werkzame oplossingen aan te bieden voor problemen en behoeftes van overheid of burger.
 - Overheid** (staat): Bepaalt de rechten en plichten van individuele burgers en de inrichting van publieke voorzieningen.
 - Anders, namelijk: _____
-

Q6 Hoe zou u de term 'effectiviteit' van beleidsinstrumenten gericht op het voorkomen van voedselverspilling definiëren vanuit uw perspectief? Kortom, wanneer is beleid effectief?

Q7 De gemeente Amsterdam heeft op het gebied van preventie van voedselverspilling twee actierichtingen opgesteld. Deze actierichtingen zullen aan u gepresenteerd en uitgelegd worden. De gemeente is betrokken bij verschillende initiatieven en activiteiten, die onderdeel uitmaken van de actierichtingen.

De eerste actierichting: 'De gemeente maakt beleid tegen voedselverspilling'

Uitleg:

Voedselverspilling wordt tegengegaan door op specifieke branches en op specifieke groepen Amsterdammers in te zetten. Hierbij wordt bijvoorbeeld gebruik gemaakt van bewustwording en economische instrumenten om

voedselverspilling te ontmoedigen en overschotten terecht te laten komen bij Amsterdammers die ze het hardst nodig hebben.

Verwacht resultaat:

Aan de hand van initiatieven in de stad om voedselverspilling tegen te gaan worden inzichten benut voor het ontwikkelen van nieuw beleid en effectieve programma's vanaf 2021 ten aanzien van voedselverspilling.

Initiatieven en activiteiten als onderdeel van de actierichting 'De gemeente maakt beleid tegen voedselverspilling'

1. Fast food voedselverspilling en -verpakkingen

Dit proefproject heeft als doel om verpakkings- en voedselverspilling bij fast foodbedrijven tegen te gaan.

2. Dynamische prijsstelling

Er worden pilots gehouden met dynamische prijsstelling. Bij producten waarbij de einde-houdbaarheidsdatum nadert wordt gestart met het afprijzen (eerder dan pas op de laatste dag).

3. Food Center tegen voedselverspilling

Voedselverspilling wordt voorkomen door een efficiëntere logistiek voor het brengen van lokaal geproduceerd voedsel naar de stad (carpoolen voor streekproducten).

4. BuurtBuik

Voedselverspilling wordt tegengegaan door overgebleven eten op te halen bij horeca, supermarkten en groenteboeren. Het overgebleven eten wordt gedeeld met buurtbewoners, zodat het ten goede komt aan Amsterdammers met een kleine beurs.

5. Amsterdam verspillingvrij

Dit project wil voedselverspilling tegen gaan in één volledige straat in Amsterdam, om te laten zien dat het kan.

6. Verspillingvrije Week

Een communicatie- en actieprogramma opgezet door de gemeente Amsterdam en de landelijke stichting Samen Tegen Voedselverspilling.

7. Onderzoek naar 'te vermijden verspilling'

Aan de hand van een onderzoek naar het aandeel 'te vermijden verspilling' van organische stoffen in het afval worden gerichte communicatieplannen opgesteld om met bewoners te streven naar afname van het aantal weggegooid kilo's voedsel.

Op een schaal van 1-7 hoe effectief schat u deze initiatieven en activiteiten in?

Effectiviteit wordt in dit onderzoek beoordeeld als 'in welke mate het voorkomen van voedselverspilling in de gemeente Amsterdam toe te schrijven is aan het gevoerde beleid en de daarbij ingezette beleidsinstrumenten?'

Ronde 1: Effectiviteit							Opmerkingen	
	1 Zeer ineffectief	2 Ineffectief	3 Redelijk ineffectief	4 Neutraal	5 Redelijk effectief	6 Effectief	7 Zeer effectief	Beargumenteer uw antwoord indien mogelijk. Plaats anders een 'X'.

1. Fast food voedselverspilling en -verpakkingen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
2. Dynamische prijsstelling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
3. Food Center tegen voedselverspilling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
4. BuurtBuik	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
5. Amsterdam verspillingvrij	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
6. Verspillingvrije Week	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
7. Onderzoek naar 'te vermijden verspilling'	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

Q8 De tweede actierichting: 'Initiatieven tegen voedselverspilling en voor efficiëntere productie van voedsel worden ondersteund'

Uitleg:

De gemeente ondersteunt initiatieven vanuit alle hoeken van de samenleving die strijden tegen voedselverspilling en voor een duurzamer, gezonder dieet. Om deze initiatieven te helpen de weg naar ondersteuning te vinden, vragen we aan de doelgroepen regelmatig om voorstellen voor projecten te leveren.

Verwacht resultaat:

De resultaten van de vele projecten zullen worden gedeeld zodat Amsterdammers en bedrijven hiervan kunnen leren. Vanamsterdamsebodem.nl, RUMORE en Green Campus zijn hier geschikte platformen en netwerken voor. Over twee jaar begint de voedselverspilling af te nemen.

Initiatieven en activiteiten als onderdeel van de actierichting 'Initiatieven tegen voedselverspilling en voor efficiëntere productie van voedsel worden ondersteund'

1. Amsterdam Foodcapital

Deze samenwerking van het mkb, kennisinstellingen en Voedsel Verbindt wil aandacht vragen voor de in technisch en duurzaam opzicht leidende rol die de MRA wereldwijd heeft op het gebied van voedselinnovatie.

2. Samenwerking Koninklijke Horeca Nederland

De gemeente probeert samen met de KHN de restaurants te helpen met concrete preventieplannen. Eerder uitgevoerd onderzoek wijst uit dat 20-70% minder verspilling mogelijk is. Restaurants zullen hun strategie willen heroverwegen na de heropening (vanwege Covid-19). Hiervoor is een samenwerking gestart met Greendish en het adviestraject Restaurants van Morgen in voorbereiding genomen.

3. Food Rescue Center

In dit traject wordt er gekeken hoe horecarestaurants meer gebruik kunnen maken van 'geredde verswaren' in hun menu's en hoe zij gebruik kunnen maken van imperfecte producten (bijv. uiterlijke kenmerken van groente/fruit). Dit is een initiatief van InstockMarket.nl en samen met de organisatie DutchCuisine wordt beoogd de chefs in de restaurantkeukens tot minder verspilling te laten komen.

4. Promotie ondernemers initiatieven met restant verswaren

Promotie van producten (zoals bier uit aardappelen & brood en bitterballen gemaakt van oesterzwammen gekweekt op koffiedik) via het platform Made in Amsterdam, Kitchen Republic en Instock.nl en InstockMarket.nl.

5. Promotie foody bag

Promotie van de foody bag, voorheen de doggybag.

6. 'Verspil mij niet bak' in supermarkten

In een 'verspil mij niet' bak worden producten geplaatst met korting omdat het product tegen de uiterste houdbaarheidsdatum aanloopt of het product uit het assortiment wordt gehaald.

7. Leren koken met producten van de voedselbank

De retail sector, restaurants en marktkooplui distribueren hun overschotten aan bezoekers van de Voedselbank. Dit draagt in belangrijke mate bij aan het voorkomen van voedselverspilling. Kookcursussen met de aangeboden producten kunnen voorkomen dat er thuis niet alsnog voedsel wordt weggegooid, aangezien veel mensen niet weten hoe ze bepaalde producten moeten verwerken.

8. Onderzoeksprogramma's preventie van voedselverspilling en hergebruik

In samenwerking met kennisinstellingen in Amsterdam zullen nieuwe onderzoeksprogramma's van landelijke en internationale trajecten naar preventie van voedselverspilling en hergebruik worden gestart.

9. Support your locals

Lokale initiatieven van producenten die normaliter aan de (tijdelijk gesloten i.v.m. Covid-19) horeca leveren gebundeld in een landelijke handelswebsite waar consumenten kunnen bestellen voor thuislevering.

10. Slow Food Youth Network

Een samenwerking met dit netwerk, waarvan de Amsterdamse afdeling van deze internationale jongerenorganisatie zich inzet tegen voedselverspilling met het organiseren van de World Disco Soup Day.

11. Boeren voor Buren

Dit project wil een verbinding leggen tussen regionale productie en consumptie. Dit is een eerste pilot binnen het Korte ketens project, waarin Amsterdam en partners een kort lijn opzetten van boeren met voedseloverschotten en B-keuze producten uit de regio naar Amsterdammers een kleine beurs.

Op een schaal van 1-7 hoe effectief schat u deze initiatieven en activiteiten in?

Effectiviteit wordt in dit onderzoek beoordeeld als 'in welke mate het voorkomen van voedselverspilling in de gemeente Amsterdam toe te schrijven is aan het gevoerde beleid en de daarbij ingezette beleidsinstrumenten?'

