A thesis submitted to the Department of Environmental Sciences and Policy of

Central European University in part fulfilment of the

Degree of Master of Science

Barriers and challanges of „GROW YOUR OWN" food schemes in Melbourne, Australia

Dorottya HUJBER

Budapest, Hungary

2008

Erasmus Mundus Masters Course in Environmental Sciences, Policy and Management

MESPOM

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Dorottya HUJBER

CENTRAL EUROPEAN UNIVERSITY

ABSTRACT OF THESIS submitted by:
Dorottya HUJBER
for the degree of Master of Science and entitled: Barriers and challanges of „GROW YOUR OWN" food schemes in Melbourne
Month and Year of submission: May, 2008.

In the present thesis two urban agricultural practices are analyzed in Melbourne, Australia, namely backyard and community gardening production. The latter is managed by community members usually on fenced public land. In both schemes food production for people's own consumption takes place, including vegetables, fruits and animals.

The aim of the study is to give a general overview on why people are growing food in an urbanized area like Melbourne today and what barriers and challenges the growers face. Multiple stakeholder analysis is carried out giving opportunities for residents, governmental officials, academics, non-governmental organizations and associations to share their experiences and views. The thesis uses qualitative research methods.

The study presents that there are various reasons for growing food but the main motivation of growers is enjoyment of the fresh, tasty produce. Health, environmental and community involvement considerations come after that and these three have equal importance. Economic motivations and food security reasons are not that relevant. However, officials believe that the schemes are driven mainly by environmental considerations. Backyard and community gardeners have to overcome financial, legal and societal barriers. Lack of space, water, finances and supportive policies are the major drawbacks.

Both schemes are beneficial for the individual as well as the whole community. Therefore supportive actions should be taken by local authorities, governmental bodies and non-governmental organizations. Growing your own food fosters urban sustainability and has a great potential in reducing negative effects of the current food system, such as food miles, ecological footprint, health implications and societal inequities.

Keywords: urban agriculture, community garden, backyard production, urban food system

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Acknowledgements

I would like to express my special thanks firstly to Professor Zoltán Illés for giving me guidance and support throughout the whole research period sometimes in person and other times on-line when the distance was irreconcilable. His sincerity and helpfulness gave me strength for the completion of this thesis. I am also very thankful to Eszter Tímár for her positivism and great help for shaping my English and giving me good advises.

I also owe the colleagues of Victorian Eco-Innovation Laboratory deep gratitude for their invaluable professional and personal help in Melbourne. I would like to thank Professor Chris Ryan for giving me the opportunity to work with him and his great team. His guidance and kindness made my stay valuable and unforgettable. I am very grateful to Kirsten Larsen and Ferne Edwards for giving me great ideas and support, whenever I needed. Without them my stay would not have been the same.

I would like to thank the contribution of all the interviewees. Backyard gardeners and kind people from different community gardens are the main actors of this research. It is all about them. I wish all of them a great harvest. Thanks are due to people from governmental bodies, local authorities, Non-governmental organizations, associations and educational institutes who gave valuable input for this research.

Acknowledgements are also due to the MESPOM program and the leading spirit of this great educational program, to Aleh Cherp. Special thanks to all of my kind fellow friends form the MESPOM and MS classes. I will never forget the time we have spent together and your friendships will remain very precious for me.

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ABBREVIATIONS

ACSIS	Australian Centre for Science, Innovation and Society
CG	community garden
NGO	non-governmental organization
PUA	peri-urban agriculture
UA	urban agriculture
VEIL	Victorian Eco-Innovation Laboratory
WHO	World Health Organization

1 INTRODUCTION

We are living in a globalized and increasingly urbanized world, where the world's population has to face many challenges. Probably there is not much time left to find solutions to environmental, social and economic concerns. We have to face the consequences of population growth and rapid urbanization. There is a rising demand for resources and food to feed people. Food is coming from further away places leaving larger ecological footprints. "My garden is the closest place where I can get a fresh carrot" was told by one of the interviewees during the research. Growing food in gardens for self consumption is one form of agricultural production and if it is happening in a city or an urbanized area it is called urban agriculture (UA). It is defined as "… an industry that produces, processes and markets food and fuel, largely in response to the daily demand of consumers within the town, city or metropolis…" (Smit, Ratta and Nasr 1996). It is a complex system, which interacts with other systems in and around the city. The different urban agricultural practices can serve the market demands or individual goal of self sufficiency. Producing or growing your own food can make a difference in the life of the city and can foster sustainability in many ways. This activity can take place on private land in case of backyards or on public/semi-public places in case of community gardens (See Chapter 2). The contribution of urban residents to world challenging issues will be demonstrated in this thesis focusing on food production in backyards and community gardens.

1.1 Problem definition

Since the millennium more than half of the world's population has been living in urban areas. According to a certain forecast this trend will continue and by the year of 2050 this number

could reach 60-70% (Lang and Heasman 2004). Projections by demographers show that the world's population will reach 10 billion by 2050, which is double the 1990 level. Within the last 50 years water and food consumption have increased six times (Bongaarts 1998). There are different views about the future challenges regarding the carrying capacity of the earth. Some say that there will be enough resources, land and production capacity to feed the growing population, but others say that we are already putting too much burden on the environment and the further intensification of agriculture is not possible (Bongaarts 1998).

Wackernagel and Rees (1996) believe that "the Earth's ecosystems cannot sustain current levels of economic activity and material consumption, let alone increased levels." Beside the population growth they also highlight the increasing per capita energy and material consumption trend which have a significant influence on sustainability.

It is acknowledged that the reader is familiar with the concept of ecological footprint but I would like to quote the original authors to show what they exactly mean by it. "Ecological footprint accounts for the flows of energy and matter to and from any defined economy and converts these into the corresponding land/water area required from nature to support these flows." (Wackernagel és Rees 1996). Based on this approach we can calculate and compare the footprint of different cities (Figure 1-1), regions or countries, but also different production methods and consumption patterns. If every one on Earth lived like the average North American, we would need three Earths to satisfy our needs. We do not only have to face with population growth in general and in urbanized areas but also with increasing consumption patterns. An average Canadian requires 4.2 hectare (ha) to serve his/her resource needs and absorb his/her emissions out of which 1.3 ha counts for the food production (can be called "foodprint"). Industrialized

countries have a deficit, which basically means that they "import extra carrying capacity" from other regions. This cannot be the basis of a sustainable community (Wackernagel és Rees 1996).

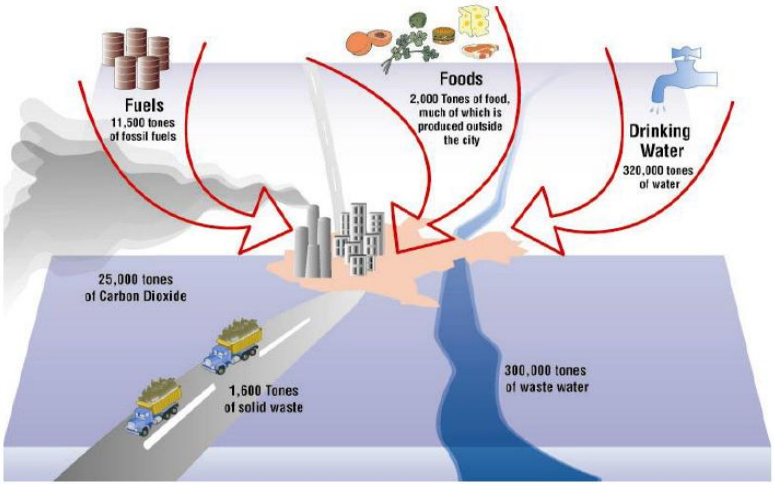

Figure 1-1: Thee ecological footprint of an imaginary European city of 1 million people

Source: http://unep.org/urban_environment

There is another side of the problem too. One German study showed how a container of yoghurt, considering all ingredients and package, travels 11,000 kilometer (km) before it ends up in a consumer's basket although all of these could be produced within 80 km. Food mile calculations show how far the product was brought from. And as a consequence it is possible to see how dependent is the community on external, distance markets and resources (Norberg-Hudge 1994). Due to increased transportation the level of air pollution and greenhouse gas emission is getting more significant. Here comes the question: so why it is not produced locally closer to the consumer?

There is no problem with the trade itself but what is shocking is the scale of unnecessary transport. This is the case with milk production in the United Kingdom. According to a statistic, by Food and Agriculture Organization of the United Nations, 119,000 metric tons of milk is

exported produced by British farmers while 114,000 tons were imported in 1996 (Figure 1-2) Also the scale of trade has increased in the last decades. In 1990 thirty times more milk was traded than ten years earlier, which is shown in Figure 1-3 (Norberg-Hodge, Merrifield and Gorelick 2002).

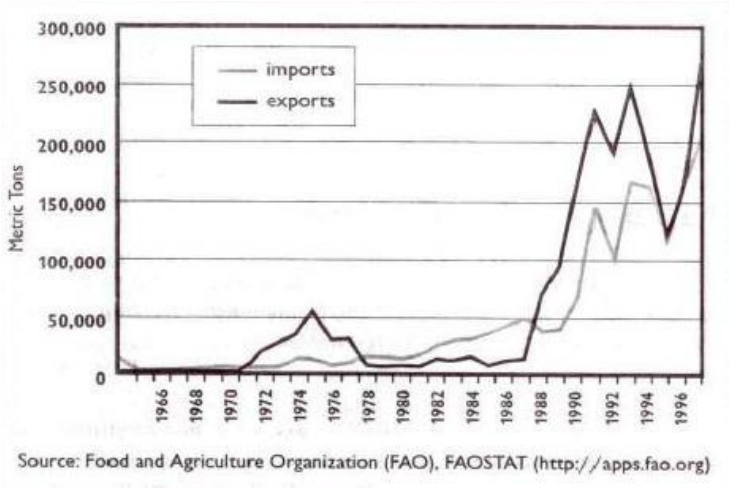

Figure 1-2: Milk import and export in the UK (1965-1998)

Source: (Norberg-Hodge, Merrifield and Gorelick 2002)

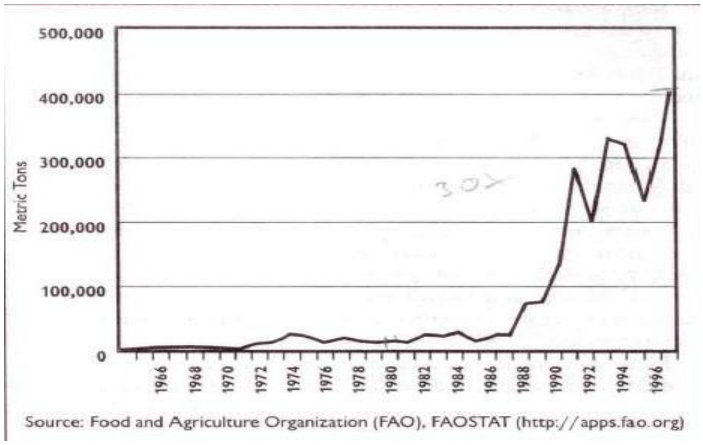

Figure 1-3: Unnecessary trade in fresh milk in the UK (1965-1998)

Source: (Norberg-Hodge, Merrifield and Gorelick 2002)

The amount of world-wide food export reached 774 million tones in 1999 compared to 190 million tones in 1961, which shows a four-fold increase and the level of production did not grow that significantly (Millstone and Lang 2003). This globalized food system is helping to reach higher food security, better and stable supply, but in the same time people become more vulnerable and exposed to diseases (Tansey and Worsley 1995).

The current food system would be able to provide enough food for all and still in the United States of America 31 million people were food insecure in 2000. Food security is an essential and basic element of individual health and well-being, where "all people, at all times have physical and economic access to sufficient, safe, culturally acceptable, and nutritious food to meet their dietary needs and food preferences for an active and healthy life through local non-emergency sources." (K. H. Brown 2002)

Decision makers, politicians and local people have to consider all these and many more issues in the world. The reader might ask so what is common in the above mentioned problems? Food is the linking element of all the above highlighted issues. Food is a basic element of human life affecting all areas of everyday activities. The whole food system starting from production, processing, packaging, through distribution, consumption to waste management is greatly influences the environment, social structure and economic development. With increasing urban population growth this system becomes more complex and interrelated. Urban agricultural practices, in developing as well as in developed countries, are good methods to adapt to the emerging challenges through re-localization of the current food system while creating more sustainable and livable urban environment (Mougeot 2005). It cannot be the solution for all

problems, but together with other practices and strategies can contribute to a better future and bring resilience in the food system.

In the following pages a journey begins which will take the reader to places in the northern and the southern hemisphere and introduce people who are practicing urban agricultural production in their gardens or in community gardens. These people have the power to make a change to build better societies, foster higher environmental values and promote economic viability. Please follow the lines as a pathway to discover the places and people living in Melbourne to see what everyday people can do to mitigate global problems on local level.

1.2 Aims and objectives

Agricultural production began within and around townships when the first humans started to produce their own food. Practices and systems have changed with time but there is an increasing global interest in local and urban food production, which revives many initiatives and agricultural practices around the world.

