Urban Agriculture in Amsterdam

Understanding the recent trend in food production activities within the limits of a developed nation's capital

Abstract

Urban agriculture, the practice of growing food inside a city, can play a significant role in a cities food system, especially in feeding the urban poor. Its presence varies greatly across regions, however, and it is predominantly seen in Asia and Africa, where it is often practiced out of necessity, in order to feed families or gain much needed additional income.

Urban agriculture is not confined to developing countries, however, and, in recent years, is becoming increasingly popular in cities across the United States and Europe. One such city is Amsterdam, the capital of the Netherlands, where especially community gardens have sprouted up in the last three years. This trend cannot be expected to be driven by the same motives that drive urban agriculture elsewhere, as food is readily, and for most citizens affordably, available in supermarkets. As such, the current research was conducted to understand the current developments, and based on these findings give implications of what can be expected of food production in Amsterdam in the future.

In order to do this, interviews were conducted with urban farmers and allotment gardeners, policy documents were studied and literature on urban agriculture was read. This research revealed that the food production activities found in Amsterdam can be divided in six categories: allotment gardens, beekeeping, community gardens, restaurant gardens, school gardens and water gardens.

The interviews revealed that food production is often not the main purpose of the activity. Instead, improving social cohesion in a neighbourhood and educating others (children and adults) about growing food are the main motives for practicing urban agriculture. When growing food is the main aim, it is done with the intention to practice sustainable food production. In several cases, gardeners tried to adhere to the principles of permaculture in order to achieve this. Economic necessity was never mentioned as a motive. Quite to the contrary, several gardeners mentioned that buying vegetables in the supermarket is cheaper than growing them.

As a result of these motives, and maybe also because most urban farmers in Amsterdam have little experience with growing food, hardly any intensive production systems were found. Most food is simply grown in the soil, or in raised beds where the soil is too polluted, and methods to increase use of the vertical space, which are typical of urban agriculture elsewhere, were hardly encountered.

The municipality was found to be an active supporter of urban agriculture. Most initiatives had some form of help from either the central municipality or one of the city districts when starting up or with maintenance. The municipality does this mainly to stimulate citizen initiatives that improve local neighbourhoods, but also to promote local, sustainable, food production and to strengthen the ties between the city and its rural hinterlands.

Acknowledgements

The best way to get knowledge about urban agriculture is to talk to the urban gardeners and farmers who are out in 'the field' getting their hands dirty. As such, I want to thank everybody who took the time to participate in the interviews: Lucienne, Marthieu, Kees, Sjef and colleagues from the school gardens Blijdestijn, Ridderbos, Gerrit Kalff and Wagner, Xavier from Bolenius, Ronald from de Kas, Auke from de Trompenburg, Ellen from De Brede Moestuin, Henriette from De Kok en de Kweker, Sabine and Saniye from De Groene Vaart, Thea and her team of volunteers at the water gardens on Hobbemakade, Marietta at Wijkopbouworgaan Zuid West, Jan and Nelleke from Nellestein, Alex at SWOMP, beekeeper Oscar and the allotment gardeners at Frankendael.

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Acronyms and Abbreviations

ANMEC (or NME)	Amsterdam Centre for Education on Nature and Environment
BvV	Bond Van Volkstuinders (Association of Allotment Gardeners)
DRO	Dienst Ruimtelijke Ordening (Spatial Planning Department)
RUAF	Resource centres on Urban Agriculture and Food security
SWOMP	Slimme Woonwagenbewoners Op Mooie Plekjes
UA	Urban Agriculture

Figures

1 Introduction

1.1 Context

The global population is on the rise, and is expected to increase from over 6 billion currently to 9 billion people by 2050 (FAO, 2011). At the same time, the average purchasing power, and with it the consumption of food, per capita is increasing (Godfray et al., 2010). These trends are expected to result in an increase in the demand for food of about 70 to 100 percent by 2050 (Worldbank, 2008; Royal Society of London, 2009).

The population is not only growing, it is also becoming increasingly urban. More than half the global population, some 3 billion people, currently lives in cities (World Bank, 2009) and this number is expected to rise to 5 billion by 2030 (UNFPA, 2007). As a result, the distance between production and consumption is increasing, leading to increasingly complex logistics and a greater demand for transport. This effect is magnified by globalisation, because increased global trade means that rural hinterlands are increasingly often in other countries, where land and labour are cheaper. In the US, for example, the distance travelled by food from production to consumption increased by 25% between 1997 and 2004 (Weber et al., 2008).

Additional production of food does not necessarily have to be rural, however, as food can also be grown in the cities, or, in other words, in urban areas. Especially for the urban poor, this can be a means to secure the necessary food to stay alive (Dubbeling et al. 2010; Mougeot, 2000; Smit et al., 2001). One obvious benefit of producing food in these areas is the proximity to the demand. Growing food close to where it is consumed can reduce the need for transportation and packaging (Garnett, 2000), which in turn means a reduction in greenhouse gas emissions and solid wastes. As such, food production in cities, often referred to in the literature as urban agriculture, can help mitigate the problems of climate change and waste production.

Most research into urban agriculture to date has focused on cities in developing, especially African, countries, where urban agriculture plays an important role in feeding the citizens of several megacities (Smit et al., 2001). As a result, much is known about the benefits urban agriculture can provide to people there, and about the drawbacks that have been encountered (and how to prevent these). Also, limiting factors (constraints) are a frequent point of discussion in case studies and research has offered several opportunities for promoting urban agriculture (Smit et al., 2001).

But research there only covers a part of the puzzle, as urban agriculture is not exclusive to developing countries only. On the contrary, urban agriculture has become, and is becoming, increasingly more popular in cities both in the United States and in Europe (Smit et al., 2001). Some urban farmers there fear that the current food industry, with its heavy reliance on fossil fuels, is not sustainable

In the Netherlands, urban agriculture (or "stadslandbouw" as it is called there) is becoming increasingly popular in several cities, including the capital city, Amsterdam. Articles about food production at home or in the city appear frequently in local and national newspapers, showing an increasing interest of the public in this phenomenon. Supermarkets have picked up on this trend and are including edible plants (mainly herbs) in their assortments.

In the meantime, community gardens are sprouting up in certain parts of the city (Lems et al., 2011) and people in Amsterdam are increasingly buying local (often organic) products (PLAN, 2010), signalling a stronger demand for locally grown food.

In order to understand these recent phenomena in Amsterdam, and through this add to the understanding of what drives urban agriculture in developed countries' cities, this thesis researches several urban agricultural activities in Amsterdam in order to describe what is happening where, and why.

1.2 Research question

Taking the above considerations in mind, this research seeks to answer the question

What factors are influencing the recent growth of urban agricultural activities in Amsterdam, and what does this imply for the future direction of food production in the city?

To answer this question, two lines of investigation are necessary. On the one hand, an inventory of urban agricultural activities is needed and a sample of these activities should be investigated further in order to understand what is driving them, and what is limiting them. Furthermore, a study of the available literature concerning urban agriculture, urban green and urban development can provide valuable insights in the development of urban agriculture in other cities. These insights can be used to understand the recent developments in Amsterdam, and to evaluate if an expansion of urban agriculture is likely.

1.3 Outline of the report

This two-pronged approach is described in more detail in the methodological chapter, chapter four, but only after the reader has had the opportunity to read up on urban agriculture (in chapter two) and study the theoretical framework for describing and understanding urban agriculture (in chapter three).

The methodology is followed by a brief description of the research location in chapter five, after which the results are presented as an overview of the activities in Amsterdam in chapter six. The implications of these findings are analysed, in chapter seven, in order to reach recommendations for city planners and for further research in chapter eight. The main findings are presented, and the

2 Background

2.1 The occurrence of urban agriculture worldwide

The presence of urban agriculture varies greatly between cities and throughout regions worldwide. In some cities, for example in several Asian cities, a share as large as 80 percent of families engage in food production of some sort, while in some North American cities this share is only 10 percent or lower (Smit et al., 2001). A rough estimate puts the total number of "actively engaged" urban farmers at 800 million worldwide, with another 150 million people employed in processing of urban produce (Smit et al., 2001).

Figure 2.1 Urban agriculture reform takes root in Kampala, Uganda.
Photo: Moses Makoha. Source: IDRC website

In several cities across the world, urban agriculture provides a large share of the demand for one or more food groups. In Kampala, Uganda, for example, more than half the land within the municipal boundaries is used for agriculture and 70 percent of all poultry needs (meat and eggs) are supplied from within the city (Lee-Smith, 2010; Smit et al., 2001). In Dakar, Senegal, more than 60 percent of the city's demand for vegetables is grown within the city, while poultry farming is sufficiently large to provide for 65-70 percent of the national demand (Mbaye et al., 2000). Urban agriculture is also widespread in Asia. In Singapore, for example, 80 percent of poultry consumed is produced in the city (Smit et al., 2001).

That urban agriculture dates back as far as cities themselves can be seen in the early empires of Latin America. Maybe the best example still preserved to date are the Chinampas, the water gardens that sustained the Aztec capital Tenochtitlan (Onofre, 2005). But urban agriculture is not just a thing of the past in Latin America, and in recent decades it was embraced by several governments, for example Peru and Argentina, as an important economic activity, especially in times of crisis (Smit et al., 2001). Technologies from Asia and Europe are used alongside local growing methods, and transnational knowledge exchange takes place frequently, for example through the Latin American Urban Agriculture Research Network (Smit et al., 2001).

North America also has a long tradition in urban agriculture, starting with the practice of livestock keeping on the town commons that was brought in by European settlers. With increasing urbanisation

In Europe, after the Second World War, urban agriculture had a separate but similar development on both sides of the wall. In Eastern Europe, agriculture was centralized in rural areas, but when this became unreliable people started depending on food production within the human settlement. As such, urban agriculture blossomed when the socialist regimes started to fall apart, because the transition period meant increased economic hardship and more self-reliance (Smit et al., 2001).

In Western Europe, urban agriculture had long been practiced in many cities. In Paris, for example a large industry existed that produced salad crops using horse manure as inputs. With the decline of horse drawn transport this industry eventually faded away. During the two world wars, urban agriculture accounted for over half of the total food production, but afterwards quickly receded again, as space was increasingly used for urban expansion (Smit et al., 2001). Recent years have seen a revival of urban food production in several countries, like Germany, France and Italy. This revival is linked to slow food movements and sustainable food movements, which both favour local food production (Smit et al., 2001).

2.2 Different forms of urban agriculture

Urban agriculture consists of a wide variety of products, produced using a range of methods on various locations and under different forms of organisation (Smit et al., 2001). This variability can be the result of different local circumstances (economic, climate, structural), different traditions and attitudes, varying food preferences and different land usufruct arrangements.

In Havana, Cuba, for example, urban agriculture is predominantly practiced out of economic necessity (Altieri et al., 1999). When the socialist bloc collapsed in 1989, Cuba could no longer import fossil fuels, chemical fertilizers and pesticides at artificially low prices. Food imports, which previously accounted for more than half of the population's calorie intake, were also reduced. As such, local food production became a necessity to feed the population and proximity to cities was a must, because of the lack of fossil fuels. In response, urban agriculture flourished. To deal with the lack of pesticides, knowledge exchange networks arose alongside organic seeds and inputs distribution networks to help farmers with combatting pests through organic means (Altieri et al., 1999).

Figure 2.3 Urban agriculture in Cuba.
Source: City Farmer News

Religious tradition and norms also play a role in deciding which products are grown and how they are

Acceptance of urban agriculture as an urban land use varies across cities, countries and cultures. In many African countries, agriculture was until recently, or is still, seen by city administrators as something rural that has no place within a city. The large presence of urban agriculture in African cities is therefore often not thanks to, but despite of, government measures, and is practiced out of necessity by families searching for a dependant and affordable source of food. Asian governments are generally more supportive, which is reflected in the high percentage of households involved in urban agriculture in cities there (Smit et al., 2001).

The way cities are structured and the amount of open space that is available also influence the potential for urban agriculture. Smit et al. (2001) note, for example, that Eastern European cities, due to their design during communist times, in which urban expansion was concentrated in planned, high-rise mini-cities, have a lot more open space than their Western counterparts, creating a “unique opportunity to promote urban agricultural production” (Smit et al., 2001).

Innovation can also shape the way urban agriculture takes place. Several authors mention innovation as an important part of, or even a necessity in, urban agriculture (Smit et al., 2000; Mougeot, 2000; Altieri et al., 1999). In Arilje, Serbia, for example, a method to improve the yields of raspberries was detected by removing the young shoots. The method was perfected and spread throughout the community by a local extension agronomist and soon the whole region was growing raspberries using this method (Critchley, 2007, Box 2).

Innovation is not necessarily limited to technical inventions and improvements on production methods, however, but also includes changes in forms of organisation, for example (Critchley, 2007). In Havana, Cuba, this was an important part of the developments in urban agriculture, and many gardens flourish because the gardeners found ways to actively involve the community (Altieri et al., 1999).

3 Theoretical framework

3.1 Introduction

The first modern studies of urban agriculture date back to the 1960s (Mougeot, 2000) and since then, many case studies have been investigated and described in peer-reviewed journals and books. Many of these studies have been initiated or sponsored by development aid agencies, and as such the focus is often on cities in developing countries and on the place of urban agriculture in a development context. These studies, enriched with literature about urban agriculture in developed countries, form the theoretical foundation for the current research.

In this chapter, the lessons learned from previous studies are presented in two frameworks: one for describing urban agriculture (section 3.2) and one for understanding it (section 3.3). In section 3.4, the potential roles and motives of stakeholders are discussed, and these findings are incorporated into the two frameworks. The chapter closes with a brief summary of the theory in section 3.5.

3.2 Describing urban agriculture

3.2.1 Introduction

Urban agriculture can be narrowly characterized as all agriculture that falls within or on the edge of an urban area. However, this description is not very informative and leaves much to the imagination of the reader. Smit et al. (Smit et al., 2001) offer a more elaborate definition that, in their own words, ”would emphasize those elements that have come to characterize urban agriculture as it is practiced today – while recognizing the great variety within it.” (Smit et al., 2001).

The characterizing elements that Smit et al. refer to in their statement are described by Mougeot in a thematic paper, in which he analyses definitions of urban agriculture in case studies (Mougeot, 2000). In his analysis he finds six elements that regularly occur in these definitions, which he classifies as types of economic activities, location, areas, production systems and scale, products and product destination (Mougeot, 2000). These six characteristics are explained in the following text, after which their applicability to the current research is discussed, resulting in a slightly altered group of characteristics.

Afterwards, definitions of urban agriculture are discussed in order to arrive at the definition that is used for this thesis, after which several common types of urban agriculture are briefly described.

3.2.2 The characteristics of urban agriculture according to Mougeot

The **types of economic activities** are the different activities in (or phases of) the production process. These include the production phase (growing the food) but can also include processing and

urban / peri-urban and peri-urban / rural is a matter of some debate and different studies are found to have uses different methods for this (Mougeot, 2000).