Ronde 1: Effectiviteit								Opmerkingen
	1 Zeer ineffectief	2 Ineffectief	3 Redelijk ineffectief	4 Neutraal	5 Redelijk effectief	6 Effectief	7 Zeer effectief	Beargumenteer uw antwoord indien mogelijk. Plaats anders een 'X'.

1. Amsterdam Foodcapital	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
2. Samenwerking Koninklijke Horeca Nederland	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
3. Food Rescue Center	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
4. Promotie ondernemers initiatieven met restant verswaren	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
5. Promotie foody bag	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
6. 'Verspil mij niet bak' in supermarkten	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
7. Leren koken met producten van de voedselbank	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
8. Onderzoeksprogramma's preventie van voedselverspilling en hergebruik	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
9. Support your locals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
10. Slow Food Youth Netwerk	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
11. Boeren voor Buren	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

Q9 Heeft u suggesties of ideeën voor potentiële beleidsmaatregelen die effectief zouden kunnen zijn om voedselverspilling te voorkomen?

Q10 Deze ideeën zullen worden meegenomen in de tweede vragenlijst van dit onderzoek.

Nadat de resultaten van deze vragenlijst geanalyseerd zijn, zult u (in januari) de tweede vragenlijst ontvangen.

Voor vragen of opmerkingen kunt u mij bereiken via annabel.oosterwijk@wur.nl.

Hartelijk dank voor het invullen van deze vragenlijst! Ik hoop op uw verdere medewerking!

2.2 QUESTIONNAIRE ROUND 2

Q1 Beste participant,

Dit is de tweede en laatste enquête in dit onderzoek naar de effectiviteit van anti-voedselverspillingsbeleid in de metropoolregio Amsterdam. Uw organisatie heeft de eerste enquête ingevuld en daarom zou ik u willen vragen om ook deze enquête in te vullen.

Q2 Wat is de naam van uw organisatie?

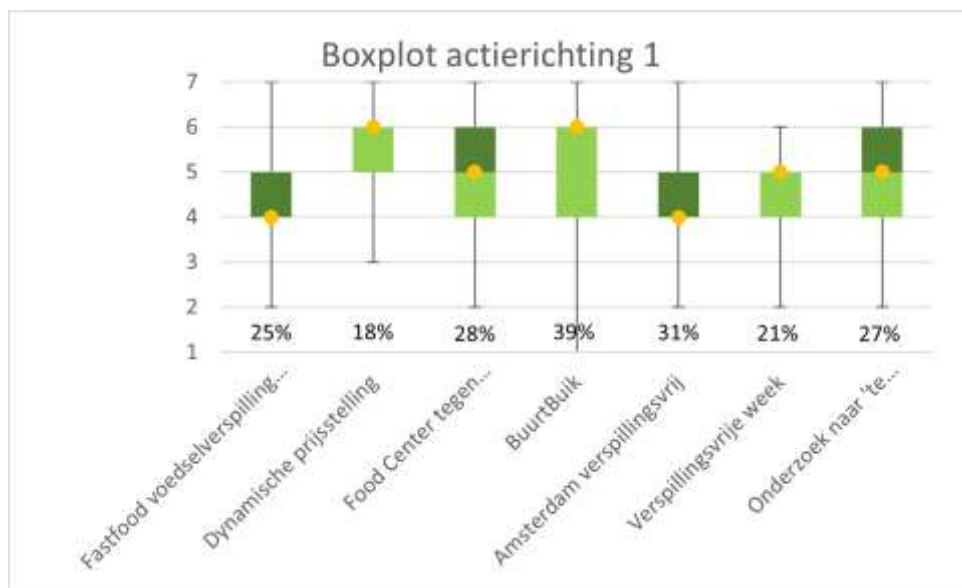
Q3 Deze enquête geeft u inzage in de antwoorden van andere belanghebbenden in de voedselketen van de eerste enquête. Met deze inzichten vraag ik u opnieuw de beleidsinstrumenten te beoordelen op effectiviteit.

Deze resultaten zullen inzicht geven in de mate van overeenstemming tussen verschillende organisaties in de voedselketen van de MRA. Als de antwoorden dicht bij elkaar liggen, kan er worden geconcludeerd dat er een overeenstemming is tussen belanghebbenden in de keten dat een bepaald beleidsinstrument als (niet) effectief wordt ingeschat. Deze inzichten zijn van groot belang voor het maken van nieuw beleid, strevend naar circulariteit.

Q4 De eerste actierichting: 'De gemeente maakt beleid tegen voedselverspilling'

In onderstaande afbeelding kan per beleidsinstrument worden gezien wat de spreidingsbreedte van de antwoorden van de eerste enquête is. De mediaan is weergegeven door middel van de gele stip. Het percentage onder de boxplot geeft de variatie coëfficiënt weer.

Onderaan deze pagina staat een uitgebreide uitleg over de interpretatie van onderstaande afbeelding, samen met de uitleg van de beleidsinstrumenten.



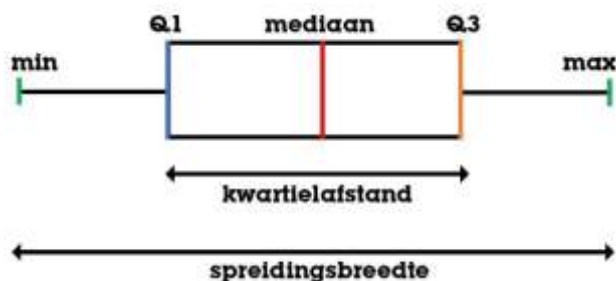
Met de kennis van de spreiding van de antwoorden uit de eerste ronde, vraag ik u opnieuw de beleidsinstrumenten te beoordelen. Op een schaal van 1-7 hoe effectief schat u deze initiatieven en activiteiten in?

Effectiviteit wordt in dit onderzoek beoordeeld als 'in welke mate het voorkomen van voedselverspilling in de gemeente Amsterdam toe te schrijven is aan het gevoerde beleid en de daarbij ingezette beleidsinstrumenten?'.

Ronde 2: Effectiviteit							
	1 Zeer ineffectief	2 Ineffectief	3 Redelijk ineffectief	4 Neutraal	5 Redelijk effectief	6 Effectief	7 Zeer effectief
1. Fast food voedselverspilling en -verpakkingen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Dynamische prijsstelling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Food Center tegen voedselverspilling	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. BuurtBuik	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Amsterdam verspillingvrij	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Verspillingvrije Week	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Onderzoek naar 'te vermijden verspilling'	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Uitleg boxplot:

De boxplot geeft de spreidingsbreedte van de antwoorden weer. Binnen de boxplot zijn er 4 groepen (kwartielen). De gekleurde blokjes bij elkaar geven 50% van de antwoorden weer, hierbinnen valt de mediaan. Als de spreidingsbreedte kleiner is, dan is er meer overeenstemming tussen de respondenten dat een bepaald beleidsinstrument (niet) effectief is. De mediaan is het middelste getal, oftewel tussen het tweede en derde kwartiel. De variatie coëfficiënt geeft de relatieve spreidingsmaat weer, dus de spreiding ten opzichte van het gemiddelde. Dus een hogere variatie coëfficiënt betekent een hogere spreiding rond het gemiddelde (gevisualiseerd in de boxplot).



Uitleg beleidsinstrumenten:

1. Fast food voedselverspilling en -verpakkingen

Dit proefproject heeft als doel om verpakkings- en voedselverspilling bij fast foodbedrijven tegen te gaan.

2. Dynamische prijsstelling

Er worden pilots gehouden met dynamische prijsstelling. Bij producten waarbij de einde-houdbaarheidsdatum nadert wordt gestart met het afprijzen (eerder dan pas op de laatste dag).

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Voedselverspilling wordt voorkomen door een efficiëntere logistiek voor het brengen van lokaal geproduceerd voedsel naar de stad (carpoolen voor streekproducten).

4. BuurtBuik

Voedselverspilling wordt tegengegaan door overgebleven eten op te halen bij horeca, supermarkten en groenteboeren. Het overgebleven eten wordt gedeeld met buurtbewoners, zodat het ten goede komt aan Amsterdammers met een kleine beurs.

5. Amsterdam verspillingsvrij

Dit project wil voedselverspilling tegen gaan in één volledige straat in Amsterdam, om te laten zien dat het kan.

6. Verspillingvrije Week

Een communicatie- en actieprogramma opgezet door de gemeente Amsterdam en de landelijke stichting Samen Tegen Voedselverspilling.