The aim of the thesis is to gain knowledge about urban agricultural practices in the developed, industrialized countries especially focusing on Australia. It is a country and a continent at the same time with a territory of 7 617 930 km^2 in size but at the same time agricultural resources can be found only in a limited area of 498 974 km^2 which is 6,55% of the total land surface (CIA 2007) and has to feed 21.3 million people (ABS 2008). The research was conducted in Melbourne, the capital city of the State of Victoria, which is the centre of agricultural production within the country. The population of the metropolitan area of Melbourne is around 3.5 million as it is shown on Figure 1-4 (City of Melbourne 2004). In the study Melbourne Metro is

considered, because the City of Melbourne is only one municipality or "district" within the capital city.

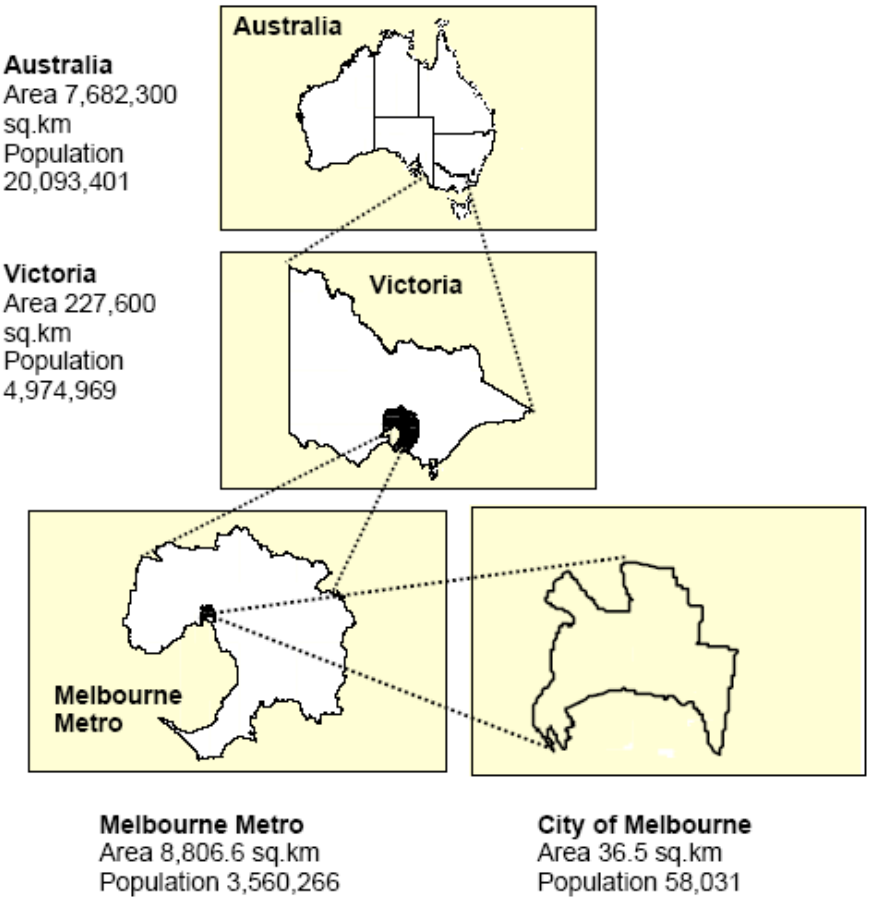

Figure 1-4: Population and area of Australia, Victoria, Melbourne Metro and City of Melbourne

Source: (City of Melbourne 2004)

Another reason for choosing Melbourne is that there was a great opportunity to work with a creative research group at the Australian Centre for Science, Innovation and Society (ACSIS) in Melbourne. They have been working on issues related to urban food systems in Melbourne researching the challenges and opportunities regarding urban sustainability. ACSIS is connected to the Department of Land and Food Resources at the University of Melbourne. They have

achieved high recognition and acknowledgements from the Victorian State Government and from different academic bodies for their valuable academic work.

Being a Hungarian and being committed to the country's development motivated the author to include Budapest in the research. After looking at and analyzing the different existing schemes in Melbourne, the study was intended to investigate how community gardening as an alternative agricultural method could be applied in Budapest. Such practice does not exist in Budapest but there are some attempts to motivate residents to get involved in local community driven actions, where plant growth is involved. Realizing that the Melbournian case study needed two and a half month there was not enough time to fully develop a second case study on Budapest unfortunately. Therefore it is not included in this thesis research but can be the subject of a further research. Bringing new ideas in a new environment is always challenging, but spreading knowledge and good practices in different countries can benefit the well being and sustainability of the whole world.

The main objectives of the research are the following:

- To investigate urban agricultural practices in local contexts focusing on not for market production (garden/backyard and community garden) in Melbourne.
- To discover the reasons behind "grow your own" practices.
- To come to know the opinion of different stakeholders about food production in metropolitan areas.
- To highlight the challenges and possible future outcomes of the two specific urban agricultural practices in Melbourne.

As a closure of the research it is intended to develop some initial proposals for further investigations and recommendations for the policy makers in order to achieve a higher level of recognition of urban agricultural practices. The study will be used and presented by ACSIS on different platforms and it will also serve as a valuable input for their further research.

1.3 Research question

The research questions were formulated at the pre-empirical stage of the research, after getting familiar with the broad concept of urban agricultural production and food systems in general. This was an important and essential stage before setting up the research and moving forward to the empirical work. When formulating the research questions the guiding principle was to keep the research focused and give coherence to the study (Punch 1998). After seeing the problems regarding urban population growth, growing ecological footprint and unnecessary food trade, many questions were waiting for answers. To bring these complex and interrelated issues under a well defined scope some focused questions had to be raised. Formulating the questions was an ongoing process till the final version was phrased.

The master thesis is aiming to find the answers to the following research questions:

- Why are people motivated to grow their own food in an urbanized area like Melbourne?
- How do different stakeholders (governmental bodies, local authorities, non-governmental organizations, associations and residents) see the barriers and challenges for growing food in Melbourne?

1.4 Methodology

In order to fully assess the topic and find answers to the research questions, qualitative research methodology was chosen as the basis of study. The existence of urban agricultural initiatives and legal frameworks were studied at international, national and local levels. The research process followed the classical scheme of qualitative method because of the flexibility of the method. In the initial stage a broad literature review was conducted, than in the primary research stage primary and secondary data was collected at national and local level. These phases were followed by the analytical stage where data were analyzed and interpreted followed by the writing up stage where the process and the findings were put on paper with recommendations for further actions.

1.4.1 Research design

The aim of the thesis is to study human behavior and get an understanding about people's practices in urban food production. Social science research has the ability to build explanatory theory based on data about the behavior of people.

Social science research is based on observations and descriptions of behavior in everyday situations (Punch 1998). Qualitative research approach allows the researcher to analyze these behaviors and quantitative analysis can be used to understand and characterize social processes. In a qualitative research conversations and observations are analyzed, naturally occurring data are collected and hypothesis generation is applied (Silverman 2000). Valuable research is most likely to be based on the collection and explanation of primary data. Giving a description of the historical background and current situation is always necessary to familiarize the reader with the

topic. But there is a need to explain the ongoing processes and this goes one step further than description (Punch 1998). An explanatory study focuses on answering the "why" and "how" questions and this is the aim of this research too.

A qualitative and partially quantitative method was used during the research which allows the reader to fully understand the situation and it gives the opportunity for the researcher to draw conclusions based on primary and secondary data.

To be able to get a full picture a framework was developed consisting four main steps (Figure 1-5). This first step, the literature review, gave the opportunity to establish an overview on the subject and get a better understanding of the issues. This was an essential element of the research, which gave good background knowledge prior to the fieldwork. Specific books, journal articles and scientific paper were used dealing with food systems, urban agricultural practices, and other related issues necessary for the research. On-line publications of the Australian Bureau of Statistics and government bodies, like the Department of Primary Industries, Department of Sustainability and Environment also added valuable information, as well and relevant internet sites of non-governmental organizations and local authorities. Reviewing the literature allowed to have a broad picture but also to find the interesting, challenging and problematic areas. This also gave the opportunity to narrow down the interest to a more specific field and formulate some more focused research questions.

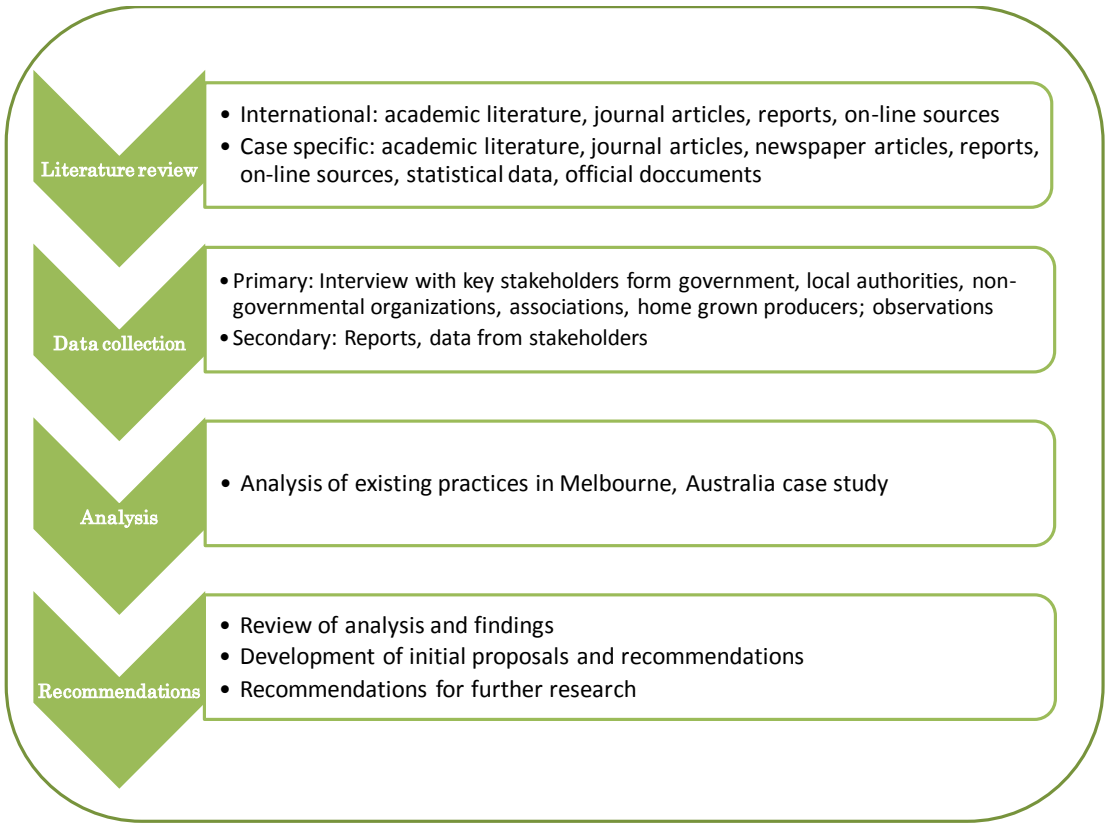

Figure 1-5: Research design

Quite a lot of existing projects and also all kinds of sources can be found dealing with urban agriculture in general but the theories needed to be tested on case specific level. After generating ideas about the subject, data was collected in order to assess how things appear in a real life situation. The aim was to see why Melbournian people grow their own food and what are the barriers and opportunities specifically for them. Some might be in line with the data found in the literature but some are not. Melbournian case study was chosen to build up theories conducting interviews with different stakeholders and making observations. Case study research has the advantage to gain specific knowledge on the issues and to have some insights in a specific location in a specific period. But at the same time this allows the researcher to discover the complexity of the case specific system in order to understand its wholeness in a holistic focus.

In the next step analysis of the collected data was carried out in Melbourne. Theories from the literature review were compared with the findings of the case study but at the same time theories were generated inductively looking at the real-life situations. A coding method was used to analyze the interviews of different stakeholders and the field notes of the observations.

After finishing the analytical stage the findings were reviewed and presented. The research was aiming to give recommendations to overcome the barriers and challenges that growers have to face. The possibility of further studies was also assessed at the end of the thesis.

1.4.2 Data collection

Collecting data for this qualitative analysis included primary and secondary data. The specific research question was finalized at the end as the study progresses after reviewing the literature and it influenced the method of collection and the sample size. Punch (1998) states that small sample sizes can be utilized to gain a holistic view on the situation rather than conceptualizing the reality by correlating different variables. Multiple methods and multiple sources were used in data collection, such as interviews, observations and documents in both cases. The sample size (the number of interviewees) was not specified at the beginning but it occurred naturally as the study went on.

Interviews and observations gave the basis of primary data analysis. Looking at the data collection in the case of Melbourne a top-down and a bottom-up approach was applied at the same time. The paper intends to show the perspective of different stakeholders. On the one hand the opinion and interest of the decision-makers, non-governmental organizations and academics wanted to be foreshown (top-down approach) and on the other hand the thoughts and behavior of

people doing the actual agricultural work in the urban areas had to be manifested (bottom-up approach). Both stories needed to be told to get the whole perspective.

During the research period (from end of February till beginning of May) in Melbourne all together 63 **interviews** were conducted with different stakeholders (officials and growers). The interviews in the "top-down approach" meaning officials followed the semi-structured style but they were more specifically focused on the issues related to home grown food and production for self in Melbourne (See Appendix 1). There were 19 interviews conducted with officials in English and each lasted for about one hour. Only some of the meetings were voice recorded with the permission of the interviewees but all conversations were written up in form of a dialogue. Respondents from the top-down approach were named, but backyard producers and people involved in community gardening were listed only by their first names and their responses were not recorded on the tape.

