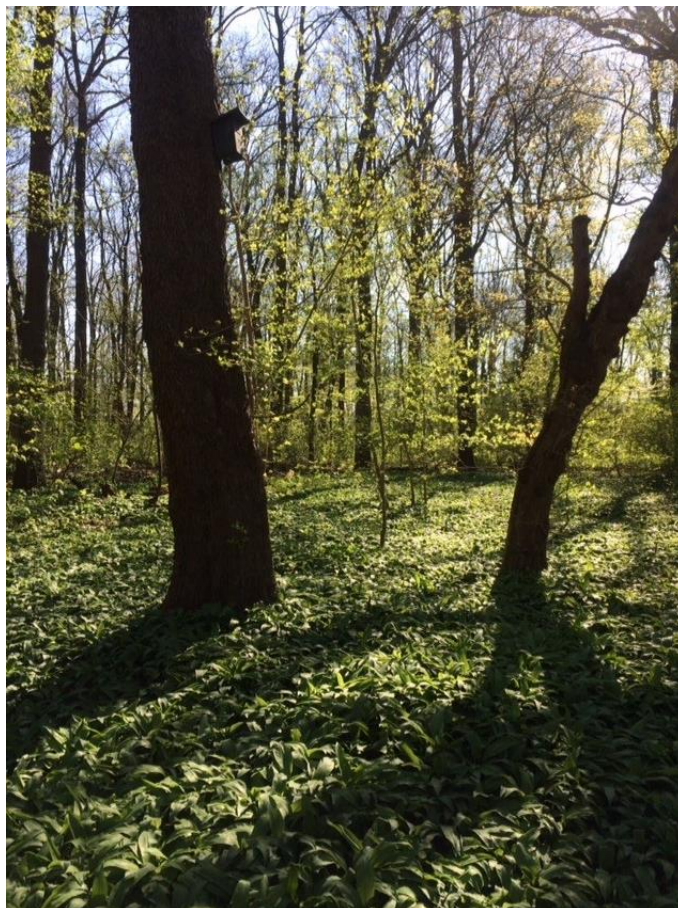


**Planning, management and urban food foraging in public green spaces –
A case study in Rotterdam**

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A field of wild garlic in Rotterdam. Source: Menke Groot Kormelink

To change life, we must first change space

-

Henri Lefebvre, 1991

Colophon

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Abstract

Urban foraging is a practice where people search for and harvest often edible plants and fungi. The practice is a phenomenon which occurs in different urban environments worldwide but is mainly left out in the planning and policy of the urban green space. The purpose of this research is to explore the practice of urban foraging and how the perspectives of planners and urban foragers are intertwined in their effect on the practice. This thesis makes use of quantitative methods which are semi-structured interviews and policy document analysis to analyse the different perspectives on urban green spaces. There is found that urban planners are not fully informed about the occurrence of urban foraging and what it exactly implies. They mainly focus on the aesthetic, recreational and biodiversity services of the public green space. No policy is created for the practice of urban foraging. Urban foragers, however, mainly use the provisioning services of public green spaces. They harvest for a variety of edible species in urban parks, but also planting strips, street trees and ornamental planting areas. These insights may help in strengthening the planning of public green spaces through also including the provisioning ecosystem service.

Key words: Urban foraging, urban planning, provisioning ecosystem services, Urban green space, Alternative food systems, Lefebvre, human-plant geographies

Summary

In most western cities, public urban green spaces are not designed to include food production because this is perceived to be located outside urban environments. But, unintentionally, planners have created public urban green spaces which contain a variety of edible species. There is a group of citizens who search for these species and harvest them to use as a source of food. This activity is part of a broader phenomenon called urban foraging. Urban foraging, also indicated as urban gathering or urban collecting, is a practice in which people gather products from the urban environment, these products can be wild plants fungi or animal resources and they are used for food, crafts, medicines and other purposes (McLain, 2014). This phenomenon has been studied in different cities and probably occurs in all urban setting worldwide.

Currently, this phenomenon is understudied in research and overlooked by planners in cities. In research, it is described that urban foraging can provide a variety of benefits to urban citizens, for example, it can strengthen the socio-ecological connection, it can be used as a source of food, and maintaining cultural identities. But, there are many aspects of urban foraging which remain unclear such as its consequences for food safety, nuisance, impact on biodiversity. How the urban green space is used by their citizens is affected by both urban planners and urban foragers. So, it is important to include both perspectives to understand the practice of urban foraging. The aim of this thesis is to assess how these groups are intertwined and how they influence the practice. The following research question is used to study this phenomenon: *How do different perspectives on the (use of) urban green space affect the practice of urban foraging?*

To answer this research question the physical space is looked upon through the urban ecosystem services framework. Especially the provisioning ecosystem service is perceived because urban foraging mainly falls under this practice. The social aspects are approached to the lens of Lefebvre through the production of space and the right to the city. The spatial triad is used to understand how the urban space is produced for and by urban foraging.

A case study approach is used, which is the city of Rotterdam, located in the Netherlands. This thesis has an explorative character because urban foraging is not studied yet in the Netherlands, and in general, relatively understudied from a planners perspective. Semi-structured interviews were held and policy documents were analyzed to answer the research question. To structure and analyze the data, the research software program ATLAS.ti was used.

The results showed that there is a difference in the knowledge of urban planners, policy makers and urban foragers about the practice of urban foraging. The urban planners are not well-known with the practice, they are focused on other aspects of the urban green space which are mainly increasing the biodiversity, providing recreational areas and creating an aesthetic appearance. Urban foragers have more specific knowledge about the different types of species which can be used as food and where these can be found in the urban environment. These insights may help urban planners to include all ecosystem services in the public green space and provide access to these spaces for all social groups. Because at the moment the provisioning ecosystem service is mainly located in private or semi-private spaces and therefore not equal accessible for every citizen.

Acknowledgement

During my master Urban Environmental Management I got interested in urban agriculture and how this is planned in the urban space. Another aspect of the urban environment that intrigues me is the public space. In the beginning of my thesis I tried to combine these two and this is how I ended up on the topic of urban foraging which was also new to me. During my thesis I explored a whole new way of planning the urban green space through urban foraging. Also, I became an urban forager myself.

In the first place I want to thank my supervisor Dr. Barbara Tempels for her helpful critique and feedback, advice, knowledge and her endless support throughout my whole thesis period. This was very valuable to me and without her supervision I could not have managed to create this thesis. Secondly, Alice Bischof for the time to discuss my thesis topic and input of ideas to use in my thesis. Thirdly, Dr. Francesco Orsi for taking the time to read, discuss and assess my thesis. At last, I would like to thank all of the interviewees for their time to answer my questions and discuss the topic of urban foraging. I learned a lot from their perspectives on urban foraging which I have used in this thesis so I was able to answer the research question.

I hope you enjoy reading this MSc thesis about urban foraging.

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1. Introduction

Most of the food which is consumed in cities is produced through global supply chains, but this is changing. The current food system, which has developed under capitalism, has created a disconnection between urban residents and their sources of food. This has been originated for a part from the dualisms which have been arisen between the urban and the rural environment, and ultimately between humans and nature. This affects the spatial ordering of food in which cities are detached from the production of food (Nyman, 2019). However, this process is changing as a countermovement of the capitalist food system there is a renewed interest in growing and producing urban food and it is getting more conventional as a source of food. As such there is a shift in the perception of cities as spaces also suitable for food production and not solely for food consumption. While this renewed interest in urban food production is mainly exemplified in urban farming initiatives, less attention goes out to the practice of food gathering in cities.

A great challenge for urban agriculture is to find a place where it can be situated because of land scarcity and a high competition for urban land. Also, urban agriculture is often located in spaces which are in a transition period such as brownfields. These spaces are designated by official planning and policy authorities and are only meant for temporal use. So, it is difficult for urban agriculture initiatives to survive as they are vulnerable for changes in the policy and planning of cities (Koopmans, Keech, Sovová & Reed, 2017). Urban agriculture is often realized in urban areas which are specifically designed for food production such as community gardens, allotments, urban farm, school gardens or rooftop gardens. It has different forms and occurs in different locations but the focus of these areas are mainly about the production of food.

However, green infrastructure which is not planned for food production can also provide a source for food (Baldermann et al., 2016). The existing green vegetation in cities already offers a variety of edible species. Leal, Alves and Hanazaki (2018) refer to these species as “unconventional food plants” as they are not common as a source of food. These green infrastructures are, in contrast to urban agriculture, open public spaces, and therefore free to enter for every citizen. This phenomenon has been documented in cities all over the world and is linked to the practice of urban foraging (Shackleton, Hurley, Dahlberg, Emery & Nagendra, 2017). The practice entails the gathering of products in public spaces in urban environments, mainly focused on food but also as a source of medicines and decorations. Besides plants and fungi, animal resources are also used through fishing and hunting in the urban environment (Poe, McLain, Emery & Hurley, 2013). While this re-emerging practice is getting more attention, most of the urban residents are not familiar with the concept of urban foraging and by the potential of green urban infrastructures as a source of food. Also, by most formal city authorities it is not recognized and noted as something to take into account (McLain et al., 2012).

As the practice of urban foraging is getting more popular among urbanists, there is a growing societal relevance in understanding how these diverging viewpoints have come about. Especially since the practice is re-emerging in cities and the desire to forage in the city is growing (McLain, Hurley, Emery & Poe, 2013), while in most cities regulations and policies regarding this practice are lacking (Shackleton, Hurley, Dahlberg, Emery & Nagendra, 2017). This results in uncertainty among urban foragers in what is allowed or forbidden. Although the practice is regularly not recognized by planning and policy it occurs in many urban environments worldwide, but there is no agreement about the

consequences of urban foraging on the urban environment and the inhabitants. Given that local authorities generally are in favour of stimulating local food production in cities but are restrained by a lack of space, urban foraging offers a valuable alternative as it does not require large plots of land for urban agriculture but is already integrated in the public green space. Therefore, more knowledge is necessary to improve the green infrastructures in urban environments to accommodate for the emerging practice of urban foraging. Also, this knowledge can serve as a source and basis to substantiate the planning policy of the green space.

The practice of urban foraging does not need an area intended for food production as they can use wild edible products from a variety of green spaces. Mainly because of the disconnection between urbanites and nature under the capitalist food system, people are disconnected to the food production and their sources of food. This determines what they acknowledge as food and where it should come from. It is determined that 103 plant species are responsible for 90% of the world food supply, while there are more edible product available other than these 103 species (Leal, Alvez & Hanazaki, 2018). Edible weeds are seen as sustainable source of food because they can survive in the urban environment as they can endure during dry periods and they do not need a lot of maintenance (Paddeu, 2019). As Nyman (2019) states that food can be simultaneously both abundant and scarce in the same urban environment.

1.2. Problem description

1.2.1 Introduction to urban foraging

Research about urban foraging started in Baltimore, USA by Jahnige (2002) according to Synk et al. (2017) and is currently more occurring in the USA but it is also emerging in Europe. Urban foraging, also indicated as urban gathering or urban collecting, and the concepts non-timber forest products or wild edible plants are used to indicate what is collected in urban environments. Urban foraging is a practice in which people gather products from the urban environment, these products can be wild plants fungi or animal resources and they are used for food, crafts, medicines and other purposes (McLain, 2014). All different kind of plants are used and also all parts can be used, this means that people forage native and non-native plants, and deliberately planted vegetation and spontaneous growing plants. They use the fruits, vegetables and nuts, but also the flowers, leaves, roots and bark are used for different purposes. These products or goods are foraged in a variety of spaces within the city which can be public or private, familiar places are urban parks and urban forests but also less prominent green spaces are used such as urban street trees, yards, vacant lots, planting strips, alleyways, cemeteries and along railroad tracks (berlin london).

The practice of urban foraging is a global phenomenon, it occurs in a diversity of cities in different countries. In both the global North as well as the global South the practice is recognized as a common practice, being part of the everyday lives of many citizens (Mollee, Pouliot & McDonald, 2017). Fisher et al (2018) found in their study about urban park use in five different European cities that 28% of citizens visit urban parks for the reason of collecting nature products. The people who forage differ in their socio-economic backgrounds, as the people who forage have a different cultural background, age, gender and income and therefore Robbins, Emery and Rice (2008) argue that urban foraging is a practice which cannot be linked to a specific 'type of people. Urban foraging is practices individually or in informal small groups but it does also take place in organised groups, tours and workshops (Nyman,

2019). Also, the motivations why people gather are diverse. The most well-known reasons why people forage are for food provisioning, as a recreational activity, for improvement of their health and well-being, collecting crafts and arts materials, as a cultural tradition or contact with nature (Jay & Schraml, 2009; Landor-Yamagata et al., 2018; Synk et al., 2017).

1.2.2 Contradicting views about the impact of urban foraging

In most research articles about the urban green infrastructure, the use of green as a food source through the practice of urban foraging is not acknowledged. Research focused on edible wild plants and foraging is for the most part located in areas outside the urban environment, a small amount of research is focused on foraging in the urban environment but these come to different conclusions about its sustainability. A part of the research in this topic concerns urban foraging as a practice which is overlooked and devalued by urban planning and policy (McLain et al., 2014) while another part is focused on the behaviour and motives of urban foragers (Landor-Yamagata, Kowarik and Fischer, 2018).

In the current debate, about the use of the urban public landscape for its production there are different perspectives on the potential to contribute to the city and its residents, see Table 1. There are contradicting views on the practice of urban foraging and its consequences for the urban green environment (Plas, Plas-Haarsma, Huitzing & Nie, 2015). On the one hand, proponents claim that it may provide citizens with products and goods but it can also increase social cohesion, strengthen the human-nature connection and create a more biodiverse environment (Charnley et al., 2018; McLain and Poe, 2018). This has led some cities to experiment with urban foraging. In Seattle, located in the United States, the Parks and Recreation Department changed its regulations to permit foraging and they experiment with food forests in urban parks. Another example in Europe is the city Andernach in Germany, which initiated the project “Edible City”, a program which encouraged citizens to harvest edible plants from the public green space (Landor-Yamagata, Kowarik and Fischer, 2018). On the other hand, there are also some who criticise this phenomenon such as conservationists and most urban authorities. In most cities urban authorities are not aware of the practice or they fear that urban foraging will destroy urban green infrastructures, by over- exploitation of urban green areas. In turn, this would disturb urban ecosystems as products are not available for animals, or may be hazardous as the food products could contain toxic chemicals from soil or air pollution. This shows that there is no agreement on whether urban foraging is beneficial or a threat for nature.

Beside these concerns of urban foraging for the health of citizens and the conservation of nature in urban areas, there are also other problems mentioned related to urban foraging. Urban authorities assume difficulties will arise related to the maintenance of providing productive vegetation as they think it will be expensive to plant and cultivate crops. Because they are located in the public space, urban authorities feel that they are responsible. Another problem mentioned is the mess of falling fruits or vegetables if these plants are located in streets or near foot or bicycle paths (Charnley et al., 2018).

<i>Proponents</i>	<i>Opponents</i>
Improves biodiversity (Fischer & Kowarik, 2020)	Decline of biodiversity
Socio-ecological connections (Palliwoda, Kowarik & von der Lippe, 2017)	Destroying of green areas
Recreational opportunities	Nuisance by fallen fruit and nuts
Source of food (Bunge, Diemont, Bunge & Harris, 2019)	Overharvesting
Multifunctional use of urban space (Russo, Escobedo, Cirella & Zerbe, 2017; Clark & Nicholas, 2013)	Expensive maintenance
Strengthening of social cohesion (Hurley, Emery, McLain, Poe, Grabbatin & Goetcheus, 2015)	Decline of the aesthetic appearance of green space
A more diverse diet (Baldermann et al., 2016; Frazee, Morris-Marano, Blake-Mahmud & Struwe, 2016; Bvenura & Sivakumar, 2017)	Food safety through, air pollution, soil pollutants and excrement's from animals (Amato-Lourenco et al., 2020; von Hoffen & Sämuel, 2014)
Maintaining cultural identities (McLain et al., 2012)	
Public available resources (Bellina, 2016)	

Table 1. the proponents and opponents in the debate of urban foraging.