7. Onderzoek naar 'te vermijden verspilling'

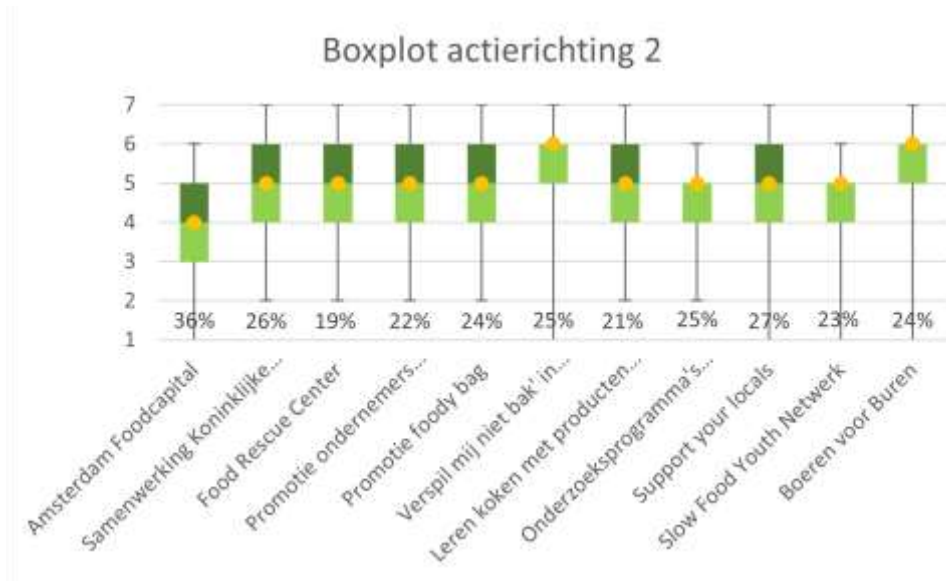
Aan de hand van een onderzoek naar het aandeel 'te vermijden verspilling' van organische stoffen in het afval worden gerichte communicatieplannen opgesteld om met bewoners te streven naar afname van het aantal weggegooid kilo's voedsel.

Q5 De eerste actierichting:

'Initiatieven tegen voedselverspilling en voor efficiëntere productie van voedsel worden ondersteund'

In onderstaande afbeelding kan per beleidsinstrument worden gezien wat de spreidingsbreedte van de antwoorden van de eerste enquête is. De mediaan is weergegeven door middel van de gele stip. Het percentage onder de boxplot geeft de variatie coëfficiënt weer.

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Met de kennis van de spreiding van de antwoorden uit de eerste ronde, vraag ik u opnieuw de beleidsinstrumenten te beoordelen. Op een schaal van 1-7 hoe effectief schat u deze initiatieven en activiteiten in?

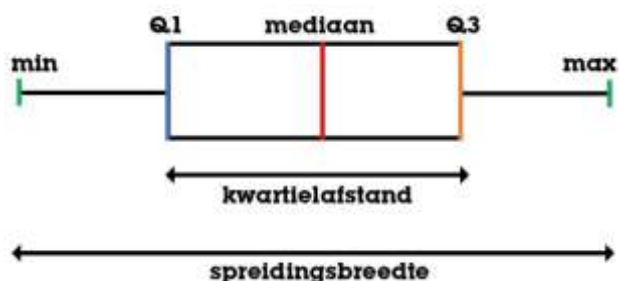
Effectiviteit wordt in dit onderzoek beoordeeld als 'in welke mate het voorkomen van voedselverspilling in de gemeente Amsterdam toe te schrijven is aan het gevoerde beleid en de daarbij ingezette beleidsinstrumenten?'

Ronde 2: Effectiviteit							
	1 Zeer ineffectief	2 Ineffectief	3 Redelijk ineffectief	4 Neutraal	5 Redelijk effectief	6 Effectief	7 Zeer effectief

1. Amsterdam Foodcapital	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Samenwerking Koninklijke Horeca Nederland	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Food Rescue Center	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Promotie ondernemers initiatieven met restant verswaren	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Promotie foody bag	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. 'Verspil mij niet bak' in supermarkten	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Leren koken met producten van de voedselbank	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. Onderzoeksprogramma's preventie van voedselverspilling en hergebruik	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. Support your locals	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. Slow Food Youth Netwerk	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. Boeren voor Buren	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Uitleg boxplot:

De boxplot geeft de spreidingsbreedte van de antwoorden weer. Binnen de boxplot zijn er 4 groepen (kwartielen). De gekleurde blokjes bij elkaar geven 50% van de antwoorden weer, hierbinnen valt de mediaan. Als de spreidingsbreedte kleiner is, dan is er meer overeenstemming tussen de respondenten dat een bepaald beleidsinstrument (niet) effectief is. De mediaan is het middelste getal, oftewel tussen het tweede en derde kwartiel. De variatie coëfficiënt geeft de relatieve spreidingsmaat weer, dus de spreiding ten opzichte van het gemiddelde. Dus een hogere variatie coëfficiënt betekent een hogere spreiding rond het gemiddelde (gevisualiseerd in de boxplot).



Uitleg beleidsinstrumenten:

1. Amsterdam Foodcapital

Deze samenwerking van het mkb, kennisinstellingen en Voedsel Verbindt wil aandacht vragen voor de in

technisch en duurzaam opzicht leidende rol die de MRA wereldwijd heeft op het gebied van voedselinnovatie.

2. Samenwerking Koninklijke Horeca Nederland

De gemeente probeert samen met de KHN de restaurants te helpen met concrete preventieplannen. Eerder uitgevoerd onderzoek wijst uit dat 20-70% minder verspilling mogelijk is. Restaurants zullen hun strategie willen heroverwegen na de heropening (vanwege Covid-19). Hiervoor is een samenwerking gestart met Greendish en het adviestraject Restaurants van Morgen in voorbereiding genomen.

3. Food Rescue Center

In dit traject wordt er gekeken hoe horecarestaurants meer gebruik kunnen maken van 'geredde verswaren' in hun menu's en hoe zij gebruik kunnen maken van imperfecte producten (bijv. uiterlijke kenmerken van groente/fruit). Dit is een initiatief van InstockMarket.nl en samen met de organisatie DutchCuisine wordt beoogd de chefs in de restaurantkeukens tot minder verspilling te laten komen.

4. Promotie ondernemers initiatieven met restant verswaren

Promotie van producten (zoals bier uit aardappelen & brood en bitterballen gemaakt van oesterzwammen gekweekt op koffiedik) via het platform Made in Amsterdam, Kitchen Republic en Instock.nl en InstockMarket.nl.

5. Promotie foody bag

Promotie van de foody bag, voorheen de doggybag.

6. 'Verspil mij niet bak' in supermarkten

In een 'verspil mij niet' bak worden producten geplaatst met korting omdat het product tegen de uiterste houdbaarheidsdatum aanloopt of het product uit het assortiment wordt gehaald.

7. Leren koken met producten van de voedselbank

De retailsector, restaurants en marktkooplui distribueren hun overschotten aan bezoekers van de Voedselbank. Dit draagt in belangrijke mate bij aan het voorkomen van voedselverspilling. Kookcursussen met de aangeboden producten kunnen voorkomen dat er thuis niet alsnog voedsel wordt weggegooid, aangezien veel mensen niet weten hoe ze bepaalde producten moeten verwerken.

8. Onderzoeksprogramma's preventie van voedselverspilling en hergebruik

In samenwerking met kennisinstellingen in Amsterdam zullen nieuwe onderzoeksprogramma's van landelijke en internationale trajecten naar preventie van voedselverspilling en hergebruik worden gestart.

9. Support your locals

Lokale initiatieven van producenten die normaliter aan de (tijdelijk gesloten i.v.m. Covid-19) horeca leveren gebundeld in een landelijke handelswebsite waar consumenten kunnen bestellen voor thuislevering.

10. Slow Food Youth Network

Een samenwerking met dit netwerk, waarvan de Amsterdamse afdeling van deze internationale jongerenorganisatie zich inzet tegen voedselverspilling met het organiseren van de World Disco Soup Day.

11. Boeren voor Buren

Dit project wil een verbinding leggen tussen regionale productie en consumptie. Dit is een eerste pilot binnen het Korte ketens project, waarin Amsterdam en partners een kort lijn opzetten van boeren met voedseloverschotten en B-keuze producten uit de regio naar Amsterdammers een kleine beurs.

Q6 Er werd u in de eerste enquête gevraagd om suggesties te geven voor toekomstig beleid om voedselverspilling te voorkomen. Deze suggesties zijn geanalyseerd en degene met de meeste potentie zijn toegevoegd, zodat andere respondenten uw suggestie(s) ook kunnen beoordelen. Er is een selectie gemaakt van uw anti-voedselverspillingsbeleid suggesties.