The "bottom-up approach" included people growing their own food in backyards/gardens and community gardens (they are referred as growers, gardeners and producers from now on). A survey type of structured set of questions were asked from 41 growers but the expected outcome was qualitative rather than quantitative (See Appendix 2). People working in their own garden or own plot often became so emotional about their activity that a rigid, structured interviewing method would not have been effective. As soon as they had the chance to talk about their own little space, they were willing to share their whole life story how they became "food producers". In these circumstances the interviews were unstructured rather than structured or semi-structured. The language was also an issue in the case of community gardens because many of the plot holders were immigrants and were unable to communicate well in English. Sometimes other

members of the community helped with translation but sometimes only parts of the conversation could be written down. In finding the backyard producers, the snowball sampling procedure was used where the interviewees referred to other friends and acquaintances.

The research was not aiming to collect representative data on the Melbournian population as a whole and it could not cover all aspects of the "grow your own" situation. This research can be regarded as a pilot study. Having exact data on how many people are involved in backyard food production and how much food is exactly produced should be the subject of a more specific research with more time and resource allowance. In this case study 28 people were involved from community gardens including voluntary workers and coordinators as well as plot holders; and 17 home backyard producers could be reached within the allocated time period.

In Melbourne the following people were interviewed in the top-down approach (19 officials):

- Dr. Ruth Belini , Associate Dean, landscape sociologist and senior lecturer in the Faculty of Land and Food Resources, University of Melbourne.
- Dr. Carolyn Whitzman, Senior lecturer in urban planning at the University of Melbourne
- Corey Watts, Australian Conservation Foundation, Rural Landscapes Campaigner
- Lee Choon Siaw, Victorian Health Promotion Foundation, Senior Project Officer, Active Communities & Healthy Eating Unit
- Kate McCluskey, Moreland Food Access Project
- Craig Murdoch, Vegetable Growers Association, Victoria
- Karen Deegan, Environmental officer at VicUrban (Victorian Government's sustainable urban development agency)
- Andrew Partos, Senior urban designer at VicUrban
- Vincent Morris, Agribusiness officer at the City of Cardinia and Shire of Casey
- Peter Parbery, Department of Primary Industries
- Ben Neil, CEO of Cultivating Community

- Chris Ennis, Head of market garden at CERES, Community Environmental Park
- Adam Grubb, Permablitz, advocate of permaculture, founder of Eat The Suburbs network
- Ben Nicholson, urban planner, Green Roofs Australia
- Pam Morgan, Food for All policy officer at Melton Shire Council
- Dr Beverley Wood, Food Security Project Officer, Victorian Local Governance Association
- Peta Christensen, Cultivating Community, support worker
- Wendy Van Dort, EcoHouse, Port Philip
- Karen Cameron, City of Yarra

Another form of primary data collection technique was **observation.** Living and conducting a research in a foreign country always motivates people to make observations on every single moment in the new surrounding. This is an important tool in order to get familiar with a new culture and gain knowledge on how and why people react during their activities. Photographs were also taken to demonstrate the physical appearance of the food schemes.

In qualitative research an unstructured approach is more likely to be used which is a more natural and open-ended way to observe the stream of actions (Punch 1998). Traditionally ethnographers use this method to describe the behavior of a social group while observing their activities. All senses – touch, taste, smell, hearing and sight- can be used to learn about people (Esterberg 2002). Observations were used in Melbourne where the activities of plot holders in different selected community gardens were looked at. Field notes were taken as a method of recording. The observation of community gardens was serving the aim of the study by getting another perspective about the behavior of the gardeners. Bearing this in mind, a cross section of gardens was selected to understand the perceptions and actions of different people coming from different backgrounds. One field note was written in each community garden and each observation lasted between one and two hours. This resulted in ten field notes. People working in the gardens were

informed about the inquiry and they were not only observed but interviewed and sometimes photographed as well. Not only were the gardeners subjects of the observation but the sites as well as the surrounding areas.

Beside the previous techniques, **documentary data** was also collected and analyzed. Written text and documents are also a good way to learn about human behavior and social interactions. These can include many sources from letters through media to governmental documents (Esterberg 2002).

In the research project many different sources were used. Official documents such as public records were obtained to collect statistical data and also to learn about policy implementations. The documents were located in libraries, on-line data bases and on the official home pages of different governmental bodies or authorities. Essential data were provided by the Australian Bureau of Statistics (ABS). Most of the policy documents could be found on the web-sites of local, state and federal governments.

1.4.3 Data analysis

The collected data from interviews, observations and documents had to be analyzed in a systematic way. To make sense of the interviews (both in the top-down and bottom-up approaches), a coding method was used. The responses were listed and the patterns, differences and common elements were found and categories were created. Grounded theory method seemed as a relevant way of analyzing the collected data.

The method consists of two parts. First an open coding was used where the identification of themes and categories took place. As an outcome of the recognition of the themes some

descriptive codes are likely to be developed (Punch 1998). After this broader perspective a more focused coding started up. In this second stage the key recurring themes were highlighted and grouped. Here the codes are more interpretive in nature. This also helps in reducing the data to reach a manageable size (Esterberg 2002). The grouping of responses was based on common themes. Both the officials and the producers had the same categories, which will be demonstrated later on in the specific study.

Common themes were identified during the coding of the interviews and observations. The answers were itemized and grouped. These groups then were listed under the corresponding categories. The total number of answers was considered as 100%. Depending on how many answers were included within that particular category gave the result in percentage. Interviewees gave many different reasoning to a particular question and their views are represented in different categories at the same time. Growers usually do not grow food only because of one particular reason but there are many motivating factors behind their action. The importance of findings are relative to each other but in this way an order of the most commonly mentioned reasons could be arranged and demonstrated. Issues related to environment, economy, social cohesion and community, enjoyment, health and food security were unfolded during this stage and led to the creation of these main categories. The criteria for the categorization are displayed in Appendix 3.

Data collected by observation method served as supplementary input for the study. Findings of the field notes were incorporated into the description of the urban agricultural methods and into the interpretation of the research outcomes. It played an essential role in the qualitative research

because looking at different community gardens and perceiving them with all senses allowed the researcher to understand the behavior of people who are growing their own food.

After coding and memoing was finished the final step of the research appeared, namely conclusion drawing. At this stage the long process of data collections reaps its reward and it is integrated in a coherent result. In the triangulation process all the evidences were brought together to answer the research questions. Using interviews, observations and documentary data gave a full picture at the end of the research process and gave more validity to the study. The results and findings from the top-down and from the bottom-up approaches were compared and joined together in Melbourne. The views of participants were demonstrated in the analysis and were complemented with the findings coming from the observation and different documents.

Having all the collected information and assessment in mind the final conclusions were drawn, recommendations were developed and the research questions were successfully answered. At the end of the study a recommendation for possible future researches was highlighted, where the applicability of the Melbournian type of community gardening scheme in Budapest could be assessed.

1.4.4 Validity and limitations

The scope of the study is limited to urban agricultural food production in the context of Melbourne, Australia. The aim was to familiarize the reader with the concept and actual status of this food production scheme. The research was intended to demonstrate why local residents in Melbourne are growing their own food in their own gardens or in community gardens. They both are forms of urban agricultural food production. And also the barriers and challenges of such

practices were analyzed. The study only included these self- sufficient production forms and others, like market gardens, urban farms, and school gardens were excluded because of the complexity and their different purposes of production.

The number of interviewees was limited due to the given time frame and the purpose of the study. The collected data are not representative for the whole population of Melbourne. It serves as a purpose of a pilot study rather than a full, representative analysis of the situation. Using complementary secondary data sources the subjectivity of the results was avoided. Findings evolving from the Melbournian case study can serve as a basis for a further more specific and detailed research.

The collection, analysis and interpretation of data were carried out mainly in English (not the native language of the researcher) and this might have led to some misinterpretation of the findings. Although the official language of Australia in English, some of the interviewees were not native. Expressing their views and give clear explanation might be limited.

2 Sustainability of cities and urban agriculture

Growing food in and around settlements is not a new phenomenon in the world. When *Homo sapiens* appeared on Earth it collected food from nature and hunted animals for more than 100,000 years. Then people realized that selecting some species and planting them in the surrounding area can be beneficial, so farming began some 10,000 years ago (Lang and Heasman 2004). In the preindustrial times cities practiced a closed-loop system producing their own food and taking care of the generated waste that was mostly organic at that time (Smit, Ratta and Nasr 1996). The processing of food industrially dates back only to 200 years ago (Lang and Heasman 2004) when rapid urbanization took place. This was the time when rural communities were separated from urban or town areas in terms of functions. The countryside became the favored place of production and urban farming was considered an unhygienic, unnecessary practice. The functional separation was more visible in the industrialized "north" while in the "south" it was not so conspicuous. The natural ecological and nutrient cycle was interrupted and waste was not utilized as an input but rather as an output of the system which was eliminated through large-scale management systems and ended up in dumps or got incinerated (Smit, Ratta and Nasr 1996).

The roots of modern agricultural practices lay in the 18th and 19th century, in the colonization time. The biggest change in traditional food production appeared in the 20th century. During this revolution the use of chemicals, intensification, higher energy use, transportation and breeding technologies became the basis of production. The leading nations in this great change were the USA and the UK. The "Fordist" large scale standardized production and processing of food started to gather ground (Lang and Heasman 2004) causing significant ecological damage to our

natural environment. After 1980 the change of paradigm started to appear, where ecological sustainability, economic efficiency and cooperation of governmental and non-governmental organizations came to the front (Láng 2003).

2.1 Concept of sustainable cities

Cities serve as cultural, economical, administrational, educational, financial and social centers, which have to host increasing number and proportion of people. These are also the places where environmental problems arise and experienced at the same time. Cities require inputs in forms of food, energy, water and other materials coming from far away places. After using these resources they are transformed into air pollutants, sewage and garbage. Urban dwellers are very much dependent on the existing systems, which are taking care of the transportation of resources and wastes. Well-grounded, socially and environmentally conscious strategic policy development is needed in order to foster long term livability of urban areas.

Even everyday people whose profession is not related to environmental sciences can also easily understand the concept of sustainability or sustainable development. But at the academic level the phrase is widely used and interpreted in many areas showing the disciplinary nature of the issue. The connection and overlay of the three main pillars namely the economic, environmental and social dimensions highlights the complexity of sustainability.

Sustainability was first discussed at the 1972 United Nation Conference on the Human Environment in Stockholm. Leader politicians form 113 countries raised questions and concerns about environmental problems on global scale. They realized that air, water and chemical pollution and contamination does not consider borders between countries and this recognition led

to the global political cooperation on environmental issues. This global political willingness became the basis of concept of sustainable development, which highlights the need for economic development to overcome poverty, the need for environmental protection and for social justice (Newman and Kenworthy 1999). This is not a final tangible solution that can be achieved but a process or a journey that should be part of our everyday decisions.

Countries like Canada, Australia, New Zealand and the United States of America started to react first in the early 1990's and apply the principles of sustainable development in their decision-making processes. In 1992 the United Nations Conference on Environment and Development was held in Rio de Janeiro bringing scientists and heads of governments together from all around the world to discuss the improvements and emerging environmental issues. As a result of the "Earth Summit" the representatives of 179 countries signed the Rio Declaration, a statement on sustainability. The Agenda 21 was also developed there, which contained action plans for further development. This international level agreement was than translated to local level by the governments of the signatory parties. Local governments have been continuously developing strategies and programs to accomplish their Local Agenda 21 Plans (Newman and Kenworthy 1999).

International documents like the Agenda 21 have not clearly highlighted how the principles can be applied to sustainable development of urban areas. Previous environmental agreements were mostly focusing on natural environment. As we now experience that half of the global human population is living in urbanized areas, there is a big importance of incorporating these principles into city and town planning decision-making processes. The growing percentage of built-up area is pushing natural ecosystems further and further out and this is working against the sustainable

living conditions of human settlements. The UN already hold a conference on Human Settlements in Vancouver, Canada in 1976 but the main breakthrough happened in 1996 in Istanbul, Turkey, where the second Habitat conference took place. It was later also called as the "City Summit", where the Habitat Agenda was approved. Prior to that in 1994 the Global Forum on Cities and Sustainable Development was organized.

Urban agriculture is able to significantly contribute to the sustainable development of cities and towns because it's socio-economic dimensions. This is highly applicable in developing countries where the urban food production is one of the largest industries within the city and gives job opportunities for many (Smit, Ratta and Nasr 1996).

Health, food and urban environment can also be integrated in one approach, where Local Agenda 21 and Health 21 policy framework can work together in order to mitigate problems emerging from the globalised food trade and increased urbanization (WHO 2001).