These different viewpoints on gathering plants in the public space in cities may result in tensions between the foragers and the authorities. These tensions can also occur between foragers and other citizens, especially in public spaces. These tensions are based on the different perceptions people have about the impact of urban foraging on the nature and the city itself such as disturbing green spaces (McLain et al., 2012). At the moment there is no consensus about the approach of the practice of urban foraging in spatial planning.

Scientific research on the practice of urban foraging is quite limited, especially research from a planning perspective located in Europe is very small. There is some research done in the United States about urban foraging and how this is related to urban planning, and there is some research devoted to the rights of citizens to use goods from the public green space. In Europe, Landor-Yamagata, Fischer and Kowarik (2018) studied urban foraging in Berlin and provided knowledge about the motivations and background of foragers and what products are gathered. In London, Nyman (2019) studied urban foraging as a practice that reconfigures the understanding of the position of cities in the food system. However, research on the practice of urban foraging from a planners perspective in European cities is quite limited and a relatively new study area. More scientific research on the practice of urban foraging may provide new insights which can contribute to the study field in Europe about this practice. The scientific objective is to provide more knowledge on the role of planning and policy in the practice of urban foraging from a physical-socio-spatial perspective.

1.3 Research objective

These different perspectives on the consequences of the practice of urban foraging or the lack of knowledge about this practice affect how urban planners manage the urban green space. Most research about urban foraging in relation with planning and policy is located in the United States but also in Europe an increase can be perceived in scholarship about this topic. But in all the western societies it is observed that in planning and policy the practice of urban foraging is discouraged or not recognized, so regulations regarding urban foraging are not present, discourage or prohibit the practice. In the planned urban green areas urban foraging is not taken into account, for example in most urban areas they specifically implement non-bearing fruit trees and shrubs because they cause nuisance on the streets or nuts and edible weeds are removed from the green environment because they are regarded as waste.

The space in urban environments have a high value as it can be scarce, so this ensures that space is used in multifunctional ways in order to make optimal use of it. But this is a difficult process and many different interest play a role in this process. Green infrastructures are difficult to value because their financial value may be difficult to explain. And so, a relatively small amount of green space have to be used by all the residents which have different interests. This ensures that urban foraging, which is a unknown practice by many, is often not taken into account. The scientific problem for urban foraging is that there is a gap in the knowledge that combines different perspectives on urban foraging to explain why it is not recognized by planning and policy.

This research want to contribute to this gap by providing insights from different stakeholders which are related to urban foraging and the green infrastructures located in the urban environment. This leads to the research question which is: *How do different perspectives on the use of urban green space affect the practice of urban food foraging?*

To answer the research question three sub questions are formulated:

- *How do planners, policy makers and urban foragers consider the practice of urban foraging in the urban green space?*
- *How is the practice of urban foraging affected by the production of the green space?*
- *How is the urban green space produced by these different actors?*

2. Theoretical framework and concepts

This chapter contains the theoretical framework in which two theories related to urban foraging and city planning are explained and linked together. They are used to get a better understanding of the research topic and to help in answering the research questions. From these theories several key concepts are derived that are discussed in detail and afterwards they are linked to the results.

In the first place the theory on ecosystem services by Costanza et al. (1997) is explained. This theory conceptualizes nature in relation to the human world as a system that provides certain services from which humans benefit. With regard to foraging, the fruits, nuts, plants and herbs that can be gathered can be thought of as a service provided by an ecosystem. This ecosystem service is to a certain extent overlooked by planners and policy makers within the urban environment. Secondly, this thesis builds on Lefebvre's theory of the production of space, in which he argues that space is socially constructed by the society it belongs to (Lefebvre, 1974). In order to explore urban foraging in a specific area the context is important, so the social environment and the related stakeholders should be considered. The first theory, the use of ecosystem services, is used as a background for the physical aspects of this research and Lefebvre is used for the social components.

2.1 Ecosystem services

Ecosystem services can be defined as "The direct and indirect contributions of ecosystems to human well-being" (Costanza et al., 1997). Humans depend on the benefits of services provided by ecosystems for many aspects, such as food provisioning, medicines, climate regulation, drink water access and nutrient cycling. This concept became more widely known during the 2000's when the Millennium Ecosystem Assessment (MEA) started to use this term in their work. The MEA published an assessment about the condition of the world's ecosystem services and the consequences of ecosystem changes for the human well-being. The ecosystem services consist of different subservices which are grouped in four categories, namely provisioning, regulating, supporting and cultural services, illustrated in Figure 1. Ecosystem Services Framework. Source: Millennium Ecosystem Assessment Synthesis Report (2005). The supporting service can be regarded as the base for the other three services because without these services, such as nutrient cycling, soil formation, pollination and habitat provision, an ecosystem cannot exist. This ecosystem service is necessary for the production and functioning of the other three ecosystem services. The other three ecosystem services are the provisioning services in which products are obtained from nature such as food or medicines. Regulating services ensure that ecosystem processes can be regulated such as climate regulation or flood regulation. The last services is the cultural service which provides non-material benefits which people can obtain from nature such as aesthetic values or recreation (Constanza et al., 1997).

Urban foraging can be classified under the provisioning ecosystem service because it is linked to the aim of collecting goods from the urban environment for food, crafts, medicines and other purposes. The practice of urban foraging can also be classified under the cultural ecosystem service as people use it for recreation and to improve their cultural and spiritual well-being, it is also used as a form of education.. However, this thesis will mainly focus on urban foraging classified under the provisioning ecosystem service with the main focus on food provisioning through the collection of plant material. In literature the provisioning ecosystem service is related to edible green infrastructures or landscapes, this includes urban foraging or gathering but also urban agriculture, allotment gardens, rooftop gardens and urban forests (Ackerman, Conard, Culligan, Plunz, Sutto & Whittinghill, 2014; Ignatieva & Ahrné, 2013; Leeuwen, Nijkamp & Noronha Vaz, 2010; Russo et al., 2017). Russo et al. (2017) argue that for analysing the planning of edible green infrastructures or landscapes in cities it is of importance to use the provisioning ecosystem service and to determine its role in the planning of urban green spaces. In this thesis this framework will be used to analyse to what extent this ecosystem service is present in the city and how citizens, planners and policy makers manage and behave towards these ecosystem services.

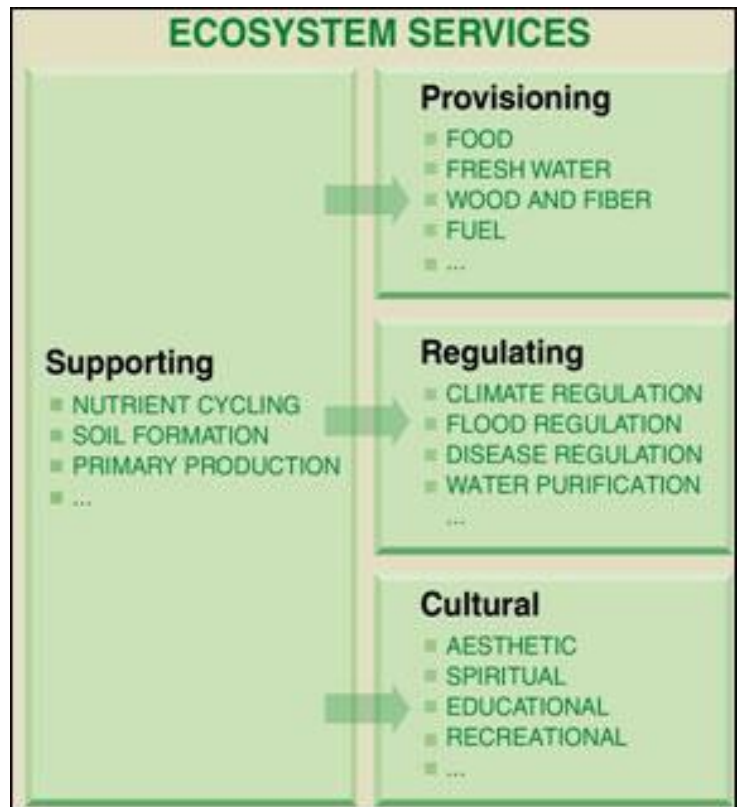


Figure 1. Ecosystem Services Framework. Source: Millennium Ecosystem Assessment Synthesis Report (2005).

2.1.1 The use of ecosystem services in urban planning

The planning of green infrastructure started 150 years ago to counteract the negative effects of urban sprawl and urbanisation which is a loss of biodiversity and natural habitats. This losses lead to a decrease of many ecosystem services (Colding, 2011). Green infrastructure planning focuses on the conservation of natural ecosystem values and the provision of associated benefits to citizens. Ahern, Cilliers & Niemelä (2014) argue that the concept of green infrastructure is connected with multifunctional use of space. Therefore, the framework of ecosystem services in combination with the planning of green infrastructure is useful as this can identify the different functions and values of a green space. With the use of ecosystem services the urban space can be used more efficiently and more sustainable, this is necessary because urban green spaces are generally scarce but high in use. Also it helps to overcome the urban-rural divide.

Many studies are using the ecosystem services to quantify and value the specific services provided by a particular ecosystem, but this is mainly done on a national or regional scale. Only a small amount of the studies focuses on the urban ecosystem services, while studying ecosystem services in the urban environment is of great importance for the well-being of citizens. Furthermore, urban planners often

focus on one or a few functions of green infrastructure without considering the combination with other benefits. There is still much difficulty with the integration of ecosystem services in land use policy and planning practices (Di Marino, Tiitu, Lapintie, Viinikka & Kopperoinen, 2019). Although, there is an increase in urban planners and landscape architects who have a renewed focus on the use of parks and public spaces. They acknowledge that these areas can also provide, often classified as, rural ecosystem services such as food production and pollination. They want to include ecosystem services as well to support the well-being of citizens and to create more sustainable cities (Gren & Andersson, 2018). The use of ecosystem services in urban planning can contribute to negative urbanisation effects, such as heat stress and pollution of the urban environment, and it can provide opportunities for a better urban quality of life. It can also be helpful in creating a better balance between ecological and social aspects in urban planning strategies (Sardeshpande & Shackleton, 2019).

Although it is a difficult task to incorporate ecosystem services into urban planning strategies, there are some obstacles in this process. In the first place not all urban planners and policy makers are aware of the ecosystem services framework. While this is an important tool to use as it leads to more efficient and sustainable land use which is highly required in urban areas because urbanisation poses severe pressure on various natural resources (Elmqvist et al., 2015). Secondly, the urban planning domain has to deal with knowledge which falls outside their expertise, because they also need to deal with political or ecological issues (Hansen & Pauleit, 2014). To include ecosystem services into urban planning more involvement with different stakeholders is needed such as practitioners, experts and policymakers. This is also expressed in the call for involvement of the public rather than excluding them from restoring and creating urban green spaces (Di Marino et al., 2019).

2.1.2 Provisioning ecosystem services in the urban space

A lot of research is focused on the implementation of green spaces in cities and its benefits although some benefits are more prominently described than others. Urban green spaces are often valued for their regulating and cultural ecosystem services, but there is rarely focussed on the benefits provided by provisioning ecosystem services (Russo et al., 2017). This may be a result of a process which occurs in cities, as a process of ‘museumification’ of nature can be perceived according to Gobster (2007). This entails that the current attempts at ecological restoration of urban green spaces focuses only on particular uses and values of urban nature. Urban green spaces should provide an habitat for animals and endangered plant species, and there is also a strong focus on the aesthetic values in urban green space design. This has consequences for how people experience urban nature and it leads to that interactions with nature are restricted to particular activities. Urban green spaces are designed with a focus on aesthetic and recreational values and so people can look at, recreate in and pass through it but harvesting of products in these areas is strongly discouraged (McLain et al., 2014). Provisioning ecosystem services are most of the time not taken into consideration while a green space is designed. In his article Gobster (2007) describes how museumification can be linked to the history of landscape architecture of park designs. Museumification is partly a result of park design based on Naturalism, this trend started during the Romantic Movement in the eighteenth-century in Europe. When urbanisation started in this period, wild nature in urban environments was humanised and it became a subject of aesthetic appreciation with corresponding passive behaviour to preserve these visual sceneries. In the 1920’s ecological restoration already emerged in arboretums and botanical gardens, which were referred to as

'outdoor museums', and later on was incorporated in other urban park designs. This movement aims at providing solutions for ecological problems by creating healthy and sustainable ecosystems through increasing biodiversity, improving wildlife habitat and regulating climate change effect (Cranz & Boland, 2003; Gobster, 2001, 2007). Consequently, these processes leads to that the approach of museumification ensures that only a particular group of citizens will be satisfied. This is a missed opportunity to use urban parks and nature to strengthen the ties between nature and society, and to create a space which supports the needs of a more diverse group of citizens.

While in urban public green spaces, especially urban parks, the provisioning ecosystem service is disappeared, some urban areas are specifically designed for the provisioning of mainly food. These areas are generally referred to as urban agriculture but also to less popular concepts as urban food forests, rooftop gardening and public harvest gardens. In policy and planning urban agriculture and public urban green spaces are often treated as two separate land uses and they are valued in a different way, but they do not necessarily have to be separated (Lovell, 2010). Urban agriculture as well as other urban green infrastructure can be valued by more than one ecosystem service because they can function as multifunctional landscapes (Hurley & Emery, 2018). Multifunctional landscapes are landscapes designed to serve multiple goals and values at the same time. For example, a green space designed for urban agriculture can produce food but also function as a park where people can recreate and it can regulate heavy rainfall events.

2.2 Henri Lefebvre, the production of space and right to the city

The second part of this theoretical framework is based on the work of Henri Lefebvre, mainly on his work of "The production of space" (1974) and "The right to the city" (1968). In these work Lefebvre focuses on how space is constructed by social relations and he discusses the spatial justice or injustices herein. According to Lefebvre it is difficult for urban inhabitants to manage the urban space in a way that is useful and valuable for them. As globalism and capitalism are still the leading systems nowadays and green spaces are commodified landscapes, the concepts of Lefebvre can help to understand the practice of urban foraging as an subversive activity that challenges the dominant regime. They can help explain why urban foraging is often unnoticed or discouraged, sometimes unconsciously, by urban authorities and city developers, and in urban green space planning. The practice of urban foraging is mainly valued for its social and ecological contributions while in cities, spaces are mainly valued by its monetary input.

2.2.1 Introduction of Henri Lefebvre

Henri Lefebvre was a philosopher and sociologist born in France in 1901, his work was mainly inspired by Marx, Hegel, Nietzsche and Heidegger. He wrote many works in a wide range of topics and his work about daily life, urbanism, space and the state has had a great influence on current urban theories. A recurring thought in his work is about the possibilities of achieving great changes in the structure of the human society in which the socio-spatial environment is more humane and inclusive. He had a critique on the current organization of the human society which was and still is under great influence of capitalism, the state and consumer society (Purcell, 2014). This results in the use of space for accumulating capital at the expense of its citizens. Kipfer (2002) argues that the theory and concepts

about human society of Lefebvre are still relevant to use as capitalism is still the dominant economic system for most part of the world and has a great influence on the daily lives of people. Both of his works the production of space and right to the city are used and quoted in many articles nowadays where they are linked to urbanization and globalization. It may help to understand and analyse the complexity of the current form and structure of society (Zieleniec, 2018).

2.2.2 The production of space

According to Lefebvre geographical space is fundamentally social, it is a social construct. Space should not only be understood for its function but also as a social process by those who use the space. Public spaces are a result of the specific views, beliefs, norms and ideas of a society, therefore every society produces its own space (Elden, 2004). Space is continuously under debate by various groups within a specific environment and therefore it is a political process. Although it is the group who is most powerful who decides about the condition of the dominant spatial form. This group will act in their own interests so this will ensure that particular groups and practices are included and some will be excluded. How public space is planned and designed on the one side but also how people use it and behave in it on the other side is determined by a combination of the complex aspects of cultural identity, social history, economic system and political context. The importance of the production of space can be understood not only by analyzing these complex aspects, but according to Hayden (1997) attention should be paid to the particular difficulties and conflicts at play in the public space. Lefebvre argues that space is not neutral. Particular actions are allowed to happen while others are restricted which can be the result of formal regulation but also through informal behavior.

According to Lefebvre the dominant spatial form in the urban environment is created under capitalism. Space is now shaped in a way which reflects the needs of the conditions of the market and of groups with economic and political power. And so Lefebvre argues it is also the urban form which ensures that capitalism can survive. These powerful groups want to control the spaces in the urban environment by imposing their needs on space and on others. They act in their own interest and impose their will on the other people living in the city through their dominant power. Under the system of capitalism their needs for space are mainly focused on the maximum profit.