Op een schaal van 1-7 hoe effectief schat u deze initiatieven en activiteiten in?

Effectiviteit wordt in dit onderzoek beoordeeld als 'in welke mate het voorkomen van voedselverspilling in de gemeente Amsterdam toe te schrijven is aan het gevoerde beleid en de daarbij ingezette beleidsinstrumenten?'.

Ronde 2: Effectiviteit								Opmerkingen
	1 Zeer ineffectief	2 Ineffectief	3 Redelijk ineffectief	4 Neutraal	5 Redelijk effectief	6 Effectief	7 Zeer effectief	
Kookprogramma met restjes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Duurzaam inkopen MVO	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
THT bewustzijn	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Onderzoek en financiering verwaardingsfabriek	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	
Bewustzijn consumenten & voedselprijs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	

Uitleg beleidsinstrumenten:

1. Programma koken met restjes

Een programma (Nederland eet restjes bijv.) gericht op koken met leftover en kneusjes. In dit programma kan de nadruk worden gelegd op 'lekker' in plaats van op 'verspilling' en het bevat tips over eten langer goed houden.

2. Duurzaam inkopen in MVO beleid

Aandacht voor voedselverspilling meenemen in duurzaam inkopen van overheden. Dit kan ook worden opgenomen in het MVO-beleid van organisaties en bedrijven. De overheid kan een trekker zijn, door dit op te nemen in de voorwaarden van commerciële cateraars.

3. Bewustzijn THT op verpakking vergroten

Bewustwording creëren dat de THT datum niet de datum is dat een product niet meer geschikt is voor consumptie. Bewaarinstructies op een verpakking en bewustzijn bij consumenten hoe ze een product kunnen beoordelen op geschiktheid voor consumptie is hierbij van belang.

4. Verwaardingsfabriek

Onderzoek naar de verwaarding van restproducten en tegelijkertijd financiering voor de implementatie van deze verwaardingsfabriek. In een verwaardingsfabriek worden reststromen uit voedingsindustrie weer verwerkt tot ingrediënten.

5. Bewustzijn consumenten & voedselprijs

Door middel van thema's of acties de consument bewuster laten worden over voedselverspilling. Daarnaast moeten consumenten zich bewust worden dat prijsconcurrentie verspilling in de hand werkt. Consumenten en

supermarkten hebben vaak de mindset dat voedsel zo goedkoop mogelijk moet zijn. In een eerlijke prijs zouden de productie en transportkosten zijn doorbelast.

Q7 Bent u geïnteresseerd in de resultaten van dit onderzoek, vul dan in onderstaand tekstvak 'ja' in. Eventuele vragen of opmerkingen kunnen hier ook terecht.

Daarnaast wil ik u hartelijk bedanken voor uw medewerking in dit onderzoek!
Ik ben ook te bereiken op annabel.oosterwijk@wur.nl

APPENDIX 3 ROUND 1 38 RESPONDENTS VS 21 RESPONDENTS

Policy instrument	Median 38 respondents	Median 21 respondents	IQR 38 respondents	IQR 21 respondents	Mean 38 respondents	Mean 21 respondents	Standard deviation 38 respondents	Standard deviation 21 respondents
Fast food food waste and packaging (1)	4,0	4,0	1,0	1,0	4,3	4,4	1,1	1,2
Dynamic pricing (2)	6,0	5,0	1,0	2,0	5,4	5,2	1,0	1,1
Food Centre against food waste (3)	5,0	5,0	2,0	2,0	4,6	4,8	1,3	1,4
Buurtbuik (4)	5,0	4,0	3,0	3,0	4,5	4,5	2,0	1,9
Amsterdam waste-free (5)	4,0	4,0	1,0	2,0	4,2	4,0	1,3	1,3
Waste-free week (6)	5,0	5,0	1,0	1,0	4,6	4,7	1,0	1,0
Research into 'avoidable waste' (7)	5,0	4,0	1,0	1,0	4,6	4,4	1,3	1,1
Amsterdam Foodcapital (8)	4,0	4,0	2,0	2,0	4,0	3,9	1,4	1,3
Collaboration Koninklijke Horeca NL (9)	5,0	5,0	2,0	2,0	4,9	4,9	1,4	1,5
Food Rescue Centre (10)	5,0	5,0	2,0	0,0	4,9	4,9	1,1	0,9
Promotion entrepreneurial initiatives with leftover fresh produce (11)	5,0	5,0	1,0	1,0	4,6	4,4	1,1	1,2
Promotion foody bag (12)	5,0	5,0	2,0	2,0	4,8	4,7	1,2	1,4
'Don't waste me' bin in supermarkets (13)	6,0	5,0	1,8	2,0	5,2	5,1	1,4	1,3
Learning to cook with products from the food bank (14)	5,0	5,0	1,0	2,0	4,8	4,8	1,1	1,1
Research programs of national and international pathways to the prevention of food waste and reuse (15)	5,0	5,0	1,0	1,0	4,8	4,6	1,2	1,2
Support your locals (16)	5,0	5,0	2,0	2,0	5,0	5,0	1,4	1,6
Slow Food Youth Network (17)	5,0	5,0	1,0	1,0	4,5	4,5	1,2	1,4
Boeren voor Buren (18)	6,0	6,0	1,0	1,0	5,4	5,7	1,3	1,4

APPENDIX 4 DROP-OUT PERCENTAGE⁴

Stages FSC and type of stakeholder	Respondents round 1	Respondents round 2	Drop-out percentage
Civil society	27	19	30%
Knowledge transfer	17	10	41%
Partnership	5	5	0%
Market	34	19	44%
Primary production	7	5	29%
Processing	7	4	43%
Distribution	5	3	40%
Retail	11	6	45%
Consumption	11	7	36%
Waste	5	2	60%
Government	3	2	33%
Governance	3	2	33%
Total	38	21	45%

⁴ Stakeholders can be part of several stages in the FSC and/or types of stakeholders and therefore the amount of stakeholders per stage in the FSC and/or type of stakeholders does not add up to the total amount of stakeholders participating in this study.

APPENDIX 5 POLICY SUGGESTIONS BY STAKEHOLDERS

Policy suggestions			
Afvaltarieven voor supermarkten	De rol van supermarkten richting consumenten, zij kunnen het gedrag van consumenten directer en wellicht sneller beïnvloeden. Maar misschien moeten we het huidige concept supermarkt wel opnieuw uitvinden, waarbij de hele keten anders wordt en het aanbod, verpakkingen etc..	Geef boetes voor het weggooien van voedsel aan supermarkten en restaurants, werk aan nog meer dynamische prijsstelling, werk aan een bewustzijn dat het niet per se gewenst is dat alles altijd verkrijgbaar is. Laat prijzen van voedsel ook weerspiegelen wat de productie en transportkosten zijn - belast dat door.	Producenten en supermarkten stimuleren om minder te produceren, bv door hoge afvaltarieven
Supermarkten verplichten iets maatschappelijks te doen met overgebleven spullen	Verplicht groothandels en supermarkten om iets nuttigs en maatschappelijks te doen met hun overgebleven spullen. Er zijn genoeg organisaties (taste before you waste, guerilla kitchen, buurtbuik, etc.) die zich vrijwillig inzetten om dit voedsel weer uit te delen aan hongerige Amsterdammers.		Groothandels zouden een convenant moeten tekenen waarin ze aangeven hun derving aan te bieden aan lokale organisaties, zij doen een contributie aan lokaal werkende organisaties of steunen hen om hun derving te verwerken en om bewustwording rond voedsel en voedselverspilling te voorkomen, in het speciaal bij kinderen.
Samenwerken	Ik weel heel graag lokaal assortiment aanbieden maar ik weet niet wat het aanbod is. Zou dit niet georganiseerd kunnen worden. Een online groothandel waar lokale aanbieders hun producten op kunnen zetten zodat ik als supermarkt bij hun kan inkopen.	Heel lokaal - bijvoorbeeld op wijk of buurtniveau - een pilot uitzetten waar alle stakeholders die in het tegengaan van voedselverspilling een rol hebben of kunnen nemen - in samenwerking een plan opzetten. Supermarkt, actieve bewoners en bewonersorganisatie, lokale boeren / tuinders / andere leveranciers - stadsdeel en horeca. Zal heel inspirerend werken en leerzaam zijn voor andere delen van Amsterdam en betrokkenen.	Ga vooral te rade bij mensen die reeds initiatieven ondernemen zoals Food Circle (Coby Babani), Taste before You Waste (Sophia Lee-Bensch), Kaskantine (Menno Houtstra) en Sapiant Social and Environmental Solutions (Coby Babani). Initiatieven bundelen
Onderzoek verwaarding	Onderzoek naar verwaarding van restproducten en tegelijkertijd implementatie van deze resultaten in de bedrijven of bij de consumenten. Aan de implementatie en valorisatie van de onderzoeksresultaten ontbreekt het nog al eens. De ideeën zijn goed en de resultaten veelbelovend, maar de implementatie en realisatie blijft achter of gebeurd niet. Vooral HBO en MBO opleidingen zijn uitermate toegerust om te helpen om de resultaten van het onderzoek te implementeren en toepasbaar te maken. Bij elk project zou een HBO opleiding betrokken moeten zijn.		