2.2 What is urban agriculture?

In the literature there are several working definitions that formulate the concept slightly differently. The term "urban farming" or "urban food production" is also used as a synonym in some of the papers and in everyday life practices. The United Nations also acknowledges the use of "metropolitan-intensive agriculture" but uses the expression of urban agriculture in general and defines it as *"... an industry that produces, processes and markets food and fuel, largely in response to the daily demand of consumers within the a town, city or metropolis, land and water dispersed throughout the urban and peri-urban area, applying intensive production methods,*

using and reusing natural resources and urban wastes, to yield a diversity of crops and livestock." (Smit, Ratta and Nasr 1996)

The Resource Centres on Urban Agriculture and Food Security (RUAF) simply defines urban agriculture "*as the growing of plants and the raising of animals within and around cities*." They also highlight the difference between urban and rural agriculture in the following way: *"urban agriculture is embedded in -and interacting with- the urban ecosystem".* The World Health Organization (WHO) uses the term "local production" in its Urban and Peri-urban Food and Nutrition Action Plan (WHO 2001). Local produce is defined as: "*food grown within a certain distance from the point of its consumption*" (FSLC 2002). In some cases the literature distinguishes urban and peri-urban food production systems, where by urban they mean the city center, the inner-city areas, and talking about peri-urban they consider the urban fringe, the suburban territories. In this research it was not necessary to distinguish the two locations because the aim was to find out what is the motivation of people growing food irrespectively of the area within the city.

Often people think about urban agriculture (UA) as a vestige of rural agriculture and treat it as marginal food supply area. It is believed that food must come from places in rural areas because that is the place for production while urban areas must serve residential purposes. It might not be known but a big portion of our food is coming from urban areas. It was found that in the year 2000 approximately 15-20% of the world's food was produced by 200 million city dwellers (van Veenhuizen 2006). Urban agriculture can be called an industry, which is giving jobs for more than 800 million urban residents around the world (Smit, Ratta and Nasr 1996). The scale of

production, the applied technology and distribution however can vary greatly. But not only that, the purpose and the reason behind UA may also differ significantly.

People are producing food for commercial, recreational reasons or for subsistence. Growing vegetables, fruits and raising animals in Western Europe today is more likely a complementary activity, a hobby for the enjoyment of the owner (WHO 2001). Most of the countries during and after the Second World War promoted agricultural production in the cities. In the United Kingdom these places were called Victory gardens. In the 19th century most of the vegetables was produced within Paris using the waste of the city as an input for production. Subsistence food production increased in Central Eastern Europe and in the former Soviet Union after the decline of the large-scale collective farming system (WHO 2001). In the US at the beginning of 1975 the number of households growing vegetables was around 49%, but in 1978 it decreased to 41%. Later this ratio started to increase again at the end of the 1970's due to higher food prices (Gaynor 2006). During the post-Soviet economic crisis Cuba started to apply urban agricultural practices and even today almost 60% of the vegetables are produced within urbanized areas (Mougeot 2005).

Urban agricultural production includes vegetables, fruits, herbs, aromatic, medicinal and ornamental plants but also crops for fuel. Beside plants it also includes animals like fish, poultry, rabbits, pigs, goats and other living creatures. Urban production systems include horticulture, animal husbandry, aquaculture, forestry and some other production like growing mushroom or keeping silkworms (van Veenhuizen 2006). Almost everything can be grown within the city except some livestock, which are subjects to local regulations. Usually cereals and bulky goods are more adequate to produce in rural areas.

Researches and policy documents related to urban agriculture are mainly developed because of urban food security, promotion of better health, urban planning, community building and economic development of local, urban communities.

2.3 The food system

Urban agriculture does not stand alone but it has interactions with other urban or national, global systems. It is also part of the broader food system, which provides food for the community. The scale of the system is not local but includes also national and global activities. It consists of different elements such as *"*growing, harvesting, storing, transporting, processing, packaging, marketing, retailing, and consuming*"* of the food (FSLC 2002). The food system also connects biological, economic and social aspects of life, which creates a complex interdependence of actors and actions (Tansey and Worsley 1995). Urban agriculture is an essential element of the urban food system, which is embedded in the national and global food system and provides food for urban residents.

The urban food system is built upon three activities. First is the consumption or the demand for food; the second is the production or the supply to satisfy the needs; and the actions in between how the food gets from the farm to the table is the third main element. More urbanized locations tend to consume more processed and pre-cooked food. High value and value added food supply of vegetables, meat and crops are more common and the needs are mainly satisfied through long food chain supply systems. In villages the surrounding land provides all necessary goods but in urbanized areas it is usually unable to cover all needs and food import from rural and international markets becomes an important element (Smit, Ratta and Nasr 1996).

The current food system tends to follow a linear structure where the steps of production, processing, packaging, distribution, marketing and consumption are following each other without returning the generated waste into the system. The existing food system is not sustainable because of its linear structure and the related negative environmental, social and economy consequences (SEED 2008). Today's system serves the interest of rich, industrialized nations where 80% of the resources are consumed by 20% of the world's population (Tansey and Worsley 1995).

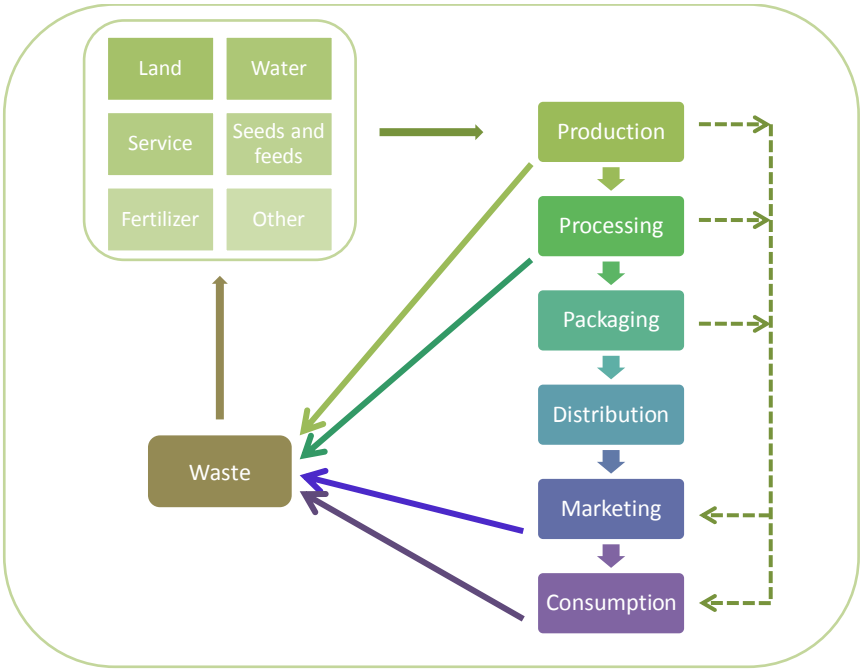

Figure 2-1: The food system

Source: Adopted from UNDP 1996

Agriculture is the basis and most important element of the food system. It is argued that the system based on urban agricultural production tends to have a closed-loop structure. In the beginning availability of adequate inputs and resources are required as it is demonstrated in Figure 2-1. Urban production can take place in urban or peri-urban areas and the motivations for

production can differ but to be able to start up and maintain the processes, sufficient quality and quantity of water, land, nutrient supply are requisites. The inputs of urban agricultural production may well differ from the rural production system because conditions are not the same and it utilizes the resources provided by the city. Collecting rainwater from runoffs and upgrading the soil utilizing compost made of food and green wastes are important principles in an urban environment (K. H. Brown 2002). Other than these, special financial support is needed and training for the farmers. Development of new intensive technologies and share of information also must take place in order to improve production.

During production, many different agricultural technologies can be applied based on the location of the area and the scale of production. Usually production takes place on small parcels between residential areas/houses, on rooftops or in backyards but larger-scale agricultural farms can also be found in peri-urban areas. After the crop is harvested or the livestock is being bred, processing takes place, where the food is washed or transformed and packaged. Usually urban produced foods are fresh products which do not need much processing or individual packaging or cooled storage facilities. In many cases the products are sold or given directly to the customer or used without entering into the distribution system. Some urban farmers have contracts with retailers, local shops or restaurants; some sell their own produce on the market place or farmers markets. In this way the involvement of middlemen is limited in the distribution system and the distance travelled is minimal. Marketing can be either centralized or decentralized and also it can be informal trade between the grower and consumer. In this system, the solid waste that is full of nutritious, biodegradable material is recycled, composted and a new input for the new production (Smit, Ratta and Nasr 1996).

In urban agricultural food system where production takes place in the city the steps of the current food system can be decreased. On Figure 2-1 the dotted lines show that the production and consumption of foodstuff can be very close to each other and in case of community gardens and household gardens it can even appear at the same place and the producer and consumer can be the same person.

2.3.1 Food system in the State of Victoria

It was also essential to gain knowledge on the Victorian food system because it can highlight the current status, problems, challenges and opportunities of the existing agricultural production. Melbourne, the capital of the State of Victoria is the centre of administration, distribution and consumption of foodstuff produced within the state and the main consumer of resources and emitter of wastes.

The Victorian Eco-Innovation Laboratory (VEIL) investigated and compiled a valuable report on the Victorian food system highlighting the key challenges and giving innovative recommendations for future strategies. It was found that the food sector's contribution to Victoria's gross state product is about 20%, which includes the direct value of 8.9 billion AUD coming from the food production (Larsen, Ryan and Abraham 2008). The produced food is not only consumed within the state but a big portion is being exported to other states and countries. The current production system is responsible for 12.9% of Victoria's greenhouse gas emission (Victorian Greenhouse Gas Inventory 2006). Water is a scarcity in the state and through food export 40% of harvested water is also sent away in form of virtual water, meaning water used for the production of the food product (Larsen, Ryan and Abraham 2008). The current production and consumption patterns of food is comprising a total of 37% of Victoria's ecological footprint,

the highest value prior to goods (23%), housing (19%), services (11%) and mobility (10%) (EPA 2005). Specific numbers on each part of the food system is demonstrated in Appendix 4 in a well arranged figure using aggregated data put together by VEIL.

A clear trend can be seen in the structure of agricultural production. The farms are getting larger, the number of farmers is decreasing and the ownership is getting dominated by corporate agribusiness companies. This was also highlighted by one of the interviewees.

Boundaries are no longer obstructing access to products coming from all around the world. The ever-increasing distance that a food product travels raises issues like fossil fuel use, carbon-dioxide emission and nutritious food. Due to the globalization of food industry people are able to buy products from far away places, which are mostly sold in supermarkets (Tansey and Worsley 1995). Big international retailer chains have become the main source of food products often located in the periphery of cities where people have to travel by car.

A study was done demonstrating the distance that food has to travel, called food mile, to reach the Victorian consumer. According to the calculation the typical food basket travelled 21,073 kilometers on road before it reached the consumer, which is almost the same distance as Australia's total coastline, emitting 16,989 tCO_2-e greenhouse gases during the freight. When they were taking all kinds of transportation modes into consideration then the distance became even longer and it accounted for 70,803 km. The difference in the distance shows that the products mainly travelled by air freight. As an example we can see the different distance travelled in case of oranges. Domestically produced oranges in Australia were transported 567 km while the ones from California travelled 12,878 km (Gaballa and Abraham 2007). The calculation of food miles in each city is important because it gives a good understanding of the

effects and interconnection of the existing food system. Being able to make a comparison between cities, countries, systems or different time frames can indicate the need for further action towards a more sustainable and resilience food system.

Victoria State has the highest rate of home production of food among all Australian states. Fish, crabs and other seafood was caught by residents on the sea. Recreational fishing served approximately 5,000 tonnes of seafood, which was 34.9% of commercial produce in Victoria in 1992. This is the latest available data. As Figure 2-2 shows almost 6% of vegetable and 3% of fruit is produced by Victorian residents compared to the marketed products (ABS 1994).

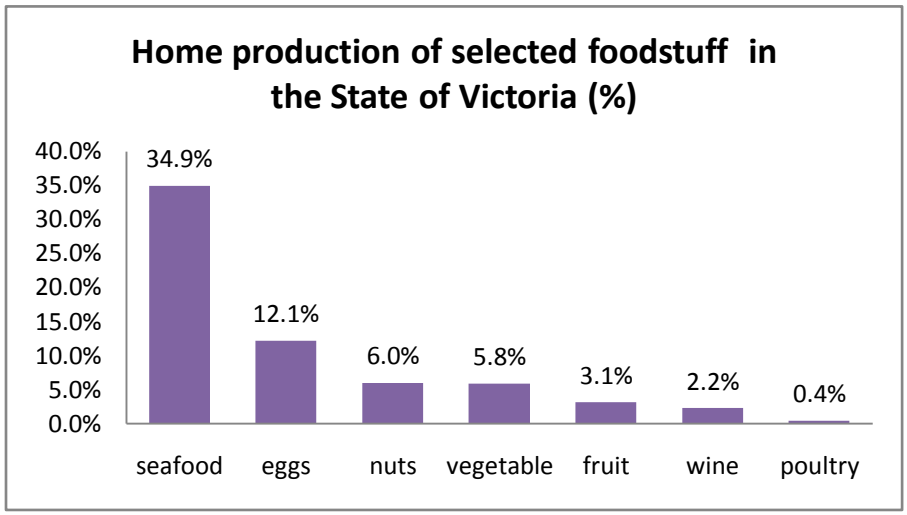

Figure 2-2: Home production of selected foodstuff in the State of Victoria (%)

Source: Adopted from Home Production of Selected Foodstuffs, Australia (ABS 1994)

As the continuation of the previous Figure 2-2 the next Figure 2-3 shows how much of the home grown foodstuff was produced in the metropolitan area of Melbourne and outside of it in non-metropolitan areas of Victoria. It can be seen that in most cases the production in Melbourne is less than in outside. Translating this into numbers it means that 18,720 tonnes of vegetables and

12,468 tonnes of fruits were produced within the capital city. It is interesting to see that over one and a half million dozens of eggs (54.7%) were coming from backyards but only 9.6% of poultry (13 tonnes) is coming from urban area (ABS 1994). Lemons, limes, apples, oranges and plums were the most frequently planted trees in backyards and this data can be confirmed by the author's observations. Branches of different kinds of fruit trees were overhanging of the high fences in almost every second or third gardens. Tomatoes, pumpkins and cabbages were the most popular vegetables.