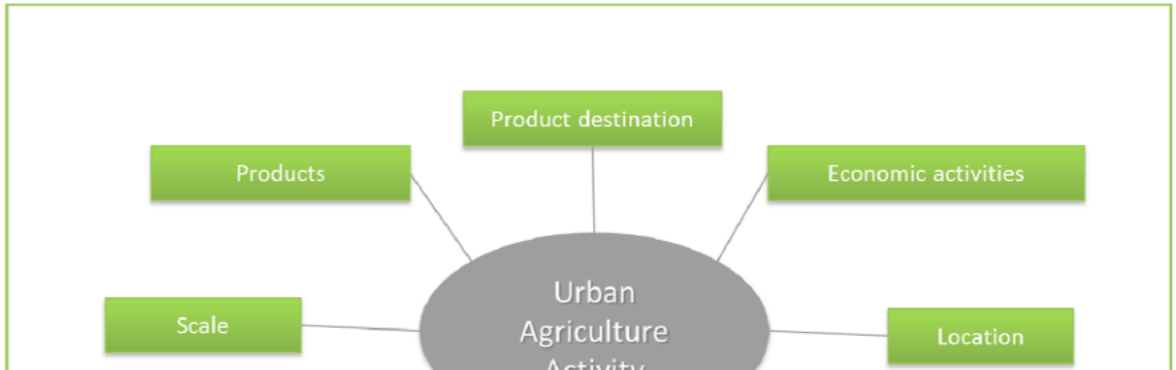
Sites used for urban agriculture vary greatly, and different authors have come up with different ways to classify them. Mougeot uses the word "areas" to describe "sites". This is confusing, while the word **area** typically refers to the **size** of a surface. Hence, the word "sites" is used throughout this report[2]. Sites can be built-up or open space (development status), they can have different official land-uses (e.g. residential, industrial), be under different tenure/usufruct arrangements (more on this in section 3.3.2 on constraints) and can be on-plot or off-plot (in other words, at the home of the urban farmer, or further away) (Mougeot, 2000).

Production systems and scale vary greatly between different urban agriculture initiatives (Smit et al., 2001), ranging from part-time household activities involving one or more people in a family to medium or even large-scale operations in sheds or urban greenhouses. Growing methods are often aimed at maximizing the use of space, while space tends to be limited (and hence expensive) in urban areas (Mougeot, 2000). The production systems used by urban farmers can also give away clues about their motives. Farmers that seek to optimise yields will probably use more intensive growing methods than those who pursue urban agriculture out of hobby.

Throughout this report, production systems and scale will be dealt with as two separate topics. This results in a framework with seven categories, as depicted in figure 3.1.

Products can be categorized in several ways. Mougeot proposes food vs. non-food, both of which can be further subdivided, for example based on purpose (non-food can be fuel, ornamental, other) or durability (perishables versus long-lasting foods).

Product destination describes what the products are meant for. Own consumption and trade (for money, but also bartering or as gifts) are chiefly mentioned in the literature (Mougeot, 2000).



3.2.3 Definitions of urban agriculture

The definition offered by Smit et al. (2001) includes all of the previously described elements and runs as follows. Urban agriculture can be defined as

"an industry that produces, processes, and markets food, fuel, and other outputs, largely in response to the daily demand of consumers within a town, city, or metropolis, on many types of privately and publicly held land and water bodies found throughout intra-urban and peri-urban areas. Typically urban agriculture applies intensive production methods, frequently using and reusing natural resources and urban wastes, to yield a diverse array of land-, water-, and air-based fauna and flora, contributing to the food security, health, livelihood, and environment of the individual, household, and community" (Smit et al., 2001).

While this definition gives a clear impression of how the different characteristics can be incorporated into a definition, it is too broad for the current research.

Firstly, this thesis focuses only on activities in the urban area, thus excluding the (peri-urban) activities that take place in the periphery of the city. Secondly, only activities that produce food are investigated, so the other economic activities (processing and marketing) and other products (flowers, fuels, etc.) are not incorporated. Thirdly, while it might be true that urban agriculture typically uses intensive production methods and urban wastes, this does not necessarily have to be true for the current case study and is not an essential part of making urban agriculture urban. Lastly, the wording "an industry" gives a commercial connotation to urban agriculture that is not necessarily correct, while urban agriculture might be done for various reasons (more on this in section 3.4) including non-commercial ones.

These considerations give rise to the following definition, proposed by the researcher, which will be used to define urban agriculture for the purpose of this thesis:

"All activities where food is produced within a town, city, or metropolis, on many types of privately and publicly held land and water bodies found throughout intra-urban areas. These activities provide different kinds of food (products) using a range of methods in different scales."

This definition reflects the scope of this research (location = intra-urban, economic activities = production, products = food) and makes no assumptions with regards to methods, scale, sites and product destination.

The scope regarding which products are included in the research is well expressed by Garnett as follows "Urban agriculture or food growing encompasses the production of all manner of foodstuffs, including fruit and vegetable growing, livestock rearing and beekeeping, at all levels from commercial

Allotment gardens are gardens of a limited size on which food can be produced. In Amsterdam, allotment gardens are defined as "a parcel of land on which ornamental plants and/or vegetables can be grown and on which often a small house of defined proportions can be placed, in which it is allowed to stay overnight in the period of April till October." (DRO, 2004a).

A **community garden** is maintained by several members of a community, and can typically be found on shared or public space. The community can be a predefined community, for example from a specific cultural background or socio-economic setting, but it can also occur that a sense of community is derived from the shared gardening.

Vacant lots are parcels of land that are (temporarily) not used. Urban agriculture can sometimes be conducted on these lots, hence making use of otherwise unutilized space, and potentially leading to a (visually) more attractive neighbourhood (Altieri et al., 1999).

Guerrilla gardening is a form of gardening where people illegally plant flowers or vegetables on public green spaces, for example using seed bombs to plant many plants at the same time.

Permaculture is a set of principles for designing human settlements and agricultural systems aimed at achieving sustainability. The term was introduced in the 1970s by Bill Mollison and David Holmgren.

Other types of activities are defined by the area on which they take place, for example **water gardens** and **rooftop gardens** or by the purpose they serve, for example **hospital gardens** or **restaurant gardens**.

3.3 Understanding urban agriculture

3.3.1 Introduction

With urban agriculture properly defined the first step in developing a theoretical framework is set. In order to understand its occurrence and the way it develops, however, more needs to be done. From the work by Smit et al., it becomes apparent that there are four types of factors that are relevant for understanding the occurrence and development of urban agriculture in a certain city: opportunities, constraints, benefits and drawbacks.

Opportunities for urban agriculture arise when circumstances favour the expansion of urban agriculture, for example through the increased availability of funds. Constraints, on the other hand, hinder the growth of urban agriculture, for example through obstructive legislation (Smit et al., 2001).

Benefits derived from urban agriculture form the underlying motives for conducting it, while the drawbacks are reasons not to do it. Taken together, they can tell you something about the

Throughout this section the first four factors are described in the order they were presented, culminating in a graphical overview of these factors and how they relate to each other. Stakeholders are dealt with in a separate section, as this is a rather big and multi-faceted topic on its own.

3.3.2 Constraints

Several factors can hinder the development of urban agriculture in a city. De Zeeuw (2004) identifies four groups of constraints:

1. Limited access to productive resources (including land) and insecure land tenure
2. Prohibitive urban policies and regulations
3. Lack of support services and appropriate technologies
4. Lack of organisation among urban farmers

The last three reasons are closely related and influence each other to a certain degree. Both prohibitive policies and lack of support services (like training and extension work) are the result of a lack of understanding of policy makers about the importance of urban agriculture (De Zeeuw, 2004). Because urban farmers are usually not organized (point 4) they are inefficient in communicating their needs to policy makers and putting urban agriculture on the policy agenda (de Zeeuw, 2004).

Smit et al. (2001) largely agree with the abovementioned constraints (but group them slightly differently) and add three others: sociocultural biases against urban agriculture, special risks of urban agriculture (for example theft) and post-production constraints (i.e. lack of processing or marketing capacity).

Smit et al. also note that the limited access to productive resources (or inputs) is often not a matter of physical unavailability of such resources, but rather that access is restricted through administrative or institutional constraints (Smit et al., 2001). An oft mentioned example of such a restriction is **insecure land tenure**. This implies that the person using the land does not know for how long they will be able to use it, making investments in the land unwise and unlikely.

Furthermore, land that is available might not be affordable, as other potential uses might produce higher rents than agricultural use can provide.

3.3.3 Opportunities

On the other side of these constraints are factors that can help or stimulate the development of urban agriculture in a city.

When urban agriculture provides other benefits than food production and there is a demand for these other benefits, this can create a demand for urban agriculture. Examples of benefits that are in

Urban agriculture can also be stimulated if it fits well in governmental programs. For example, if a municipality wants to improve the public green spaces or provide more functionality for local residents they might use community driven urban agriculture as a means to achieve those ends.

3.3.4 Benefits

The benefits urban agriculture can provide are well described in the literature. This might in part be due to the fact that much research is conducted from a development aid perspective (and sponsored by development aid organisations), and as such is focussed on the ways in which urban agriculture can provide benefits within this context.

Improved food security and livelihoods are often mentioned as the primary reasons for promoting urban agriculture. Producing food in cities complements rural agriculture and as such provides more food, often healthier food (vegetables and fruits) and help offset seasonal fluctuations in food supply, because many types of urban food production can be practiced year round (Mougeot, 2000; Smit et al., 2001).

Related to food security, urban agriculture could especially contribute to providing more **healthy food**, such as fruits and vegetables. That this is not only relevant for developing countries, becomes clear from Garnett's (2001) investigation of urban agriculture in London, in which she points out that a more healthy diet could significantly reduce the occurrence of certain diseases among Londoners, especially among the poorest and people in deprived areas (Garnett, 2001).

Health benefits can also come from the activity of producing food itself. A recent study among Dutch allotment gardeners and their non-gardening neighbours found that the gardeners move more, report less health complaints and visit the doctor less frequently (Van den Berg et al., 2010).

Economic benefits are another frequently mentioned group of benefits. Urban agriculture can provide income, generate employment and make use of otherwise unused resources, especially wastes and waste water (Smit et al., 2001; Mougeot, 2000).

The sustainability of cities can be enhanced through urban agriculture (Smit et al., 2001). Producing food locally means cities become better able to sustain themselves, while also reducing the need for transport. When urban wastes are used as inputs for urban food production, urban agriculture helps cities become more resource efficient and reduces the amount of waste that has to be otherwise dealt with (Smit et al., 2001).

Liveability of cities is how citizens experience their surroundings and what these surroundings offer them. Urban agriculture can contribute to a higher liveability through three ways: by improving the local climate (e.g. air quality and temperature), by 'greening' the city environment and by providing

One could argue that liveability is an essential part of sustainability, as an unliveable city is unlikely to sustain itself for long. While this statement has some merit, the separation into two different categories better emphasizes the differences between impacts of cities on the sustainability of society ('the sustainability of cities') on the one hand and the desirability of conditions in the city ('Liveability of cities') on the other. Hence they are mentioned as two separate categories here.

3.3.5 Drawbacks

The most significant drawbacks of urban agriculture are health and hygiene effects and environmental impacts (Smit et al., 2001). Less severe, but also worth mentioning, is that urban agriculture can in some cases lead to inefficient use of urban resources and have a negative impact on city aesthetics (Smit et al., 2001).

Health risks in urban agriculture are most often seen in animal rearing and when untreated wastes are used. Because of the proximity of the agricultural activities to large populations, the risk of diseases spreading from animals to humans (zoonosis) is larger in urban agriculture compared to rural agriculture (Smit et al., 2001). Furthermore, health risks can come from pollution in soil, water and air that comes into the food making it unsafe for consumption (Smit et al., 2001).

The environmental risks stem mainly from the use of agrochemicals, which can infiltrate and pollute other urban and natural environments through runoff, seepage or in some cases airborne transportation (Smit et al., 2001).

Another environmental risk is the introduction of exotic species that can overcrowd native varieties. Furthermore, replacing urban forest by small edible plants removes the supporting function these forested areas play and can impact insect and bird populations (Smit et al., 2001).

Inefficient resource use occurs for example when urban agriculture is conducted on land that could better be used for other purposes. These other purposes can be environmental, for example wetlands, but also development or use for recreational spaces like parks. Water, like land, is another resource for which urban agriculture competes with other uses within the city. If no fees are charged for water use, it can happen that farmers use too much for irrigation, leaving the rest of the city short of water (Smit et al., 2001).

Negative aesthetic impacts can occur with some urban agricultural activities, especially if they are not well maintained, because urban agriculture is generally more exposed to the public view than other urban activities (which take place inside buildings) (Smit et al., 2001). What is considered aesthetically pleasant depends on socio-cultural perceptions, of course. The keeping of livestock in the city, for example, was considered normal in several African cultures, but was deemed improper, and often banned, by colonial governments. In Nakuru, Kenya, for example, bylaws dating back

3.3.6 Overview

Taken together, the above findings are summarized in figure 3.2.

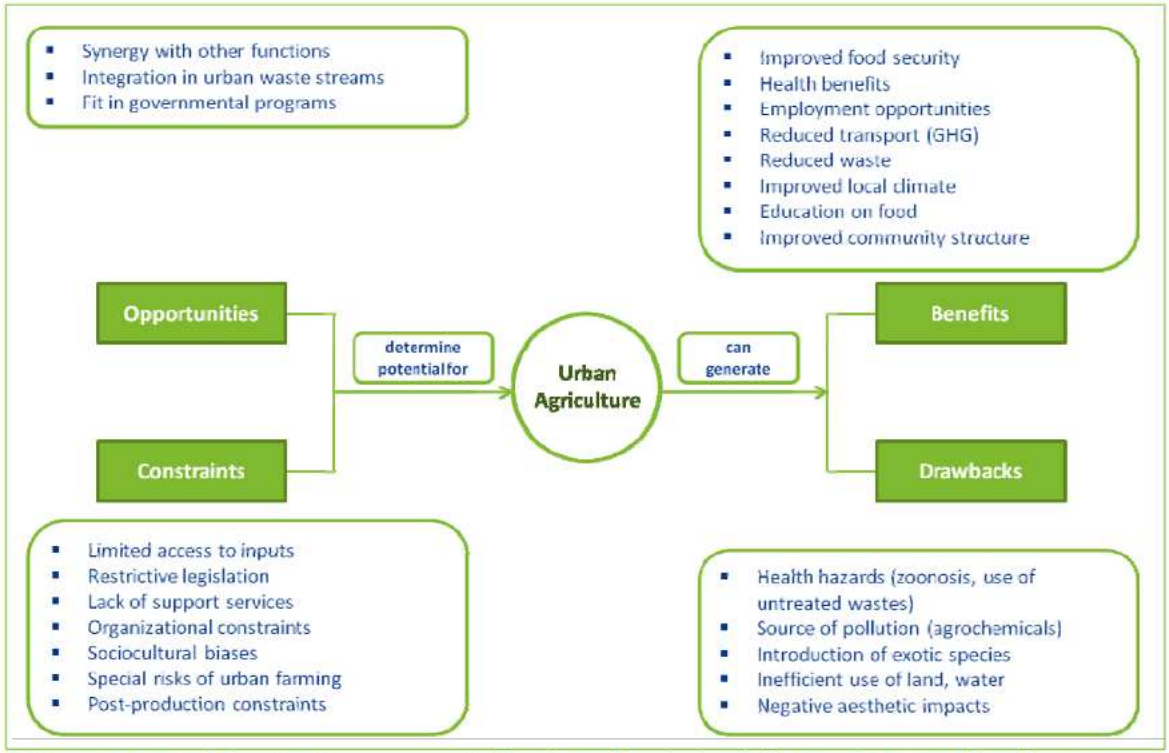


Figure 3.2 Overview of the opportunities, constraints, benefits and drawbacks of urban agriculture. Based largely on Smit et al. (2001), with additional findings from Altieri et al. (1999), De Zeeuw (2004), Garnett (2001), Mougeot (2000) and Van den Berg et al. (2007).