Programma koken met restjes	At5 programma a la binnenste buiten en dan qua koken gericht op koken met leftovers en kneusjes		De nadruk meer leggen op 'lekker' dan op 'verspilling' . Ik bedoel hiermee dat door te laten zien (en laten proeven) dat restjes lekker zijn (en geen armoe) krijg je mensen volgens mij eerder mee. Kookprogramma's kunnen helpen. Nederland eet restjes... Leuk programma denk ik.			Het is voor veel mensen een kwestie van tijd. Als foodcoop klant ben ik net als andere leden heel bewust bezig met voorkomen van verspilling, maar vaak bestel ik meer dan ik kan koken. Dus mijn kookambities zijn altijd net iets groter dan wat realistisch is. Dus in een drukke week gaat er nogal eens iets naar de composthoop. Tips over eten (vooral groente) langer goed houden zijn handig. Niet iedereen heeft plek of geld voor een grote vriezer.	
Bewustzijn voedselprijs	om verspilling tegen te gaan zouden we eens af moeten van het idee dat voedsel zo goedkoop mogelijk moet zijn. in Nederland gaan reclames van supermarkten alleen maar over prijsconcurrentie. dat is slecht voor duurzaamheid van productie, slecht voor boeren en bevordert de verspilling.			Geef boetes voor het weggooien van voedsel aan supermarkten en restaurants, werk aan nog meer dynamische prijsstelling, werk aan een bewustzijn dat het niet per se gewenst is dat alles altijd verkrijgbaar is. Laat prijzen van voedsel ook weerspiegelen wat de productie en transportkosten zijn - belast dat door.			
Bewustzijn consumenten	Verkoop van producten in verschillende hoeveelheden aanbieden Kennis vergroten bij mensen over voedselverspilling	Neem bewoners mee in de niveaus van valorisatie van overschot van eten/voedsel bij kinderen.	In mijn ogen is de allerbelangrijkste schakel in verspilling de denk wijze van de consument. verwachtingen van altijd kunnen krijgen wat je wil op het moment dat je het wil leiden hoe dan ook tot verspilling. bedrijven kunnen niet te vaak nee verkopen dat accepteert de klant niet. hergebruiken van product is vaak	Meer en meer wordt gegeten op het werk. Via Inkoop en de manier van werken in de kantine (moet er altijd iets beschikbaar zijn of klaar maken op bestelling aan het einde van de lunch) Dit vraagt om aanpassing van de catering contracten. Betrekken van de burger via prijsvragen	Data van bepaalde producten weghalen, zulke definitieve data laat de consument schrikken waardoor ze het weggooien. Leer mensen op reuk en smaak te vertrouwen	Bij ons in de winkel hebben wij het thema samen minder verspillen. Deze slaat ontzettend aan.	Ik geloof dat het meeste voedsel wordt verspild bij de consument thuis. Dus ik denk dat informeren via meerdere kanalen (in supermarkten, op tv, bushokjes, radio, social media, etc) goed

			<p>economisch niet haalbaar en bij vooral start ups die dat wel doen wordt het tijd gesubsidieerd en betaald door investeerders omdat het hip is maar levert niets op. en dat is dan weer lastige concurrentie voor de echte bedrijven.</p>	<p>e.d Grootste verspilling zit bij de burger. Stimuleren dat burgers die iets over hebben het aan de burens / buurt kunnen geven. Simple apps (zijn er al) maar stimuleren. heeft ook positieve werking op sociale cohesie. Wegnemen belemmeringen vanuit voedselgereguleerders.</p>	<p>i.p.v. een inktvlek.</p>	<p>kan werken. Acties om de consument bewust te maken.</p>
Beloning bedrijven	<p>Instellen van prijs voor bedrijven die voedselverspilling met x procent omlaag hebben gekregen. Ik denk als iets aan de lean en green award uit de logistiek maar dan voor bijvoorbeeld restaurants of winkels.</p>					
Financiering verwaardingsfabriek	<p>Het mede financieren van een verwaardingsfabriek voor reststromen uit de agri en ingrediënten industrie. In Noord-Holland komt jaarlijks 140.000 ton ofwel 30 vrachtwagens per dag aan foodgrade materiaal beschikbaar dat nu wordt verbrand, gecomposteerd of aan diervoeding weg gaat. Dat materiaal is op te werken naar ingrediënten die weer in levensmiddelen verwerkt kunnen worden. Businessplan is klaar , financiering ontbreekt</p>					
Subsidies goede initiatieven	<p>Korte ketens bevorderen door middel van subsidies voor experimenterende initiatieven die nieuwe vormen van boer-burger samenwerking opzetten en testen.</p>					
GFT bak Amsterdam	<p>Voer vanaf nu een groene bak in Amsterdam. Hiermee kun je de reststromen verwaarden en creëer je aandacht voor de problematiek.</p>					
Monitor	<p>Inzicht in gebruik en verbruik in de vorm van een lopende monitor</p>					
Duurzaam inkopen opnemen in MVO beleid	<p>Aandacht voor voedselverspilling meenemen in duurzaam inkopen van overheden en aanbevelen om te laten opnemen in het MVO-beleid van organisaties en bedrijven - zelf het goede voorbeeld geven in je eigen organisatie. Dit ook oppakken met de cateraars, van groot tot klein. De grote (caterars van expo's, vliegtuigmaatschappijen enz) voor het effect, kleine cateraars voor de bewustwording van de inkopers.</p>		<p>Overtollig voedsel verwerken tot kant-en-klare producten of halffabricaten is goed centraal schaalbaar mits de afzet gegarandeerd is. Het is onderzoeken waard om met grote landelijke partijen te kijken hoe we hier een minimale afzet kunnen garanderen. De overheid kan daarvoor trekker zijn door bijvoorbeeld in de tenders naar de commerciële cateraars hier voorwaarden in op te nemen. Ook door gevangenissen, kazernes etc. te verplichten producten af te nemen van producenten die reststromen verwerken tot producten. Belangrijkste te tackelen probleem/dilemma: logistiek. Want van decentraal naar centraal om te verwerken en daarna weer naar decentraal voor consumptie gaat in tegen de ultieme korte-keten-gedachte.</p>			

Bewustzijn THT/verpakking	<p>Een belangrijk item in voedselverspilling is de definitie van houdbaarheid, Bewustwording dat THT een tenminste houdbaar tot datum is en niet de datum dat een product niet meer geschikt is voor consumptie. Voedselproducenten kunnen daar een grote rol in spelen door duidelijk op hun verpakking aan te geven hoe daarmee verstandig om te gaan. Bewaarinstructies mits goed gevolgd kunnen de houdbaarheid verlengen. Daarnaast is het zaak om de consument te leren hoe ze een product kunnen beoordelen als de THT versteken is.</p> <p>Vanuit ons bedrijf werken we nauw samen met een aantal maatschappelijke instellingen als, daklozenopvang .https://www.deregenboog.org/ en https://sorgbasis.nl/ Producten die dicht tegen of op de THT datum zitten zijn daar zeer welkom. Helaas kunnen we vanuit een commerciële basis waarbij we moeten zorgen dat onze klanten altijd kunnen vinden wat ze zoeken niet voorkomen dat er producten zullen zijn die niet meer verkoopbaar zijn. Wat we wel kunnen voorkomen is dat ze weggegooid en vernietigt worden</p>	<p>Kijken naar de verpakking van producten, en beter afstemmen op de aankoop van de burger</p>	<p>Communicatie over betekenis van TGT en THT aanduiding, simpele tests of checks om te bepalen of voedsel nog veilig</p>
Blockchain	<p>Blockchain invoeren, dan is voor iedereen duidelijk waar het voedsel blijft en wat de prijs is. Bovendien kan met Blockchain naar een eerlijke prijs worden gestuurd...</p>		