These dominant spatial forms have an impact on the daily lives of people who are using the urban space or those who are excluded from the urban space. However, citizens do not always accept and obey to the rules which are imposed by the dominant power. In their everyday lives they have their own values and ideas on how space can be used and they find ways to use the space in a way which suits their values. But this is not always corresponding with the dominant space and can result in a conflict.

For a better understanding of the complexity of everyday life Lefebvre identified the spatial triad, see Figure 2. Spatial triad by Lefebvre, for an overview, which consists of three different elements of space. These elements in the triad are a theoretical structure to analyse and read the urban environment and they are crucial to understand the production of space. Zhang (2006) describes the three elements as three cameras focused on one particular event at the same time. According to Watkins (2005) it is a tool which can be used to explore a particular phenomenon or event in the social world. The spatial triad helps to link the abstract notion of space with the lived experience in that space. This will prevent the focus on only one singular aspect of space. These three aspects are:

- Representations of space (conceived space): According to Lefebvre this is the dominant space in society and it is the space represented and planned. This space is constructed by scientists, planners, urbanists and social engineers. It is a constructed space consisting out of symbols, codes and abstract representations. For example, this may be in de form of policy documents, rules, maps, drawings and designs.
- Spatial practices (the perceived space): Spatial practices are used by people to adapt to the dominant space, it is about decoding space. This element embraces production and re-production, it is about the routines of people which are conform with official representations of space. It enables them to participate effectively in the urban space.
- Spaces of representation (lived space): This is the space of the inhabitants and the users, in which they give meaning to the spaces they use. It is the space opposite to the dominant space. The lived space is the imaginative space, formed by cultural meaning.

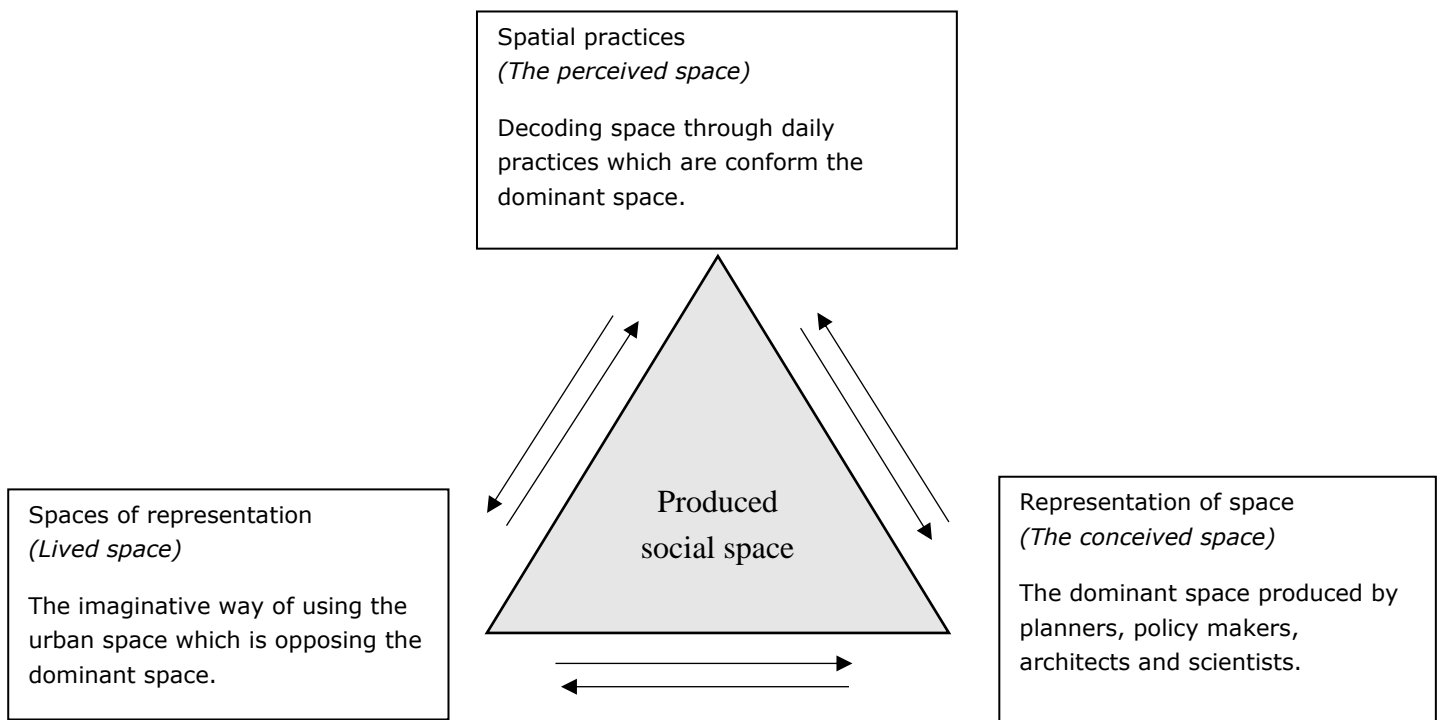


Figure 2. Spatial triad by Lefebvre.

2.2.3 Right to the city

So, according to Lefebvre, the urban space is produced by capitalism in which the market and the state have the dominant power. Lefebvre thinks that because of this inhabitants become isolated from the urban environment, as space is now produced for them instead of by them. This is why he came up with the concept of right to the city which entails that citizens have rights to participate and appropriate urban space. In participating in the production of space citizens should also play a role in the decision making process. So decisions should not only be made by the state but also by the inhabitants (Lefebvre, 1996).

The appropriation of space means that all inhabitants should have the right to use the existing space in cities and they should not be excluded from this space. Urban spaces should not only serve the dominant powerful groups but also minorities should be able to use the space. It should be used in a way which can serve all inhabitants and therefore it is of importance to know how they want to use urban space (Purcell, 2014). Therefore, Lefebvre argues, it is necessary to have true knowledge of space and all of the interlinked aspects of the space. To create a more equal space, it is necessary to have knowledge on the production of space. Zieleniec (2018) states that the intention of the right to the city is to create a more just and humane urban environment in which all citizens can use and appropriate the urban space. Cities should not only be created by the groups of people with money and power but it should be all citizens who have a say in the use of space. But this is a difficult process under capitalism as this system is to the advantage of the market and the state. The spatial triad can be used to understand the production of space by the different perspectives and identify the conflicts at play. This information can help to create a city in which all citizens have a more equal right to inhabit the city instead of a few powerful groups.

According to the right to the city there is now a gap between on the one hand the state led governing of cities influenced by capitalism and on the other hand the citizens who live and use the city. The core of the concept the right to the city is the struggle by urban inhabitants to manage the urban space themselves through a democratic process. The right to the city is about altering the relationship between the state and the people in which citizens are not only subjected to the will of the state. Urban spaces are merely focused on the needs of the dominant class, this leads to the exclusion of other classes and practices, in this case the practice of urban foraging. Urban foragers do not have the freedom to use the urban space for gathering products as they doesn't have access to knowledge such as the soil quality and can get into conflicts with authorities. Citizens should have a more central role in the development of urban spaces so they could implement their wishes and needs instead of a mainly top-down planning approach. Lefebvre wants to close this gap by including the inhabitants in the decision-making process and he want the inhabitants to become more active.

2.2.4 Urban foraging outside the formal economy

Robins, Emery & Rice (2008) describe that urban foraging functions outside the formal economy, even outside the alternative markets. Urban foraging should be seen as a practice of daily life and not as a specific group or community. Foraging is a non-capitalist practice according to Nyman (2018) because the plants can be collected for free and this all takes place without market exchange. Also this practice is not mediated by formal economic actors. People involved with urban foraging are seen as operating not conform capitalist nature. Although this does not mean that urban foraging is politically neutral because this practice exists within the urban society. This leads to a reaction of other groups to control and characterize the practice of urban foraging (Robins, Emery and Rice, 2008). But because this practice falls outside the formal economy this may result in exclusion by formal authorities which design and manage public green spaces (McLain et al., 2014). While Lefebvre argues that a city should be constructed collectively by its citizens and that people should be able to use the space for their needs. In the case of urban foraging this is not possible if the practice is not formally recognized, which also

happens unintentionally, because specific planning and policies can lead to inaccessibility to harvesting edible species from the urban environment.

2.2.5 Foraging for food as a right to the city

In urban foraging there are different groups involved, all these groups use and produce the space where urban foraging takes place because they search and harvest several plant species from the public urban space. They are actively changing the urban space as they use it in a different way than most people do. Urban foragers are trying to use the urban space in a way that corresponds with their needs of taking products from the public space for a variety of reasons. But in order to gather these products they need time and money to gather knowledge about the products, places, possibilities and health issues associated with urban foraging (Robbins, Emery and Rice, 2008).

In most activities for urban food growing, some form of exclusion can be perceived. Usually, the space used for food production should be protected from outsiders, the “citizens of the street” are not welcome in these areas (Tornaghi, 2017). The common idea is that only people who worked and produced food should have access to the food. So, this means that only people who can afford these urban areas have access to urban food production. The first step to achieve social justice is to acknowledge the urban food injustice in food production activities in the urban environment (Galt, Gray and Hurley, 2014). So, eventually all citizens have a right to forage and harvest in the city. Poe, McLain, Emery and Hurley (2013) discuss urban forest justice and citizens’ rights to wild food in the urban environment. They argue that for urban forest justice the rights of local people should be recognized by local authorities to have control over their own spaces. They should have access to the decision making process because this process influences the access and use of urban green spaces.

City’s residents usually do not have much influence on the urban design of the space and how the space can be used because inhabitants are most of the time not involved within the planning and policy process (Shillington, 2013). The use and design of the urban green space is generally focused on the provision of regulating ES to mitigate climate change effects and on cultural ES such as the aesthetic aspects and providing space for recreation. This approach leads to inaccessible areas for urban foragers, less diverse products to gather, removal of valuable products and deliberately plantation of inedible species. There are other stakeholders who decides on these aspects, these are the urban planners, city makers and policy makers. They decide how the space will be used by the inhabitants, to a certain degree, and they decide on the legislation.

While there is already a process going on in cities in which citizen participation is take into account by urban authorities but adequately enough to implement the practice of urban foraging. Citizens are often only participating in the end of the decision making process or they are only provided with information and can ask questions or make suggestions. Eventually, this results in limited possibilities to have a voice in the design and use of green space which is heard by planning and policy makers and taken into account by them (Ghose, 2005). Also, citizen participation mainly takes place on a local level in an specific location such as a residential neighborhood or a specific project (Fors, Molin, Murphy & van den Bosch, 2015). While urban foragers are mainly operating throughout different places within the city and not exclusively in their own neighborhood. In the participation of green spaces not all spaces are included, for example river banks, roadside vegetation and street trees are regularly not part of

participation projects (Rosol, 2010). And so, it is difficult for urban foragers to participate in these projects in order to be involved in the decision making for all urban spaces.

By emphasizing the idea of the right to the city by different stakeholders the gap between users and planners can be diminished if there is more awareness about the needs and wishes of urban foragers about the design of the public space. These insights should be used by the planners and policy makers when they decide on the public space (Purcell & Tyman, 2018).

In Figure 3 a framework is created in which the theoretical framework is summarised and linked to each other. It is the socio-ecological relations that shape the green spaces in the urban environment (Heynen, Kaika & Swyngedouw, 2006) and so both processes should be examined and linked to understand urban foraging.

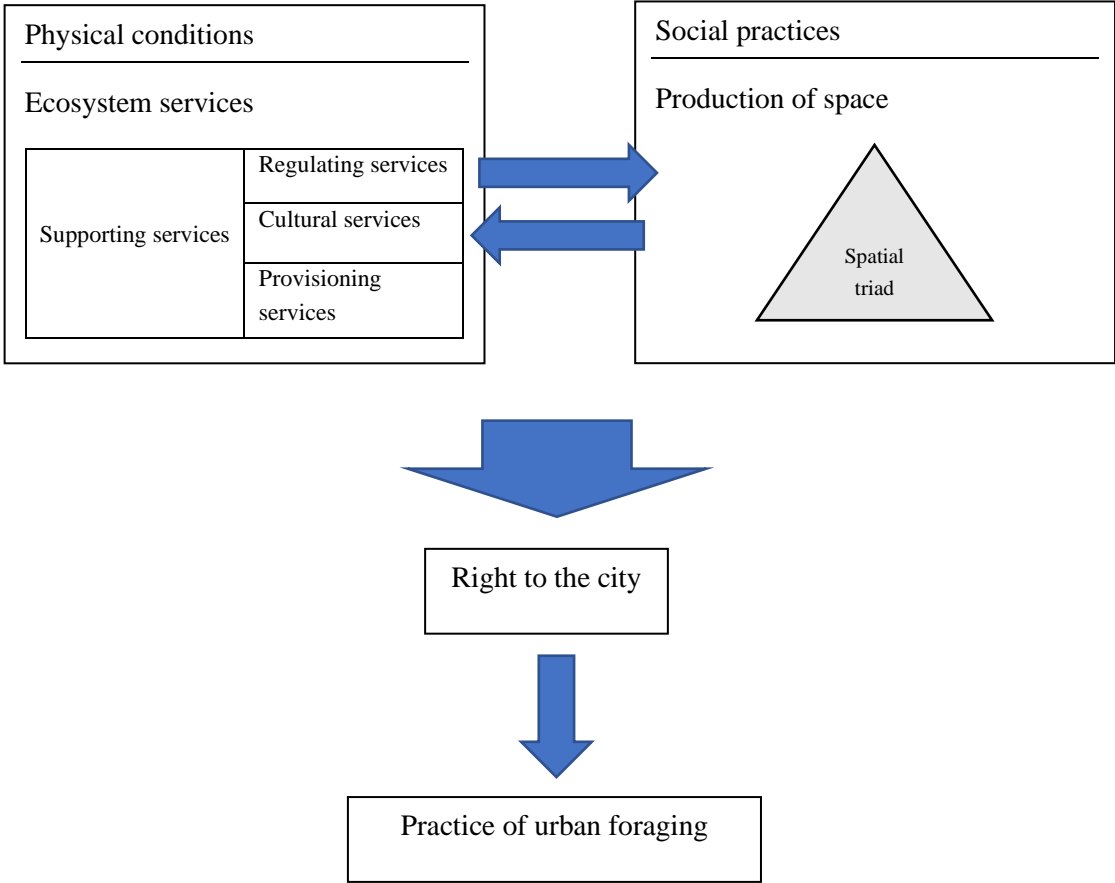


Figure 3. Theoretical framework about the social-physical urban space.

3. Methodology

This section discusses the methods and instruments used to understand the practice of urban foraging in Rotterdam. After a section on the methodological design, the second section discusses the logic of the case selection and some general background information on Rotterdam. Subsequently, considerations regarding data collection and analysis are discussed, after which the last part focused on the validation of the research methods.

3.1 Methodological background

Taking into account the need for a thorough understanding of the phenomena of urban planning and foraging, this research opts for the use of qualitative research methods. Through qualitative methods it is possible to capture how individuals construct their own meanings and have different interpretations about the world. Given these diverging conceptions of social reality in general and foraging in particular, it is important to analyze these issues by studying the perspectives of different stakeholders. Each group of stakeholders likely shares a somewhat common idea about urban foraging, making it an interesting exercise to try and understand how they emphasize their own reality and how they construct this. The research methods used to capture these different perspectives are semi-structured interviews with different stakeholders and a policy document analysis. Using semi-structured interviews gives the ability to access directly what happens in the world and gives insight in a social phenomenon (Bryman, 2012). In combination with the interviews, also policy documents analysis is used as a research method to get insight in the underlying structures of the policy about the urban green space. The use of documents will help in creating a better overall picture in how a social institution operates (Silverman, 2015). As such, this research takes an interpretive approach to find out how people give meaning to this phenomenon and to create an understanding of their perception. To understand a certain phenomenon in an specific environment, in this case the practice of urban foraging, it is necessary to examine and to re-examine the collected data, it will be primarily an iterative process (Silverman, 2015). It will involve going back and forth between the data collection and the theory in order to link the theory and the research in the end. This also involves the intertwinement of the generation and analysis of the data. This approach allow the direction of the research to be explorative and interpretative. As this research touches different disciplinary fields an explorative approach helps to shed light on urban foraging which has so far gained little recognition from scholars and urban planners alike. This research goes further, however, by trying to explain why urban foraging is only marginally accounted for in urban spaces.