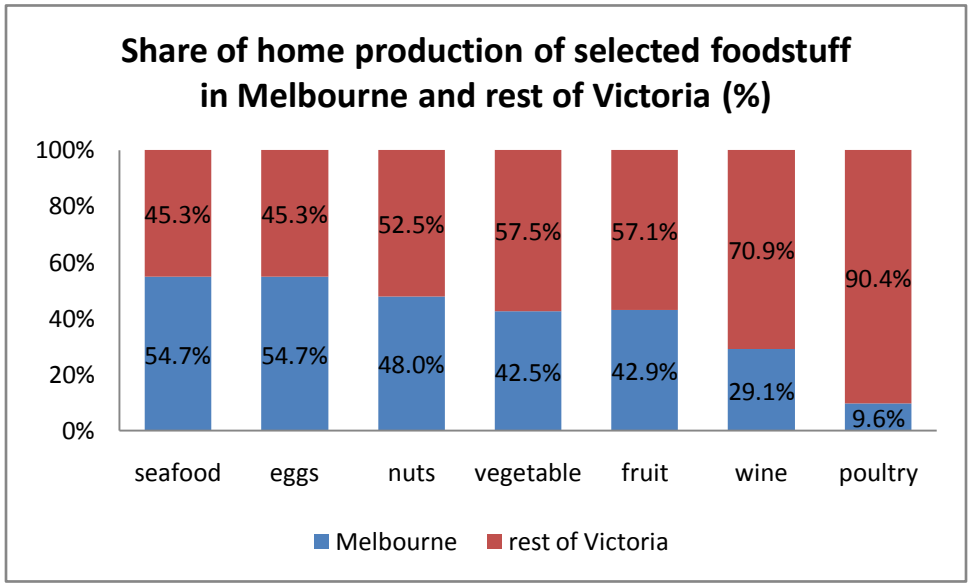

Figure 2-3: Share of home production of selected foodstuff in Melbourne and rest of Victoria (%)

Source: Adopted from Home Production of Selected Foodstuffs, Australia (ABS 1994)

Growing food locally around the house or in a nearby community garden can significantly reduce food miles and ecological footprint of the city. As a consequence mitigation of emissions due to long distance transport of food is also possible. This local action and the promotion of urban agricultural practices can also help in the global climate change battle and a good way to

secure food for the households if the effects of global warming cause difficulties in the existing food system.

2.4 Types of production

Food can be produced for different purposes and on different scales. Crops and stocks produced in urban areas are usually consumed by self, friends or the community or sold on the market. Growing for commercial purposes the produce is usually brought to the local market place, farmers' market rather than further national or global places. There are usually less middlemen involved while the produce makes its way from the field to the plate. Through local marketing food requires less packaging and provides fresher supply than rural products (Smit, Ratta and Nasr 1996). All of these practices can significantly add to urban food security (K. H. Brown 2002). Production can be grouped in two broad categories. One is the production for the market, the other one is not-for-market. The focus of this research is on the later one but the commercial production must be mentioned as well.

Market oriented urban agricultural production takes place on privately owned or leased land and the scale of production varies from micro, small, medium size to large scale. The production system can differ greatly as well. Food can be grown as outdoor crop or under plastic tunnel or greenhouse. The number of applied technologies and type of food products are almost endless. Fish can be breed in aquaculture, bees can be kept in beehives or vegetables can be grown in a hydroponic system in urban or peri-urban areas (van Veenhuizen 2006). Urban farmers are devoted either in full time or part time to work on their land (K. H. Brown 2002). Urban farms are close to the consumer and can sell their produce right at the gate, at farmers' markets or retailer chains can to buy up their fresh fruits, vegetables and livestock. But they also have

contracts with restaurants or have a fix place at the wholesale market. From this description it could be seen as if urban agriculture was similar to any other agricultural production in rural areas. It might be true but there is a significant difference: the locality. The food does not have to travel far from where it was produced; it is the closest place where the supply of fresh produce can be secured for the urban dwellers. But it goes beyond the actual production as such because they use urban resources, like land, water, work force to satisfy local demands.

One form of market gardening is Community Supported Agriculture (CSA), where the basic idea is to bring farmers and consumers close together. The consumers pay in advance to the farmer at the beginning of the planting season and the customer can obtain fresh usually un-processed food every week for the whole year. In 2002 there were 1,000 CSA farms in North America and about 200 box schemes in the UK (van Veenhuizen 2006). This scheme can also be found in Hungary and one of my interviewees runs an organic farm based on CSA called Open Garden in Gödöllő city close to Budapest.

Another interesting approach in the USA is the Small Farms/School Meals program. The aim is to supply urban schools with fresh, nutritious, locally produced food. This is a good way for farmers and entrepreneurs to find a continuous market for their produce (K. H. Brown 2002). This form of cooperation can be expanded to kindergartens, prisons, hospitals and other institutions.

Not-for-market agricultural production takes place also on public, semi-public and private land. Parks, green belts, open spaces along roads and rail lines are public places and serve perfect locations for community gardens. Semi-public spaces include school gardens or grounds of hospitals and other public benefit institutions. The gardens of privately owned or leased houses

provide perfect places for growing vegetables, fruits, herbs or keep animals. Production for self consumption is the main focus of the thesis. There are two activities investigated namely backyard and community gardening, which are both different forms of urban agricultural practices. Both types of production schemes enable local residents and communities to foster self-reliance in terms of fresh fruits, vegetables, herbs and also eggs or meat.

2.4.1 Backyard gardening

In the literature the garden around the house is mostly referred to as backyard because of the English tradition. In Australia the structure of the residential areas followed the English setup, where the useful garden area is found behind the house and only a small portion of area is left in the front or at the side. But using the term backyard in this research refers to all kinds of home gardens. It includes not only horizontal but vertical spaces like walls, balconies, rooftops, pots and containers. In backyards people produce not only edible plants but ornamentals as well and also keep animals like chicken or honeybees. The essence of gardens is well-worded and described in the book written by Head and Muir (2007): "backyards are hybrid places- part of the betweenness of suburbia itself; between country and country, culture and nature, inside and outside, public and private." Houses and backyards formed an entity, a little ecosystem where the gardens provided to food, the water, the fuel for the house and served as sink for the household wastes (Head and Muir 2007).

Food production in home gardens are less studied and also less data is available in academic researches because they are not as visible as community or allotment gardens. Australia is a well assessed country compared to the rest of the industrialized countries. Head and Muir published a book on backyard production in Sydney and some other settlements based on interviews (Head

and Muir 2007) and Gaynor (2006) collected historical data on urban food production. Woodward and Vardy (2005) published a book on community gardens in Melbourne introducing gardeners and showing what they grow. But still there is much more information available about the nature and structure of informal urban agricultural production in North America and also in developing countries.

Some data is available on the amount of this informal production but very little is known how much it contributes to individual, household and community food security. Most families grew their own food in the beginning of the 20th century, but as more and more people moved to urbanized areas they stopped producing their fruits, vegetables and meat. According to an assessment, only four per cent of food is grown for self in Australia in backyards (Blazey 2002). Data provided by the Hungarian Central Statistical Office shows that in 1999 the proportion of homegrown foodstuff reached 22% whereas it was only 11.3% in 2004 (KSH 2007). The World Health Organization found that approximately 500 million USD, in terms of economic value, fruits and vegetables are produced in 30 million Western European home gardens in urban areas yearly. Forty-seven per cent of Bulgarians were self sufficient in 1998 in home grown produce (WHO 2001).

The Digger's Club, who are maintaining and supplying enthusiastic gardeners with heirloom seeds, found that 42 square meter plot is enough to feed a family of three for a whole year in considering Australian conditions. This area could supply 500 kilograms of vegetables if it is well maintained. One person would only need one bed with a length of ten meter and one meter in width (Blazey 2002).

A study done in Toronto differentiated five types of gardens and gardeners based on the purpose of production. In Cook's Garden (1) the producers grew food for the food itself and they were trying to reach as high level of self-sufficiency as they could. Teaching type of garden (2) was established by parents with young children. Their aim was to educate the young ones about the origin of food and show them the link between production and consumption. In the third type of garden environmentally conscious (3) families and individuals grew their fruits and vegetables in order to reduce their ecological footprint. Another common reason for gardening was the hobby (4) and enjoyment. These people planted edible plants not primarily for the sake of food production but because they like to plant and care for the plant. In the aesthetic garden (5) the gardeners planted trees for their beauty and the produce appears as a bonus (Kortright 2007).

2.4.1.1 History of backyard production in the Melbournian context in brief

Since first people arrived to the southern part of Australia and established Melbourne many things has changed. The life of the first settlers in the early 19th century greatly differed from today's residents. Melbourne became an official settlement in 1837 and Victoria State became an independent colony in 1851. Food was not produced in or around the city in large quantities at that time but it was imported on ships (Brown-May and Swain 2005).

This has changed with time and in 1881 in the outer suburbs of Melbourne 40% of people owned large livestock and 63% had chicken and poultry in their gardens. Even in the high density housing areas 8% of households had livestock and 21% had poultry. Keeping animal and being partially or wholly self sufficient in terms of milk, eggs, vegetables and fruits was a natural thing at the end of the 19th century. Backyard producers used water collected from rooftops and horse manure, treated "nightsoil" and plant residues as natural fertilizers (Barrett 1971).

Between the two World Wars the interest in home gardening started to rise. The contemporary gardening magazine acknowledged the healthiness of home grown produce, which gave satisfaction and joy to the producer while reducing the expenditures on food. Workers, middle and upper class were all involved in urban agriculture but their motivations were slightly different. The workers grew their own mainly because of economic reasons but the middle and upper classes wanted to demonstrate their independence and enjoy the freshness of the produce and the pleasure of gardening (Gaynor 2006).

Australia had deficit in food supply during the Second World War because they had to feed the Allied troops, mainly British soldiers. Distribution failures and food shortages took place in the cities. Households in the country were asked to start up food production in their backyards for self consumption. They used the slogan "Grow Your Own" and gave information about home gardening (Gaynor 2006). They also advertized the positive implications of home grown produce showing its health and economic benefits. It was even a national duty to help the neighbors establishing a vegetable garden or planting fruit trees.

After the difficult war years consumerism started to take over everyday life. The production in backyards which was the symbol of independence earlier started to fade and the ownership of car become the new hobby, the new symbol. The so called "low-maintenance" gardens became popular in the 1950's, which only partially contained vegetable beds, fruit trees and compost areas. Residents did not want to have large animals in their neighborhoods anymore and regulations started to restrict the kinds and number of animals that could be kept in the backyards (Halkett 1976). It was not a need, a necessity anymore to "grow their own", rather they wanted to live a modern life where work and leisure filled out their lives.

A new wave of enthusiast growers arrived in the 1960-70's from southern Europe, mainly from Italy and Greece. They left their home to start a new life in Australia and many settled down in Melbourne. As soon as they arrived and bought their house, backyards and streets started to produce food again. The enthusiasm of immigrants to grow food in the urban areas is also manifested in the data which show that 34% of Italian-born citizens kept chicken while this number reached only 7% in case of Australian-born residents (Halkett 1976) (Gaynor 2006).

With the appearance of global environment concerns the idea of "grow your own" became to live its renaissance. Educated citizens and people willing to save the environment started to have their own chicken and harvest their own vegetables. According to a survey 30-40% of metropolitan households were involved in vegetable and fruit production and 6% had egg production within the state of Victoria in 1992. (ABS 1994). And this motivation still exists today and will be demonstrated in the analysis of the research (Chapter 3).

2.4.2 Community gardens

With rapid urbanization more people are living in cities and other urbanized areas and many of them have chosen to live in multi-unit dwellings because of necessity or by choice. In these circumstances families of individuals have limited opportunities for gardening. Community gardens are places where the members of the community can grow their own food. It has a broad meaning all around the world and does not have an overall exact definition. Holland (2004) explains this with the diversity of communities who are trying to solve local problems and are influenced by local conditions. A common feature of the gardens is that participation and involvement of the neighbouring community is present.

Community gardens revive for many purposes, these are places to grow food, provide opportunities for leisure and recreation. They serve as solutions to local problems such as environmental degradation, social exclusion and poverty, lack of available space for recreation (Holland 2004). The gardens are usually run by the community of local residents and are placed on public land owned by municipalities, land trusts, institutions, community groups or other entities. The gardens are fenced in most cases. There is a wide range in sizes, some gardens contain one common plot or more, and others can have as many as 350 individual plots (K. H. Brown 2002). Not only the number but also the size of each plot can differ. Each little piece of land is cultivated by a member, who can be an individual, a family or a group of people. In community gardens many different kinds of vegetables and fruits can be produced but also herbs and ornamental plants can be found. In some gardens also animals, like chicken or rabbit are kept for the community. People growing their own food in CGs do it for self consumption and for their families, but in many cases food is given to friends or swapped and shared with community members. Also the produce can be given to local pantries or disadvantaged groups. The gardens can be placed in urban, sub-urban or rural areas.