APPENDIX 6 DEFINITION EFFECTIVENESS BY STAKEHOLDERS

Definition effectiveness
Wanneer een aanzienlijk deel van het doel dat het beleid zich gesteld heeft wordt behaald
Zo min mogelijk weg gooien
Wanneer het gedrag van consumenten en anderen in de voedselketen zo verandert dat er minder voedsel verspild wordt.
Beleid is effectief indien het een meetbare impact heeft hetzij kwantitatief (minder verspilling) of kwalitatief (meer aandacht op social media)
Als de doelstelling wordt bereikt zonder dat er schadelijk neveneffecten ontstaan, zoals extra CO-2 uitstoot of hoge kosten voor burgers
ik snap de vraag niet
Als we (de Green Office) een impact kunnen oefenen op de manier van omgaan met voedsel aan de UvA. Als we de keuzes van de universiteit kunnen beïnvloeden zodat we bijdragen tot een duurzamer toekomst.
Als het effect heeft
Dat het leidt tot minder voedselverspilling zodanig dat aan de productiezijde minder grond voor landbouw nodig is/ incentives om meer grond in gebruik te nemen verminderen.
Als in de komende jaren voedselverspilling van boeren, groothandels, restaurants en consumenten naar beneden gaat. Bij groothandels kan voedselverspilling vrij makkelijk zeker 50% naar beneden, bij consumenten met heel veel moeite , maar het effect op bredere bewustwording is groot
Naar behoefte telen
Als het de gestelde doelen behaalt
Als het doel van het beleid binnen de vastgestelde termijn wordt behaald.
Als het steunend is in het tot stand komen van individuele projecten geen geld op zoek naar projecten maar projecten helpen aan geld
Ideaal: Als aan het eind van gehele voedselketen 100% van de gekweekte/verbouwde ingrediënten wordt geconsumeerd door vooraf bestemde doelgroep. Praktisch: 100% van ingrediënten uit voedselketen wordt geconsumeerd.
indien doelen en acties begrijpelijk en uitvoerbaar zijn en op voldoende draagvlak kunnen rekenen
Ik ken de instrumenten onvoldoende
Als partners zoals de lokale supermarkt, gemeente, scholen en bewonersorganisaties besluiten echt samen te werken en impact te hebben met ambitieuze doelstellingen.
Dit vind ik een erg moeilijke vraag. Ik weet niet veel van overheidsregelingen m.b.t. voedselverspilling, daarom proberen we er zelf wat aan te doen. Ik denk wel, dat als er een beleid is, dat de meeste Amsterdammers zich daar niet bewust van zijn.
Effectief is het als er een meetbare verschuiving waar te nemen is in de resultaten van het voorkomen van voedselverspilling.
x

APPENDIX 7 RESULTS ROUND 1 AND ROUND 2⁵

Round 1 to round 2	Policy instrument	Median round 1	Median round 2	IQR round 1	IQR round 2	Mean round 1	Mean round 2	Standard deviation round 1	Standard deviation round 2
Stable	Fast food food waste and packaging (1)	4,0	4,0	1,0	1,0	4,4	4,4	1,2	1,0
	Dynamic pricing (2)	5,0	5,0	2,0	2,0	5,2	4,9	1,1	1,4
	Waste-free week (6)	5,0	4,0	1,0	1,0	4,7	4,2	1,0	1,2
	Research into 'avoidable waste' (7)	4,0	5,0	1,0	1,0	4,4	4,6	1,1	0,9
	Amsterdam Foodcapital (8)	4,0	4,0	2,0	2,0	3,9	4,0	1,3	1,2
	Collaboration Koninklijke Horeca NL (9)	5,0	5,0	2,0	2,0	4,9	5,3	1,5	1,0
	Promotion foody bag (12)	5,0	5,0	2,0	2,0	4,7	4,9	1,4	1,2
	Research programs of national and international pathways to the prevention of food waste and reuse (15)	5,0	5,0	1,0	1,0	4,6	4,9	1,2	0,8
	Support your locals (16)	5,0	5,0	2,0	2,0	5,0	4,9	1,6	1,4
	Slow Food Youth Network (17)	5,0	5,0	1,0	1,0	4,5	4,4	1,4	1,0
Convergence	Food Centre against food waste (3)	5,0	5,0	2,0	1,0	4,8	4,8	1,4	0,9
	Buurtbuik (4)	4,0	5,0	3,0	1,0	4,5	4,7	1,9	1,2
	Amsterdam waste-free (5)	4,0	4,0	2,0	1,0	4,0	4,1	1,3	1,0
	'Don't waste me' bin in supermarkets (13)	5,0	6,0	2,0	1,0	5,1	5,4	1,3	1,2
	Learning to cook with products from the food bank (14)	5,0	5,0	2,0	1,0	4,8	4,6	1,1	0,7
Divergence	Food Rescue Centre (10)	5,0	5,0	0,0	2,0	4,9	5,1	0,9	0,8
	Promotion entrepreneurial initiatives with leftover fresh produce (11)	5,0	5,0	1,0	2,0	4,4	4,7	1,2	1,2
	Boeren voor Buren (18)	6,0	5,0	1,0	2,0	5,7	5,0	1,4	1,4

⁵ In bold: consensus statements

APPENDIX 8 COMMENTS OF STAKEHOLDERS PER POLICY INSTRUMENT

Fastfood voedselverspilling en -verpakkingen (1)						
Geen idee wat de aanpak is	x	Hier valt naar mijn idee nog veel winst te behalen	Veel klanten en ondernemers zijn er rijp voor	Kan effectief zijn omdat je met partijen om de tafel kunt gaan zitten	Het project is nog niet opgezet	Fastfood ketens zijn best grote bedrijven, dus daar kan veel verpakking bespaart worden.
x	x	Niet zo duidelijk hoe hier de gemeente een rol kan spelen?	x	Dit is erg moeilijk in te schatten omdat ik alle initiatieven niet ken.	Wordt hier veel voedsel verspild?	x
De beloning voor fastfood-bedrijven is te klein. Marges zijn groot.	Enkele grote spelers, indien bereid grote stappen te zetten	Valt veel te winnen	Daar is veel winst te halen	Verpakkingen zijn een ander probleem dan voedselverspilling. Ik zie de correlatie niet echt.	x	x
Dynamische prijsstelling (2)						
Mits voldoende communicatie leidt tot voldoende extra belangstelling voor het product	x	x	Goede kans van slagen indien goed wordt uitgelegd	De huidige stickers in supermarkten lijken te werken	De gemeente stimuleert dit maar de ondernemers moet dit uitvoeren. Wij zijn afhankelijk van hun data en effectiviteit	x
x	x	Niet zo duidelijk hoe hier de gemeente een rol kan spelen?	x	Dit is erg moeilijk in te schatten omdat ik alle initiatieven niet ken.	x	
x	Win-win-win situatie op moment van aankoop.	Prijs is voor veel consumenten leidend	Als instrument tegen voedselverspilling goed, mits niet de producent, maar de super de korting betaalt	Vraagt extra investering supermarkt, maar zal ook in haar voordeel zijn	Dit gaat werken. Iets met gierige Nederlanders.	x
Food Center tegen voedselverspilling (3)						

Ik snap de winst nog niet - wel als afzet/inkoop/verspilling via slimme datakoppeling beter op elkaar wordt afgestemd en dan nog eens met duurzame logistiek wordt benut	x	Valt nog veel winst te behalen	Kansrijk mits goed aangepakt	Dit heeft andere voordelen misschien maar ik zie de link met verspilling niet	Dit project kan bestaan uit meerdere uitwerkingen	x
x	x	Vervoer is niet het struikelblok bij de groothandels: maar verkeerde bestellingen en ontbreken van capaciteit om on of moeilijk verkoopbaar voedsel verder te distribueren	x	Dit is erg moeilijk in te schatten omdat ik alle initiatieven niet ken.	x	x
Korter en dichterbij = sneller en gaat langer mee. Plus trots op producten en daardoor voelt slechter om weg te gooien.	Mogelijk meer relevant voor andere doelstellingen	Ambtelijk, log	Minder kilometers is altijd beter	Begin bij de bron. Haal het voedsel niet van ver weg als het ook van dichtbij kan komen. Geef subsidie aan lokale producten zodat ze de concurrentie aan kunnen met basilicum Kenia	x	x
Buurtbuik (4)						
Mits goede logistiek snijdt het mes hier aan vele kanten! Plus wordt gedragen door bewoners en participerende bedrijven.	X	Supergoed initiatief, maar het draagt niet veel bij aan de bewustwording van voedselverspilling	Zet niet veel zoden aan de dijk, wel sympathiek	Deze initiatieven bereiken 100% het doel	Het is effectief maar gehinderd door gebrek aan voedseloverschot van de horeca	Super goed, ik denk dat zulke dingen al bestaan zoals Taste Before You Waste, maar er kan altijd nog meer eten gered worden!