3.4 Stakeholders in urban agriculture

3.4.1 Introduction

Stakeholders in urban agriculture are all those affected by it, or affecting it, in some way or another. Taken together, these stakeholders shape the occurrence of urban agriculture in a city. They can create opportunities, use opportunities that are there, impose constraints or find ways around them.

This section explains which potential stakeholders exist, what possible motives they have for practicing or stimulating urban agriculture and how they can be analysed.

3.4.2 Potential stakeholders

Stakeholders in urban agriculture are all those affected by it, or affecting it, in some way or another. These include the urban farmers themselves, people involved in the post-production stages

stakeholders are even more involved, working together with urban farmers to produce the food. An example of this last category is a university that allows farmers to use some of its land for cultivation, in return for a share of the crops (Smit et al., 2001).

The relationship between these different kinds of stakeholders and the concepts presented in section 3.3 is shown in figure 3.3.

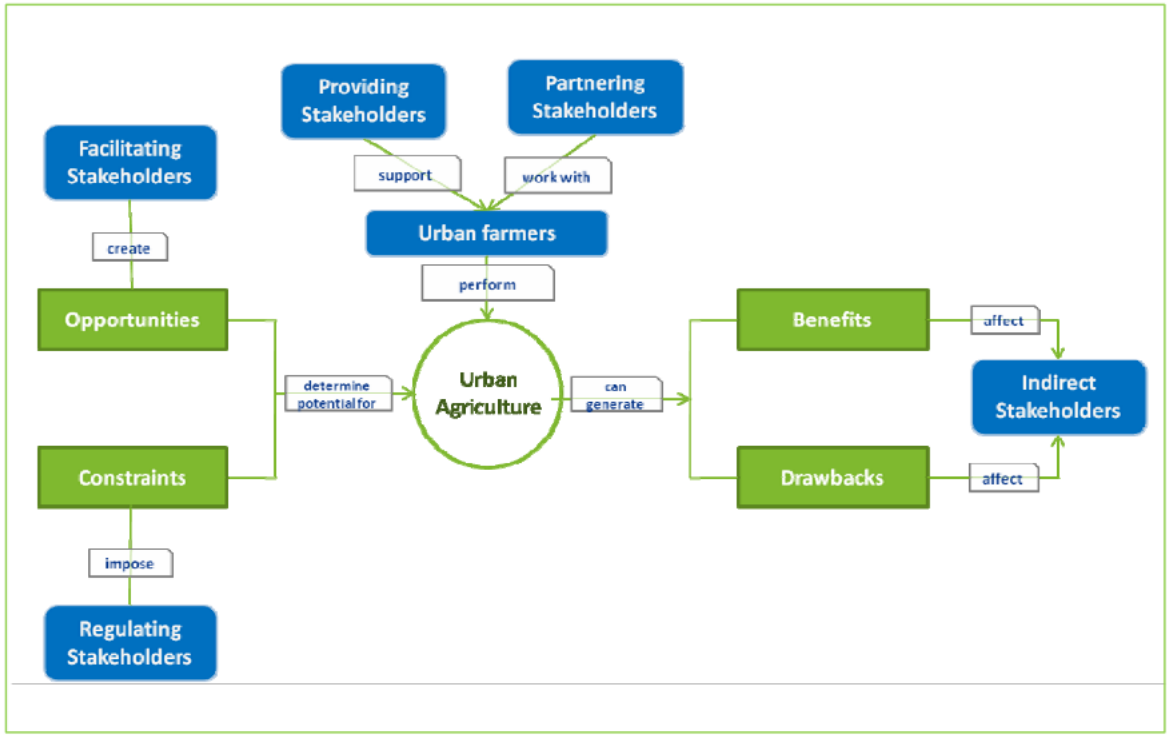


Figure 3.3 The role of different stakeholders in urban agriculture. Based on Smit et al. (2001).

A fifth group of stakeholders is included in this figure that is not present in the work of Smit et al.: people who are affected by urban agriculture, but do not play an active part in it. This group of stakeholders is referred to as **indirect stakeholders** throughout this thesis. The aforementioned neighbour who is bothered by the sound of the rooster is an example of an indirect stakeholder.

3.4.3 Motives for practicing urban agriculture

Urban farmers can have various different reasons for having an urban farm or garden. These reasons are likely to fluctuate with the socio-economical status a farmer has, and with the environment he or she finds him-/herself in.

Some farmers might grow food in order to feed themselves and their family, when other

Furthermore, people might practice urban agriculture because they are concerned about the sustainability of the current food system. Some people worry about their ecological footprint[3] and the 'food miles' their meal has travelled[4] (de Zeeuw, 2004). In this light, urban agriculture is a form of local food production that, through reduced transport and packaging, helps make the food system more sustainable.

Immigrants, coming from other countries and cultures, might use urban agriculture to grow their preferred foods which are otherwise unavailable (or unaffordable) in their new home (de Zeeuw, 2004).

3.4.4 Motives for including urban agriculture in city planning

Municipal policy makers can play an important role in the development of urban agriculture in a city (De Zeeuw et al., 2006). On the one hand, they can impose restrictions that constrain the use of urban agriculture (as seen in section 3.3.2). On the other hand, they can stimulate urban agriculture by

> Creating a conducive policy environment for urban agriculture and its formal acceptance as an urban land use.
> Enhancing access to vacant urban land and land tenure security.
> Delivering adequate support services to enhance the productivity and economic viability of urban agriculture.
> Taking measures to reduce the health and environmental risks associated with urban agriculture.

(De Zeeuw et al., 2006).

Furthermore, the municipality can help steer the development of urban agriculture in such as way that promotes gender equality and social inclusion.

The stance city planners take towards urban agriculture is influenced by their goals, and by their perceptions of urban agriculture. In cities where food security is not a given, urban planners might be focussed primarily on the role of urban agriculture in the food system. This is likely to be reflected in policies favouring certain urban agricultural activities over others.

When city planners are more concerned with aesthetics and urban development instead, they might choose to restrict urban agriculture to certain areas or only permit certain types of activities, or they might choose to ban it altogether. However, it is also possible that city planners in this context turn to urban agriculture as an **urban design instrument**, meaning that it is used to shape the urban environment in such a way that promotes desired behaviour or deters undesired behaviour (Wilbers

De Zeeuw (2004) offers several reasons why urban agriculture is used by city planners. These reasons are

1. The increasing role of intra-urban and peri-agriculture in the provision of recreational and eco-educational services and other services for urban citizens (agro-tourism, care or educational farms).
2. The role of urban agriculture in landscape management and maintenance of urban biodiversity.
3. Urban agriculture can be used as a buffer for storage of urban storm water and heat.

As such, several cities have included urban agriculture in their urban land use plan or neighbourhood upgrading projects (Wilbers and de Zeeuw, 2006).

3.4.5 Incorporating stakeholders into the theoretical framework

As shown in this section, stakeholders and their motives play an important role in the development of urban agriculture. As such, it makes sense to incorporate them into the framework for describing urban agriculture. Figure 3.4 shows an updated framework in which this is done.

In this updated framework, product destination has been taken together with motives and named purpose (because the product destination is the purpose for which the products are produced, and because the motives of urban farmers form their purpose for doing the activity).

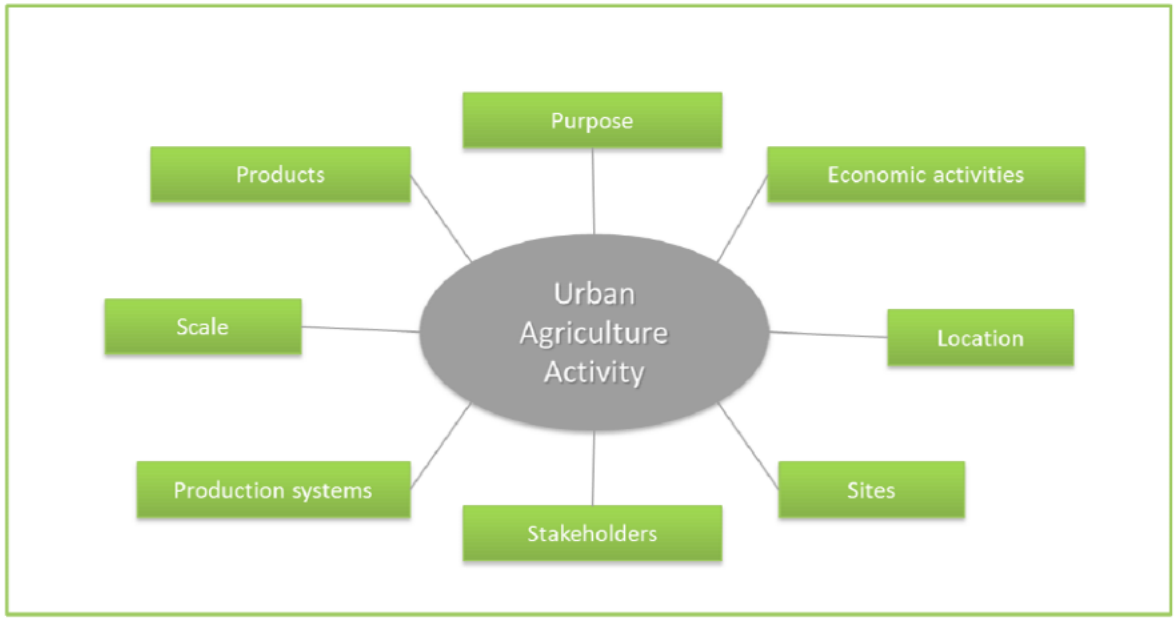


Figure 3.4 Updated framework for describing urban agriculture, including stakeholders. Based on Mougeot (2000) and

3.5 Summary of theoretical framework

To summarize the above findings, urban agriculture can be **described** using the seven characteristics from Mougeot: economic activities, location, sites, production systems, scale, products and product destination.

Investigation of urban agriculture in a particular city along these seven dimensions gives insight into the **benefits** and **drawbacks** it generates there. This investigation can also reveal clues about who are involved (**stakeholders**) and what their **motives** are. Further knowledge about stakeholders and their motives can be obtained through a **stakeholder analysis**.

This knowledge is necessary to **understand** the **constraints** and **opportunities**, benefits and drawbacks that shape the development of urban agriculture in a city.

4 Methodology

4.1 Introduction

This chapter explains how the research was conducted.

As explained in the introduction, the general approach consisted of two parts: a literature study and interviews with urban farmers. The first part, the literature study, yielded a theoretical framework that helped to interpret and structure the results. The second part, the interviews, was done to gather primary data about urban agriculture in Amsterdam.

The interviews were aimed solely at urban farmers (including allotment gardeners). Other stakeholders exist, as discussed in section 3.4, but these were not interviewed. This approach was chosen because time was limited and urban farmers, the primary stakeholders, were a logical place to start with the interviews. The other stakeholders were not overlooked, however, and questions about the roles of potential other stakeholders were included in the interviews with urban farmers.

The process of finding candidates for interviews was dynamic, meaning that new leads were actively pursued throughout the research. For example, several initiatives that were pointed out to the author during the interviews were contacted and interviewed later in the research. A visit to an exposition on urban agriculture in Arcam (the Amsterdam Centre for Architecture) also led to the discovery of several new activities, some of which were interviewed.

In the rest of this chapter, the research is discussed along three steps:

1. Collecting the data
2. Organising the data (dealt with by describing the different datasets)
3. Presenting the data

Each of these steps is described in its own section, after which the chapter concludes with a section containing reflections on the methodology.

4.2 Collecting data

4.2.1 Finding farmers

The first leads on what is happening in Amsterdam came from family, friends and colleagues who sent links to websites and newspaper articles about urban agriculture (for which the author is very grateful, see acknowledgements section). This brought to light several initiatives and, in some cases, contact details of people who were in one way or another involved in Urban Agriculture.

4.2.2 Practitioner interviews

Most of the primary data in this study was collected through interviews with urban gardeners in Amsterdam (also referred to throughout the text as **practitioners**). The interviews were semi-structured, meaning that, during the interviews the list of questions served as a guide through the conversation, rather than all questions being asked in a specific order.

The interview was centred around the following topics: products, scale, product destination, purpose and benefits, methods and inputs, difficulties (drawbacks and constraints), knowledge, organization and stakeholders. To prepare for the interviews, a list of potential questions was discussed with the supervisor, edited, discussed again and given its final shape that can be found in annex B.

Potential candidates for interviews were emailed a short letter explaining the purpose of the email and asking for their participation (for the full text of the email, see annex B). As such, the first round of selection of practitioners was based primarily on availability of email address.

During this first round, fourteen emails were sent, generating seven replies: four school gardens and three other initiatives. All seven replies were favourable and led to interviews. During these interviews, and during further research, more initiatives were encountered and a second round of emails was sent. In this round, no more school gardens were addressed, as the four gardens interviews seemed an appropriate representation of the thirteen school gardens in Amsterdam, especially considering the high degree of similarity between the results of the four interviews.

In total, nine emails were sent during this round, generating eight replies of which seven led to interviews (one replied positively at first, but did not follow up on further attempts to establish a date). Later in the research, two additional leads were followed up of which one led to an interview and the other to a short phone interview.

All in all, 25 initiatives were contacted, of which 17 replied (68%) and 15 interviews were conducted (60%, including one phone interview).

4.2.3 Allotment gardener interviews

Rather late in the research an opportunity presented itself to visit an allotment garden park that was run by one of the urban farmers (Ellen Mookhoek, of de Brede Moestuin). The park, Frankendael, is a recreational park, so this seemed a good opportunity to find out if gardeners there were actually growing food at all, and if so, to what extent.

As such, a visit to this garden complex was made and 16 people were interviewed there. The selection procedure was very simple: every gardener that was encountered during a walk through the garden park was asked if they had a few minutes to spare for a questionnaire. Luckily, 16 out of

4.2.4 Street interview

Initially a street interview was to be part of the research, used for examining peoples attitudes towards urban agriculture, as well as creating an inventory of how many people grow food in their homes and how much time they spend on this. The questionnaire was created, tested on family and friends and refined several times (and for completeness has been added to this report in Annex D).

However, after an initial test run showed that a lot of time would be necessary to get a reasonable amount of interviews (it took 20 minutes to find one person willing to be interviewed) it was decided to postpone the street interviews until more essential parts of the research were finished. Unfortunately, these other parts took too much time to allow the street interviews to take place at a later date, and as such they were not conducted.

4.2.6 Secondary data and contextual information

The primary data described in the previous sections was only a part of the puzzle, and secondary data, from websites and previous studies of specific activities (allotment gardening, and community gardens in city district Nieuw-West).

Furthermore, data about local legislation was found on a municipality databank that serves as a register of all municipal legislature[5].

4.2.7 Literature review

Finding literature about urban agriculture was greatly aided by the RUAF foundation website, especially the online distance learning section, which summarizes the theory around urban agriculture and points to numerous case studies to illustrate the concepts mentioned.