The term "community garden" is used mainly in North America, Australia and New Zealand but their European counterparts are called "allotment gardens". The distinction is quite blurry but traditionally allotment gardens are divided into larger parcels (200-400m^2) and the land is owned by the local authorities, public bodies or by a private entity. The tenants are families or individuals who are renting and cultivating their own parcels without cooperation of the other community members. Unusually a small house or a shed is established on each parcel, where the equipments or other garden furniture can be kept. The gardeners are united in an allotment association and a yearly membership fee has to be paid (K. H. Brown 2002) (Faurest 2007).

Fruits, vegetables and horticultural plants can be grown. There are about 80,000 plots in Berlin (Faurest 2007), 300,000 in the United Kingdom (Womack 2008), 26,000 in Sweden and 26,800 in Switzerland (jardins-familiaux 2008).

Different gardens serve different purposes and can be categorized accordingly. Eight main types of community gardens were identified in an article, but off course the boundaries are not rigorous because the gardens can fulfil many functions in the same time (Ferris, Norman and Semprik 2001). The most common type is the *leisure garden (1),* which includes allotment gardens. They are characterised by small plots for vegetable or flower production. The potholders are mainly living in apartments and can enjoy community programs around the common barbeque space. The garden is fenced and locked. The second type of garden severs not only communal but also environmental purposes and is called, *ecological restoration garden parks (2)*. Beside growing food the restoration of the area is an important motive accompanied by environmental education. In *demonstration gardens (3)* academics and volunteers teach local residents how to grow plants more sustainably by using water wisely, making compost and following organic production practices. *Social enterprise/entrepreneurial gardens (4)* help urban poor providing them a place and opportunity to work and have their own income through agricultural production. *Pocket parks (5)* are established on "reclaimed land", places that are not in active use giving the opportunity to the public to enjoy new, green areas. *Crime diversion/work training gardens (6)* are great initiatives that teach how to garden, earn money and be a valuable member of the society to prisoners, ex-prisoners and communities effected by crime and drugs. *Healing and therapeutic gardens (7)* are established to provide health and recreational benefits to mentally or physically ill patients. In *school gardens (8)* students learn where the food is coming from while actively participating in the production and cooking processes. Volunteering parents are also

involved maintaining the garden during school breaks (Ferris, Norman and Semprik 2001) (Donati and Pike 2007).

2.4.2.1 History of community gardens in brief

Community gardens first appeared in medieval times in Europe, where food was grown by the community together within the walls of the settlements (Donati and Pike 2007). While in Europe the gardens became institutionalized, in the USA the started up more like movements. They appeared when social and economic crises arose and were advocated by reformists to help the society. As early as 1893 the major of Detroit provided vacant municipal land to urban poor and unemployment. The same consideration led the development of relief gardening during the Great Depression, when they tried to maintain the mental and physical health of thousands of unemployed (McGourty 1979). In the First and Second World Wars food shortages became common and the War Food Administration established the so called “Victory Gardens”, where 40% of fresh vegetable needs were produced (Figure 2-4). Land and seed was provided for the individuals and communities by the government, schools, businesses and seed companies to grow their own food because the rest of the food needed for the army (Faurest 2007).

Figure 2-4: A poster promoting victory gardens

Source: Reproduced in: Charles Lathrop Pack. The War Garden Victorious: Its Wartime Need and its Economic Value in Peace. Philadelphia: J.B. Lippincott Publishing, March 1917. (Faurest 2007)

In the 1970's a new movement started led by environmental considerations and because of the sharply rising food prices (McGourty 1979). The centre of the new movement was in New York and was based on volunteer work. These initiatives were not supported by the government or only partially unlike the European allotment gardens. An activist group called Green Guerillas took over vacant lots and unused spaces within the city and turned them into productive green land in 1973. Their aim was to green the city and create better environment for the citizens. It was so successful that the government took notice of the action and supported them by offering them leases (Donati and Pike 2007). The first demonstration project of community garden was set up and became popular within a short period, which led to a national program where fifteen other cities were involved. The city established the Green Thumb organization in 1978 and started to lease plots for 1 USD per year till the sites became subject to construction work. Today 63 community gardens are owned and managed by two NGOs in New York providing places for low-income families to grow their own food on these vacant lots (Faurest 2007). According to a survey there were approximately 6,000 community gardens on vacant lots and public land in

thirty-eight U.S. cities in 1998. One third of these gardens were established after 1991 and this shows a growing interest (K. H. Brown 2002).

The first Australian community garden was established in Melbourne in 1977. In the Nunawading Community Garden the majority of potholders were from the Australian-borne middle class who dug the garden for the enjoyment. Eliott (1983) analyzed seven community gardens within Melbourne (Balwyn, Essendon, Fitzroy, Hawthorne, North Richmond, Nunawading, St Kilda). She concludes that production of food in not necessarily driven by economic considerations but community gardens are the places of social interaction and enjoyment of nature as well (Eliott 1983).

2.5 Benefits of „grow your own" food production

After gaining information on the development of community and backyard gardening practices the use and benefits of such activities must be assessed and highlighted. Both of these urban agricultural production practices have effects on all three pillars of sustainability. Promotion of these initiatives can contribute to the mitigation of the problems highligted in Chapter 1. Thinking globally and acting locally is a good way to foster overall sustainability goals within urbanized areas. Growing food for self consumption can address environmental issues like ecological footprint, food miles or protection of biodiversity. They can contribute to individual and social economic benefits through reduction of expenditure on food or mitigation of negative externalities. Other than these they promote food security, physical, mental health and well being, which is beneficial to the gardener and the community. The benefits do not stand alone but complement and enhance each other (Figure 2-5). The reasons for growing food and forms of production are many therefore the expected advantages also vary.

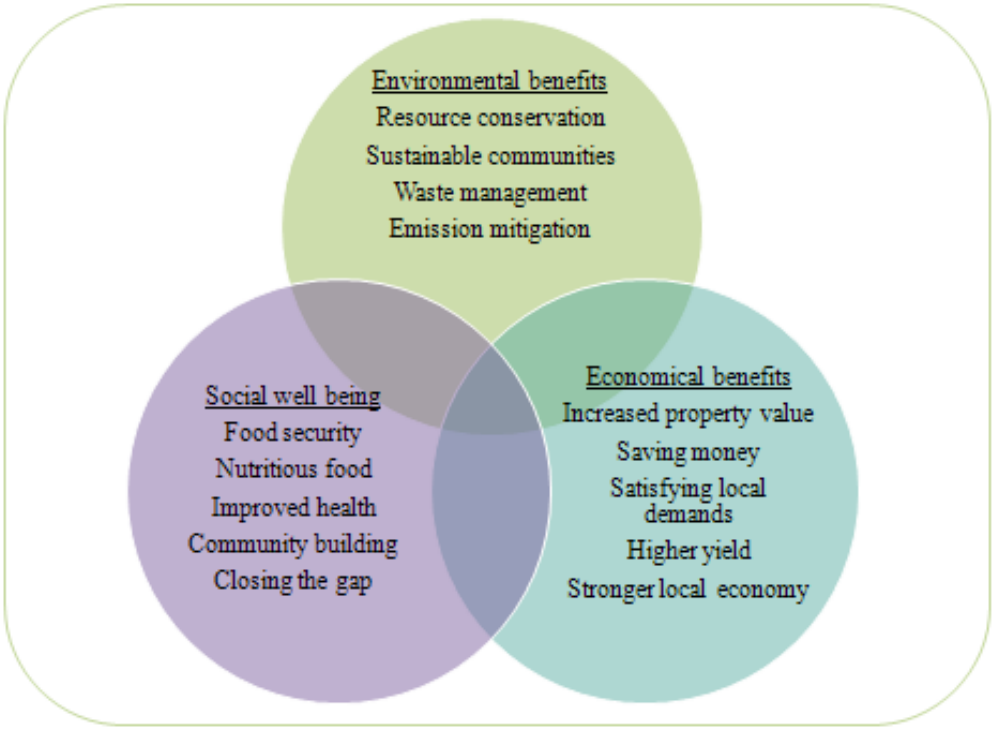

Figure 2-5: Advantages of urban agriculture

Source: Adopted from (Smit, Ratta and Nasr 1996)

2.5.1 Environmental benefits

Nature surrounds us and has measurable and non-measurable values. A sustainable society must use its natural capital wisely without overexploiting its own resources and without restricting the possibility of self sufficiency of future generations. We all depend on nature, adequate land, clean air, sufficient amount of rain, optimal climate are all necessary basic elements that support our lives and the overuse of our natural capital threatens the availability of ecosystem services. Yet people living in cities are distanced from nature not only physically but psychologically as well. People can live for many days without experiencing the presence of fresh air because they live, travel and work in air conditioned spaces. Food reaches people in a frozen or precooked form without noticing the basic ingredients.

The most frequently highlighted benefit of such practices is the **re-localization** of the food system. Gardens, balconies and rooftops are the closest places where food can be produced. Growing food in close distances reduces the **food mile** and can contribute to the reduction of the city's overall **ecological footprint** as well. As a consequence emission can be lowered because products do not need transport (Mougeot 2005). A Canadian study found that **greenhouse gases** can be reduced by 1300-1400 tones annually if some vegetables and fruits (that can be grown locally) were produced within Kingston (Lam 2007). These environmental benefits can significantly contribute to economic benefits as well.

What is **waste** today for the city can be turned into useful inputs to urban and peri-urban agricultural production. Organic as well as inorganic waste can be utilized. Raised beds and planting containers can be built out of left over or reprocessed wood, tire or plastic. Plastic bottles are perfect for raising young plants before planting them out. Organic solid waste, such as leftover from food is utilized with great success and used as natural fertilizer. This small scale, household utilization of waste can significantly reduce the amount of centrally collected and managed waste (Smit and Nasr 1999).

Having more green in the cities is not only nice aesthetically but beneficial environmentally. An interesting finding was that beside open green spaces on the ground, green roofs can reduce the **heat island effect** within urbanized areas. And it can also provide better insulation reducing the need for heating and cooling (Akbari 2001).

2.5.2 Social and health benefits

The most frequently formulated benefit of growing food for self consumption was individual and community **food security**. Most of the efforts done by governments and local authorities promoting urban agriculture are motivated by the fact that there are more and more disadvantaged people in urbanized areas who are not able to access safe, culturally acceptable and nutritious food. One reason is poverty the other is physical disability. The food that urban poor can afford is usually not fresh, not nutritious and highly processed. People who are limited in their mobility, for example because do not own a car or live with a wheelchair, have difficulties to reach the available supermarkets often located in the outskirts of the settlements. As a consequence of food insecurity the nutrition intake is lower and causes higher risk for diseases (Faurest 2007). For them growing their own food can provide adequate, fresh produce.

It is believed and proved by studies that the **nutrition** level of fresh food is diluted during long distance transportation. Particularly vitamins A, C, E and riboflavin are lost even if cold storage is applied. Vegetables and fruits marketed in long distances are picked and collected before their optimal ripening stage and even manipulated with antibacterial solutions against rot (Gaballa and Abraham 2007). Sliced and cut vegetables lose 20-30% of their vitamin C content in an hour. Freshly picked and ripened vegetables and fruits are in their optimal consistency and the beneficial vitamins and nutrition are present in their highest volume. The biologically ripened pepper consists more vitamin and pro-vitamin than the ones in economic maturity (Brecht, Ritenom and Sargent 2007).

Mental and physical improvements are experienced when people interact with the natural environment. The **aesthetic** and usability of the surrounding green space is important especially

for elderly and urban poor because their activity is usually localized around their neighborhood (Mass, et al. 2006).

The reasons for growing food in community gardens can vary. It was shown in a survey conducted in the city of Philadelphia, U.S., that 20% of the plot holders gardened because of **recreational** reasons, 19% for improvement of **mental health** and 17% for the improvement of their **physical health**. It was also found that gardening three or four times a week equals to the physical activity of bicycling. (L. Brown 2006). Regular physical exercise has positive effects on health. It can lower the risk of cardiovascular disease, stroke and high blood pressure. Through healthy eating obesity can be controlled and the emergence of related diseases like diabetes can be reduced (WHO 2001).

The importance of "**regard**" was also highlighted. Sharing the self grown food with neighbors and family members not only tights social ties but also gives pride and satisfaction to the grower. Sharing the produce and eating together enhances social, mental and physical health as well (Offer 1997).

Community green spaces around properties are underutilized and often not seen as communal shared spaces. Developing these places and turning them into a garden these functionless places can be useful for local residents. Doing so helps in the **reduction of crime** and fear of crime, which was proven in mixed-race housing estate in cities. Residents learned to care for and be responsible for communal open spaces (O. Newman 1996).