X	X	Buurtbuik is slechts een van de "ophalers". De gemeente zou in iedere wijk plekken moeten bieden om derving te verwerken aan buurtbewoners	x	Dit is erg moeilijk in te schatten omdat ik alle initiatieven niet ken.	Super initiatief! Maar niet voor massa denk ik.	X
Te veel logistieke uitdaging voor een al kant en klaar product.	Effectief maar wel veel inzet nodig	Sympathiek, maar marginaal	Veel kleine initiatieven maar 1 grote. Blijft dicht bij de buurt en de bewoner en daarmee zeer waardevol voor bewustwording en gedragsverandering	Bij projecten zoals deze snijdt het mes aan meerdere kanten. Goed tegen armoede, goed tegen eenzaamheid, en zeker ook goed tegen voedselverspilling.	X	X
Amsterdam verspillingsvrij (5)						
Lijkt me heel veel gevraagd van de inwoners en teveel onderlinge sociale druk opleveren	X	Als hier een goede campagne met praktische tips voor thuis omheen zit: zou effectief kunnen zijn!	Voorbeeldwerking belangrijk	Deze laatste drie zijn bewustwordingsinitiatieven , waarvan ik niet kan zeggen of ze effectief gaan zijn	Het project is uitgesteld vanwege corona	Ik denk dat een hele stad verspilling-vrij te maken is onmogelijk.
X	X	Schoolprogramma's ontwikkelen	X	Dit is erg moeilijk in te schatten omdat ik alle initiatieven niet ken.	Goede pilot, maar moeilijk opschaalbaar in alle wijken.	X
Afhankelijk van hoe?	X	Sympathiek, marginaal, risico groot dat het niet opschaaft	Voorbeeldfunctie	Campagnes zullen wel werken denk ik.	x	x
Verspillingsvrije week (6)						

Goed voor bewustwording en uitproberen van nieuwe business/gedragsopties . Vraag is wel of het beklijft	x	Concepten als dit (week zonder vlees, stoptober, dry january) werken naar mijn idee vaak goed	Korte termijn werkt minder goed	x	Het beoogde bereik van schoolkinderen en hun ouders/verzorgers is behaald	Communicatieprogramma's bereiken vaak alleen jongere mensen, die meestal meer bewust zijn van voedselverspilling, milieu etc. ie. Communicatie campagnes bereiken niet de mensen die nog meer zouden kunnen doen aan minder voedsel te verspillen.
x	x	Kan een kleine impuls geven	x	Dit is erg moeilijk in te schatten omdat ik alle initiatieven niet ken.	Goed initiatief voor bewustwording, maar bereikt niet de massa	x
Afhankelijk van hoe?	x	Goed idee	Statement	Campagnes zullen wel werken denk ik.	x	x
Onderzoek naar 'te vermijden verspilling' (7)						
Onderzoek is zeker zinvol, de vraag is of vervolgens vanuit gemeente naar bewoners communiceren voldoende effectief kan zijn.	x	x	Meer iets van lange adem	x	De aanvraag voor een pilot is nog niet gehonoreerd	x
x	x	De gemeente moet laten onderzoeken hoe ze de sector kan dwingen maatregelen te nemen, bv door hogere afvalbelasting	x	Dit is erg moeilijk in te schatten omdat ik alle initiatieven niet ken.	x	x
Inzicht in eigen handelen is beste	x	Dat moet sowieso eerst gebeuren.	Veel werk	Onderzoek is altijd goed.	x	x

argument voor verandering.		Want waar hebben we het eigenlijk over?				
Amsterdam Foodcapital (8)						
Moet gebeuren, ondersteunt de rest	x	x	Mooi initiatief, moet kans krijgen	Misschien op langere termijn	Dit is nog niet gestart	x
x	x	Dit is voornamelijk green washing. Het Food Center heeft zich altijd verweerd tegen acties tegen voedselverspilling. 80% van de ondernemers staan hier zelfs openlijk vijandig tegenover	x	Dit is erg moeilijk in te schatten omdat ik alle initiatieven niet ken.	x	x
Kennis + trots = macht en investeringsbereidheid	Goed initiatief, niet specifiek voedselverspilling	Al deze ideeën acht ik effectiever dan de vorige categorie. Pakken het probleem bij de wortel aan	Goed om je te positioneren	Lijkt me loze marketing. Vind het al een kuttitel.	Veranderpotentie op grote schaal	x
Samenwerking Koninklijke Horeca Nederlands (9)						
Goed plan om met de branche op te pakken	x	x	Die zijn er rijp voor	Kan veel effect hebben door de schaalgrootte	Het contact en de wens tot samenwerking is groot maar de horeca is dicht	x
x	x	Dit is voornamelijk green washing. Het Food Center heeft zich altijd verweerd tegen acties tegen voedselverspilling. 80% van de ondernemers staan	x	Dit is erg moeilijk in te schatten omdat ik alle initiatieven niet ken.	x	X

		hier zelfs openlijk vijandig tegenover				
Is direct zichtbaar in de businesscase.	Goed dat overweging ondernemer wordt genomen als uitgangspunt	Al deze ideeën acht ik effectiever dan de vorige categorie. Pakken het probleem bij de wortel aan	Horeca ondersteunen zal werken	Het lijkt me dat consumenten graag een kromme komkommer willen eten. Kijk maar naar het succes van Instock.	Bewustwording	x
Food Rescue Center (10)						
Educatie en opleiding van bewustere koks is goede zaak en zal op lange termijn effectief kunnen zijn.	x	x	2, 3 en 4 zit in dezelfde hoek	Lijkt me op wat beperktere schaal effect te hebben	Het contact en de wens tot samenwerking is groot maar de horeca is dicht	x
x	x	Hier kan zeker laaghangend fruit worden geoogst	x	Dit is erg moeilijk in te schatten omdat ik alle initiatieven niet ken.	x	x
Betere businesscase.	Belangrijke doelgroep	Al deze ideeën acht ik effectiever dan de vorige categorie. Pakken het probleem bij de wortel aan	Goed om uit te proberen	Zet die chefs maar aan het werk. Er mag echt wel anders naar eten worden gekeken in de horeca. (als een maatschappelijk probleem en niet als een olympische sport)	Economisch lastig	x
Promotie ondernemers initiatieven met restant verswaren (11)						
Waarschijnlijk voorlopig nog een niche, lange adem	x	x	x	Leuk, maar kleine schaal	Het contact en de wens tot samenwerking is groot maar de horeca is dicht	x
x	x	Hier kan zeker laaghangend fruit worden geoogst	x	Dit is erg moeilijk in te schatten omdat ik alle initiatieven niet ken.	x	x
Hoogstens symbolische en sympathieke waarde. Zet weinig	x	Al deze ideeën acht ik effectiever dan de vorige	Belang van goeie PR	Dit lijkt me aan de ondernemers zelf om reclame te maken voor	Creëert betrokkenheid	x

zoden aan de dijk qua massa.		categorie. Pakken het probleem bij de wortel aan		zichzelf. Het zijn meestal ook producten die gericht zijn op meer welgestelde Amsterdammers. Dit heeft geen zin om te promoten in geuzenveld.		
Promotie foody bag (12)						
Wanneer dit gemeengoed wordt zal minder worden weggegooid in restaurants (misschien kleiner deel alsnog thuis) Tenzij restaurants het afval nog circuleren, dan vind ik dat ook effectief.	x	x	Werkt in Haarlem	x	Het contact en de wens tot samenwerking is groot maar de horeca is dicht	x
x	x	Dit kan een trend worden	x	Dit is erg moeilijk in te schatten omdat ik alle initiatieven niet ken.	x	x
Kan een trigger zijn voor horeca om grotere porties te serveren. Verplaatsen van het probleem.	Simpel als kracht	Al deze ideeën acht ik effectiever dan de vorige categorie. Pakken het probleem bij de wortel aan	Zet weinig zoden aan de dijk denk ik, wel goed voor bewustwording	Wie wil er geen doggy bag? Hij heeft een beetje een cheap imago, maar gratis eten, daar heeft nog nooit iemand nee tegen gezegd.	Burger betrekken	x
'Verspil mij niet' bak in supermarkten (13)						
Alles wat daar nog goed terecht komt is meegenomen. Onderzoek wijst ws uit of deze bakken ook goed benut worden? Is	x	x	x	Werkt al wel, kan uitgebreid	Dit loopt al langer: wij hebben geen beschikking over data van supermarkten	x