Another work of great importance to this research is the book by Smit et al. (2001), titled “Urban Agriculture: Food, Jobs and Sustainable Cities”. This book, as is clear from the many times it was referenced in the previous chapters, contains a thorough description of several facets of urban agriculture, based on, and backed up with numerous examples and case studies.

One more paper worth mentioning here is the work of Mougeot (2000), which helped a lot in establishing the theoretical cadre for describing urban agriculture.

4.3 Datasets

4.3.1 Three datasets

The collected data, both primary and secondary, was compiled into three different datasets. One set contained all activities in Amsterdam about which enough information was found to confirm their existence, type and location, one set contains the activities where an interview was conducted and

4.3.3 Dataset II: The practitioner interviews

The information provided during the interviews was noted down using pen and paper. Later on, the answers were typed over into word documents where they were grouped by topics.

The third and final step in creating the dataset was to transform certain qualitative statements into measurable variables and apply this transformation to all the interviews, creating a spread sheet with data in Excel. These measurable variables are all simple counting operations to create statements such as "10 out of 15 activities used organic fertilizer, while none used any form of pesticide"[6]. No statistical analysis was performed, as the dataset is too small to yield any significant results.

By far not all data in the interviews is suitable for a transformation, however, and much of the data, for example on stakeholders or on historical facts, remained qualitative. As such, the second dataset consists of both the excel table as well as the word documents.

The phone interview only yielded information on some of the areas of interest. For those fields where it did not provide (sufficient) data, results will be given based on the remaining set of 14 interviews.

4.3.4 Dataset III: The allotment gardener interviews

This dataset contains the answers of the allotment garden interviews.

For some questions, the answers are grouped into categories and the occurrence of each category is counted. For example, question 2 asks the gardeners about their reasons for having an allotment garden. Based on the answers provided, six groups were identified: being outdoors, community feeling, for the kids, getting hands dirty, growing own food and having a piece of land.

For each of these six possible answers, the amount of interviews in which they were mentioned was counted, thus providing insight into the predominant reasons for allotment gardeners to have a garden.

4.4 From data to results

The data from the datasets is presented in the following chapter. While many aspects are qualitative, most of the results are descriptive in nature. Where possible, these descriptions are supported by pictures or by tables and graphs based on the data in the datasets.

Throughout the report, the results and the analysis thereof are structured according to the topics presented in the theoretical chapter. Firstly, the six descriptive characteristics that are not fixed in the scope of this research are dealt with: purpose, products, production systems, scale, stakeholders and sites. These are followed by the four dimensions of understanding urban agriculture: constraints,

4.5 Reflections on methodology

4.5.1 Completeness of dataset

The current methodology for finding initiatives was very much based on the availability of online information, combined with tips from interviewed urban farmers. As such, it is not unthinkable that several activities are not included in the investigation, as not all urban gardeners can be expected to maintain a website.

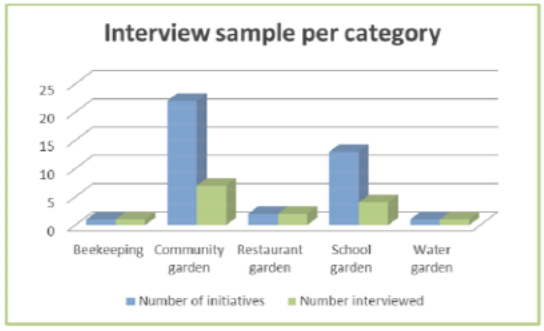
Especially initiatives that are conducted on public lands without municipal permission are unlikely to be easy to find. Small-scale initiatives involving only one or a few people might also not be registered anywhere, because the people in these initiatives might not have the time, or the inclination, to publish about the activity.

One approach that could have been adopted in order to find more initiatives is to contact city district offices (and perhaps also the central municipality) and ask them for the initiatives in their area. The revelation that there was sense in this approach came a bit too late in the research to still be of use.

4.5.2 Selection of interviews

In order to generalize findings from the interviews to the whole city it is important to check if the sample of activities interviewed is representative of the total set of activities conducted in the city.

As becomes apparent from figure 4.1, the activities that have few occurrences (one or two) have all been interviewed, while of the more frequently present activities (community gardens and school gardens) roughly 30 percent have been visited. This seems like a reasonable distribution. If more activities were to be visited, they should probably be community gardens, because these have a higher variability than school gardens (because school gardens all follow the same set up, for the same purposes).



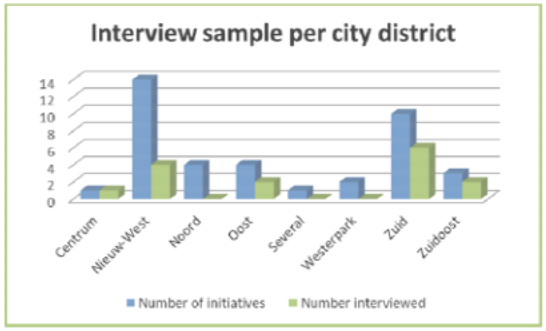


Figure 4.1 (left) and 4.2 (right) Bar charts displaying interview sample sizes per category and city district

Figure 4.2 shows the distribution of interviews over the city districts to check geographical coverage

As mentioned in section 4.2.2 potential candidates for interviewing were contacted via email, which means initiatives that were not reachable by email were not included in the interview sample. While not necessarily the case, it could be that initiatives without email access differ significantly from initiatives that do have email access in ways that could be important to this research.

It could be, for example, that these initiatives do not have an email address because they involve people from a different social or cultural background (poor people, for example, might not have a computer), from a certain age range (not all people from older generations know how to use a computer) or with different preferences (people might not want to use a computer).

As such, it might have been a good idea to include initiatives that do not have an email address (and contact them by phone).

4.5.3 Limited applicability of results from allotment garden interviews

The allotment garden interviews were all done in one park, on one date and without any sampling or selection techniques. As such, it is unlikely that a generalization of the findings to the general allotment gardening population will yield any valid conclusions. This concern is especially valid when considering the large variations between parks in size, function (recreational vs. utility) and location (a different location could result in gardeners from a different socio-economical or cultural background, but could also have implications for the suitability of the gardens for different types of plants).

Given this concern, the interviews conducted at Frankendael should not be interpreted as an attempt to describe the entire population of allotment gardeners, but rather as an initial inquiry into what motivates allotment gardeners and how this can be researched.

If at some point policymakers would like to stimulate the growing of food in allotment gardens, for example, an interviewing setup similar to the one applied here could be used and the questionnaire used here could serve as a basis for such research. In this case, further questions should probably be added to investigate what motives people have for not growing (more) food on their gardens.

5 Research Location

5.1 Introduction

The aim of this chapter is to provide the reader with a better understanding of Amsterdam, the location of this research. The chapter starts with a geographical description, followed by some relevant facts and figures. After this, the municipal organisation is described, focussing on elements that could be interesting for this research.

5.2 Geographical description

5.2.1 Land and land use

Amsterdam can be characterized as an urban area, surrounded mostly by pastures, with water (the IJ lake) bordering one side.

The total area within the municipal borders is roughly 21,932 hectare (or 219 km^2), of which 35 percent is built-up area, 25 percent is water, 12 percent is agricultural, 10 percent is dedicated to recreation (including parks and allotment gardens) and the remaining 18 percent is divided among traffic, semi built-up area (mainly construction) and natural areas. The division is illustrated in figure 5.1.

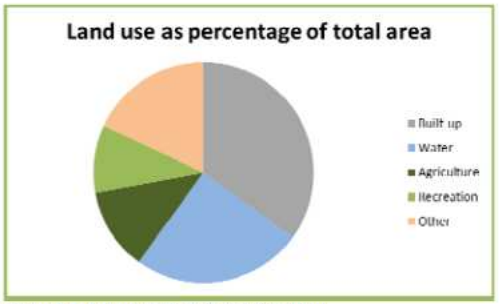


Figure 5.1 Land uses in Amsterdam

The agricultural area is only peri-urban (on and around the cities edge, see section 3.2.2) and as such is not included in this study. As can be seen on the map (figure 5.2) and in table 5.1, the agricultural area is mainly found in district Noord (on the north side of the city) with the remainder mostly in the western part of district Nieuw-West. In Noord, mainly dairy farming is practiced (the land is to wet to grow crops) whereas in Nieuw-West a mixture of activities is conducted, including dairy farming, growing grains and vegetables, sometimes using greenhouses (website Boerenstadswens).

The area of Amsterdam is divided into eight city districts (see map in figure 5.2 for their boundaries). From table 5.1, which shows land use per city district in hectares and percentages, it becomes clear that, as could be expected, the percentage of agrarian and natural areas is larger in the peripheral city districts and lower in the more central districts. Likewise, the relative amount of built-up area increases as you move towards the centre.

Table 5.1 Land use per city district (in hectares and %). Based on data from DRO/Statistiek Bodemgebruik 2009

	Centrum	West	Zuid	Oost	Westpoort	Nieuw-West	Noord	Zuidoost
Size (ha)	809	988	1,730	3,056	3,505	3,246	6,388	2,211
Traffic	7%	11%	10%	8%	7%	9%	4%	11%
Built-up area	65%	62%	58%	27%	40%	37%	17%	47%
Semi built-up area	2%	5%	4%	10%	23%	6%	5%	6%
Recreation	3%	10%	15%	10%	2%	19%	6%	19%
Agrarian	0%	0%	2%	2%	0%	13%	31%	5%
Forest and nature	0%	0%	2%	1%	2%	5%	3%	1%
Water	22%	12%	10%	42%	26%	11%	34%	9%

5.2.2 Water

As mentioned in the previous section, 25% of the total surface area of Amsterdam is water. While a large part of this (nearly half) is formed by the lakes in the northwest corner (see map 5.2), it is interesting to note that even in the centre district of the city the percentage is 22%. This water is mainly in the many canals the city is famous for, as well as in the river Amstel and the Noordzeekanaal.

5.2.3 Public green

Part of the recreational area consists of public green spaces, for example parks, roadside green and green areas on squares. These green spaces are interesting for this research, because they are logically the most likely sites for urban agriculture to take place in the city.

The spatial planning department (abbreviated as DRO in Dutch) recognizes four types of public green, as depicted on the map in figure 5.3: playing areas (orange), allotment complexes (yellow), parks and forest (green) and cemeteries (turquoise).

5.2.4 Soil pollution

Urban soils perform a number of functions in a city. They support building foundations, absorb rainwater and, of course, support vegetation of different kinds grown for different purposes (Critchley, 2011). Urban agriculture is one of those purposes, and for this purpose it is important that the levels of pollutants in the soil are below certain maxima, as vegetables grown in polluted soils can form a serious health threat to their consumers (Smit et al., 2001).

The map in figure 5.4 depicts pollution levels in the topsoil. Light blue and blue areas are clean, green areas are mildly polluted, yellow areas contain medium levels of pollution and red areas are strongly polluted.

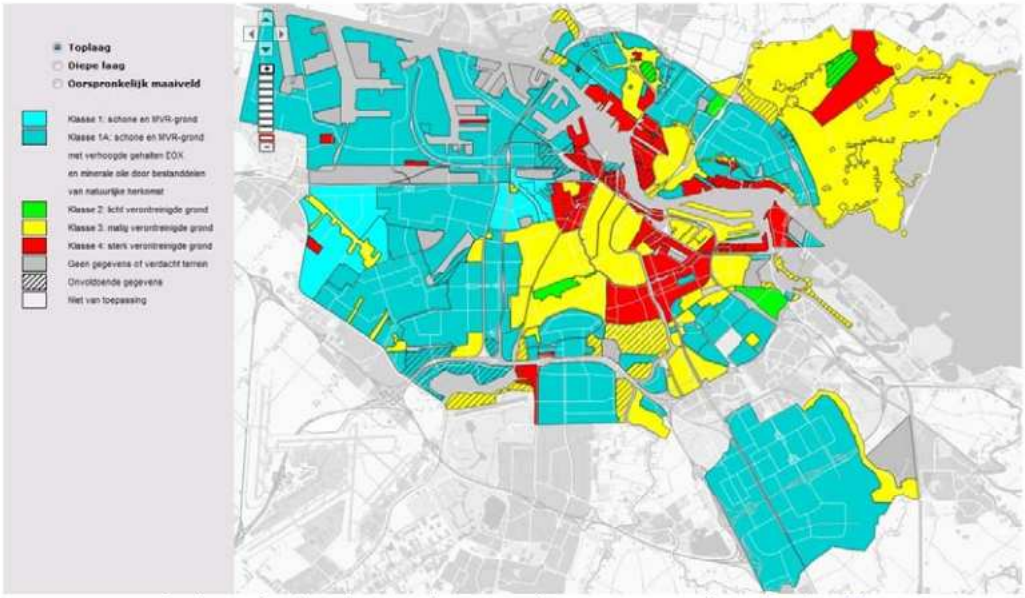


Figure 5.4 Map of pollution levels in the topsoil in Amsterdam. Source: DRO (http://gisdro.nl/BODEMKWALITEIT/)

It is clear from the map that the soils in the central part of Amsterdam are unsuitable, as are the soils in the top right part. In most other areas, especially in districts Zuidoost and Nieuw-West, the topsoil appears to be clean enough for food production.

5.3 Amsterdam: facts and figures

5.3.1 Demographics

According to the latest confirmed statistics, Amsterdam housed roughly 767,000 residents in September 2009. In recent years, the population has grown, and was estimated to be around 780,000 people by the start of 2011 (O&S, 2011).

5.4 The municipality of Amsterdam

5.4.1 Central organisation and city districts

As mentioned in section 5.2, the municipality of Amsterdam is split up into eight city districts. These districts have their own local board (with the exception of the harbour area Westpoort, which is run by the central municipality).

The city districts are responsible for most daily governance, including maintenance of the public (green) space, issuing building permits, municipal responsibilities regarding well-being, sports, education and culture, as well as handling certain subsidy requests.

The central municipal administration provides several services to the central municipal government as well as the different city district boards. An important service in light of this research is the spatial planning service (Dienst Ruimtelijke Ordening, or DRO in short) that plays an important role in regulating land use and shaping the public space in Amsterdam.

5.4.2 Municipal vision on the roles of green in the city

Green spaces are organised under a main ecological structure called the Hoofdgroenstructuur, which, according to the Structuurvisie[7], "contains the minimum amount of green area that Amsterdam needs to fulfil invaluable functions for green recreation, improved climate, water storage, heat reduction, improved air quality, biodiversity, and food production" (translated from Dutch, emphasis added by author).

What is worth noting here, as it has implications for the roles urban agriculture can play in the city, is that according to the structural vision "areas that are turned inwards, serving only one purpose, have no place in the city of the future" (translated from Dutch). This implies that urban agricultural activities that only serve to produce food are not welcome in Amsterdam's public green space.

6 Results: Activities in Amsterdam

6.1 Introduction

At present, there are roughly 40 to 50 initiatives involving food production in Amsterdam that are documented in some form or other (on the internet, in reports or newspapers), ranging from community gardens to school gardens, restaurant gardens and gardens on water. Besides these activities, Amsterdam has 37 allotment garden parks, most of which are for recreational purposes but some of which are dedicated to food production (so called utility gardens) as well.