Community gardens are interactive places where people with different backgrounds can meet. Strengthening the community by **bringing neighbors together** who would not naturally interact

highlights the importance of such initiatives. It is especially important in those areas where the rate of immigrants is high. Through gardening they are able to show where they were coming from and share their culture with the other gardeners. It was found that racial differentiations can be also diminished (Shinew, Glover and Parry 2004).

Gardens and green spaces have **therapeutic benefits**. For people suffering from mental disorders or experiencing anxiety and depression looking at or working in a garden serve as a good therapy. Working together in a productive garden provides not only physical activity but enhances social interaction and builds confidence and self-esteem (WHO 2001).

2.5.3 Economic benefits

Intensive urban agricultural production leads to several times as much of **yield** than rural agriculture due to more intense care and intensive practices. The production is done in limited areas where the available land and sometimes the water is a scarcity. This fosters a more focused and wisely developed production method, where life-cycle thinking takes place (Smit, Ratta and Nasr 1996).. Another study found that at least five times more yield can be produced in community gardens than the national standard for vegetable mixes if adequate labour and soil is provided (Baker 2004). Using multicropping technique can give the owner diverse, fresh food supply all year long. Compared to rural farming techniques there is less need for heavy machinery use, because most of the work is done manually. The need for fertilizer can be also reduced because compost and utilization of organic solid waste from urban areas give a perfect supply of minerals and nutrition (Smit, Ratta and Nasr 1996).

Resource conservation is another important benefit of urban agriculture. The concept of "**fungibility**" was highlighted in the context of expenditure. The expression means that some resources can be substituted for other. It is especially important for those families who spend more than half of their income on food. If saving is achieved on food expenditure, more resource remains for other purposes (Smit and Nasr 1999). Another study showed that community gardeners started to grow their own food because of economical considerations to **save money**. Families having plots in a garden reported 100-300 USD yearly saving in Milwaukee and even 700 USD in Philadelphia with this activity (Lackey and Associates 1998).

It was found that houses looking over to or are within 1000 feet of a well managed green space, like community gardens can achieve a 7-15% higher **property value** (Faurest 2007). People who are interested in food production but cannot afford to buy a house with backyard are looking for places where community gardens can be found in a close distance.

The **aesthetic** of the city is also an important economic factor. Urban agriculture has a regenerative effect because it uses vacant, trash-ridden lots in the inner urban areas of the city. It is a common feature in the North American cities that people leave the inner areas and move into the green suburbs leaving many unused, abandoned lots behind. Chicago has 70,000 vacant parcels of land. These places and formal industrial sites could be turned into productive areas after some property redevelopment or by using raised beds (K. H. Brown 2002). These available places can benefit local resident who are willing to grow food and it is good for the city because they can create livable, green neighborhoods enticing back suburban residents.

Growing your own food sometimes has not visible and tangible economic benefits. Eating organically, locally grown vegetables and fruits can **reduce future health cost**. A research

estimated that 130 million USD could be saved annually through improved diet in Kingston, Canada through reduction of the development of heart diseases, diabetes and cancer (Lam 2007).

In today's society the direct or indirect economical benefits of such practices are not well defined. Due to rising fuel prizes, growing food will be more viable and beneficial even in affluent countries and cities.

This chapter gave an overview of the current status of two urban agricultural practices. Backyard gardening and community gardens are beneficial schemes and can promote urban sustainable development in many ways. Mitigation of the negative environmental, societal and economic effects of the current food system is necessary and growing food for self consumption can be a valuable contributor in this action. People have been growing their own food for various reasons as it was highlighted above. But what could be the motivation for a person living in Melbourne today? This will be demonstrated in the following chapter.

3 ANALYSIS OF „GROWING YOUR OWN" FOOD SCHEMES IN MELBOURNE

Australia and particularly Melbourne was chosen to be the subject of the case study. This was not because the city had a long history of urban agriculture, nor was it the first one to establish community gardens in the world, but because of the fact that they applied such practices, bringing the ideas mainly form England and also from other parts of the world. They were open to new ideas and brought some of the existing practices into their culture. That is what makes it interesting from a Hungarian perspective. Hungarians should also walk with open eyes looking for new solutions in order to revitalize the country, the cities and the communities.

The aim of this section is to present the actual research conducted in Melbourne. Investigation and analysis of the current situation of "growing your own" food schemes will take place on the following pages. The reason for conducting the research was to find out the opinion of people about two particular types of urban agriculture practice, namely backyard and community gardening. The aim was to gain knowledge and understand why people are growing food today in an urbanized area like Melbourne and also to find out what they see as barriers and challenges to do this activity.

3.1 Facts and figures

First some essential background information is given about the country, the State of Victoria and particularly about Melbourne. These facts and figures allow the reader to get familiar with the local context and learn about the physical environment of people living in the area. This gives a better understanding of the arising issues discovered during the case study research. Having all this new information in mind a multiple stakeholder analysis is provided, as the main part of the

research, to discover what is happening in Melbourne today related to urban agricultural practices.

3.1.1 Environmental conditions for food production in Melbourne

Melbourne has a perfect location from the agricultural point of view. Good soil is found here and today 4,500 commercial agricultural enterprises can be found within the territory of Melbourne. Salinity is a major threat to production. The best productive soils are taken over by residential areas (DSE 2006).

Vitoria State has a range of different climate zones but basically the Metropolitan Melbourne area falls in the temperate zone allowing people to grow food all year round.

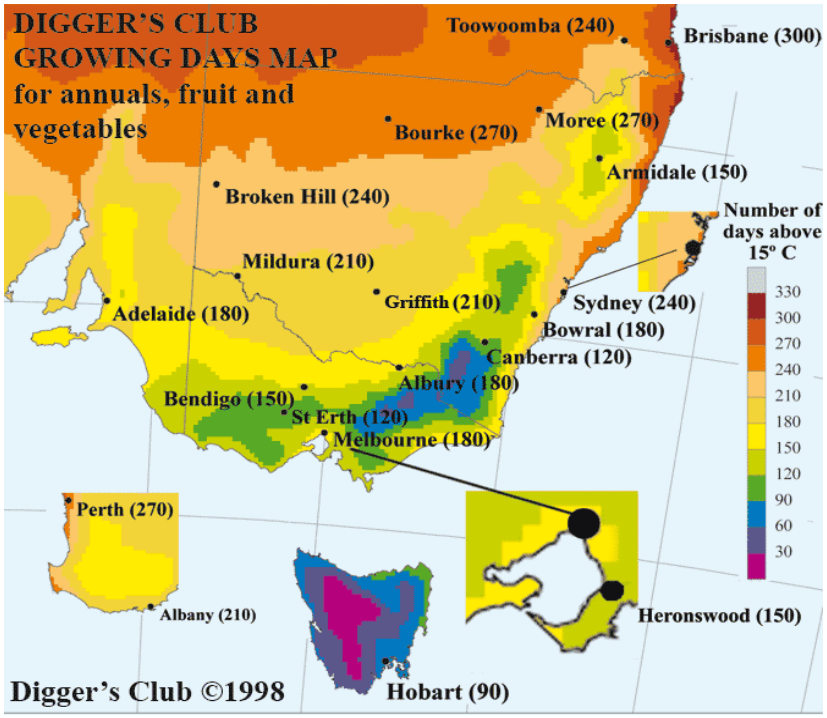

Figure 3-1: Growing days map for annuals, fruits and vegetables

Source: The Diggers Club (www.diggers.com.au)

The annual daily minimum temperature is 10.2 Celsius degrees, and the maximum reaches 19.8°C with the highest maximum around 42 °C in summer time in the last twelve month (BOM 2008). In Melbourne the number of day above 15°C (growing days) ranges from 90 to 180 days as it is shown on Figure 3-1. From flower to fruit a pumpkin would need 150-180 growing days (Blazey 2002).

It has a standard annual rainfall of 600-650 mm, which allows good agricultural production in the area. However trends show a decline in the average rainfall (Figure 3-2). Translating this into numbers, it means that 20-40 mm negative change was observed between 1950 and 2007. And in recent years the rainfall fell to the lowest on record and caused loss for the farmers (BOM 2008).

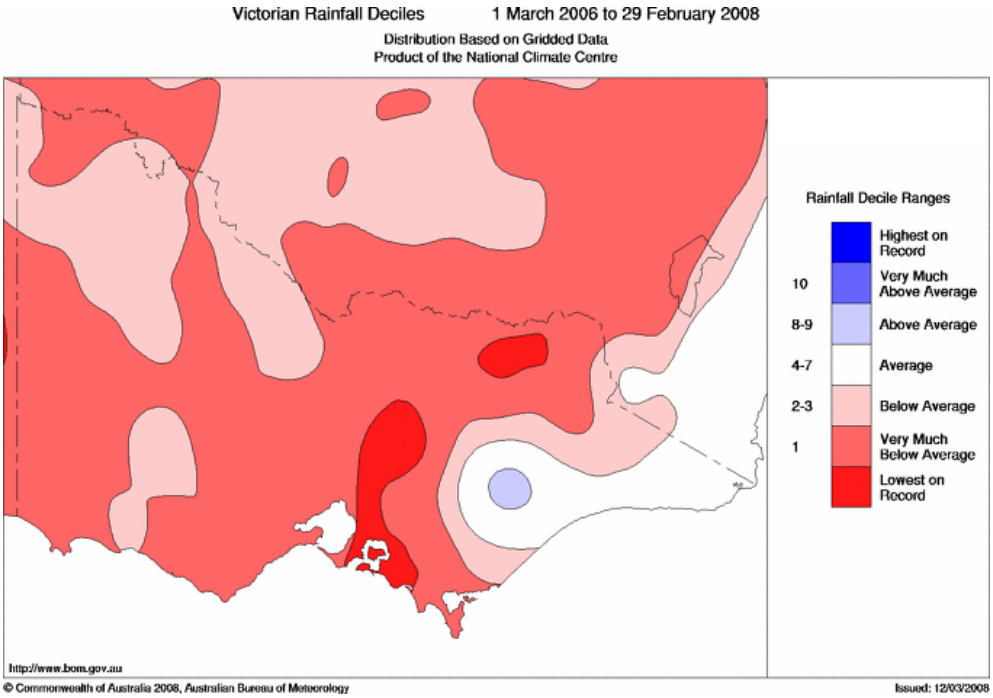

Figure 3-2: Victorian Rainfall Deciles (2006-2008)

Source: Australian Government, Bureau of Meteorology

The city has three river basins which provide drinking water for the citizens and supports the agricultural industry. These are the Yarra, the Maribyrnong and the Werribee basins, but in

recent years they have experienced low streams due to lack of adequate rainfall and draught. Melbourne's drinking water is coming from reservoirs and water storage systems accounting for 157,000 hectares of land, which is currently on a low level (DSE 2006).

3.1.2 Effects of the current climate

Changes in climate patterns are leading to a change in agricultural production and consequentially to a rise in the price of food. Between September 2005 and September 2007 the cost of food was twice of the rate of Consumer Price Index. The highest impact of the draught was on vegetable and fruit production and the price of vegetables grew by 43% and of the fruits by 33%. Lack of rainfall is only one of the reasons. Other extreme climate events are affecting the costs, like the Cyclone Larry which destructed the banana yields in 2006 (CSIRO 2007). Also global demand and supply trends have a great impact on global prices of food, which consequently pressurizes the cost of Australian crops. Reduced yields in Europe and other countries, global oil prices and policies have contributed to the increase of grain prices. This chain reaction then continued in increased animal feed costs which then led to higher meat and dairy product prices (Quiggin 2007). The prognosis also shows that the wet areas are going to be wetter and the dry zones drier but also the number of extreme events will increase according to the Bureau of Meteorology (2008) which then must be followed a more resilient and adaptive agricultural production structure. The severity of drought will be increased as a result of higher temperatures and decreased rainfall levels. According to some calculations there is a possibility to have about 40% more months of draught by 2070 (CSIRO 2007).

Quiggin (2007) believes that the price of fresh vegetables and fruits grown by local producers will rise in the future and price spikes will be experienced frequently due to draught. He states

that “the current severe drought may start to occur every two to four years, rather than once a decade, unless strong action is taken to reduce global emissions.”

3.1.3 Backyard production and community gardens in Melbourne today

All the above mentioned problems draw the attention to the two urban agricultural practices: backyard and community garden food production. Moving from history towards more recent times a shift can be seen. There has not been any exact assessment of how much food is produced in backyards or in community gardens but some facts and figures can be found in studies, statistical publications and in the academic literature.

Backyard

Aggregated data for the current area of backyards is not known. The City councils keep records on the built in areas but the author found it difficult to estimate the total area of green spaces within privately owned houses. There are different types of dwellings and available spaces to grow food. The production area can range from a small pot on the balcony to a few hectares of garden space.

It is known that 72% of residential lots were over 500 square meters and 28% were larger than 750 m^2 in 2001. The bigger lots are found in the outer suburbs (DSE 2006).What is sure is that the trend shows that bigger houses are being built on smaller blocks. There was a big loss in small separate houses, which were extended or demolished and became semi-detached house. Division of blocks is also observable (DSE 2007). In 2001 forty-five percent of dwellings were owned, 21% were rented, 4% were public rentals and 30% were being purchased. In general Melbourne has a low density residential profile (5-15 dwellings per hectare mostly), one-third to one-fifth of European cities (DSE 2006).