3.2 Case study

3.2.1 Case study design

Situated in the literature on urban planning, this research builds on the case study method common to planning studies to understand how the planning and place development processes work regarding the practice of urban foraging. Another reason for the use of a case study is that this will lead to a better understanding of complex social phenomena (Yin, 2009). A case study has a focus on the context and the diversity and different values which belong to this context, these will help to get a grip on the practice of urban foraging. Urban foraging is considered as complex practice because it is linked to different concepts based in social as well as ecological scholarship.

A single case study is used in this thesis, from this type you can gain intensive analysis of limited but rich data which allow the researcher to examine key social processes. The specific type of case study

will be an typical or representational case study. This type is used to provide insight into a broader phenomenon, in this case the practice of urban foraging. With the typical case study, ‘the objective is to capture the circumstances and conditions of an everyday or commonplace situation’ (Yin, 2009).

3.2.2 Case study background

The research studies Rotterdam, a city with 651 000 residents, making it the second largest city in the Netherlands (CBS, January 2020), see Figure 4. Rotterdam is known as a working class city with a large port and a great diversity of nationalities as there live people with 174 different nationalities. As the city is bombed during the second world war a diversity of new and old architecture can be found in Rotterdam, making the question of how urban space is shaped and planned an everyday and dynamic affair.

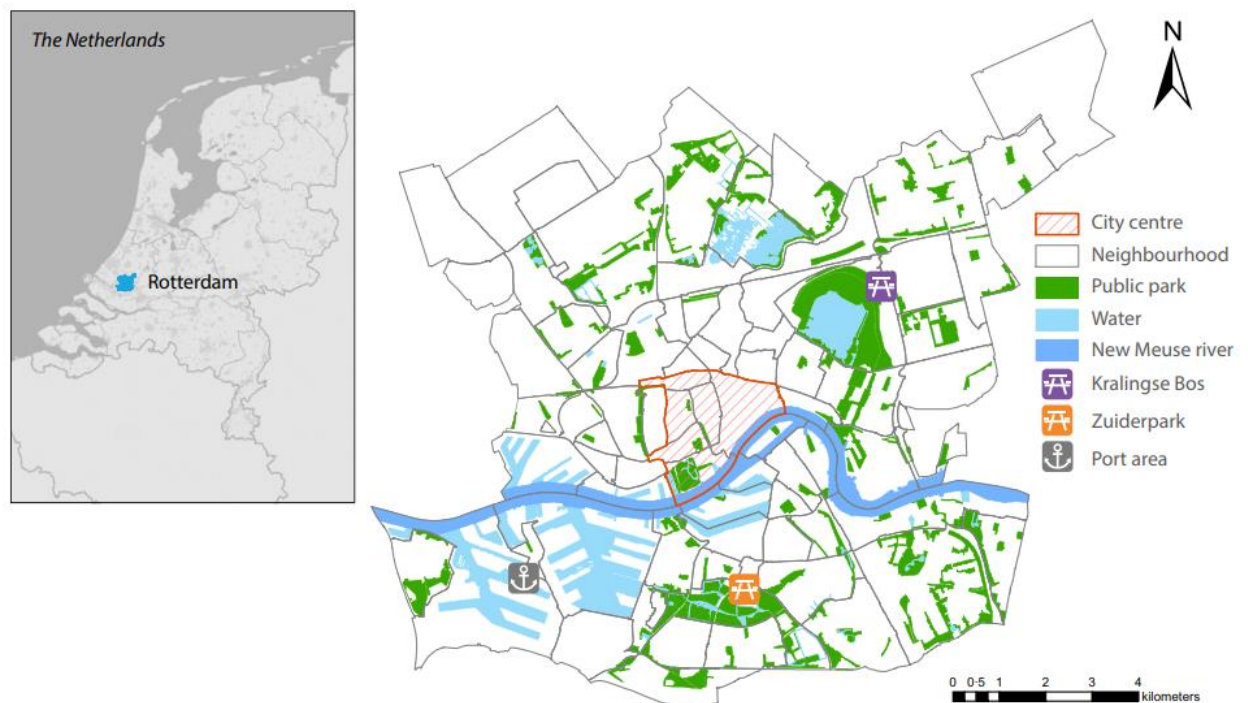


Figure 4. Map of Rotterdam, The Netherlands, with key characteristics of the urban green space. Source: Derkzen, Astrid, Teeffelen & Verburg (2015).

As Rotterdam can be found in the lowest lying delta in Europe, they face environmental challenges such as extreme rainfall and periods of drought. For several years, they are dealing with these challenges by using a climate change adaptation strategy. Incorporating more green space and using this to make the city more climate adaptive is one of the focus points in this strategy. In the coming years the Rotterdam city government plans to add 20 hectares of green space within the city, a large part of which will be public space. They want to improve public parks and nature areas in the city and they want to add more green in neighborhoods. The city government plans to realize these goals through an integrative strategy by collaboration with inhabitants, businesses, investors and housing corporations. Another point of attention in their green infrastructure strategy is the focus on urban agriculture, which is realized in

certain specific areas throughout the city. In 2012, more than 200 urban agriculture initiatives were realized in the municipality of Rotterdam (Säumel, Reddy & Wachtel, 2019). This is relevant for this case study for the reason that there is some common ground between urban foraging and urban agriculture. They both have a relation with local food production in the urban environment.

As more cities face and will face challenges with climate change and are re-greening their space this is an interesting and relevant case study to see how they deal with urban foraging when designing and improving public green space within the city. Because the municipality of Rotterdam is currently focusing on adding new green infrastructures and the improvement of these in Rotterdam it will be valuable to see how this strategy is combined with the practice of urban foraging. Also, with the growth of cities, urban agriculture is an upcoming phenomenon in western cities to promote local food production. The municipality of Rotterdam already has 10 years of experience with urban agriculture, this is documented in policy documents and by the research department of the municipality. As they are at the start of creating new policy for the urban green space, they have experience with urban agriculture and they have an open policy strategy, this particular research area is chosen because these three elements ensure that accessible data is provided to do an intensive analysis on the phenomenon of urban foraging.

3.3 Data collection

For this thesis qualitative data collection methods are used, this thesis is based on semi-structured interviews with different stakeholders in Rotterdam and policy documents about the green space of Rotterdam.

3.3.1 Semi-structured interviews

In this research, semi-structured interviews are used because this helps interviewees to express their opinions about the topic and this allows the interviewees to come up with new ideas or topics which were not yet taken into account. This may result into new perspectives on which the researcher can build on. Previously, before the interviews were taken, a framework was set up with the relevant themes and concepts which helped in guiding the interviews, see annex 2 for the interview guide.

The interviews are held with a variety of stakeholders which are related to the design or management of the urban green spaces. The selection for these interviews were done through web research in the first place and interviewees were found by snowball technique. This technique was especially helpful in finding interviewees at the municipality as there are different departments and they could refer to the right persons as they have more knowledge about the structure of the municipality. Urban planners and landscape architects working at the municipality were approached and clarified that in their department they do not decide about creating or managing edible green spaces. They referred to urban ecologists and urban forest rangers as the right persons to interview regarding this topic. Which was the same for the urban green managers and the researcher working at the municipality who also recommended the urban ecologist and urban forest ranger departments.

The stakeholders who were interviewed for this thesis can be subdivided into two groups, roughly these are public and private actors. On the one hand, interviews were taken with people who have a formal position with regard to the urban green space which were governmental actors and policy makers. And on the other hand, there are interviews taken with people who are in an informal position and who have

an relation to the practice of urban foraging. This approach is taken to shed light on the practice from different perspectives. Interviews were held with urban foragers with an particular expertise in this field such as experience in giving workshops or tours about urban foraging or they have education related expertise. The reason for this is that they can share their experiences they had during the years, they have an extensive knowledge about the possibilities of urban foraging and they are more likely to have been in contact with the planning and policy of the municipality of Rotterdam. Because the practice of urban foraging is relatively unknown by official authorities, it is not possible to do interviews with people who have a direct link with urban foraging. But there are many departments, within the municipality and other organizations located in Rotterdam, which are connected to the design of green space and have an direct or indirect influence on urban foraging. So, therefore interviews were held with people who are in some way connected to urban foraging through their relation with urban green space. In the list below it is explained in more detail how they are related and how they can contribute to this research.

<i>Function</i>	<i>Description</i>	<i>Number of interviews</i>
Urban green manager at municipality	This person is working at the municipality of Rotterdam, responsible for the management of public green spaces, the organization of budget programs in order to maintain the green space and administrative advice on the design and maintenance of green space.	3
Researcher at municipality	Has focused on research on the inequality in Rotterdam and urban agriculture initiatives related to the social aspects.	1
Urban ecologist	Focuses on the spatial planning in relation to the laws about flora and fauna, advices about the possibilities in the design of urban green space.	2
Forest ranger	An urban forest ranger inspects the flora and fauna in the public green spaces, addresses people who disturb the urban nature, and they provide citizens with information.	2
Spokesperson at Staatsbosbeheer	One of the three spokesperson at Staatsbosbeheer for 16 years. Has knowledge about the organization and its strategies and explains their policy.	1

Table 2. Interview overview of governmental actors.

<i>Function</i>	<i>Description</i>	<i>Number of interviews</i>
Urban forager, specialized in tours/workshops	Tours and workshops in the public green space	3
Urban forager, commercial interests	Forages for local events	1
Urban forager, educational interests	Workshops at schools	1
Actor specialized in edible infrastructures and urban foraging	Works with local residents on food production	1

Table 3. Interview overview non-governmental actors.

In total 15 interviews were taken with people where many have a different background. Some interviews were held in person in the beginning of the data collection, but most of the interviews were taken online through mobile phone or video phone calling. During the period of data collection a pandemic arose, so it was not an option anymore to meet people in person. Therefore, it was necessary to search for other methods to interview people. All the interviews were held in Dutch, as this was the native language of the interviewees and the researcher. By using the English language there was a possibility that they might be obstructed while they want to express themselves.

3.3.2 Policy documents

For this thesis also policy documents are collected and analyzed, see Table 4 for the list of policy documents. The focus of these policy documents were documents related to planning and policy regarding the use and design of urban green spaces in Rotterdam. A relatively broad focus was used because there are no policy documents available with the specific notion of urban foraging in the public green space. Most of the documents used are public available policy documents published by the municipality of Rotterdam. But also the website of the municipality is used, they have an comprehensive amount of webpages dedicated to their planning and policy related to the green space. The policy documents were acquired through different methods. The first method used was desk research mainly on the website of the municipality of Rotterdam, this method was used continuously throughout the data collection and analysis, see Table 5 **Fout! Verwijzingsbron niet gevonden.** for an overview of websites and topics, for the links of the websites, see annex 1. Another form of data collection of the policy documents was provided by the interviewees who work at the municipality. They recommended the policy document ‘Gemeente Rotterdam – Assetmanagement Green’ and the motion ‘Edible green, Rotterdam harvesting the fruits’. The purpose of analyzing these policy documents was to understand their vision and ideas about the design of the green infrastructure. Besides the policy documents from the municipality of Rotterdam, this thesis also made use of private policy documents provided by Staatsbosbeheer and their website page about their guidelines about urban foraging. The following policy document were used:

<i>Document</i>	<i>Description</i>
Gemeente Rotterdam – Handboek Openbare Ruimte Rotterdamse Stijl, 2010	This is a background document used by planners for the design of the urban space. A part is specifically focused on the urban green space.
Gemeente Rotterdam – Beheeraanpak openbaar groen, 2016	This document is focused on the different zones of the green space and which specific types of vegetation should be used in each zone.
Gemeente Rotterdam – Bomenstructuurvisie, 2008	A separate document with the focus on trees, its purpose for Rotterdam and guidelines about the use of different types of trees.
Gemeente Rotterdam – Assetmanagementplan Groen, 2019	Urban green managers use this document as a guideline for the maintenance of urban green spaces.
Gemeente Rotterdam – Rotterdam gaat voor groen, 20 hectare erbij, 2019	A vision document about the focus of new green spaces in Rotterdam.
Leidraad bij de gedragscode Flora- en Faunawet t.b.v. bestendig beheer van groen in de Gemeente Rotterdam, 2015	The different rules are described and explained with the focus on maintaining the flora and fauna of the public green space.
Gemeente Rotterdam – Stimulating urban agriculture in and around Rotterdam, 2012	Different types of urban agriculture projects are described and how these project could be stimulated in the future.
Cees Bronsveld – Onze oogst, sociale effecten van Rotterdamse stadslandbouwprojecten, 2014	This is book about urban agriculture projects with a focus on the social aspects. This book is created commissioned by the Municipality of Rotterdam.
Afdoening motie 'Eetbaar groen, Rotterdam plukt de vruchten', 2018	A motion by a group of councilors from the municipality to implement more edible green spaces.
Powerpoint by Staatbosbeheer – Urban foraging, what is allowed and why? 2019	A focus on the juridical aspects of urban foraging and how they implement this in their policy.

Table 4. Policy document overview.

<i>Website sources</i>	<i>Topics</i>
Gemeente Rotterdam	Urban agriculture, mowing policy, urban trees, citizenship
Staatsbosbeheer	Foraging guidelines
Eetbaarrotterdam	Municipal activities linked to foraging or agriculture
Rotterdam Food Cluster	Urban agriculture
Koninklijke Nederlandse Natuurhistorische Vereniging (KNNV)	Information about foraging
Wildplukwijzer	Foraging locations
Rotterdams milieucentrum	Urban foraging workshops

Table 5. Overview of website sources.

3.4 Data analysis

3.4.1 Semi-structured interviews

To analyze the semi-structured interviews they were transcribed and read after each interview was taken. An inductive approach was used to analyze the interviews and to create a set of codes based on the interviews. A set of themes was created at the start of the interviews but new themes came up during the process of analyzing the interviews. These new themes and information gathered during the interviews were used in the following interviews and this process was repeated after every interview. As research approach for analyzing the interviews, grounded theory is used, in this approach data collection and data analysis takes place simultaneously (Thornberg & Charmaz, 2014).

Eventually after this process, all transcribed interviews were transferred into the program ATLAS.ti, which was used as a tool to organize the interviews and to do a thematic analysis. Two types of coding were used, at first open coding was used to explore and categorize the interviews. During this process data is broken down into smaller parts, compared and then grouped into new concepts and categories. After this process axial coding was used to assemble the codes, concepts and categories and compare them in order to make connections between them and to form new categories. In Axial coding the focus lies on the links and relationships between the codes and categories. The process of axial coding should help with explaining the complexity of a phenomena (Frieze, 2014). During this process the interviews were reread so no relevant data would get lost during the coding processes. Eventually, a set of 53 separated codes were created, these codes were merged into a set of 3 main codes, see annex 3.

3.4.2 Policy documents

The policy documents about the urban green space were used and obtained through different ways. In the beginning some of the documents were used (which one) to orientate the focus points of the municipality of Rotterdam and to get insight in the type of information provided by them. These documents were analyzed more globally while later on during the data analysis they were analyzed in detail. An overview of the policy documents and their content created during the first period provided a base for a new analysis focused on specific parts of the documents. Also, during the data analysis the thesis objectives became more clear which resulted in a more targeted analysis.

But as different types of policy documents are used, it was needed to focus on different aspects, to combine the obtained insights, to compare them and if necessary analyze them again. In the policy documents 'Assetmanagementplan Groen', 'Rotterdam goes green' and 'Management Strategy, public green', there is focused on the ecosystem services used in the urban green space and their reasoning for these types and in particular their views on the provisioning ecosystem service. While the policy document about the laws related to the flora and fauna and the provided PowerPoint by Staatsbosbeheer, another approach was needed, this document is analyzed through the laws aimed at urban foraging and gathering of products from green spaces. The documents about urban agriculture were used to create an understanding how urban agriculture is related to the urban green spaces in Rotterdam, to what extent are they connected and integrated and how this is done. An detailed analysis was used for the motion about edible green to understand the needs from a political perspective and how they want to implement this in the urban green space.