The map in figure 6.1 shows an overview of where the different activities are located.
The rest of this chapter discusses the six different kinds of activities described above (in alphabetical order: allotment gardens, beekeeping, community gardens, school gardens, restaurant gardens and gardens on water) and goes on to describe some forms of urban agriculture that have not been encountered, but could be practiced in Amsterdam (and are expected in to start soon in some cases).

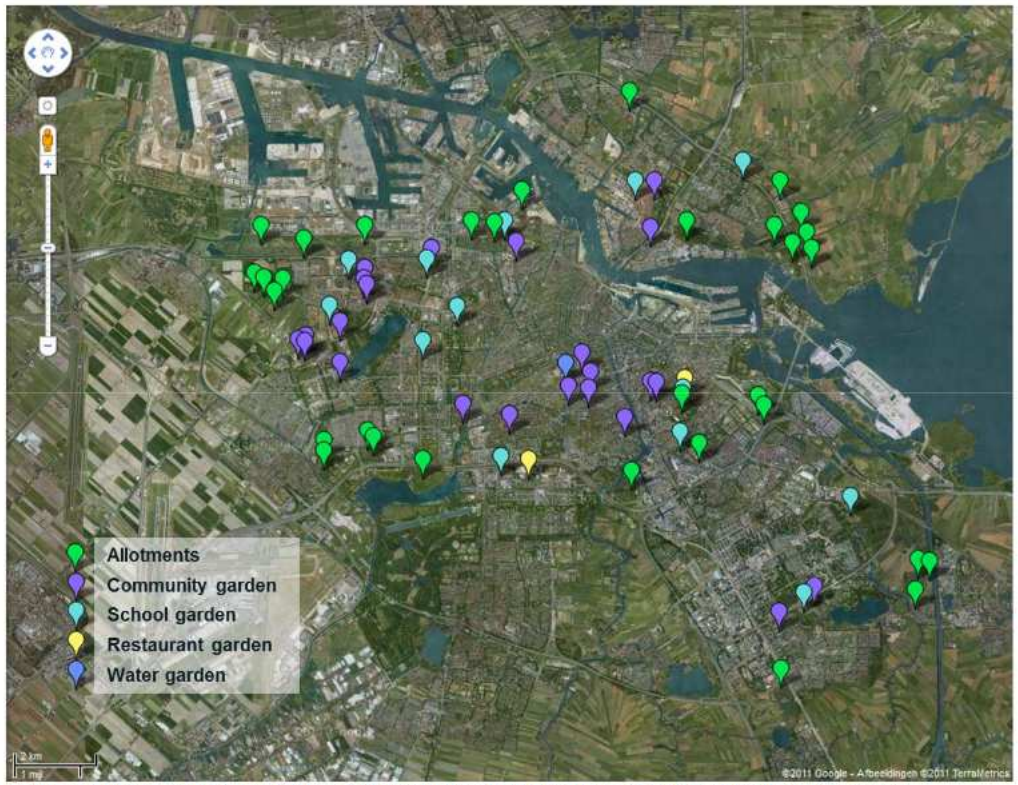


Figure 6.1 Map of urban agriculture in Amsterdam, showing different activities in different colours

Table 6.1 Overview of the six activities found in Amsterdam. Based on interviews and visits conducted during the research.

Activity	Definition	Amount[1]	Sites	Products	Size	Impression[2]
Allotment gardens	Gardens of limited size, rented out to individual gardeners, on which food and ornamental plants can be grown	37 parks, ± 6000 gardens[3]	On the periphery; Adjacent to (sports)parks	Vegetables; Fruits; Herbs	50-300 m^2	
Beekeeping	Looking after bees in order to produce honey[4]	1	Backyards; Allotment gardens; Community gardens; Parks;	Honey	In the city: ± 5 hives Rural: 10-20 hives	
Community gardens	Shared garden, maintained by members of a local community	22	Typically on shared spaces in the vicinity of housing	Vegetables; Fruits; Herbs	25-1250 m^2, typically between 100-300 m^2	
Restaurant gardens	Gardens managed by restaurants. The produce is used in the restaurant	2	Parks; Vacant lots. In the vicinity of the restaurant maintaining them	Vegetables; Herbs	One garden is 1.2 ha (12.000 m^2). The other is several hundred m^2 and a greenhouse	
School gardens	Gardens used for education of primary school children	13 complexes, ± 6700 gardens[5]	Typically near (sports)parks; Some along the periphery	Vegetables; Herbs	Individual gardens are 7-10 m^2, each complex has 400-1000 gardens	
Water gardens	Floating gardens	1	Canals	No edible products	200 rafts of 3 m^2	

1. This column contains the number of occurrences of the activity in the dataset used for this research (described in section 4.3.2). As such, it might well be that there are more occurrences in Amsterdam, but that the researcher is unaware of these or could not find sufficient information to verify their existence.
2. All pictures are taken by the author, except for the picture of beekeeping, which comes from http://www.thedailygreen.com/environmental-news/blogs/bees/beekeeping-66121302.
3. DRO (2004b).
4. Modified from the definition of Beekeeper provided by The Cambridge Online Dictionary (http://dictionary.cambridge.org/dictionary/british/beekeeper).
5. PLAN (2010).

6.2 Allotment gardens

6.2.1 Introduction

Amsterdam is home to 37 allotment parks, containing roughly 6,000 gardens on approximately 300 hectares of land (DRO, 2004b). These allotment parks can be divided into three categories (DRO, 2004a):

1. Utility allotment parks: Mostly small vegetable gardens (50-200 m^2) with or without small shed or greenhouse.
2. Day recreational parks: Recreational and/or vegetable gardens, with or without small house, shed or greenhouse. Staying overnight is not allowed. Average garden size roughly 200 m^2.
3. Recreational parks with overnight stay: Same as day recreational parks, but staying overnight is allowed between March 31st and October 1st. Average garden size roughly 300 m^2.

Out of the 37 parks, 7 are utility parks, 3 day recreational parks and the large majority of 27 parks are recreational parks with the possibility of staying overnight (DRO, 2004b).

Several recreational parks also have vegetable gardens, but the emphasis is clearly on recreation in these parks (DRO, 2004a).

Most of the parks (24 out of 37) are joined together in the Bond van Volkstuinders (Association of Allotment Gardeners), meaning that all gardeners on these parks have to be registered as members of this association. The association has a chosen board and a set of rules and regulations that apply to all the associated parks. Within this structure, each park also has its own local board which is concerned with the daily running of the park.

6.2.2 Purpose

Allotment gardens were started in the Netherlands in the late 18th century mainly for economical purposes, helping working class people add to their income by growing their own food (Wilbers, 2005). Later, in the early 20th century, the emphasis shifted towards a social perspective, as becomes apparent from the mission of the Committee for Working Class Gardens to 'provide urban families on a large scale with the possibility to have happiness, pleasure, health and clean air in life by bringing nature closer' (Wilbers, 2005).

Nowadays still, the garden can have several purposes for the allotment gardeners. De Vries et al. (2004) mention growing food, active recreation and relaxation as possible reasons for having an allotment garden, as well as the social context in which the gardening takes place (De Vries et al., 2004).

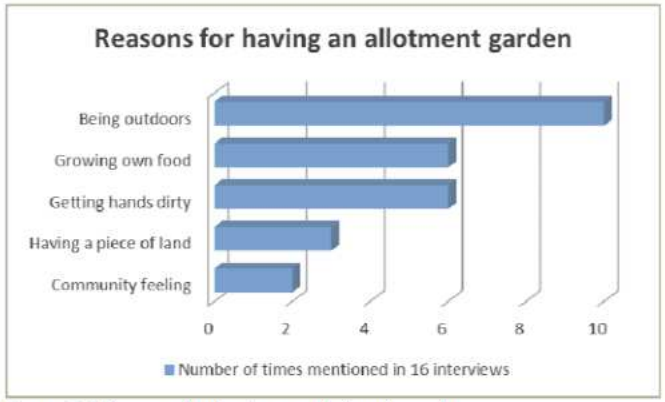


Figure 6.2 Reasons for having an allotment garden

6.2.3 Products

People who use their garden for productive purposes grow vegetables, herbs, fruits and flowers in their gardens. Among others, potatoes, green beans, broad beans, peas, strawberries, grapes and berries where mentioned in the interviews.

By the rules of the association of allotment gardeners, it is not allowed to use the garden for rearing livestock, pelt animals, poultry or pigeons (Reglement BvV, art. 6a). Beekeeping is only allowed with written authorization from the board (Reglement BvV, art. 6b).

6.2.4 Scale

As mentioned in section 6.2.1 the gardens range in size from roughly 50 to 300 m^2, with utility gardens usually no larger than 200 m^2.

The parks vary largely in size from as small as 17 gardens to as large as 448 gardens. On average, parks have 167 gardens, but recreational parks tend to have more (213) while utility garden parks tend to have less (85) (Based on data from de Vries et al., 2004).

6.2.5 Production systems

Most allotment gardening is conducted on open ground. Sometimes sheds or greenhouses are used. These are subject to rules regarding the maximum size (typically 10 percent of the total garden area).

The use of chemical pesticides is forbidden (Reglement BvV, art. 5c). For fertilizer no restrictions are found.

6.2.6 Stakeholders

Most allotment gardeners are represented by the BvV (Association of Allotment Gardeners) in talks with the municipality. Furthermore, the BvV seeks to actively influence policy making (van Schaik,

This indicates two more groups of stakeholders: urban allotment gardeners and the population of Amsterdam at large. The first clearly have an interest in allotment gardens, and the second could have, especially if they have an allotment park nearby.

6.2.7 Sites

The allotment gardens are situated mainly along the periphery of the city (see map in Figure 6.1). The few exceptions that are within the built-up area are all situated next to a park or sport fields.

6.2.8 Constraints

Allotment garden parks need a certain minimum size to function. This is because the board is run by volunteers, chosen from among the gardeners, and hence a large enough group of gardeners is needed to make sure enough people are available who want to and can dedicate time to running the park.

Which a typical garden being around 300 m^2 this means allotment parks easily take up several hectares of space (the average size of allotment parks in Amsterdam is around 9 hectares). This space is not easily found in the city, which explains why most parks are on the periphery. Expanding urbanisation can still threaten these parks however.

A constraint on food production on allotment gardening is the limited time people have for their garden. Several (3 out of 16) of the interviewed gardeners mentioned they did not have enough time to spend on their garden to grow food.

6.2.9 Opportunities

An opportunity that was used by the BvV to ensure the continuity of several allotment parks was to have them included in the ecological main structure (discussed in section 2.4.2).

Furthermore, the role of allotment gardens as multi-functional green spaces providing leisure, recreation and food fits well within municipal plans. This is illustrated by a recent attempt (in 2009) to improve the attractiveness of certain problem neighbourhoods, where money was made available by the government for refurbishing 3 allotment parks in such a way that they would interact more with the neighbourhood and create opportunities for closer contact among neighbours[8].

6.3 Beekeeping

6.3.1 Introduction

Bees are usually kept in rural areas, but the increasing tendency towards monoculture and the use of insecticides is making it increasingly difficult for them there.

As an alternative to rural beekeeping, beekeeping in the city (sometimes also referred to as urban

6.3.2 Purpose

The interviewed beekeeper mentioned hobby and a natural curiosity for bees, as well as contributing to the cities ecological environment, as reasons to pursue this activity in the city. He also mentioned it was economically unattractive, as it is cheaper to get honey from a supermarket, especially when you consider all the time spent on beekeeping.

6.3.3 Products

Beekeeping is primarily used for collecting honey, but can also yield other products from the hive, such as beeswax, pollen and royal jelly.

6.3.4 Scale

Beekeeping within the city is necessarily constrained to a few colonies (around five) in one location, because there is not enough food around to support more bees. In contrast, beekeepers on the cities edge or in rural areas typically tend to tens of hives in one location.

6.3.5 Production systems

Bees are kept in colonies with one queen, several thousands of female worker bees and a number of drones (male workers).

The colonies are housed in hives, and the beekeeper tends to them there, feeding them if necessary and harvesting excess honey when possible.

Sometimes a colony can start swarming, which means a group of bees leaves the colony with a new queen to establish there own colony elsewhere. In the city, this is usually undesirable, as the new location is likely to be somebodies garden or balcony. In this case, the beekeeper responsible for the hive has to come in and collect the swarming colony.

6.3.6 Stakeholders

The beekeepers themselves are the primary stakeholders, as they put in the work and reap the rewards.

In cases where the bees are kept on garden sites, e.g. the school gardens, the gardeners on those sites are a second group of stakeholders, as they benefit from pollination by the bees.[10]

Local residents are indirect stakeholders, who might experience negative effects (stinging or bee faeces) but might also be interested in, and learn from, the experience from a nearby beekeeper.

6.3.7 Sites

The periphery of the city is an ideal spot for beekeeping, because bees can feed on the variety of vegetation offered by both the city landscape and the more rural hinterlands. This variety increases the chance of their being enough food at different times in the season.

The beekeeper that was interviewed had colonies in three locations: his own backyard, het Groen Gemaal (an 'ecological trade centre' in Sarphati Park) and SWOMP (a community garden that will be discussed in the next section).

Other locations include the school gardens (see section 6.6) and an allotment garden park called 'Bijenpark' (Bee park) where beekeeping and allotment gardens are combined. The gardeners in this park have to obey certain rules with regards to what they are allowed to plant, to ensure that a sufficient amount of bee supporting plants is grown.

6.4 Community gardens

6.4.1 Introduction

Community gardens are the predominant form of urban agriculture in Amsterdam (22 out of 39 activities, not counting allotment gardens).

Many of these gardens have been established only recently, with sixteen gardens founded within the last three years.

6.4.2 Purpose

Community gardens serve multiple purposes. When asked, all gardeners gave more than one reason for the existence of the community garden. Four out of seven gave sustainable food production as a reason, although only one of them gave it as the first reason. Three people mentioned social cohesion, improving the neighbourhood and education of adults on food production (and consumption). Education of children was mentioned in only one interview (a vegetable garden along the edge of a playground) but was also present in three other initiatives that all incorporated a kids garden.

In all community gardens, the food grown is purely used for own consumption, not for commercial purposes. In some community gardens, (part of) the harvesting is done together and consumed in a harvest celebration. In some cases, all people from the neighbourhood are invited to participate in this celebration.

In recent years, housing cooperatives and the municipality have started using community gardens as a tool to improve neighbourhoods. This was mainly done in de city district Nieuw-West, where by far the most community gardens can now be found (9 out of 22 in the dataset). Out of these nine, eight

Some gardeners prefer to grow (varieties of) vegetables that are not easily bought in the supermarket, such as chard or yellow beans.

Some also try to grow fruit trees, such as plums and apricots. These have met with various success (both apricot trees encountered during the interviews were either dead or dying) and need further experimenting.

6.4.4 Scale

The community gardens visited during this research ranged between 10 and 50 members, with a median of 15. The large complex, of about 50 members, actually consisted of several smaller groups of gardens spread across the neighbourhood, each ranging between 8 and 15 members.

Garden sizes vary from as small as 25 m_2 (along the side of a playground) to as much as 1250 m^2 (a piece of squatted land that previously housed a school), with most somewhere between 100-300 m^2.