dit te vergelijken met dynamisch prijzen?						
x	x	Krijgen supermarkten hier subsidie voor van de gemeente?	x	Dit is erg moeilijk in te schatten omdat ik alle initiatieven niet ken.	x	x
Ja, mits gepromoot en niet zielig.	Prijs is belangrijk stuurmiddel	Al deze ideeën acht ik effectiever dan de vorige categorie. Pakken het probleem bij de wortel aan	De 35% acties vind ik nu al heel goed	Maak het goedkoop en Nederlanders kopen het	Burger betrekken	x
Leren koken met producten van de voedselbank (14)						
Aanbieden van recepten, kook- en gezondheidseducatie voor klanten van voedselbank is sowieso een goed idee	x	x	x	Goed plan om meerdere redenen, maar lastige doelgroep, men heeft grotere problemen	Dit project moet nog worden gestart	x
x	x	Niet alleen de voedselbank: er zijn vele lokale voedselinitiatieven die hierin beter gesteund kunnen worden, de doelgroep van de voedselbank is klein en super moeilijk.	x	Dit is erg moeilijk in te schatten omdat ik alle initiatieven niet ken.	X	X
Kennisdeling!	X	Al deze ideeën acht ik effectiever dan de vorige categorie. Pakken het probleem bij de wortel aan	Zal zeker bijdragen	Kooklessen zijn heel handig, alhoewel er op Youtube natuurlijk van alles te vinden is. Misschien zou de voedselbank een eigen kanaal moeten beginnen.	x	x

Onderzoeksprogramma's preventie van voedselverspilling en hergebruik (15)						
Kan effectiviteit van Amsterdamse interventies versterken	x	x	Doorwerking van onderzoek duur lang	Lange termijn, effectiviteit moet blijken	Dit project moet nog worden gestart	x
x	x	Kijk eens naar wat burgerinitiatieven al doen tegen voedselverspilling en sluit daarop aan	X	Dit is erg moeilijk in te schatten omdat ik alle initiatieven niet ken.	X	X
Te vaag.	X	Al deze ideeën acht ik effectiever dan de vorige categorie. Pakken het probleem bij de wortel aan	Belangrijk	Onderzoek is altijd goed.	Metten is weten	x
Support your locals (16)						
Deze consumenten bestellen bewust, het scheelt verlies bij producent, is echter nog maar een niche. overigens is het weghalen van de tussenschakel tussen producent en consument sowieso een goede zaak tegen verspilling.	x	x	Werkt al	Zie het verband met voorkomen van verspilling niet	Hoge bekendheid gekregen tijdens corona, er zijn geen verzamelde data	x
x	x	Korte ketens is inderdaad effectief tegen voedselverspilling	x	Groot bereik netwerk	x	x
Sympathiek maar voor dit doel minder relevant.	x	Al deze ideeën acht ik effectiever dan de vorige	Biedt in winst op vele terreinen	Dat willen mensen wel. maar het moet wel goedkoop zijn	Meer korte keten	x

		categorie. Pakken het probleem bij de wortel aan				
Slow Food Youth Netwerk (17)						
Hm, geen idee wat daarvan te verwachten valt. Feel good, maar gering bereik	x	x	Sympathiek	Kleinschalig, beperkt bereik	Het project is afgelast vanwege corona	x
x	x	Slow food is sowieso een goede partner om bewustwording rond de kwaliteit van voedsel te promoten	x	Veel mobilisatie met spin-off	x	X
Jongeren betrekken.	x	Al deze ideeën acht ik effectiever dan de vorige categorie. Pakken het probleem bij de wortel aan	Doen!	Weet ik niet genoeg van	Awareness creëren	x
Boeren voor Buren (18)						
Zie 9 en 7: beter benutten van overschotten door mensen die het nodig hebben en dan ook weten hoe ze het kunnen gebruiken, dient meerdere doelen in 1 klap.	x	x	Heeft nut al bewezen	klinkt goed	Het project loopt, er zijn data beschikbaar over het bereik en het aantal vermeden kilo's voedselverspilling	x
x	x	Goede actie	x	Kleinschalig maar goed concept	x	x
Mits goed begeleid en in juiste	Unieke combinaties van	Al deze ideeën acht ik effectiever dan de vorige	Brengt op eenvoudige wijze boer en consument	Zal goed werken voor een bepaalde doelgroep	Fair pricing less waste	X

grootte/hoeveelheden. Dus geen bulk	gescheiden werelden	categorie. Pakken het probleem bij de wortel aan	bij elkaar en houdt het betaalbaar			
Kookprogramma met restjes (19)						
Zie ook 3 en 5. Ik denk niet dat een apart programma hierover echt werkt, maar dat het in lopende kookprogramma's terloops wordt meegenomen lijkt me veel effectiever.	x	Laagdrempelige manier om de consument te inspireren om te koken met restjes	Noem het dan geen restjes	Groot bereik	Afhankelijk van de kijkcijfers / vormgeving van het programma	Gandelingsperspectief voor individu
x	x	Als je dit op nationale tv doet, dat het normaal wordt, kan ik me voorstellen dat het wel effect kan hebben.	x	x	x	Groot bereik en aantrekkelijke boodschap
te kleinschalig	Leuk en leerzaam. Vooral angst en vooroordelen wegnemen.	Kookprogramma's zijn laagdrempelig	zal hebben, maar zie geen groot bereik	x	Gedragsverandering is moeilijk	x
Duurzaam inkopen MVO (20)						
Vanzelfsprekend moet aandacht voor voorkomen van verspilling deel uit maken van aanbestedingseisen bij duurzaam inkopen. Dwingt cateraars om hiervoor oplossingen te ontwikkelen	x	Goed om de overheid hier bij te betrekken	x	Schaalgrootte	Als dit verplicht wordt dan wordt het effectief	Wel risico van één van de vele criteria

x	x	Ik vraag me af of verspilling een thema is in duurzame inkoop	x	x	x	Mogelijk grote impact
Niet economisch haalbaar	Dat dit nog niet gebeurt!	Goed voorbeeld doet volgen, wellicht	Geeft de juiste selectie	x	Kleine groep, grote impact	x
THT bewustzijn (21)						
Ontbreken van kennis over THT en TGT ontbreekt en is oorzaak van veel verspilling bij consumenten. Kijk/Ruik/Proef moet worden toegevoegd.	x	x	Niet preken	Is al redelijk op weg	Dit vraagt wel om een uitgebreide media campagne	x
x	x	x	x	x	x	Mogelijk grote impact
THT is TENMINST houdbaar	Heel belangrijk! Grote winst te behalen. Vertrouwen winnen.	Dit ontbreekt nu, ik twijfel alleen of daar iets aan te doen is	Zal bijdragen	x	Duidelijke uitleg wenselijk	x
Onderzoek en financiering verwaardingsfabriek (22)						
Tuurlijk, dan worden reststromen echt circulair	x	ik denk dat verwaarding van reststromen veel voedselverspilling voorkomt!	x	Mag de industrie zelf financieren	Lijkt mij zinvol, als aanvulling / alternatief op vergisting	X
X	X	zo kunnen reststromen van de afvalbak worden gered	X	x	x	Financiering is vaak bottleneck, goed dat hiernaar gekeken wordt
140000 ton in NH	Als businesscase positief is met genoeg zeker potentiële afzet dan komt de	Geen verstand van zal bijdragen, maar zie meer in lokale initiatieven dan een grote fabriek	Zal bijdragen, maar zie meer in lokale initiatieven dan een grote fabriek	X	Lange weg	x

	industrie in beweging.					
Bewustzijn consumenten & voedselprijs (23)						
Bewustwording over omvang en voorkomen van voedselverspilling: JA, zie ook 1 en 3. Bewustwording effect Prijsconcurrentie is lastiger, te abstract. Liever communicatie over wat er in een eerlijke prijs meegenomen (moet) worden..	x	x	Preken helpt niet	Gaat voorbij aan budget van mensen	Vraagt om een uitgebreide langdurige media campagne, maar ook om landelijk belasting / btw beleid	Transparantie is cruciaal
x	x	Als voedsel duurder is, koop je minder snel te veel	X	X	x	Eerlijke prijzen zijn altijd een pré. Ik zie lastigheid in uitvoering ivm complexiteit keten
Gedragsverandering is uiterst moeizaam	Verbod op stunten met prijzen van voedsel (net als met alcohol).	Lijkt me enorm belangrijk	Zal veel vragen, maar zie daar wel de grootste winst	x	Aanbod aanpassen i.p.v. consument bewegen	x