As urban foraging is linked to different planning and policy departments it is necessary to analyze the different documents provided by the involved departments with urban foraging and eventually connect them to understand how the practice of urban foraging is developed in the city of Rotterdam. To do this, for every document a short summary was written after global analysis of the document and concepts and points of attention were featured in this summary. During the process of the policy and data analysis the documents were compared and read in detail, and new knowledge was added in the summaries. This method was chosen because new information was obtained during the process which gave new insights into the policy documents. Also, this ensured that the documents could be linked to the other documents and to the interviews and new relationships could be formed.

4. Results

4.1 Knowledge about urban foraging

The results from the interviews and the policy documents show that there is a wide range in the knowledge about urban foraging and that they have different ideas about what the practice of urban foraging entails. Knowledge about urban foraging involves locations where to harvest, rights of access, edible species and the quality of the environment of these species. On the one side of this spectrum there are the urban foragers, they have a lot of detailed knowledge on the possibilities of urban foraging. On the other side of the spectrum there were interviewees who never heard of the practice before or who did not know what it entails. But there were many interviewees in between these two ends of the knowledge they had. Some of them who were approached for their official function regarding the green space were also urban foragers in their spare time. These persons were more informed about the practice than the people who never foraged themselves.

On their website policy documents about a variety of urban green space topics within the municipality of Rotterdam can be found, most of these documents are extensive and in detail. Their policy strategies are explained in these documents and the design of different green spaces is described. But nothing related to edible products for citizens in the public space can be found in these policy documents nor on the website of the municipality. Someone working at the municipality for managing and designing green spaces made clear that he never have to deal with urban foraging. He suggested that citizens who need more information about this topic could search on the website of the municipality for urban foraging, but this practice is not mentioned on their website.

Three managers, working at the municipality in which they focus on the urban public green space, all mentioned that they hardly never discuss this topic within their work and that they never foraged themselves. Two of them mention that there is not much to be found within urban green spaces what can be used as food for humans. One of them thinks that this is one of the reasons why he never came across this topic before and why no one addresses this topic. He stated that: *'there is nothing edible to be found right now within the city, sometimes you have chestnuts and hazelnuts, these can be eaten, but otherwise, no, there is not much.'* According to another manager most species growing in the city are not edible which is done on purpose as fruit-bearing plants cause nuisance. He explains that the hazelnut trees planted in the city are special kind of trees which are non-fruit-bearing hazelnut trees, so they will not create a mess as they are meant to grow in streets and residential areas. Another green manager repeats several times during the interview that urban foraging is not something at play currently because *'there is just not much to be found for them'*. A green manager believes that there is a difference between foraging in a park or in an residential neighbourhood. *'There is a possibility that the residents will antagonize against you when you forage in their street and you should not forget that the plants are owned by someone. They planted it themselves so they want to get the harvest, so when someone else will take that, they will not be happy about it'*.

The urban ecologists know more about diversity of the urban vegetation and the types of species growing in the city because one of their tasks is to monitor the nature in the green areas in Rotterdam. They use this knowledge to inform other departments who deal with green space mainly based within the municipality. The urban ecologist who works independent from the municipality likes to forage himself as a hobby although rather not in urban environments. But he explains that because of this interest he is aware that there is a variety of edible species located in the urban environment. The urban ecologist working at the municipality clarifies that this work is mainly about increasing the biodiversity in the

urban green space, and therefore he focuses on the species which benefits the wild life in the urban environment. Urban ecologists should protect the green space and provide an area for the flora and fauna within the urban environment. So, from this perspective urban foraging could be acknowledged as a threat for the biodiversity and this is why they discuss the topic of urban foraging incidentally.

The forest ranger working at the municipality came across urban foraging last year when attention was paid by certain media. He knows that urban foraging is happening in the municipality of Rotterdam and that there is a debate going on about the practice. On the streets and in the forest he sometimes run into people who forage individually or with two persons. Because of these events he learned more about what kind of species people are looking for in specific places within Rotterdam.

Some of the urban foragers are working with edible urban species for several years. They all recognize that they are still learning about edible species and it can be difficult to distinguish some of the species, even after several years. A common view among the urban foragers was that there are a lot of people who think that it is necessary to implement new edible infrastructures in the urban environment to create a place to forage. This implies that existing green areas should be replanted with edible species or this could be implemented in new green areas. They relate urban foraging to well-known edible species mainly cultivated in urban agriculture and community gardens and so they expect that these species would require intensive maintenance. They explained that this is an often made misconception which they encounter a lot when they speak to people. According to them, urban foragers have a different view on what can be eaten, they also value weeds for their edible qualities.

4.1.1 Location

The practice of urban foraging can be found in different green spaces in the city, as respondents are going to public green areas with different functions spread through the entire city. Many of the urban foragers name out a particular, relatively big, green park/urban forest, the Kralingse Plas. A lot of different plant species can be found in this area which is one of the most common reasons by the respondents. Some of the interviewees are going there by themselves to forage individually but also urban foraging hikes and workshops are given in this area. The walks and workshops are organised on a frequent basis in this urban forest. One of the urban foragers told that he likes this place the best to give walks because the green area is quite big and he can always find many edible plants here. Also, on Google and Facebook events can be found about urban foraging walks located in the Kralingse Plas. The municipal forest ranger also encountered these urban foraging tours in this area, he mentioned that there are urban foraging walks from time to time and that all of the municipal forest rangers are aware of this. Other parks in the city are also mentioned which are used for individual foraging.

One of the urban foragers clarified why he likes to forage in urban parks: *'I've noticed that many city parks are very interesting because it has to look nice on purpose and for other reasons different kinds of plants, shrubs, herbs are planted which gives you quite a diversity.'* He also explained that because of maintenance and hoeing there will be a disturbed soil which attracts pioneer species which he thinks are also interesting to forage. He thinks that for many people these pioneer species are just regular weeds which should be removed because they disturb the aesthetic view of the green space. After all, these practices in urban parks provide an interesting biodiversity which is appealing for urban foragers and turns out to be a nice place to organise a foraging tour or workshop.

But all of the urban foragers mentioned that they can forage everywhere in the city and it is not necessary to go to an urban park or forest to find edible species. Another space in the city which is mentioned

several time by different foragers is a common residential neighbourhood. They appreciate it that edible plants can be found close to a persons living environment. They also give walks and workshops in neighbourhoods because they want to show other people that edible plants can be found everywhere in the city, so you do not have to go far to pick food. Three of the urban foragers mentioned that, when they guided a group of people during their walks, a major part of his group was not aware of these possibilities and were very surprised by the amount of edible plants which could be found within their close neighbourhood. Even in spaces which are not defined as green spaces by the local authorities such as in between the paving tiles edible plants can be found.

4.1.2 Edible species

A majority of the interviewees who forage themselves do not forage for a specific species but they forage what they can find on their walks and tours. Some of them mentioned that this is one of the aspects of foraging which they like about foraging, as you do not always know what you will find. Although one of the most referred species which is known as a species to forage is the blackberry, which is mentioned several times both by urban foragers and formal authorities. A forest ranger stated that he does not forage himself but later on he mentioned that he picks blackberries in his spare time. He believes that everybody picks blackberries during walks and that it is a well-known species by all residents: *'A far as I know people have been picking blackberries since time immemorial'*.

Weeds are also seen as a relevant species to forage and to take into account as many foragers think that weeds are undervalued by many citizens while many of them are edible and can be found almost everywhere within the city. For some weeds are the biggest part of urban foraging, an urban forager who gives workshops at schools said: *'I know there is a discussion right now about urban foraging but I think urban foraging primarily involves picking weeds'*. Three of the urban foragers wonder why it would be a problem to forage for weeds because these species are regularly recognized as unwanted species in the public green spaces by the municipality. According to them, these species are removed nevertheless by the people who maintain the public green space and thrown away. Another urban forager who regularly gives tours in different areas in the city also experiences that weeds are mainly mowed and later on thrown away by the municipality while he thinks that these weeds are valuable for food and he uses them in his tours to educate people about them. One of the urban green managers mentioned in the beginning of the interview that he knows about several kind of herbs that grow in the roadsides in Rotterdam and that there are citizens who want to take these. Also, the urban ecologists working at a private organisation has knowledge about edible weeds but has some doubtfull thoughts about them: *'This [edible weeds] is already discussed a lot and written about but who does this? Who actually makes use of them? Stinging nettle soup is named a lot, but who actually eats this kind of soup? This is a whole other story'*.

Also many of them who forage do mention that they make a difference between edible plants and mushrooms. Two of them mentioned that they will explicitly search for one of the two when they forage or do a tour and that they belong to two different groups of edible green. There are also a few urban foragers who did not forage for mushrooms at all because there is a higher risk of poisoning. They all explained that they thought that foraging for mushrooms is more dangerous then edible vegetation. It is easy to mistake an edible mushroom for a non-edible mushroom because some species are look-a-likes. Staatsbosbeheer shares the same viewpoint and tries to warn their visitors who want to forage in their area for this. On their website with the guidelines for foraging they state that mushrooms are a species which need extra vigilance as it is difficult to distinguish the edible species from the non-edible species.

A remarkable issue which is brought up in the interviews by most urban foragers and also the urban ecologist from the private organisation is that the practice of urban foraging is often time consuming. They mention that there are edible species which are recognizable by the general population such as blackberries or other species which can be found in the supermarket. However, less ordinary food such as the weeds or herbs and some types of fungi can be difficult to recognize in the wild. Therefore, it is time consuming to learn about these species and to find and harvest them. So, according to the urban ecologist: *'The practice of urban foraging remains reserved for only a small group of people who has knowledge about these species and who actually takes the step to harvest them'*.

4.2 Planning, design and policy of the urban green space

4.2.1 Policies affecting the practice of urban foraging

Urban foraging or wild food is not a topic which plays a role in the design and decision making process in the urban green policy of Rotterdam. Some of the employees at the municipality mention that the urban foraging as a topic is discussed from time to time but it leads to nothing. The reasons for this mentioned by different persons at the municipality varied: *'there is still a discussion going on about this topic, you can clearly see two camps in this discussion'*. *'No damage is caused by this practice and we do not notice much of people who forage within the city but we do not want to stimulate this so it is not included in policy'*. *'Issues related to urban foraging are solved at a more local level, issues about this topic do not end up at our department [urban management] but at the specific regional office'*. One of the urban green managers from the municipality said that they do not see any urgency right now to integrate this into policy, there are no incidents related to urban foraging and in the department of the maintenance of urban green space, they decided that it is not necessary to devote time to this topic. Although it is mentioned several times that they actually rather have people not taking anything as they think this will go along with problems such as damage to plants and green areas. In the current green infrastructure the plantation of edible green species is not consciously encouraged. Rather, the policy and planning is more focused on the prevention of urban foraging as they try to plant non fruit-bearing trees and shrubs, they remove weeds and they clean the streets from nuts. For a part, this policy has no direct link to urban foraging but is related to the maintenance costs and aesthetic design. But urban foraging is not entirely left aside in the decision making in the green space policy as explained by the green manager. If fruit bearing trees would be implemented, they should be maintained which is too expensive and it will lead to that there are only a few people who can make use of the fruits. The underlying thought of this consequence of the urban green manager is that: *'After a few people have harvested all the fruits, they will definitely take great amounts of fruit, there will be nothing left for other people. This is something which we want to prevent.'* An urban forager who gives workshops on a regular basis has a contrasting view on fruit-bearing trees in the public green space. He told that there are quince trees located at the Dakpark, this is a green public park located on a roof. Every year this trees are full of quinces and the residents of the neighbourhood harvest these quinces and eat them and make jam out of them, therefore this trees are very valuable for them. According to this interviewee this example shows that these kind of trees can be desirable in the city and may provide an addition to the neighbourhood.

A different policy is used at Staatsbosbeheer for edible green in public spaces, they have specific guidelines. The spokesperson explains that the practice is known by the organisation and addressed from time to time in order to meet the needs of their visitors but also protect the green spaces. These guidelines are published on their website. They do allow people to take something in a container of 250 grams for

personal use. They also explain the underlying reasons for these guidelines. They advise to consider the dangers of urban foraging because some products can be poisonous. So, they do not take any responsibility for people's health, harvesting in their areas is at your own risk. The points of attention are: follow the rules, be informed about the species, do not disturb the environment, leave some of the species and keep other people and animals in mind when you forage. The spokesperson of Staatsbosbeheer clarified their policy: *'We adjusted our approach after we found out that allowing a 'handful' of a species was not specific enough, so we keep track of foraging in our areas and change our policy if this is necessary'*. They have from time to time a discussion or meeting about this topic and someone presented all the rules enshrined in law, so they could base and adjust their policy to this.

People working at Staatsbosbeheer get informed about the practice of foraging but not specific in urban areas, they have green areas within cities but also in rural areas. For foraging no difference is made between the rural and urban areas. But they monitor in both areas if they see any damage encountered by foraging. They are also informed by the specific types of species foraged by visitors and adjust their policy on this information.

The spokesperson explained that they based their policy on three aspects. There is a pressure on nature in the Netherlands, so they should take into account that there are a lot of people who want to use their areas. This is why they only allow small amount to forage and only for personal use. Commercial foraging is prohibited and they are very strict on people who do this, they give them a fine. The second aspect is the culture in the Netherlands regarding foraging. She clarifies that Dutch people are not raised to forage in the wild, rather the opposite: *"Here in the Netherlands, our parents warn us already from a young age, do not touch or eat anything from nature"*. She mentioned France and Poland where it is more common to forage and in her opinion you should adjust your policy on this. For example, they make an exception for people in Katwijk aan Zee. Harvesting wild blackberries for making jam is *"cultural heritage"* in this area. So, in this area they allow residents to harvest for blackberries as many as they want. *"There is enough and it is part of the culture of the area."* The last aspect they base their policy on is the advice of the Koninklijke Nederlandse Natuurhistorische Vereniging (KNNV). This is an organization which focuses on the natural history in the Netherlands, their goals are improving and protecting natural areas. The KNNV believes that foraging should be done with respect for natural areas, because the nature is vulnerable. But, they still have some doubts, they are afraid that small scale foraging can expand to commercial foraging. According to the KNNV commercial foraging disturbs nature, and that is something they try to prevent.

The current guidelines of Staatsbosbeheer exists now for 2 years. The spokesperson of Staatsbosbeheer mentions that they changed their policy around 4/5 years ago because foraging became more popular. According to her this already started around 8 years ago, but they needed some time to change their policy because they could not decide on the consequences of foraging on their areas. But they got more and more questions about people who asked to forage on their grounds, so they changed it eventually. But, she mentions, *"there is still a debate going on in our organization, there are proponents and opponents for foraging"*.

4.2.2 Urban green space design

The policy for the design of urban green spaces is mainly based on two strategies, which is described in *"Beheeraanpak openbaar groen"* (Maintenance strategy for the public green space, 2016), and in the *"Bomenstructuurvisie"* (Spatial development strategy for trees, 2008). In the urban green space policy they treat trees separately from the green areas in the city. In the document about trees it mentioned that this document is established because in former policy documents about the urban green design there was

not enough focus on trees. An urban green manager explained that trees are more vulnerable for changes in the urban environment, such as roadwork, and therefore they need more specific attention from experts. This resulted in a separate policy document. This document is about the future vision for the tree structure in the municipality of Rotterdam for 2030, this includes the quality and criteria of the tree location, types of trees and the protection of urban trees. One of their focal points is to increase the variety of the urban trees because currently, the urban trees are vulnerable for tree diseases as there is not enough diversity in the different types of trees. Tree diseases will spread more easily when there are only a few types of trees in the city, so they want more diversity in the future. In the document there is a chapter which pays attention to the value of trees in the urban environment, in total six characteristics are described. In their view trees should be valued because they create a vibrant atmosphere, they form the city, they bring nature back in cities, they improve the quality of life by decreasing the heat, wind and noise, they reduce air pollution, and they store CO₂. On the website of the municipality various data sets and maps can be found about the trees in the municipality of Rotterdam, this is open data and public available for everyone. This data shows the type and age of a tree on a specific location, and which trees are going to be removed or replaced.