6.4.5 Production systems

On all sites visited plants were either growing directly in the ground (4 out of 6) or in raised beds (2 out of 6). One site also had an unheated greenhouse on the location, which was used among others for tomatoes (see Figure 6.4).

One particular site worth mentioning in this section is SWOMP[11], which is in fact a large experiment in sustainable gardening on a squatted piece of land. On this terrain, several growing methods are tested, for example different shapes of raised beds (including the spiral depicted in picture 6.7) and growing potatoes and pumpkins in stacks of used car tires filled with earth (see picture 6.8).

Other experiments conducted at SWOMP include water harvesting (see Figure 6.6) and composting with different materials, among them live earthworms that help mix the compost through the soil.

Figures 6.4 (left) and 6.5 (right) The greenhouse at SWOMP. The compost heap at SWOMP.

A conveniently accessible water supply is mentioned by several gardeners as being of vital



Figure 6.6, 6.7 and 6.8 (from left to right) Water harvesting at SWOMP. Example of using vertical space. Idem.

In all initiatives, only organic fertilizers and no pesticides where used.

6.4.6 Stakeholders

The people maintaining the gardens are obviously stakeholders to the activity, as it provides them with food, recreation, activity or a sense of community (as described in the above section on purpose). In almost all cases (only one excluded) the community garden each gardener has an individual section in the garden that is theirs to maintain and harvest from. In all cases, there is (also) a shared part of the garden for which all gardeners bear the responsibility together.

The urban gardeners from different gardens are not organised together in any form of union or organisation. Informal knowledge exchange does take place however, and several gardeners mentioned trips to other garden complexes and regular sharing of plants and information between garden enthusiasts.

The community gardeners that were interviewed were mainly women (7 out of 9[12]). One initiative (Vrouw en Vaart) is aimed specifically at women of diverse cultural backgrounds. In 2010, DRO investigated how allotment gardens / community gardens can play a role for this target group (Karsten, 2010). The main motives discovered in this study were a need for self sufficiency, and the desire to educate children about food (Karsten, 2010).

Furthermore, nearby residents are affected by the change in scenery in their surroundings. Most interviewed gardeners mentioned positive responses from the neighbourhood, ranging from people stopping for a short chat to people actually offering to help out.

The municipality, through the spatial planning department (DRO) or one of the city districts, plays a

6.4.7 Sites

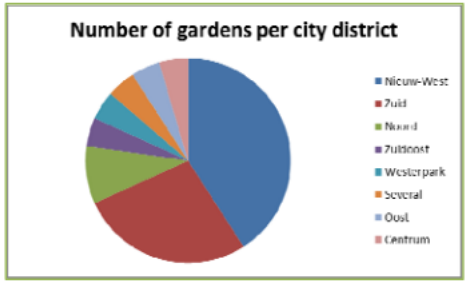
Community gardens exist in all different parts of Amsterdam, though in some districts more than others (see Figure 6.9).

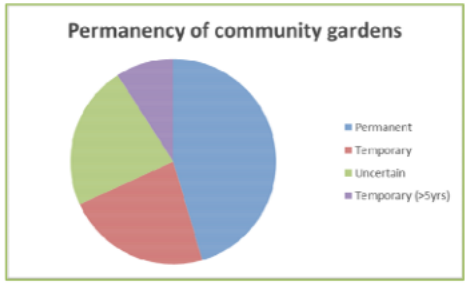
For more than half of the community gardens, the duration is either temporary or uncertain at the moment (Figure 6.10).

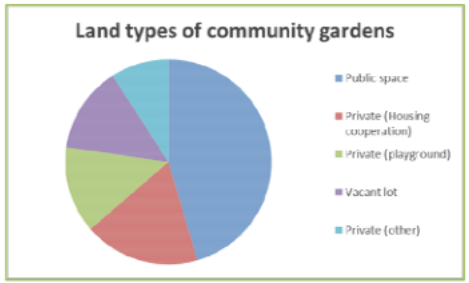
Land ownership varies, but community gardens are predominantly found on public space or private land with a public character, for example land owned by housing cooperatives (Figure 6.11).

Community gardens do not necessarily use a lot of space and can therefore be placed on small pieces of land that serve no other function.

Examples encountered in Amsterdam include unused belts of green around playgrounds and small areas along roadsides. The latter are typically the target for guerrilla gardening, and an interesting example of this in Amsterdam is tuinboonjemee, an initiative that calls on people to plant broad beans ("tuinbonen" in Dutch) on public green sites in order to raise attention for "edible green" in the city (Website tuinboonjemee.nl).







Figures 6.9, 6.10 and 6.11 (from top to bottom) Number of gardens per city district. Permanency of community gardens. Land types of community gardens.

6.4.8 Constraints

One vulnerability of community gardens is that they need someone to perform the role of a 'motor' that keeps things going and keeps the people together. If such a person is not found, or it this person quits after a while, the success of the community garden is doubtful and derelict gardens might be the result.

Furthermore, several gardeners mentioned that many starters have little knowledge of gardening, nor of organising a community garden. Examples of this lack of knowledge encountered during the field work included crops that should have been harvested already and plants that do not grow in the

Several of the community gardens in Nieuw-West were started with the help of subsidies from the central government (Lems et al., 2011). These subsidies fall under the program 'wijkaanpak'[13] and are meant for financing citizen initiatives to improve problem neighbourhoods.

Some community gardens, especially in Nieuw-West, are organised on vacant lots (Lems et al., 2011). These lots were meant for development, which was postponed by the economic downturn, thus providing space, and a need for, urban agriculture.

6.5 Restaurant gardens

6.5.1 Introduction

In 2001 restaurant de Kas (in English 'the Greenhouse') opened its doors with a not often found concept (at that time): cooking food that was all grown locally, with a small part coming from the greenhouse adjacent to the restaurant and the garden surrounding the restaurant.

In 2011 another restaurant, Bolenius, followed this example on a special location: a vacant stretch of land in business district de Zuidas. Due to a slump in the economic situation, previously planned construction of high-rise buildings was put on hold, leaving 1.2 ha of land unused. In 2010 this land was given a temporary function as a cornfield (urban agriculture indeed!) by a group of artists contracted by the municipality[14]. Now, this same stretch of land is managed by the owners of a nearby restaurant as a vegetable and herb garden.

6.5.2 Purpose

According to both restaurants, using the garden for branding the restaurant and creating publicity is one of the main reasons for maintaining the garden. One of the restaurants interviewed gets all its food from local farmers and uses the garden and greenhouse to emphasize this philosophy.

Superior taste and freshness were also mentioned in both interviews.

6.5.3 Products

Several vegetables are grown, for example spring onions, fennel and rocket salad, and also some less well known vegetables such as parsnip and Jerusalem artichoke.

Furthermore, a large variety of herbs is grown, including many kinds of basil, sage and rosemary, which find many uses in the restaurant kitchens.

6.5.4 Scale

One garden is 1.2 ha, of which roughly one third is planted. The other restaurant has a small greenhouse and a public garden of several hundred square meters.

6.5.6 Stakeholders

The restaurant owners are the primary stakeholders, as they have a direct (business) interest in the garden.

In both cases, the municipality plays a role as well, as the gardens are situated on municipal land under a use contract. This use contract entails that the restaurant owners have the right to use the land (for a certain duration) and the obligation to maintain it.

6.5.7 Sites

One restaurant is situated in a park, the other, as mentioned, in a business district on a temporarily vacant lot.

In both cases, the garden is close to the restaurant. This is necessary, as small restaurants only have limited funds to pay a gardener and hence the staff of the restaurant are likely to be the gardeners as well.

6.5.8 Opportunities

The restaurant garden on the Zuidas would not have been there without the recent economic downturn. Because of this downturn, development was stopped in its tracks, leaving the space open for production.

6.6 School gardens

6.6.1 Introduction

Amsterdam has a unique legacy in the Netherlands when it comes to school gardens. Roughly 95 percent of all pupils in group 6/7 (corresponds with 4th/5th grade, when the children are around ten years old) have a school garden (NME website). This amounts to roughly 6700 children a year (PLAN, 2010).

Figure 6.12 and 6.13
School garden Blijdestijn. The building in the left picture houses a classroom for indoor lessons and an office for the staff. The picture on the right shows the gardens towards the back of the complex, and an office building in the background reminds the viewer of the urban location.

All school gardens that were visited for an interview had a beekeeper on their grounds (in most cases a volunteer) who keeps around five to ten hives. Honey yields vary per season, but one account mentioned yields of up to a hundred kilos per year from five hives.

6.6.3 Products

Every pupil has their own gardening space of roughly 8 m^2 where they plant, care for, and harvest a variety of vegetables, herbs and flowers.

This variety is no accident, but is chosen on purpose so that the children learn about the different types of plants. The plants grown are mainly annuals that can be harvested outside of the summer holiday. These are chosen so that the children, who are not there during the summer holiday, can do the harvesting.

6.6.4 Scale

The school gardens are arranged in 13 school garden complexes, each housing between 400 and 650 gardens, with one exceptionally large complex housing one thousand.

Each individual garden is between 7 and 10 square meters, depending on which garden complex it is on, meaning that in total 4.7-6.7 hectares are cultivated.

6.6.5 Production systems

The plants are grown in the soil, some plants are planted directly into the soil as seeds, others are nursed to seedlings in a greenhouse before they are planted by the children.
Some gardens buy seeds and grow them in greenhouses and nurseries, while others choose to buy them as plants and leave the growing to a professional grower. Interestingly enough both sides argue that their choice is cheaper. This difference in perception might come from a different perception of costs involved, for example the cost of time spent on growing the plants.

The soil is checked regularly, either every three or every four years, to determine which nutrients are needed. These are then provided through natural fertilizers.

Pesticides and herbicides are not used. Weeds are controlled through weeding and ploughing.

6.6.6 Stakeholders

The most obvious stakeholders in the school gardens are, of course, the school children who have a garden there. They benefit from the education they receive there, enjoy the work outdoors (or are upset with having to get their hands dirty) and take home the harvest.

The staff of the school gardens and the teachers of the primary schools are a second group of stakeholders, as the gardens form (part of) their work and livelihoods. Also, several interviewees mentioned that the work, educating the children on nature, gives them personal joy.
Behind the scenes, the school gardens are run by the city district they are located in. This means

6.7 Water gardens

6.7.1 Introduction

The concept of growing food on water dates back as far as the 13th century when the Aztec population of Tenochtitlán (nowadays Mexico City) expanded their agricultural activities on to the lake on so called Chinampas. These gardens were made by fencing of an area in the water with reed fences and filling it up with rocks, vegetation, wastes and lake soil (Onofre, 2005).

In Amsterdam, a modern day equivalent, albeit small scale can be found in the Boerenwetering along the Hobbemakade and the Ruysdaelkade (see the blue pinpoint in the map in Figure 6.1 for a rough indication). Although these gardens are not producing food currently, they are included in the thesis because they can be an inspiration for what is possible. This is especially relevant as roughly 25 percent of the surface area of Amsterdam is water (DRO Statistiek Bodemgebruik 2009).

6.7.2 Purpose

The floating gardens serve three purposes: improving water quality, greening the neighbourhood and supporting biodiversity, especially birds.

Improving water quality happens through zebra mussels (Dreissena polymorpha) who attach themselves to the bottom of the rafts and filter the water from there. This makes the water more attractive for predatory fish and helps restore a more biodiverse equilibrium.

Support for birds happens in two ways. Firstly, the plants on the raft and the mussels underneath are a source of food for various species of birds. Secondly, the rafts serve as a nesting place for duck and other water birds (as can be seen in picture 6.14).

Figure 6.14 Ducks nesting on floating garden

6.7.3 Products

In its current implementation the water gardens do not contain any products that are edible for humans and no harvesting takes place.

6.7.4 Scale

There are 200 rafts sized 1.5m x 2 m, making the total surface area some 600 m^2.

These rafts are maintained by one part-time paid employee and a group of volunteers who come once a month for a couple of hours. The number of people that show up on this monthly cleaning

Maintenance, mainly cleaning up litter, is done both from the shore with long grabbers and from a boat (see picture 6.17).



Figure 6.15 (left) Close up of a raft that has just been planted
Figure 6.16 (middle) Rafts are connected by chains to prevent them from floating adrift
Figure 6.17 (right) Maintenance of water gardens has to be done by boat

6.7.6 Stakeholders

The activity is organised by Natuur- en Milieuteam de Pijp (Nature and Environment team de Pijp[15], or NMT in short), a team of employees from one of the neighbourhood centres in de Pijp with the mission to increase the amount of nature found in this area of Amsterdam. One member of this team leads the workgroup Water gardens, which further consists of volunteers from the area.

Local residents close to the canal are affected as well, as the water gardens change their surroundings. During the interview several passers-by came over to give compliments to the volunteers for keeping the gardens clean.

The municipality is another stakeholder, as they are subsidizing the activities of the NMT and allowing the water gardens in the canal, under the condition that they are well maintained.

6.7.7 Sites

Water gardens take place, obviously, on the water. Not all canals are equally suitable, though, as waves from passing boats can dislodge and even destroy the rafts. Canals with low traffic intensity therefore have preference. Worth mentioning here is that in its structural vision for the future, the municipality stipulates it wants to make more use of the waterways for transport (Structuurvisie 2040, 2011).

When considering food production, water pollution becomes an important factor to take into consideration. This might make several (or maybe even all) waterways in Amsterdam unsuitable for production, although recent research signals that water quality is improving in the canals (news item NOS.nl, 2011).

7 Analytical Discussion

7.1 Introduction

In the previous chapter, the results of the data search and interviews were presented per urban agricultural activity and structured along the six aspects described in the theoretical framework.

This chapter contains an analysis of the findings **across activities** aimed at providing the reader with an overview of how urban agriculture can be understood throughout the whole city and in its different shapes and sizes. Like the previous chapter, the analysis is structured according to the theoretical framework, meaning that the observations are discussed for each of the six characteristics (purpose, products, scale, production systems, stakeholders and sites) and for the constraints and benefits.

7.2 Purposes

7.2.1 Purposes of urban farmers

An analysis of the purposes mentioned in the previous chapter reveals that there are many reasons besides food production. In fact, in several cases food production is not even mentioned as an objective for the activity.

On the school gardens, for example, the purpose is purely educational, teaching the children about healthy food and about nature (and food production as a necessary part of this). This purpose also inspires the choice of products, which consists of different types of plants and flowers so that children get to know the different varieties. Eating the (healthy) produce of the garden is stimulated by sharing recipes and cooking activities at the school garden complex itself.

In other cases, for example the community gardens at Nellestein, the gardens were planned to provide a social function, to serve as a meeting place for local residents. This was part of the plans for the area, in which the main thought was to create a pleasant and green, almost park like, neighbourhood to live in.

The initiatives that are driven by the desire to produce food do so mainly from an ideological perspective, either to promote sustainable local food production (these gardeners are typically inspired by the principles of permaculture) or to achieve food sovereignty. Buurtmoestuin de Trompenburg is an example of such an initiative, and its founder is actively promoting urban agriculture throughout the city from the ideological perspective that we have to return to local food production because the current food industry is not sustainable.

7.2.2 Product destinations

7.2.3 Purposes of city planners

City planners in Amsterdam are increasingly using urban agriculture as a means of providing the 'multifunctional green space' that is part of the long term vision for Amsterdam. The focus is currently primarily on areas that require improvement (for example the collaboration with housing cooperatives in Nieuw-West) and temporarily vacant lots.