In the other document "*Beheeraanpak openbaar groen*" they differentiate between three zones which vary in character and appearance which affects the urban green space design. Within the centre there is the exclusive zone, this zone is surrounded by the cultural zone and the outer ring is called the natural zone. These three concepts focus on different management strategies and green elements as these areas have different needs. The dense built city centre with relatively many businesses has other values than the sprawling green suburbs. Attractive business conditions are highly valued in the city centre, urban green space should have an aesthetic, attractive, tidy and waste-free appearance. While in the suburbs the nature values are more important so these areas should be more diverse in species and they should have a more natural aesthetic. Also the use of the green spaces in the centre is more intensive compared to the more low dense suburbs which means more maintenance is needed in the city centre. The cultural zone is the biggest zone within the city, the management of urban green in this zone is focused on an intensive use of green although with a variation in urban (coloured) green. So this means less diversity compared to the natural zone but ecological possibilities can still be achieved in this zone. The appearance of the green space should be more natural in the outer zone and more neatly groomed to the inner zones. The outer zone, the natural zone, has a more natural appearance which is achieved by a higher variety in species and maintenance is more dynamic and less neat in this area.

In the policy document "*Beheeraanpak openbaar groen*" for each zone there is a specific list with species meant for this area, this list of species is based on another document which is called "*Handboek Openbare ruimte Rotterdamse Stijl*" (Public space program Rotterdam, 2010). This program is used as a guideline by planners and policy makers for the design of the urban green space in Rotterdam. A part of this program is focused on the Romantic Movement and its design features which are the use of ornamental shrubs and solitary plants, clear boundaries, diversity of species, special eye-catching (water)elements, organic structure and lawns and pleasant resting areas. New green space design should be based on these Romantic design principles so the urban green space in Rotterdam consists of an 'Romantic layer'. In this section it is described that this landscape design is already present in certain green areas. The most distinct urban parks, canals and public gardens are designed by the landscape architect Zocher and Rose from the 19th century.

Additionally, each zone has a different mowing policy. In the outer zones there is less mowing than the inner zone which, less mowing ensures more flowers and herbs and a more natural appearance but

according to one of the green managers: *'less suitable for things like walking your dog, a picknick, and lawn laying'*. Table 6, based on the document *"Beheeraanpak openbaar groen"*, shows that a relatively high percentage, 25%, of all the green spaces consists of flat lawn areas and 20% of the green spaces consists of grass vegetation. Two of the green managers explain that these are especially located in the city centre because grass vegetation ensures an aesthetic look appropriate for an environment with many businesses. This policy document also shows that these areas are mowed up to 28 times a year to create this look, in Table 7 you can find the mowing frequentation for every green space. He explains that this policy is based on the view that: *'the city is also an ecosystem where we should find a balance between nature values and usage values'*. Different types of vegetation are used in the zones to meet the needs of that zone, the exclusive zone contains mainly intensive lawns while in the natural zone the extensive grass vegetations can be found, see Table 7 and Figure 5Table 6.

Green space element	% of green space area
Lawn	25
Grass vegetation	20
Forest plantation accessible	12
Rough grass	10
Not in use	8
Forest plantation inaccessible	5
Forest shrubs	5
Ornamental shrubs	4
Roughness	1
Vegetation no mowing	1

Table 6. Percentage of the land surface in the use of different green space elements by the municipality of Rotterdam. Source: Municipality of Rotterdam, (2017).

Green design	Mowing frequentation	Exclusive zone	Cultural zone	Natural zone
Intensive lawn	22-28/year	●	●	•
Extensive lawn	9-12/year		●	●
Rough grass	4-8/year		•	
Grass vegetation intensive	1-3/year		●	•
Grass vegetation extensive	1-3/year			●
flower field	1-2/year	●	•	
Wild	1/2 year			●
Vegetation no mowing	-			●
●	=	Image defining element		
•	=	Minor element		
	=	Not applicable		

Table 7. Mowing frequency for the grass vegetation areas and appearance per zone in the municipality of Rotterdam. Source: Municipality of Rotterdam, (2016, 2017).

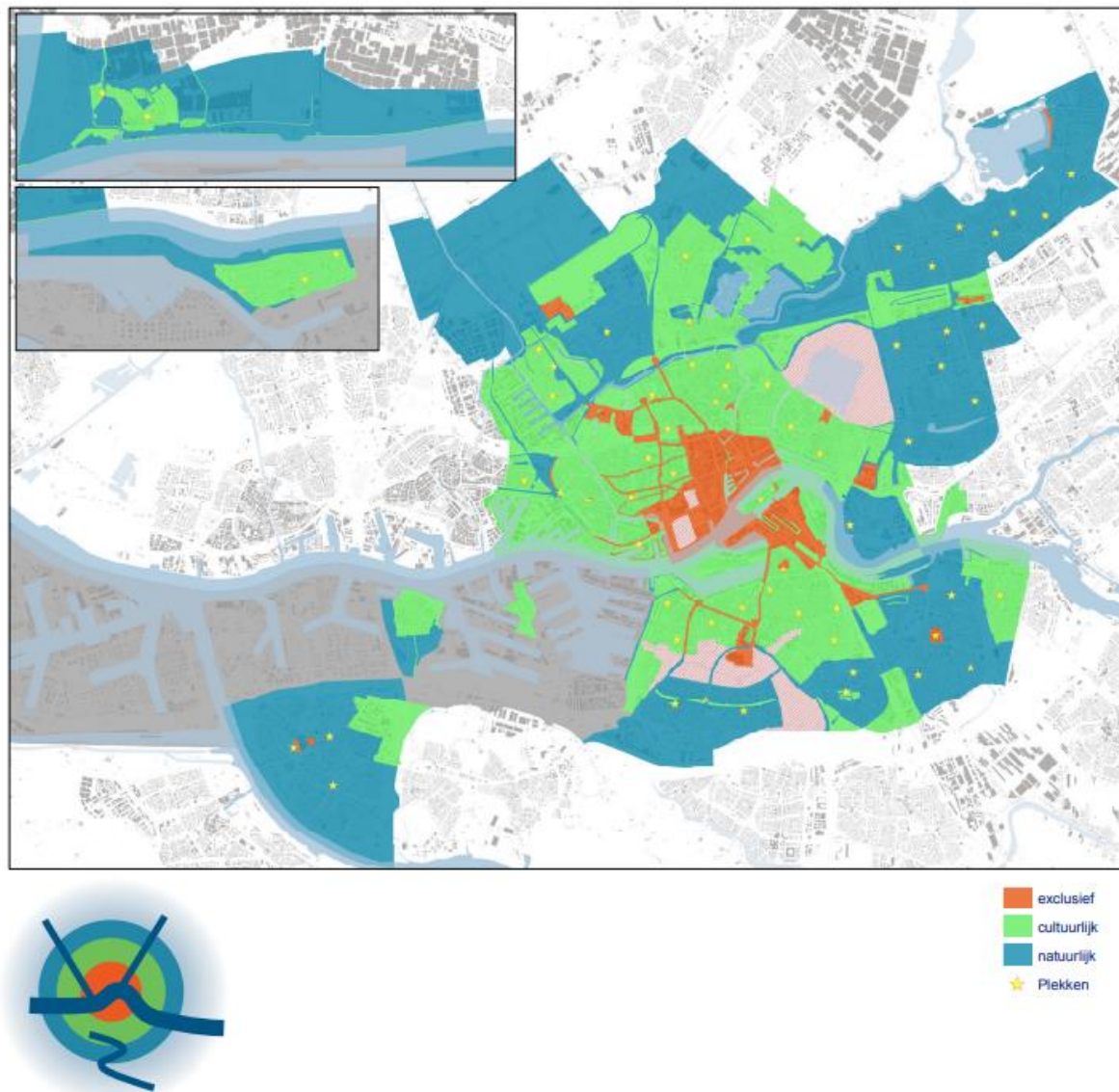


Figure 5. Allocation of the different zones for the urban green space by the municipality of Rotterdam. Source: Municipality of Rotterdam. (2017).

4.2.3 Policy related to urban agriculture and urban food forests

The municipality also released an open policy document in 2012 about urban agriculture in Rotterdam and its surroundings. This document shows different examples of existing urban agriculture projects and it is about the aims of urban agriculture projects in the future and how they want to achieve this. They mention that a ‘think tank’ is set up in 2010, which is meant as a groups of experts about urban agriculture in Rotterdam. They should advise the alderman in the municipality about the promotion of urban agriculture. One of the interviewees, a researcher working at the municipality, was part of this group and did some research about urban agriculture. But according to him, this ‘think tank’ does not exist anymore and also after this policy document from 2012 no new policy documents were produced about their developments. In the policy document it is described that most of the urban agriculture projects were grassroot initiatives set up by residents but also professionals. The municipality wants to see more of these projects in Rotterdam which is why they want to stimulate this. Although, on the

website of the municipality there are some pages with information about urban agriculture and their vision about this. They refer to the policy document from 2012 and that they still want to proceed with this development and want to contribute to this. On the website it is explained that there are possibilities to create your own small green space within your neighbourhood individually or in a community and that these can be used for edible green which is according to them *'healthy, sustainable and tasty'*. There is information about particular aspects which should be taken into account when someone wants to realise edible green such as the soil quality. For this they refer to information about soil analysis and maps with soil safety information in Rotterdam. There is also described that you should rinse everything before you eat something from your edible green space.

The municipal urban ecologist explicitly points out that he is approaching the practice of urban foraging from an ecological perspective and the effects on nature in general. This leads to the belief that urban foraging ensures that the food for animals is taken away by this practice. He acknowledged that he thought that this ecological perspective has an effect on the way he thinks about urban foraging. Both of the ecologists mention that increasing the biodiversity in urban environments is part of their work and that food production in urban agriculture or food forests is not favourable for the biodiversity. *'One of the most important goals is increasing biodiversity and this is not the case for urban agriculture and food forests, I mean, they have some value for the biodiversity but the production of food is their highest goal.'* *'For me it is a problem if they use an potential nature area for urban agriculture as we already have only small amounts of green space in the city. Under the guise of unused green space they start urban agriculture projects while these may belong to one of the best green spaces in terms of urban ecology.'* In their view increasing the biodiversity is the most important aspect for urban green spaces and if this will include edible species for humans it is an additional benefit. This is one of the reasons why the non-governmental urban ecologist believes that creating urban food forests is redundant as he explains that it is not necessary to design a forest full of edible species, a normal forest also includes enough edible species. The most important is that you need native species in every urban green space and these will naturally include edible species for animals and humans as well.

4.2.4 Formal approval

Although in none of the three zones there is mentioned something about edible species in the public green space, an urban green managers clarified that the municipality is tolerant if people want to take some of the herbs who grow in the roadsides. But he adds to this that: *'we are not going to formally allow this because if we do that we would also take the responsibility for food safety and we cannot guarantee the food safety of edible species within the city'*. If people take something which grows near the roadside then it can be contaminated by particulate matter or other dirt, so if you want to pick something he thinks that it is now at your own risk. He also clarified that they cannot prevent anyone from picking a blackberry but if they would include this into policy they would not have enough forest rangers to enforce this policy.

There are no specific rules about urban foraging at the moment. They only included the rule that it is not allowed to damage any green space which is defined in the *'algemene plaatselijke verordening (apv)'* (public local regulation, 2012) these are the local rules of the municipality of Rotterdam. But this rule is interpreted differently by any person. Everyone has their own thoughts about what this rules means related to urban foraging. According to an urban ecologists who works at the municipality, this rule does not mean that picking food from plants is not approved because it is not specifically included within the rules. But the forest ranger at the municipality said that: *'this rule means that you cannot take anything*

from the green space, this also includes fallen parts of plants laying on the ground. This is punishable and people can get a fine for this because this is all small poaching'. But he mentioned immediately after this that there was never any need to fine someone for this. Although some of the interviewees with a formal authority background were not familiar with the rules about urban foraging and didn't know if it was allowed in Rotterdam. All the interviewees share the same thoughts about the rules that this is not a very clear rule and that it is not focused on urban foraging necessarily.

Five of the urban foragers assume that it is not allowed in any form to forage within the city, according to them this implies picking something from the vegetation but also products which are already released from a tree, shrub or plant. Although, they do not all agree with these rules, they mention that they can understand this to some extent because the green spaces should not be destroyed by urban foraging. But they believe that these rules regarding the interaction of citizens with green infrastructures are unnecessary and exaggerated. To forbid foraging in any way, they assume that this will ensure that the practice of urban foraging is ruined for everyone.

All the interviewees working at the municipality believe that urban foraging is not a problem if the urban green space is not damaged and when people only harvest small amounts of species. As one of the urban green managers said: *'Yes, in principle there's little against it, it's a nice initiative'*. Another manager felt the same way: *'If we do not experience any nuisance from urban foraging, why should we bother?'* Also the forest ranger thinks urban foraging is possible if people do this with care and only in a limited amount for personal use. Until now, no one experienced many problems with people who were foraging in Rotterdam. Only two accidents were mentioned about people taking too much of a particular fungus and someone who hit a walnut tree to shake the walnuts out. But they also mentioned that this does not mean that urban foraging should be allowed because they believe there is a real chance that this will end up with many problems.

It becomes clear that prohibiting is something different than permitting as this is also discussed in the interviews. When urban foraging is not explicitly named within the apv and therefore not forbidden, this does also not directly mean that it is allowed. All the urban green experts share their concerns about formally allowing this practice and stimulating people to do this. They are afraid of damaging effects on urban green spaces and the biodiversity if too many people will forage within the city. As one of the green managers voiced his concerns: *'If we are going to allow that [urban foraging], the this will open up the floodgates, after some time people will forage everywhere and every plant will be picked at'*.

4.2.5 Permission by the land owner

To forage in Rotterdam it is necessary to ask permission to the owner of the specific area where you want to pick edible species. Although, most of the urban foragers mention that they encounter many problems with obtaining permission from the owner of the land. So in the first place you should know who the owner is and this is not always very easy to find out and it can be unclear as not every property has a sign to whom it belongs. The borders between different areas are not always indicated and they merge into each other. As one of the urban foragers still has problems with finding the owner after a few years of foraging: *'Sometimes you are suddenly in another municipality and then there is also a part that belongs to Staatsbosbeheer or Natuurmonumenten. How do these borders run? Here it is allowed and over there it is not, it is almost impossible to do'*. Because now he extended his network he knows more about how to get permission in an certain area and he thinks that because they know him they are more likely to give him permission to forage. He states that: *'If people are not familiar with urban*

foraging or when they just start with the practice it is a very difficult task to get permission from official authorities, if not impossible'.

Another problem with obtaining permission, when you know who the landowner is, is to get contact with this person. None of the interviewees can explain how this works to get permission, besides asking an organisation or person who is the owner of a particular area. There is also no agreement among the urban green managers about who or where to ask for permission. The district director was mentioned by the municipal forest ranger as the appropriate person to ask for permission. Although one of the managers and the urban ecologist were surprised to hear this, they did not know anything about getting permission through the district directors. An urban green manager expressed his surprise: *'Oh really? What should a district director do with this? Actually, I do not think they decide about this. Although, very interesting because this shows right away that it is actually very vague and people don't know what to do with this'.*

Also some urban foragers think that it is not necessary to ask for permission, because they feel that they do not harvest on a large-scale. They explain that they harvest on small-scale for personal use as well as in their workshop or tours when they do this in the city. One of them explains that the reason for this is that there is only a small amount of green spaces in the urban environment so it is not sustainable to harvest for large amounts of species. Another forager agrees that it is not sustainable to harvest large amounts, she explained that there is a high diversity in species but they are only present in small amounts. Another reason mentioned by three urban foragers is that a workshop is mostly for education and not meant for harvesting food. One of them explains that if this is the case, he asks for permission or he goes to places where harvesting is allowed, such as a private property.

The urban forager who mainly forages in residential neighbourhoods stated that: *'No I am not going to ask for permission, they are lucky that we are removing the weeds from the neighbourhood'.* Later on she explained that if she forages in a public park, she only takes small amounts because otherwise the area could be destroyed. But, for these areas she does not ask for permission either because she is aware of the problems when people harvest too much.