The gardens started with municipal support are almost all community gardens. The popularity of these gardens with the municipality might be due to the fact that they provide benefits to multiple members in the community (instead of renting the land out to one person, e.g. as an allotment garden) and serve as a meeting place where members of the community can interact and work together.

The approach of the municipality is participative and its role is usually limited to that of a service provider (preparing the land, maintenance). In some cases the municipality also acted as a source of financing. The participative approach means that community members are involved in designing the gardens when they are created. This is done to increase the chances of success, meaning that the gardens are used and maintained.

7.3 Products

Several plants pop up in many of the gardens visited. The most popular plants are: broad beans, strawberries, lettuce and rocket salad. What these plants have in common is that they are easy to grow, which makes them a good starting point for inexperienced gardeners.

Besides these popular choices a wide variety of plants is grown. Some, more experienced, gardeners, for example, like to use their garden for growing food that is not easily purchased in the supermarket. They choose the food they grow based on curiosity and on taste, not on yields or practical considerations like suitability for storage. This reinforces the conclusion that gardening is practised as a hobby, not out of necessity.

7.4 Scale

7.4.1 Size of gardens

The size of gardens varies greatly, both across categories (school garden complexes are typically larger than community gardens, an individual garden in a community lot is usually smaller than an allotment garden) and within categories (remember how community gardens range from 25m^2 to 1250 m^2).

The average size a Dutch household needs to produce all its vegetables is roughly 49 m^2, with an additional 30 m^2 for potatoes and 75m^2 for fruits (derived from table 1 in Gerbens-Leenes et al.,

7.5 Production systems

Besides a few small-scale experiments, none of the activities visited used intensive systems in their food production efforts. In stead, most production was either directly in the ground or in raised beds, with little use being made of systems that optimize use of the vertical space. One exception was encountered (as described in section6.4.5), but all techniques there were still in an experimental stage and their success is therefore not yet known.

A possible explanation for this, which corresponds well with the findings regarding purposes, is that urban farmers in Amsterdam are not interested in optimizing yields. In stead, they choose methods that feel 'natural'. This explanation is further backed up by the finding that almost all initiatives use only organic fertilizer and no pesticides, although in several cases this is also enforced by the municipality in its role of landowner.

Another possible explanation is that urban farmers in Amsterdam are unaware of, or inexperienced with, more complex growing methods. This is a feasible possibility, given that most urban farming initiatives are in their infancy (except the school gardens, but they are kept low-tech for a reason). It is not unthinkable that, when people gain more experience and the early experiments, such as SWOMP, produce good results, more complicated, higher yielding, techniques will start spreading.

7.6 Stakeholders

7.6.1 Overview of stakeholders

Table 7.1 presents an overview of the direct stakeholders that were encountered during the research, what their roles are and what motives they potentially have.

Table 7.1 Acting stakeholders in urban agriculture in Amsterdam

Actor	Role	Motives
Urban farmer	Execution	Need for relaxation Desire to work outdoors
Municipality – DRO (Spatial Planning Service)	Making space for UA Facilitating start-ups Promoting UA on vacant lots	Improve public space Improve attractiveness city
City districts	Facilitating start-ups Financial support Maintenance of public green Manage school gardens	Improve public space Improve liveability of 'their' area
Neighbourhood centres	Facilitating start-ups Support locals with management	Improve liveability of 'their' area
ANMEC (Amsterdam	Coordinate education	Promoting awareness of

Furthermore, the following non-acting stakeholders were identified.

Table 7.2 Non-acting stakeholders in urban agriculture in Amsterdam

Stakeholder	Potential positive impacts	Potential negative impacts
Citizens of Amsterdam	Improved local climate More attractive surroundings	Hinder from smell or waste
Global community	Reduced GHG from transport Reduced waste	

7.6.2 The role of the municipality

As becomes clear from table 7.1, both the central service of the municipality of Amsterdam and some of the city districts play an active role in supporting urban agriculture initiatives. Examples are plenty, including support at start up (either financial or with services) and support with maintenance.

Furthermore, the municipality is now taking an active stance in promoting community driven urban agriculture on temporarily vacant lots (as described in section 7.4.6) as a means of improving neighbourhoods and encouraging people to interact each other to improve community structure.

The city districts (described in section 2.4.1) play a direct role in urban agriculture through the school gardens, which fall under their responsibility. Furthermore, the city district of Nieuw-West was closely involved with setting up several community gardens there (Lems et al., 2011).

On the other hand, local community centres, that played a crucial role in the start-up of several community gardens (see section 7.4.9) are threatened with budget cuts and closure. If no alternative is provided for the support these centres give, this could seriously impair the further spread of grassroots community initiatives.

7.7 Sites

7.7.1 Types of sites

Smaller activities, like community gardens and beekeeping, are mainly found on three types of sites:

Small areas of municipal land that do not serve another purpose
Temporarily vacant lots (either public land or privately owned)
'Public' space owned by housing cooperatives

These findings can be explained using the theory from section 3.3.
On the on hand, these sites are unsuitable for other uses (due to size, or current economic conditions), which means they are not hindered by the possibility of a higher rent (as described in section 3.3.2). On the other hand, these sites fit well in municipality and housing cooperatives plans

Larger activities, like school gardens and allotment garden parks, are found mostly in the periphery of the city, or in some cases in or adjacent to other larger areas of green such as parks and sporting grounds.

7.8 Constraints

7.8.1 Costs of production

As seen with the allotment gardens, beekeeping and in several interviews of community gardens, urban farmers state that the costs of maintaining their urban garden and producing vegetables is higher than simply buying the vegetables in the supermarket. This is despite the fact that rents are kept artificially low, especially in community gardens where often a symbolic amount is asked (for example 10, 12 or 15 euros per year).

This has implications for the likelihood of commercial urban agriculture, and might explain why no commercial activities are found in the city (apart from the two restaurants, where the garden is mainly used to generate PR and to create an own identity).

7.8.2 Space

Larger activities, such as allotment parks and school gardens, do not easily fit in the built-up area of the city. As such, expansion of these activities, if feasible at all, would most likely be on the periphery of the city. This means that the benefits they can provide to Amsterdam citizens are further away from these citizens and therefore less likely to be used.

Space for smaller activities, like community gardens, seems to be readily available, given the fact that several new gardens have been realised in the past years and that the municipality is currently asking citizens to come up with initiatives for vacant lots. Space can potentially be found in currently unused green spaces, for example roadside green belts and green spaces on squares. One initiative, called tuinboonjemee.nl, demonstrates the potential of such green spaces, by encouraging people to plant broad beans in them. This has led to broad beans being planted in over 25 locations[16].

7.8.3 Time and motivation

Food production takes time, and in most cases regular attention. People in the city might be to occupied with other activities, like work, to be able to make sufficient time for gardening, especially if going to their garden requires travelling (as is the case with most allotment gardens). The interviews of allotment gardeners uncovered that, even among people who have an active interest in gardening, not all people find enough time to grow food.

While by no means a definitive answer to the question if the citizens of Amsterdam in general have enough time to produce food, it is a serious indication that time might be a constraining factor. But

As seen in the theoretical chapter, one of the most important motives for widespread urban agriculture in many cities is necessity. From the research in Amsterdam, it becomes apparent that, in line with expectations, this necessity is not there. This makes it unlikely that people who do not have an interest in gardening will spend time on food production[17].

7.8.5 Knowledge

Many starting urban farmers lack knowledge of gardening. This means that more intensive growing methods, that are typically more complex and hence require more experience, are not likely to be applied (nor indeed were they often encountered during this research). It can also lead to unnecessary waste, when crops are not harvested in time.

Methods of acquiring knowledge that were mentioned during the interviews were self-study through internet and books, experimenting in the garden and exchanging knowledge and plants with other urban gardeners. One of the interviewed gardeners was following a formal education in gardening.

7.8.6 Organic farming

In most initiatives, only organic farming methods are allowed, which means artificial fertilizer and pesticides are excluded. This means that certain pests and weeds can form a serious problem, especially when urban farmers lack knowledge of organic methods to repel these pests[18].

7.9 Opportunities

7.9.1 The economic crisis

The economic crisis affects urban agriculture in Amsterdam in two ways. Firstly, and most clearly, it generates space for urban agriculture. The restaurant garden on the Zuidas is a good example of this, as is the program launched by the municipality asking people to come up with initiatives for vacant lots. Secondly, the crisis can impact the way people perceive food security and the sustainability of our current food system (or our society at large). Taking food production into their own hands might be a response of urban residents dealing with a sense of food insecurity. One community garden was started as a direct consequence of this thinking, and in several others the sustainability of local food production was mentioned as a reason for urban agriculture.

7.9.2 Subsidies

Several initiatives made use of subsidies from the national government for improving problem neighbourhoods. These subsidies are typically not aimed at food production, but instead are meant for projects that contribute to improving problem neighbourhoods.

7.9.3 Urban agriculture as multifunctional green space

One reason why the municipality is conductive to urban agriculture is that it fits well within the

Also, an additional benefit of urban agriculture in this role is that it is a relatively cheap option, because the maintenance is carried out for free by the urban gardeners. This does come at the cost of having less control over the quality of maintenance. In response to this potential problem, land use contracts with the municipality include the obligation of the land user (the urban gardener) to maintain the space. This means that if gardens are neglected, the contract can be ended.

8 Recommendations

8.1 Introduction

The research question does not necessarily invite recommendations, as it is solely aimed at understanding on-going developments, without placing this understanding in a policy context. Nevertheless, several ideas popped up during the research, and these are presented in section 8.2.

Furthermore, further research could be done based on, or additional to, the current efforts. Some suggestions for directions of this further research are provided in section 8.3.

8.2 Recommendations for policy makers

It has become apparent from this research that policy makers in Amsterdam are trying to stimulate the use of community gardens, especially on vacant lots, to improve neighbourhoods. This section provides a few recommendation to support these efforts.

Many people in the city might want to garden, but can be unaware of the possibilities that exist for gardening within the city. As such, it might be a good idea to launch a promotional campaign that informs the public about what it takes to grow ones own food and what the possibilities are.

To help people find each other for starting community initiatives, an online meeting point could be created where would be urban gardeners can register and propose locations. This way, people can see if other people in their area are interested in the same thing and contact them (through the website, so that people do not have to give out personal details).

In order to go from good ideas to implementation, people might require some assistance. Neighbourhood centres in district Zuid have fulfilled, and still fulfil, this role for several community garden projects there. With the current plans for spending cuts, these neighbourhood centres might not continue to exist, in which case this support goes away. Therefore, it is important to make an inventory of the support needs these centres address, and how these needs can be otherwise provided for. This could also involve extension work among community gardeners with the aim to build on managing capacities and gardening techniques.

To combat the lack of knowledge that is encountered among urban farmers in Amsterdam, it could be desirable to create an informative leaflet or website, pointing people to useful sources of information on gardening.

8.3 Recommendations for further research

Further research into urban agriculture can be conducted along two lines: to investigate how food

Research could also be conducted on how to promote urban agriculture to Amsterdam's citizens. This could be desirable, as urban agriculture is seen to have several benefits for the city and for its people, but not everybody is likely to be aware of the possibilities for urban gardening. Besides promotional, efforts could also be informational, informing the public about what it takes to grow ones one food and what the benefits (health, relaxation) are.

For the second line of research, it is desirable to map residents needs for the services that urban agriculture, and community gardens in particular, can provide. In other words, research should focus on where (in which neighbourhoods) the needs for green recreation, interaction with other members of the community or filling up vacant lots are highest. In the meantime, it also makes sense to identify the suitability of different types of urban agriculture for delivering certain benefits.

For both lines of investigation, research could be conducted into the different sites where urban agriculture could be practiced. Rooftop gardens, for example, are popular in several cities in the United States, but no productive rooftop gardens have been seen in Amsterdam yet[19].

9 Conclusions

9.1 Introduction

Growing food is becoming increasingly popular in Amsterdam. This growth can mainly be seen in the increasing number of community gardens, of which most have been established within the last three years.

The current study was conducted to investigate what influences are behind this recent growth of urban agricultural activities in Amsterdam, and, based on these findings, what can be expected with regards to the future direction of food production in the city. In the following section (9.2) the answers that were found in this study are provided, starting with the factors behind the growth and ending with implications for the future. After this, the chapter, and with it the report, concludes with some further observations that were made during the research.

9.1 The main conclusions

The increasing awareness of the municipality (and housing cooperatives) that community gardens are a cheap option for improving neighbourhoods and public green space contributes to this current upwards trend in the number of community gardens.

The recent economic downturn has contributed as well, because stalled development projects left bare vacant lots that can now be, or are already, used for urban farming.

Concerns about the sustainability of our current food system are a third driver behind the increased occurrence of urban agriculture in the city. Local food production and education of children were the most often mentioned purposes, signalling that urban farmers find it important that people in the city (including the next generation) know how to produce their own food.

However, most urban gardens are primarily created for other functions than growing food, especially improving neighbourhoods and community structure, and providing education and recreation. As a result, urban agriculture in Amsterdam is mostly limited to small-scale community initiatives, using conventional, not intensive, methods. From this, it becomes clear that high yields (and thus food production) are not the objective.

This is understandable, as urban food production is not done out of economic necessity. In fact, several gardeners mention that it is cheaper to buy vegetables in a supermarket than to grow them in an urban garden, even when the land is used for free or at an artificially low cost. This could also explain why there are hardly any commercial food growing activities in the city.

As such, urban agriculture in Amsterdam can not be expected to make a serious contribution to

9.2 Further observations

Urban agriculture initiatives are mostly legitimate activities, functioning within the legal framework and more often that not in cooperation with the municipality. This adds to the role, but might also be due to, the role the municipality plays as an enabler of urban agriculture.

Many participants in starting initiatives face lack of knowledge and experience. Informal information sharing, books and online resources are mentioned as sources of this knowledge. No formal networks or organizations encountered. The NME Centre, or a similar setup, could play a role in providing a platform for knowledge exchange.

For smaller scale activities, space does not seem to be the main constraint – there are a lot of unused (green) areas in the city. Finding people to cultivate these areas and organizing them in a way that ensures quality and addresses issues of legal responsibility is the challenge.

For water gardens, compatibility with other uses of the water needs to be further investigated, especially in light of the city's plans to expand transport over water. Also, concerns about water quality and implications for food safety need to be addressed.