4.2.6 Political influences on urban foraging

As mentioned before, the 'Think Tank' does not exist anymore nowadays and research about urban agriculture has stopped predominantly at the municipality of Rotterdam. The urban food interest of the municipality is now covered by the food cluster which is a subdivision of the economic cluster which belongs to the department for city development in the municipality. Smaller urban agriculture projects are assigned to the Gemeentelijke Gezondheidsdienst Rotterdam-Rijnmond (GGD) (Municipal Health Service Rotterdam-Rijnmond). But, the researcher mentioned that the GGD has less budget available for urban agriculture than the municipality previously had, so the projects are not financed on a structural basis anymore. According to the researcher this food cluster is mainly focused on the commercial food projects, multinationals and the food flows within the city. These developments led to that the municipality did not need any research about urban agriculture anymore. In his opinion the operating city council has an influence on the design of green space, *'it differs per governor what they think is important for green space and if green space is important at all'.* In a former period with another city council, there was more focus on urban green space and its health benefits he explains, therefore we were able at that time to research urban agriculture. But this has changed now. *'At the moment there is*

no alderman in the current college who thinks that local urban agriculture projects are important so there is no structural financing for small local initiatives, which should be the case in my opinion.'

Two of the urban green managers mention something similar as they feel that they develop policy through following specific guidelines of the city council and that they cannot much deviate from these guidelines. *'For now biodiversity is an important theme on the political agenda for urban green space in Rotterdam so this is one of the reasons why we as policy makers for urban green space focus on increasing the biodiversity.'* The other manager also mentioned that: *'because of political developments the attention for biodiversity has increased, and as a consequence, the design of urban green space and maintenance should be changed to answer this development'*.

The current planning of the green space also has to do with an particular budget for urban green spaces which is decided by the current city council. An urban green manager explained that in the current policy and planning of the urban green spaces, they did not include harvesting of the green space. The department of green space managers has a particular budget for the maintenance of the green space and he thinks that harvesting in the green space will cost too much, and therefore this activity cannot be integrated in their policy.

Different actors working at the municipality distinguished that the policy focused on land use also is of importance for particular use of the urban green space. *'Currently, land has become part of the municipality's revenue model, which is ridiculous if you ask me.'* Someone else noted that: *'land is worth a lot at the moment and with urban green space they cannot make a lot of money'*.

4.2.7 Citizen initiatives

Recently, A group of councillors from the municipality filed a motion about the stimulation of more edible green space in the city of Rotterdam. The motion was called *'edible green, Rotterdam is harvesting the fruits'*. They focus more on advising and stimulating residents and local initiatives to implement edible green in their green spaces. The urban manager who worked on this project clarified that his team likes to see more edible green in Rotterdam especially if this is maintained by the residents and he explains that *'for these people there are some urban gardeners available which can help by creating and designing the green space, they can be approached by residents for advice for edible species'*.

Another new policy which is focused on citizen participation is the possibility of creating a front yard garden. There are specific guidelines on the website about the size of the garden, and there is describes how citizens can use the garden for cultivating and harvesting their own food. This little gardens are located in the public space but belong to the owner of the garden, so it is not desirable that other people will harvest here.

4.3 Biodiversity

4.3.1 Protection of animals and nature

All of the interviewees see a connection between the biodiversity in the city and urban foraging. Many of the people from the municipality feel like the green areas in the city are in the first place meant for animals which are living in the city. According to them, urban foraging will ensure that there will be

less food available for animals. This idea is also shared among some of the urban foragers. Although the views on the particular damage for animals caused by urban foraging differs. An urban manager is afraid that: *'if everything will be picked bare, nothing will remain for the animals'*. Although later on he adds to this that: *'I don't think there is a direct link between biodiversity and urban foraging, in theory it will be possible of course [that no food will remain for the animals] but for that, you should be really fanatical'*. The urban ecologist working for the municipality has a similar view about this process: *'of course, when you forage you will take food for other animals, this is not a problem when you will take some of it but when you will take massive amounts there will be a chance that other species will find less food'*. Urban foragers also mention that it is of importance to take biodiversity and animals into account when you forage in the urban environment. *'People should be informed before they go outside to forage, they should leave some of it and think about animals as well as they live from these green spaces'*. Almost everyone agrees that people should not forage for commercial purposes because then big amounts of specific species are taken which may result in problems for the biodiversity. As also too much damage to the vegetation can cause disappearance of a particular species, this may result in reduction of plants and animals.

When biodiversity is discussed with the interviewees, many of them also relate this with the urban green space design. Urban green space managers observed that more attention is paid to biodiversity in the urban environments. *'We think it is important that, where this is possible, nature should take its course. So what I actually mean by that is, where possible, we should let the grass grow a little longer.'* But he noticed that the use of green space by citizens for recreation is very high in certain areas so this should also be taken into account when a green space is designed. He used the example of festivals in a public parks or hot summer days, when a large group of people in a small green area gather, this can eventually lead to a damaged park. So, it is important that there is enough green space available which can accommodate these kind of recreational activities. He believes that if more people will participate in the practice of urban foraging the pressure on green space will be too high and this will negatively affect biodiversity. Another manager reasoned that *'Plants do have a function for the biodiversity, absolutely, but this is also true for grass vegetation and lawns, although to another degree'*.

The urban ecologist at the municipality explained that there are some conflicts between the designers and the ecologists about the use of green space for recreation and aesthetics on the one side and on the other side for a higher biodiversity. Sometimes there are some green spaces sown with different kind of flowers meant for insects, but this does not happen a lot. But he also observed that you need space for recreation, this green spaces are grass or lawns located in urban parks especially in the city centre. *'Occasionally, these lawns are gigantic, actually a bit too big, there is room for improvement here. This is also the case for canals, these should be more space for flowered green areas or nature-friendly water banks.'* The other urban ecologist also expressed himself about the grass areas and lawns in the city and their link with biodiversity, he used the term *'green pavement/asphalt'* and called them *'lawns without a soul'*. According to him they should be more creative when designing the green pavements. This may result in a higher biodiversity and more edible species for humans as well.

Some years ago, the municipal forest ranger followed a course about biodiversity in which he learned that, to improve the biodiversity, the current design of urban green space should be changed. *'Nowadays we have to deal with biodiversity, so more plants are needed to attract all kinds of animal species, currently there is only standard plant material. But there is a disadvantage here as with these new plant material there will be more edible species, so there is a chance people will forage these species as well. But it is one or the other.'*

One of the urban foragers also believes that more attention should be paid to increasing the biodiversity in the city. Although, he argues that this can be combined with urban foraging and more edible species for humans as well. *'There are many possibilities for improvements, we do not want to see all this [huftergroen] lazy green which lasts for ever and which needs barely pruning. In the first place this is important for biodiversity but more edible green for urban foraging can also be taken into account here.'* Another urban forager, who has been working with edible green in the city for seven years, observed that the diversity is very high for the current vegetation in Rotterdam. So according to her, this means that if you want to forage in the city you should only take small amounts of a specie. *'People should never take great amounts of something because it is very likely that you will take too much and then nothing will be left behind.'* She noticed that, during the years, there is less edible green available in the urban environment, this ensured that she changed her way of working with edible green: *'I already forage less in the city than before, because I can see that there is less to find, so I just do not feel the urge anymore'*.

An urban forager mentioned that on the one hand he understands why the municipality is concerned about the biodiversity and providing food for animals. But on the other hand, he thinks that the municipality is not acting on their concern. As they are implementing specifically non-fruit bearing trees they take away their food in advance for both animals as foragers. Also he noticed that: *'during the years I saw that potential sources of food for animals were thrown away or cleaned by people who maintain the green spaces. For example, rotting berries were cleaned up and there are many spaces where fallen hazelnuts are brushed and thrown away'*. According to him, this illustrates that the policy of the municipality is very inconsistent at the moment and that it will be hard to change because there are many interests at play. But, he believes that the municipality has good intentions and so it will be possible to improve these inconsistencies.

4.3.2 Dichotomy of the food system in urban environment and outside the city

Some of the interviewees see the city as an ecosystem which is separated from the surrounding landscapes, especially agricultural areas are mentioned as a separate landscape from urban green landscapes. They have particular ideas on these landscapes, how they should look like and how they should be used by humans and animals. An urban manager explains that: *'you should see the city as a small ecosystem in which you have to find a balance, as much as possible, between the nature values and other user values'*. According to him, this means that the urban nature areas should not be used for harvesting species: *'People should not take any of the green for any purpose, for example, it is also not allowed for residents to cut their own tulips in the public green spaces, this also applies for edible public green. Actually, we do not want residents to actively take something from the public green space.'*

Another urban green manager feels like the line between urban nature and nature outside the urban environment is very fluently, and that this is also included as a goal in their policy. But, he too mentioned that the pressure on urban green space is very high. And, that because of this, urban nature should be treated in another way compared to non-urban nature. This means that certain activities cannot take place in the urban green space, and urban foraging is a doubtful case and because of this, he said, most forms of foraging are tolerated but are not officially approved by the municipality.

According to some of the urban foragers people should think about the food system as a whole and urban foraging should be seen as included in this system. One of them explains his thoughts about the origin of the food people buy in cities. *'Most of the food is coming from agricultural areas but these areas*

used to be nature before, so it is now one or the other. So when you harvest food from greens spaces or food forests you also take food for animals, this is absolutely true. But at the same time by eating and buying food in the traditional way you also consume food which is not available anymore for other animals because it is an acre now.' Later on, he clarified that this should not be used as an excuse to forage but it is an different perspective on the food system and urban foraging. Others mention that there are many people who believe that food from urban environment is contaminated and food in the supermarket is safe. But they feel like people are not thinking about the fact that many agricultural areas are situated close to highways and that these areas are not completely isolated. So there are possibilities here as well that the food is contaminated with particulate matter, insects and animal faeces. Many of them also add to this that pesticides are used in agriculture which they think is also a form of contamination.

5. Discussion

5.1 How do planners and urban foragers consider the urban green space with regard to urban foraging?

From the results a diversity in the perspectives on urban foraging could be distinguished between all the interviewees. The urban green managers have quite an opposite perspective and knowledge about urban foraging in contrast to urban foragers. Although, also similarities can be perceived between these two groups. The municipal urban green managers believed that there are currently not much edible products available within the public green spaces. While urban foragers mentioned that there is enough to be found, in all different kind of public green spaces, which can be used for edible purposes. So, these are contrasting views on the possibilities of urban foraging in the urban environment. These contrasts ensure that these two groups have different views on how the public green space should be designed and planned in order to create an environment which is suitable for foraging. The green managers but also the urban municipal ecologist and the forest rangers expected that the current design of the public green space are not fit for foraging. They believe that it should be changed thoroughly in order to create a green space which can also be used by urban foragers. They expect that the type of species should change in more edible species, that intensive maintenance will be necessary and that it will be used extensively by citizens. They argued that this type of green infrastructure will be too expensive and that intensive use will lead to damage in the urban green space and a decrease in biodiversity. They also see problems related to the food safety of city's residents if they will harvest in the green space. However, urban foragers argue that such drastic interventions are not necessary to create an environment which is suitable for urban foraging. They forage for weeds and other edible plants and fungi, species which already grow in the urban environment. In their opinion the current policy strategy by the municipality for the urban green space should be changed as they consider this as a very strict policy which forbids any foraging in the public space.

Staatsbosbeheer has another approach, they changed their policy some years ago because they perceived a growing demand for urban foraging in their areas. So, nowadays they allow it to a certain extent. They created specific guidelines and urban foraging is discussed internally. They too see some problems with urban foraging but not to an extent that they forbid foraging in their areas.

At Staatsbosbeheer as well as at the municipality, but to a lesser extent, there is a discussion going on about urban foraging and its consequences for the green space. For both groups on the one side the decrease of biodiversity and destroying the green spaces by urban foraging is recognized as a potential problem. But on the other side they also believe that urban foraging can have positive effects. At Staatsbosbeheer this resulted in permitting only personal harvesting and for the municipality it is tolerated unofficially to some extent.

Their uncertainties about the consequences of urban foraging can also be linked to the small amount of research on foraging and especially on foraging in the urban environment which was mentioned in the introduction by Poe (2013), McLain (2012) and Shillington (2013). There were similar debatable topics related to foraging such as additional damage to green spaces, nuisance, decrease in the biodiversity and

health problems. For the municipality urban foraging is not assigned as a topic which should be looked into by their research department, their focus on local food production has even decreased over the years. So, this can also not be used as a source where they can base their planning on.

To a certain extent this can be the reason why they have no policies, regulations or laws available which are specifically developed for urban foraging. All the interviewees mentioned that it is very vague what is permitted or forbidden in the practice of urban foraging. According to the urban municipal managers and the municipal ecologist it is possible to forage within the urban environment if nothing is destroyed, which was also confirmed by the forest ranger as he only intervenes as this happens. But the urban foragers have a more negative view on these possibilities as they believe it is forbidden whatsoever. Asking permission to the owner of the location should be the solution but this proved to be a difficult process and leads to many obstacles. As a consequence, most of the urban foragers do not ask for permission to forage in the public space.

Although this mainly concerns the public urban green spaces as they consider urban agriculture, which is a provisioning ecosystem service, as a different category which cannot be included and combined with the other urban ecosystem services. Also, according to the municipality, private gardens and community gardens are more fit to serve as an provisioning ecosystem service. The urban municipal green managers all thought that it would be difficult and expensive to integrate edible infrastructures into the public green spaces within Rotterdam. But if residents develop and maintain their own food production gardens this is not a problem anymore. This may be a reason why they disconnected urban agriculture, food forests and community gardens from public green spaces. It also explains why they disconnected food production from the public green space and why it should not be encouraged or integrated.

The imbalance described by Gobster (2007) between the human values and the ecological values could also be noticed from the results. The municipal green managers, both of the urban ecologists and the forest rangers expressed their concerns about the biodiversity and its importance. As far as they concerned, policies and planning of the green space should be focused on the improvement of the biodiversity, for example, by changing the mowing policy and by creating a diverse green environment through Romantic landscape design. But also urban foraging should be kept to a minimum so the biodiversity could not be disturbed by urban foragers. So, they consider biodiversity and providing food for animals as a higher priority than the provision of food for the inhabitants and their experience during the practice. However, urban foragers have a different perspective on the negative impact of urban foraging on the biodiversity. They believe that these two can go hand in hand if urban authorities focus on both values.

5.2 How is urban green space produced by planners and foragers through the different perspectives on urban foraging?

Space is produced through different processes which take place in the city and are influenced by different actors but also by different events from the past.

These different views and knowledge between the practitioners and the urban green experts ensure that they treat the space within the city in a different way. Which could be expected as every person has his own ideas and perceptions about the urban space and the spatial practices within the urban space. In Rotterdam a contrast could be observed between the urban foragers and the people who are involved with planning the space. Presumably, this contrast is related to the formal instances and individuals, especially the municipality, who do not notice but also avoid acknowledgement of the practice of urban foraging.

To understand the complexity in the production of space and the influence of different social relations the framework of the spatial triad will be used. This triad applied on the practice of urban foraging is described below.

- *The conceived space*: From the results it became clear that planners do not examine and encourage urban foraging in the public green space for the municipal spaces. This has an effect on its design as they focus on for the most part on its aesthetics, the biodiversity and recreation. Green in public spaces should be looked at and used for recreation but should not provide citizens with the provisioning ecosystem services. This is the dominant space and how it should be conceived by its users for the public green spaces in Rotterdam. This applies to most public spaces in the municipality of Rotterdam but some public spaces are owned by other institutions. From the results it became clear that Staatsbosbeheer has another policy as they do take urban foraging into account. They do provide its users with the provisioning service although to a certain degree.

The green space is defined in planning and policy documents by the municipality through the zoning plans with the corresponding green vegetation elements. The three zones in the city have different needs and this requires a different design and maintenance strategy. The most central zone is mainly focused on the aesthetic appearance of the green space to attract people and businesses. The outer zone has a more diverse green environment because the biodiversity and nature is more important in these areas. Specific types of plant vegetation are listed and provided by planners which is the same for trees in the urban environment. Their purposes and goals are all described in the policy documents and should be used as guidelines by planners.

The provisioning ecosystem service can be found within municipal policy documents but they are mainly not planned in the public space and they are not linked to the other policy documents about green space. They are described in the form of urban agriculture, community gardens and small private green spaces. So, in the dominant use of space the provisioning ecosystem service is separated from the other three services and should not occur in the public green space but in other places.

Not only planners and policy makers have an influence on the dominant space, also scientist, so the disbalance in the research for provisioning ecosystem services within the urban environments plays a role.

- *The perceived space:* Almost all urban foragers mentioned that they forage in the urban environment or Rotterdam, with some exceptions. They believe it is not allowed to forage anything but they also know that it is condoned by many enforcing bodies for certain circumstances. So although there are no specific and formal rules and policies formed for urban foraging, they try to act in accordance with the informal rules or guidelines. But some of them do encounter problems while they forage or are approached by the municipality regarding urban foraging tours and workshops.

On the one hand, urban foragers know that they have to ask for permission by the land owner to forage in their area, so they try to follow these rules, especially when they want to give a tour or workshop. On the other hand, they are also approached from the municipality if they want to give an foraging tour. Forest rangers try to address people who are foraging in the public green space.

Urban foragers use the public urban space to forage individually but also mentioned that they like to share their knowledge through workshops and tours which are held in different public spaces. They feel a higher pressure to ask for permission for these activities compared to individual foraging

- *Lived space:* So urban foragers see the urban environment as a place where a diversity of food can be found, and that it is present everywhere within Rotterdam. Most of the urban foragers like to visit the urban forest in Rotterdam for its diverse green edible environment but also for its aesthetics and to recreate in. They like to combine the need to visit appealing urban green areas and their need to forage for edible products in the public space. When they forage they harvest only small amounts or unwanted plants such as weeds and want to protect the green space from overuse. But they feel like they are not always welcome in the municipal public green space when they forage, they feel not free to forage in every green area. Although, this is different for every place and product they want to harvest. Blackberries, for example, are more commonly known and accepted to harvest.

In the lived space urban foragers encounter many problems while they try to ask for permission. So eventually these difficulties lead to, as most of the interviewees acknowledged, that they did not always tried to ask for permission anymore.

The combination of the three elements of the triad produce the urban space. The dominant space is not designed to include the practice of urban foraging but the lived space shows that it is present in the everyday lives of citizens. The urban foragers are not stopped by the dominant space and its effect on the green space.

In all elements the same idea could be recognized about protecting the green space and maintaining it. But, there are different meanings on how this could be achieved. For the dominant space this could be realised by trying to exclude the practice of urban foraging or to ensure the practice will remain relatively small. Urban foragers believe that this can be managed including the practice of urban foraging, if urban green is treated with care by the users and they are educated by professionals. Currently, urban foragers are foraging within the municipality of Rotterdam but they keep in mind that they can be stopped or get a fine by formal authorities. Or they try to ask permission but this may result in a very difficult process in which they are forwarded from one to another.

In the dominant spaces owned by Staatsbosbeheer, small scale foraging is permitted. But these areas are mainly located outside the urban environment or at the edges of the city. The municipality has a more

urban perspective on their areas compared to Staatsbosbeheer. So, the municipality needs to take into account different aspects of the urban environment and all of their citizens, such as cooling the city and businesses located in the city. This is not the same for Staatsbosbeheer, they have the possibility to focus more on practices such as urban foraging because the experience of their visitors has a higher priority.

Some of the perspectives by the municipal green managers seem a bit contradictory. As they anticipated quite some problems with urban foraging in the public space, they do not expect these problems to happen in the private green spaces. Because, they advise to include edible infrastructures in community gardens and front yard gardens and they provide information about this topic. This does have an effect on how inhabitants use and produce space because if they are encouraged to implement edible vegetation and are provided with information, they will be more likely to see this as an option. While this does not apply for the public green space as information about urban foraging cannot be found or requested on official sources by the municipality.

The dominant space shows that the monetary value of public green space also plays a role in how planners manage these spaces. As the urban space is produced within a capitalistic system and currently has a high value for the municipality of Rotterdam, it is difficult for urban foraging to be recognized by formal authorities because it does not produce capital. This ensures that these barriers will not be solved easily as there is no incentive for formal authorities and institutions because this does not have their commercial interests. While some of the urban foragers also use the public green space in a commercial manner as their tours and workshops have a price as well. But a difference could be distinguished here as the municipality has the power to control the public space while urban foragers do not have much input here. They have the possibility to participate in neighbourhood projects about the green space but their influence then remains small and only in one specific space. And this does not ensure that this space will be public available, so other urban foragers are then excluded.

5.3 How is the practice of urban foraging affected by the production of the green space?

So, the public green space in Rotterdam is not planned and designed for the practice of urban foraging but, according to urban foragers, this does not mean that the urban space is not suitable for urban foraging. Urban foragers claim their space by foraging in different areas as they mentioned parks but also residential areas are used. They use their knowledge about the urban vegetation to claim their space within the city. This regards to knowledge about the specific types of plants which are edible and where they can be found but also to knowledge which is gained during the practice of urban foraging. After a certain amount of time they get to know how the municipality manages urban foraging and what they permit or forbid, and which people or departments could be approached for permission. And so as they gain more experience and confidence in the practice, they realise that they can manage and claim their own space. But while they manage their own space, they cannot influence all aspects of the public green space. So they also need to confront barriers in order to fulfil the practice of urban foraging. These barriers are mainly a lack of information about the possibilities but also the food safety, and they are not recognized by formal authorities so they are addressed by forest rangers while they forage or want to give a tour.

Remarkably, some aspects of the current policy result in positive side-effects for urban foraging. The focus on the aesthetic aspect of green spaces which involves extensive hoeing and digging provides pioneer species, an interesting source of edible species for urban foragers. The intention by the municipality to increase the biodiversity ensures that they create a more diverse green environment which at the same time provides more diverse edible species for urban foragers. But, the dominant space produced by the zoning plans also limits urban foraging. In the public space planners make use of spacious lawns, taking up a large part of the green space without any diversity. Especially for city's residents who want to forage in the centre of Rotterdam, this can be a problem. Also, for foragers who do not have an extensive knowledge about edible plants and fungi, it can be difficult to forage and harvest edible products in the urban environment. In the outer zone foragers have more chance to find something because there is less mowing and more diversity in the urban green space. Also the areas of Staatbosbeheer are located in these zones.

All stakeholders perceived biodiversity as a high priority in the urban environment. But, in the dominant space edible sources are thrown or mowed away by the municipality while these are valuable for urban foragers. While, the governmental planners also explained that they are afraid of damage of the green space and a decrease in the biodiversity. Urban foragers explained that they feel like the argument of the municipality does not accord with their policy. This policy is also of importance for them because it negativity affects their practice of foraging because these valuable edible sources can not be foraged anymore.

The disconnection between the public green space with supporting, regulating and cultural ecosystem services and the private space with provisioning ecosystem spaces also has an effect on urban foraging. Because the municipality does not integrate these two spaces this results in exclusion of a large part of the cities' residents who want to forage and harvest. Their right to local food production is not acknowledged by the municipality. Urban foragers must take care of their own right by experimenting

what is informally permitted in the public space to harvest. Also by creating a network urban foragers know how and who they have to approach for permission.

6. Conclusion

In the following chapter the research question will be answered, to do this the three sub-questions which are explained in the discussion will be used. A main reason for this thesis was to gain more insight in the process of harvesting food in the urban environment and how this is linked with the scientific understandings and theories about urban food. The research was conducted to understand and explain how the practice of urban foraging is positioned in the city of Rotterdam.

The debate about the influence of urban foraging which can be perceived in scholarship in this field could also be perceived in this research. Many contrasts were identified in the perspectives on urban foraging between the urban foragers and the people who plan and design the space through their official position. Urban foragers feel like the urban environment is full of possibilities to harvest edible plants and fungi while planners generally thought that there was not much plants suitable for foraging. Also both stakeholders thought protecting the biodiversity is important but their idea of the impact of foraging on biodiversity is completely different. These lead to the situation in which urban foraging is not encouraged by official authorities and the practice is devalued by most of them because they mainly see negative effects on the urban green space and not many positive aspects. This is expressed in their actions in which they create barriers, mainly unintentionally, for urban foragers such as removing parts of plants used by urban foragers, introducing non edible trees and plants and they point out to urban foragers that it is not permitted. Still, an environment is created in which foraging is condoned by most officials. Although, this situation which is created leads to many obstacles and frustrations among the urban foragers. Because there are no specific rules in municipal areas, urban foragers do not know what is specifically condoned. This is different for Staatsbosbeheer where this is actually defined and described in their guidelines. The frustrations are also formed because they notice inconsistent behaviour from the municipality. It became clear that the perception about the urban green space by the municipality of Rotterdam was not always in line with their actions. Also, the frustrations are generated because there are some misconceptions between urban foragers and official authorities. But they have almost no say in the planning of the public green space and there is little interaction between the group of foragers and planners.

This shows that the knowledge people have on the urban green space is crucial in understanding how people view the practice of urban foraging. Not only knowledge plays a role, also the concerns of the municipality lead to the current circumstances of urban foraging. The interest of the municipality is related to their desire to create high quality green spaces in relation with their revenue model. This combination ensures that they have to consider many different interests which leads to that the practice of urban foraging is not recognized at all. The practice is not a widely known phenomenon, it could be understood as a niche activity in the city of Rotterdam. Also, the practice will not directly produce income for the municipality. These two things ensure that the municipality does not invest in gaining information and doing research about this practice. The approach towards urban foraging by Staatsbosbeheer shows that it is possible to manage urban foraging in another way which includes the preferences of their visitors. But this could be declared to some extent as they have other interest compared to the municipality. Their land is located for most areas outside the urban environment and their focus is essentially on green space.

As mentioned before, urban foraging is not a widely known concept but more people are involved in this without knowing this as many people pick a berry every now and then. Generally people do not connect the public green environment with edible products, food is bought in the store and is produced through agriculture. A shift is visible as the municipality also mentions urban agriculture projects and provides information and encourages food production in private gardens owned by citizens. But still, the production of food should be, according to them, located in the private space. There is a clear separation of the provisioning ecosystem service from the public green spaces. At the moment, the municipality does not invest in providing edible products to the citizens. While at the same time there is a demand from urban foragers to have access to these edible products in which they are not opposed by the municipality.

6.1 Research limitations and further research

This thesis has focused on different stakeholders and their perspective on the urban green space and urban foraging but still there is focused on a specific group in urban foragers which were mostly experts and people with experience. This has added a specific kind of knowledge of urban foraging and they may have a different perspective on foraging in the city other than people who are less experienced in this practice. Also there is focused on urban foraging as a practice mainly valued for providing food for citizens This perspective belongs to the provisioning ecosystem service, but urban foraging is also positioned in another perspective as scientific research also studies urban foraging as a cultural practice. The practice of urban foraging classified in the cultural ecosystem service is not included in this thesis because of constraints in time. So further research on the practice of urban foraging can include the perspectives of other groups of urban foragers for a better understanding of this practice. This may provide an opening as well for further research on the value of urban foraging as an cultural ecosystem service.

Only a limited amount of people working at the municipality related to the urban green space are included in this research and so there may be different perspectives which are not included in this thesis. This is difficult for the reason that the municipality of Rotterdam is a big organisation in which many departments are established but none of them is particularly focused on the urban green space. The planning and policy of the urban green space is under influence of different departments which focus on one particular part of the green space. The practice of urban foraging is not a familiar concept by the municipality and therefore this practice is intertwined throughout different departments of the municipality of Rotterdam.

This thesis found that planners created separated green spaces for provisioning ecosystem services and for supporting, regulating and cultural ecosystem services. The latter ecosystem services are located in the public green space, while the provisioning ecosystem services are mainly located in private spaces. These are the areas for urban agriculture or community gardens, but they are not freely accessible for everyone. This ensured that the right of citizens on urban food production is limited, but how this exactly works is not examined in this thesis. Further research can be done on how these rights are divided between citizens and how these rights can be increased in the future.

6.2 Policy recommendations

This study adds to the study field of urban foraging and although this study is performed in a specific location, namely Rotterdam, the insights gained in this study can still be of relevance for other places. Therefore, some recommendations are done in order to assist current planning design with the practice of urban foraging and how to deal with this. So firstly, to come back to the quote of Lefebvre “To change life, we must first change space”, the importance of space should be recognized and its influence on people. A result from this thesis was that space is not only produced through its physical form but also through the social relations and behaviour of the people who plan and live in the space. It is not only the physical space which can be changed, also the social space should be considered when urban foraging is examined. Currently, the practice of urban foraging is not well-known at the municipality but also in research, so this is the first step to recognize the practice in the urban environment. Also, examining what consequences urban foraging has on the urban green space can help in creating a policy which is supporting the practice but also ensures that the urban green space is protected. This may be of importance to create equality for all residents to have access to urban food which is produced on local scale. Also, space is scarce in urban environments and the land should be used in a multifunctional way, so urban foraging is one of the solutions to use the public space for all ecosystem services.

Another result of the thesis was the difference in knowledge about urban foraging between planners and urban foragers. These two stakeholders can help each other when they interact and share their knowledge, because they both have a different perspective on the urban green space and how this space should be used. This can help planners as well to plan a space more focused on the needs of all citizens and to include also well known practices, in this case urban foraging. So, while there is already a beginning with citizen participation on neighbourhood scale, this could expand to a more city wide scale because urban foraging takes place in the entire city.

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Appendix

Annex 1

Webpage sources:

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Annex 2

Introductie

Hallo, allereerst bedankt dat u heeft ingestemd met dit interview, hiermee helpt u mij enorm. Mijn naam is Menke Groot Kormelink, op dit moment volg ik de master Urban Environmental Management met als richting ruimtelijke planning en daarvoor ben ik nu bezig om mijn masterscriptie te schrijven. Ik doe nu onderzoek naar de perspectieven van verschillende stakeholders die met de publieke ruimte te maken krijgen en een raakvlak hebben met wildplukken. Het interview zal gaan over wildplukken in de stad Rotterdam.

Voordat we met het interview beginnen wil ik vragen of u het goed vindt als ik het interview opneem? Ik zal deze opname gebruiken om het interview uit te typen zodat ik alles kan teruglezen en uiteindelijk kan verwerken in mijn scriptie. Dit kan zijn in de vorm van een quote, maar hierbij zal ik alleen uw functie vermelden en niet uw naam waardoor u anoniem blijft, als u het hiermee eens bent.

Interview topics voor planning gerelateerde personen

Introductie interview

Introductie persoon:

- Voorstellen
- Functie bij bedrijf
- Link met de groene ruimte
- Projecten

Introductie wildplukken

- Eigen beeld van wildplukken
- Kennis over wildplukken (plaats, soorten, groepen)
- Ervaringen met wildplukken

Groen in Rotterdam

- Focus (wat is belangrijk tijdens de ontwikkeling en beheer van de groene ruimte)
- Hoe komt een design tot stand
- Bomen tegenover ander soort groen
- Gebruik van gras in de stad
- Onkruid in de stad
- Biodiversiteit
- Eetbare planten

Samenwerking

- Met wie in het werkveld
- Met bewoners
- Hoe ziet deze samenwerking er uit

Wildplukken/eetbaar groen

- Raakvlak met eetbare planten in de publieke ruimte
- Raakvlak met wildplukken
- Beheer
- Regels
- Toestemming/vergunning
- Risico's van wildplukken (rode lijst soorten, verontreinigde grond, overlast)
- Toekomst van wildplukken

Dit waren mijn vragen. Heeft u nog verdere opmerkingen of onderwerpen die u wilt bespreken?

Kent u of weet u nog personen die ik kan spreken voor mijn scriptie?

Bedankt voor uw tijd.

Interview topics voor wildplukkers

Introductie interview

Introductie persoon:

- Voorstellen
- Link met de groene ruimte
- Projecten als dit van toepassing is

Introductie wildplukken

- Achtergrond
- Ervaring met wildplukken
- Welke omgeving
- Welke soorten

Gevaren en risico's van wildplukken

- Soorten
- Grondverontreiniging
- Andere gevaren

Inrichting groene ruimte

- Voor en nadelen
- Invloed op wildplukken
- Verschillen in groene ruimte

Publieke ruimte

- Gebruik van publieke ruimte voor wildplukken
- Ervaring in publieke ruimte
- Toestemming
- Regels

Samenwerking

- Met andere wildplukkers
- Met gemeente

Dit waren mijn vragen. Heeft u nog verdere opmerkingen of onderwerpen die u wilt bespreken?

Kent u of weet u nog personen die ik kan spreken voor mijn scriptie?

Bedankt voor uw tijd.

Annex 3

Code overview