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http://www.os.amsterdam.nl/

Website with maps from DRO (spatial planning department Amsterdam)
http://gisdro.nl/

Websites of companies and organisations

Boerenstadswens (NGO trying to educate urban people about the origins of food)
http://www.boerenstadswens.nl/projecten/

Buurtmoestuin
http://www.buurtmoestuin.nl/

Municipality of Amsterdam website on legislation
http://www.regelgeving.amsterdam.nl

Natuur en Milieuteam de Pijp
http://www.wijkcentrumceintuur.nl/wijkcentrum-ceintuur/natuur-en-milieu/werkgroep-natuur-en-milieu/

NME
http://www.anmec.nl/index.php?id=116

RUAF
http://www.ruaf.org

SWOMP
http://swomp.wordpress.com/

News items

Amsterdam.nl – Braakliggende terreinen op de kaart (News item about map of vacant lots)
http://www.amsterdam.nl/algemene_onderdelen/indexen/persberichten_6/persberichten_0/@429278/braakliggende/ (Accessed 5 August 2011)

NOS.nl - Waterkwaliteit Amsterdamse grachten goed
http://nos.nl/video/254143-waterkwaliteit-amsterdamse-grachten-goed.html

Annex A: Recommended Readings

For readers interested in broadening their knowledge on urban agriculture the book "Urban Agriculture: Food, Jobs and Sustainable Cities" by Jac Smit, Joe Nasr and Annu Ratta is an excellent place to start. Based on a broad body of primary research, it covers several angles of urban agriculture, such as the benefits and drawbacks, opportunities and constraints described in the theoretical chapter of this report. An electronic copy of the book is available for free download at http://jacsmit.com/book.html

A more interactive approach to studying urban agriculture is the RUAF online learning course, that can be found at http://moodle.ruaf.org/. This online programme consists of several courses that in turn consist of several modules. Each module deals with one topic, for example 'types of urban agriculture' and explains this topic using findings from case studies and scientific literature.

To stay up to date on recent developments in urban agriculture, the UA Magazine, also by RUAF, can be interesting to keep an eye on. The magazine, started in July 2000, has 24 issues so far. These are all available online from the RUAF website: http://www.ruaf.org.

For policy makers and researchers interested in how policies should reflect the multiple stakeholders involved in urban agriculture, the book "Cities, Poverty and Food: Multi-Stakeholder Policy and Planning in Urban Agriculture" by Dubbeling, de Zeeuw and van Veenhuizen is an interesting work.

For more information on initiatives in Amsterdam, there are two websites worth visiting. One, started by the founder of a community garden, lists several community initiatives: http://www.buurtmoestuin.nl. Unfortunately, this site is only in Dutch. The second one, http://www.farmingthecity.net/, is also available in English and lists a wide range of food-related activities in Amsterdam, including producing, marketing and transport.

Annex B: Stakeholder Interviews

The objective of the interview is to get answers to (parts of) the research question.

On the next page is the actual questionnaire in Dutch and on the third page an English translation. My aim was to make a questionnaire that can be done in 30 minutes, but which allows for further expansion if the interviewee is willing and able to spend more time on it. The possibility for expansion comes from the extra questions that can be asked if time allows, but also from going more in-depth with the questions if I notice the respondent is enthusiastic to give information.

It is good to note here that during the interviews, not all these questions were asked and questions were not addressed in a fixed order. The role of this questionnaire was mainly preparatory, to get clear what information was needed from the practitioners and what questions could be asked.

A large part of the questions can be allocated roughly to the different categories described in the theoretical framework in section 3.3.7 as follows

Aspect	**Questions**
Methods	6, 11, 12, 13
Products	1
Product destination	5, 6
Purpose	7, 9, 10
Scale	2, 3, 4
Stakeholders	16, 17, 18

Several other questions served to find out more about the constraints, opportunities, benefits and drawbacks:

Aspect	**Questions**
Constraints	14, 15
Opportunities	8
Benefits	7, 9, 10
Drawbacks	14, 17

An observant reader will have noticed that several questions appear with more than one category. This is the result of the open-ended form of the interview, which allows for answers to go off in different directions (also depending on the follow-up questions asked). For example, when asking urban farmers for difficulties they encountered (question 14) they might name things that hinder there activity (constraints), ways they dealt with them (methods) or problems resulting from the activity (drawbacks).

Interview stadstuinders (NL)

Algemene omschrijving

1. Welke gewassen worden verbouwt, dieren gehouden? Waar is die keuze op gebaseerd?
2. Hoe groot is de activiteit[20]? (Op hoeveel m^2 / hectare wordt verbouwd?; Hoeveel dieren?)
3. Hoeveel mensen werken mee? Zijn dit vrijwilligers, of in loondienst? Fulltime of parttime?
4. Hoeveel wordt er geproduceerd (van de verschillende producten)?
5. Waar wordt de productie voor gebruikt (eigen gebruik, vrienden/familie, verkoop)? Percentages?
6. In het geval van verkoop, via welke kanalen? Hoe is de kwaliteitscontrole georganiseerd?

Motivatie

7. Wat is het doel van de organisatie? (indien van toepassing?)
8. Wanneer bent u / is de organisatie met dit werk begonnen?
9. Wat waren en zijn voor u redenen om dit werk te doen?
10. Heeft de activiteit verder nog voordelen voor uzelf of voor anderen?

Praktische zaken

11. Is het makkelijk om aan de benodigde materialen, zoals zaden, water en mest of voer te komen?
12. Hoe is de watervoorziening geregeld? (indien van toepassing)
13. Wat gebruikt u voor het bemesten van planten? (indien van toepassing)
14. Wat zijn moeilijkheden die u zoal tegenkomt (ongedierte, diefstal, urbanisatie)?
15. Hoe heeft u de kennis opgedaan die u nodig heeft voor dit werk?
16. Bent u lid van een organisatie of vereniging van boeren/tuinders?

Ervaringen met omstanders en de gemeente

17. Wat zijn uw ervaringen met omwonenden? Krijg uw wel eens klachten, of juist positieve reacties?
18. Wat zijn uw ervaringen met de gemeente Amsterdam? Heeft u daar veel mee te maken?

Extra vragen (als er genoeg tijd is)

19. Denkt u aan uitbreiding? Uitbreiding van bestaande activiteiten of nieuwe activiteiten?
20. Waar denkt u dat de mogelijkheden liggen voor het verbouwen van eten in de stad?
21. Worden er ook andere activiteiten gehouden, zoals schooldagen, voorlichtingsdagen of samenwerking met zorginstanties?

Interview city gardeners (EN)

General Description

1. Which crops are grown, which animals are kept? What is the choice based on?
2. How large is the activity[21]? (How many m^2/hectares? How many animals?)
3. How many people are involved? Are these volunteers or paid employees? Fulltime or part-time?
4. How much is produced (of the different products)?
5. What is the produce used for (own use, friends/family, sale)?
6. In case of sale, through what channels? How is the quality control organized?

Motivation

7. What is the purpose of the organisation? (if applicable)
8. When did you / the organisation start this work?
9. What were and are your reasons for doing so?
10. What advantages do you see from your work, for yourself and for others?

Practical matters

11. Is it easy to find the needed materials such as seeds, water, fertilizer or fodder?
12. How is the water supply organized? (if applicable)
13. What do you use as fertilizer? (if applicable)
14. What difficulties do you encounter?
15. How have you acquired the knowledge needed for this work?
16. Are you a member of an organization or association of farmers / growers?

Experiences with bystanders and the City

17. What are your experiences with local residents? Do you get complaints sometimes, or positive responses?
18. What are your experiences with the municipality of Amsterdam? Do you have a lot to do with them?

Additional questions (if there is enough time)

19. Do you think about expanding? More of the same activity, or different activities?
20. Where do you think are the possibilities for growing food in town?
21. Do you organize other activities such as school outings, information days or collaboration with care institutions?

Email asking for participation (NL and EN)

Dutch version
Onderwerp: Onderzoek naar voedselproductie in Amsterdam

Geachte meneer/mevrouw,

Mijn naam is Peter de Lange en ik wil u kort iets vragen.
Voor mijn afstudeerscriptie doe ik onderzoek naar manieren om eten te verbouwen in de stad Amsterdam.
DE ACTIVITEIT[22] is me daarbij opgevallen als een interessant voorbeeld van wat mogelijk is en ik zou graag een keer langskomen om meer te weten te komen. Tijdens het bezoek zou ik graag een aantal vragen stellen over wat er verbouwd wordt (en hoe), met welke doelen, en welke obstakels overwonnen zijn of nog een probleem vormen.
Zou u het leuk vinden om hier aan mee te werken? Het bezoek kan in een half uur gebeuren en kan ingepland worden op een tijdstip dat u uitkomt (zowel tijdens als buiten werkuren).

Als u interesse heeft wil ik u vragen om mij dit per email te laten weten en aan te geven wat voor u goede momenten zijn om af te spreken, dan neem ik vervolgens contact met u op om een afspraak te maken. Mocht u nog vragen hebben dan zijn deze natuurlijk welkom.

Bij voorbaat dank en vriendelijke groet,

Peter

Email: p.j.delange@student.vu.nl

English version
Subject: Research into food production in Amsterdam

Dear sir/madam,
My name is Peter de Lange and I would like to briefly ask you something.
For my thesis I am researching ways to produce food in the city of Amsterdam.
THE ACTIVITY has drawn my attention in this as an interesting example of what is possible and I would like to come by sometime to learn more about it. During this visit I would like to ask a few question about what is being produced (and how), for which purposes, and which obstacles have been overcome or are still a problem.
Would you like to participate with this? The visit can be done in half an hour and can be planned at a time that suits you (both within or outside of working hours).

In case you are interested I would like to ask you to notify me per email and tell me what moments might work for you, than I will contact you to make an appointment. If you have further questions

Annex C: Allotment garden interviews

This annex contains the questionnaire that was used for the interviews at allotment garden park Frankendael., both in Dutch and a translation into English.

Enquête gebruik volkstuinen

Geachte volkstuinier,

Zou u mij met mijn onderzoek willen helpen door onderstaande vragen te beantwoorden. Als er iets onduidelijk is, of moeilijk te beantwoorden is, dan hoor ik het graag van u. Bij voorbaat dank!

Peter

1. Hoe lang (ongeveer) tuiniert u al op een volkstuin?

.....

2. Wat zijn voor u de belangrijkste redenen om een volkstuin te hebben?

.....

.....

3. Hoeveel uur bent u per week bezig op de volkstuin?

.....

4. Hoeveel vierkante meters is uw tuin?

.....

5. Hoeveel vierkante meters gebruikt u daarvan voor het verbouwen van eten (groente, fruit, kruiden)?

.....

6. Hoeveel eten (bv in kilo's) haalt u hier ongeveer van af?

.....

7. Bent u de afgelopen jaren meer of minder van u tuin gaan gebruiken voor het verbouwen van eten, of ruwweg evenveel?

.....

.....

Questionnaire usage of allotment gardens

Dear allotment gardener,

Would you like to help me with my research by answering the questions below. If anything is unclear, or difficult to answer, please let me know. Thanks in advance!

Peter

1. How long (roughly) have you been gardening on an allotment garden?

.....

2. What are the most important reasons for you to have an allotment garden?

.....

.....

3. How many hours a week are you working on the allotment garden?

.....

4. How many square meters is your allotment garden?

.....

5. How many square meters do you use for growing food (vegetables, fruit, herbs)?

.....

6. Roughly how much food (for example in kilos) do you get from this?

.....

7. Over the past years, have you started using more or less of your garden for growing food, or roughly the same?

.....

.....

8. Can you tell why you have started using more/less from your garden for food?

.....

.....

Annex D: Street interview

This annex contains the questions for the street interview, in Dutch and the English translation.

Enquête voedselproductie in de stad

Dank voor uw medewerking aan deze enquête. Deze enquête maakt deel uit van een onderzoek naar de mogelijkheden voor voedselproductie in Amsterdam. Het doel van de enquête is om een idee te krijgen hoe inwoners van Amsterdam tegen het (zelf) produceren van eten in de stad aankijken.
Vult u de vragen alstublieft naar waarheid in. Er zijn geen goede of foute antwoorden, het gaat er immers enkel om te weten te komen hoe u over het onderwerp denkt. Veel plezier!

Geef alstublieft aan in welke mate u het met de volgende stellingen eens bent

	Oneens	Beetje Oneens	Geen Mening	Beetje Eens	Eens
Eten verbouwen in de stad is niet hygiënisch	○	○	○	○	○
Eten verbouwen in de stad maakt de stad mooier	○	○	○	○	○
Groenten uit eigen tuin zijn lekkerder	○	○	○	○	○
Ik zou graag zelf eten verbouwen	○	○	○	○	○
Ik heb geen tijd om zelf eten te verbouwen	○	○	○	○	○
Zelf eten verbouwen is goedkoper dan eten kopen	○	○	○	○	○

Geef alstublieft voor elk van de volgende activiteiten aan of u deze doet en waar u deze doet

Activiteit	Binnen	Balkon	Dakterras	Voortuin	Achtertuin
Ik heb sierplanten of bloemen	□	□	□	□	□
Ik verbouw kruiden in deze ruimte	□	□	□	□	□
Ik verbouw groente in deze ruimte	□	□	□	□	□
Ik teel fruit in deze ruimte	□	□	□	□	□

Vink alstublieft aan welke ruimtes u heeft

	Binnen	Balkon	Dakterras	Voortuin	Achtertuin
Ik heb deze ruimte	□	□	□	□	□

Hoeveel uur besteedt u per week aan het planten, onderhoud en oogsten van eetbare planten?
.....

Wat zijn voor u redenen om zelf eten te verbouwen?
.....
.....
.....

Wat zijn voor u redenen om dit niet te doen?
.....
.....
.....

Van de volgende vragen zou ik het waarderen als u ze invult, omdat ik hiermee vergelijkingen kan maken per leeftijdsgroep, geslacht, etc. Natuurlijk hoeft u niets in te vullen dat u niet wilt invullen.

In welk stadsdeel woont u?
○ Centrum ○ Nieuw-West ○ Noord ○ Oost ○ West ○ Westerpoort ○ Zuid ○ Zuidoost

Questionnaire Food Production in the City

Thank you for your participation in this questionnaire. This questionnaire is a part of research into the possibilities of food production in Amsterdam. The aim of this questionnaire is to get an idea of how people in Amsterdam view urban food production.

Please answer the questions truthfully. There are no right or wrong answers, since the purpose is solely to find out your opinion on the topic. Have fun!

Please tick the boxes that correspond with your opinion.

	Disagree	Slightly Disagree	No opinion	Slightly Agree	Agree
Growing food in the city is not hygienic	○	○	○	○	○
Growing food in the city makes the city more beautiful	○	○	○	○	○
Home grown vegetables taste better	○	○	○	○	○
I would like to grow food	○	○	○	○	○
I do not have time to grow food	○	○	○	○	○
Growing your own food is cheaper than buying it	○	○	○	○	○

Please tick those boxes for which you do the mentioned activity in the mentioned location

Activity	Inside	Balcony	Roof terrace	Front yard	Back yard
I have ornamental plants or flowers	□	□	□	□	□
I grow herbs in this space	□	□	□	□	□
I grow vegetables in this space	□	□	□	□	□
I grow fruits in this space	□	□	□	□	□

Please tick the boxes for the spaces that you posses

	Inside	Balcony	Roof terrace	Front yard	Back yard
I have this space	□	□	□	□	□

How many hours a week do you spend on planting, maintaining and harvesting edible plants?
.....

What are reasons for you to grow your own food?
.....
.....
.....

What are reasons for you not to grow your own food?
.....
.....
.....

I would appreciate it if you fill in the following questions, because the allow me to make comparisons of the results per age group, sex, etc. Naturally, you do not have to fill in anything that you do not want to.

In which city district do you live?
○ Centrum ○ Nieuw-West ○ Noord ○ Oost ○ West ○ Westerpoort ○ Zuid ○ Zuidoost

What is your age?
○ younger than 20 ○ 21-30 ○ 31-40 ○ 41-50 ○ 51-60 ○ 61-70 ○ over 70