As mentioned in Chapter 2 some other data is available regarding the estimated amount of production for self on selected foodstuff (ABS 1994). This showed that in Victoria on average 10% of food was produced at home including seafood. But as fish and other creatures were mainly coming from the sea it would not be fair to consider that home grown food. Without it the number showed that approximately 5% of food was grown within the households.

Community gardens

There are approximately 60 community gardens in Melbourne today shown in Figure 3-3. They are all different, individual gardens with their own characteristics. The set up, structure, national mix is different in each garden, however they face similar difficulties and challenges. Twenty of them are managed by a local NGO, called Cultivating Community. This contributes to about 650 plots within the gardens (Woodward and Vardy 2005). The NGO receives funds and payment from the Department of Human Services (DHS) to set up and maintain community gardens on public housing estates. In these estates people with low-incomes and disadvantaged communities find affordable houses and flats. The gardens follow principles of sustainable horticulture and apply environmentally sound practices (CC 2007). The production of food can only be done in an organic way without using artificial pesticides, herbicides and fertilizers. Composting and rainwater collection is also important for the gardeners and they are looking forward to install new compost bins, worm farms and rainwater tanks.

The rest of the gardens have to form a committee of members, who are responsible for the management of the garden. Because they are usually established on public land they have to be legally reliable and must be incorporated. They usually get some sort of support from the local municipality but have to rely on their membership fees and fees for the plots. Fund raising and

donations are also good sources of income. There are CGs in the world which are cultivated commonly, but in Melbourne those gardens work only where there is some kind of ownership of the plots. Each member of the garden has his/her own plot where his/her own food is produced. There might be common areas where fruit trees, vegetables, herbs are planted or chickens are kept for the benefit of all members.

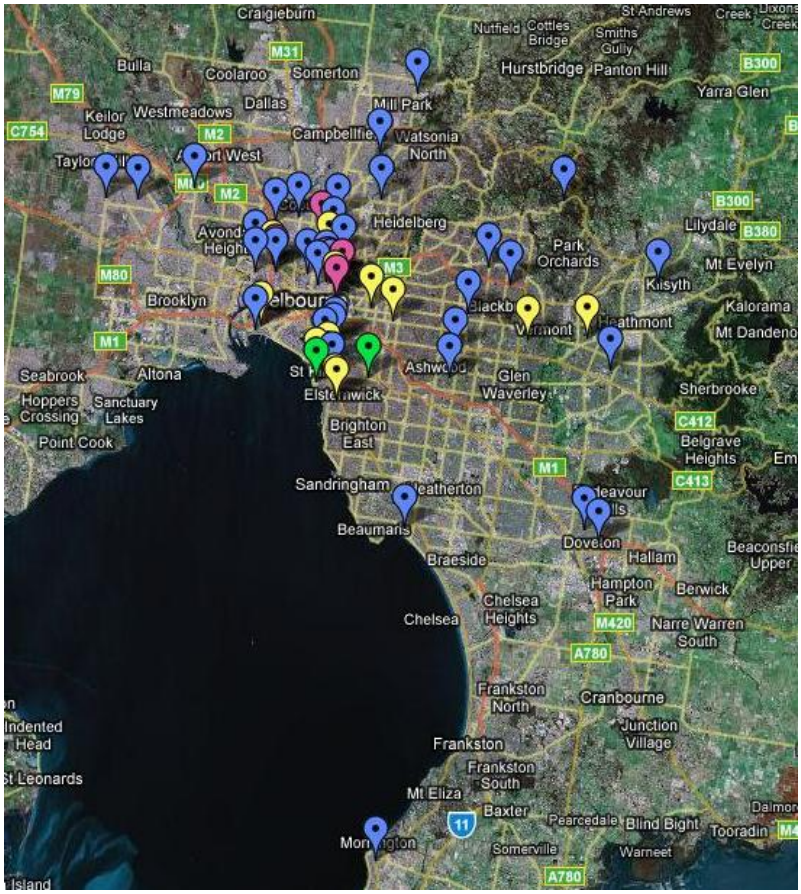

Figure 3-3: Community gardens in Melbourne

Legend: blue-non visited by the author, purple-visited by the author, yellow-visited and interview was conducted, green-backyard gardens visited by the author within the Open Garden Scheme

The Australian City Farms and Community Gardens Network was established in 1994 with the aim of sharing information and knowledge. They also provide help and consultation between the gardens and regulatory bodies. They issue a quarterly newsletter, called Community Harvest, to inform community gardens about emerging issues and actual programs.

Community gardens are located mainly on open public space. Even if the population has grown by two million between 1954 and 2001, the percentage of urban green space increased from 19% to 25% due to drastic physical extension of the city, which has tripled within this period (DSE 2006). These areas can provide places for establishment of new gardens.

3.2 Understanding the Melbournian perspective: Stakeholder analysis

As it was mentioned earlier food production in backyards is used to be a symbol of independence in Australia. Also literatures list different reasons why people are producing food, but what do people think about growing their own food today in Melbourne?

Multiple stakeholder analysis was carried out by the author to understand the reasons why people growing food in their backyards and in community gardens. To see and understand the barriers and opportunities of such practices, different stakeholders were asked to give their views on the issue. People from government departments, associations, non-governmental organizations (NGO) were interviewed as well as the very people actually growing their own food in their gardens.

Qualitative method was used as the basis of the analysis. In the followings the results of the case study research are presented obtaining information from the different stakeholders and observations. The findings are organized by the sequence of questions answered by the

stakeholders representing the officials and the growers. Also secondary source of information, studies and other media, are presented to underpin or disprove the results.

Throughout the analysis the people interviewed are distinguished and grouped according to their activities. When talking about the top-down approach people working in governmental sector, NGOs, associations, academic fields are considered and referred to as officials. The other group of people belongs to the bottom-up approach and includes people obtaining plots in community gardens and people producing food in their gardens (mainly in backyards). They will be mentioned as growers or gardeners in the followings. Gardeners had very different ethnical background. They were coming from China, Vietnam, U.K., Ireland, Italy, Greece, Germany, Croatia, Sri Lanca and also from Australia.

The responses of the stakeholders were listed and put into categories. The number of responses within each category provided percentage distribution relative to the whole. It was further explained in sub-section 1.4.3.

The first section analyses the motives of people growing food for self consumption and the second section highlights the difficulties and challenges that such urban agricultural practices face today in Melbourne. In the last section opportunities and the future of community gardening and backyard production are assessed.

3.2.1 The motivation for growing food

People who were interviewed were coming from different backgrounds and had different relationships with urban agriculture (UA) as such. This also means that they have various understandings of the issue and have different definitions of UA. Some have been working on

issues related to urban agriculture (UA) but some only heard about UA recently and it was not part of their activities. But they all had some common interest in the field and were all keen to receive the results of this research.

In the government departments and public offices there is no common working definition of UA and it mainly depends on the employees what they mean when talking about urban agricultural practices. It can be stated that most of the officials consider UA as "plants grown for food within an area of settlement". Most of the interviewees included both urban and peri-urban agriculture within the definition but two excluded the outer, fringe areas which are beyond the urban growth area. It is interesting to see that most people did not specifically mention animal husbandry, but mainly considered crops like vegetables or fruits. For one person it meant a "transition between rural farming and urban built up environment". Only one of the interviewees has taken into account the whole system from production, through distribution, cooking, disposal and recycling of waste, while all the others emphasized mainly the production. But almost all of them were also looking at all the different scale of production, taking production in backyards and community gardens, market gardens, rooftops, urban farms into account, basically every place where food can be produced.

3.2.1.1 Environmental motivations

People living in urbanized areas are part of nature even if high-rise buildings and paved pathways hide it from us. Signs of nature can be found in every corner of the city. These can be trees on the streets, birds, flying foxes or possums, just to mention some visible proof of life in Melbourne. Also in an urban area clean air, clean water, land and adequate food is needed to keep people healthy and to create a livable environment. They are essential elements of life.

Urban and rural areas and systems interact with each other and they are all part of a bigger cohesion called ecosystem.

The environment and related issues were important for both groups of the interviewees (officials and growers) but they had different views on the problems. It was interesting to see that subjects which were listed under the environmental category were mentioned the most among officials. They believe that urban agricultural models and initiatives are driven by environmental issues and they see these approaches as solutions for some of the urban population as it is shown in Figure 3-4. The distribution among the different reasons why urban agriculture is important and why people are growing their own food were more or less even but the environmental concerns stood out and accounted for 28% of responses. Health, social and economic reasons all came just after that. Among environmental issues sustainability, reduction of food miles and ecological footprint were clearly highlighted. The first two were mentioned twice as often as any other issues within this category. Because the focus of the research was on self sufficiency, not on the production for the market, the responses also reflected more of this type of food production and not the issues related to market gardens or bigger scale food supply systems. The direct benefits of these models were emphasized by the stakeholders, including: reduced food transport, reduced water and energy use. One person mentioned the benefit of reducing the heat island effect of the city through establishments of green roofs.

Measuring and valuing the services that an ecosystem can provide is difficult and it is a relatively new field as well. It is not the subject of this study to give an estimate in economic terms but to highlight the importance of the services. Melbourne is very automobile dependent and a study showed that an average food basket travels 21,073 kilometers on road before it reaches the

consumer (Gaballa and Abraham 2007). Observing the products and packages at the vegetable and fruit wholesale market in Melbourne it could be clearly seen that much of the produce was transported from Queensland, New South Wales and other parts of Australia as well as from Asian countries. Heavy trucks are transporting food from places where the produce is in season at the time but in a country like Australia it means hundreds of kilometers were highlighted by one of the officials. Participants see urban agriculture as a constructive way of reducing transportation related emissions. Backyards, balconies, roofs and community gardens are the closest places where food can be produced and the produce travels the shortest distance possible.

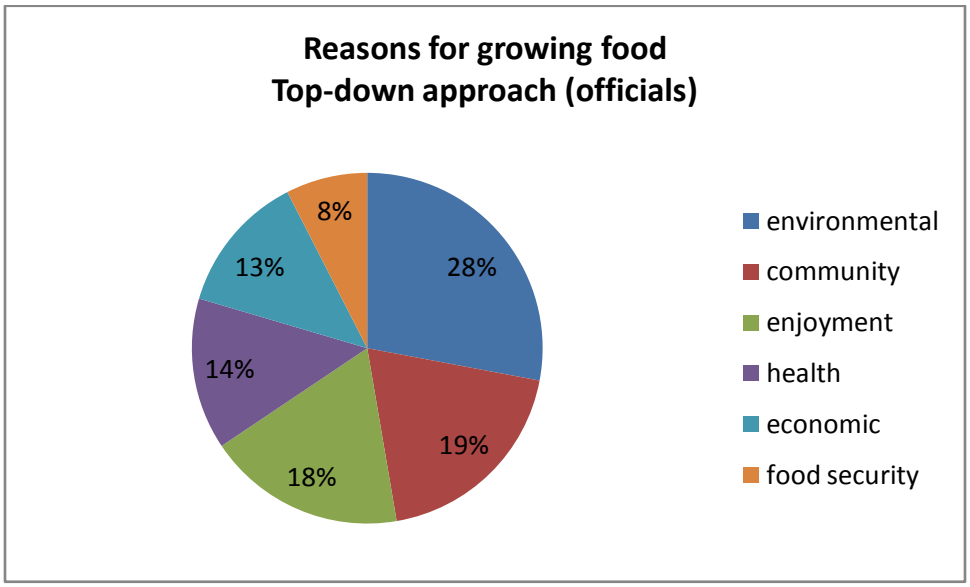

Figure 3-4: Reasons for "growing your own" food, opinion of the officials

It was shared among all stakeholders that not everything can be produced in an urban environment, but at the end they provided a long list that can be and are subject of UA. Grains are easier and cheaper (economically and environmentally) to produce on a large scale and also it would be too labor intensive to grow and process them individually, was emphasized by an official.

Not only people working in the environmental field, but also interviewees working for the state government or local authorities believed that bringing food production closer can mitigate environmental problems in Melbourne. There might not be written governmental policies yet that are explicitly supporting urban agricultural activities but people working in offices have a great influence on the decision-making processes. In the Melbourne 2030 – Planning for Sustainable Growth paper the government envisions Melbourne as a sustainable, living city in the future. One of the nine main policy priorities is the development of a greener city. Within this vision policies are focusing on reduction of greenhouse gas emission, mitigation of climate change, reduction and efficient use of water, improvement in waste recycling (Figure 3-5) and facilitation of urban sustainability (DSE 2002). Some local actions can be seen supporting community gardens in case of the municipality of City of Yarra, and establishment of backyard vegetable gardens by the Moreland Food Access Project.

Figure 3-5: Using a compost system

Environmental issues were not highly represented among gardeners. People growing their food in their households or in community gardens (CG) are not doing this activity primarily because of environmental considerations. However it must be noted that there is a great difference between the backyard producers and plot holders in CGs. From the first group, 16% of participants stated that sustainability, reduction of food mile and the importance of seasonal eating played an important role when they started to grow their own food or keep animals. In CGs it was listed as the last priority among the categories, accounting for 10% of total responses.

Figure 3-6: Collecting rainwater from the roof of the tool-shed

Within this category half of the respondents were concerned about the sustainability of the current food production system. They believed that growing food at home requires less water, less energy and transportation can be significantly reduced. Most of the respondents also underlined the importance of more efficient water use. The draught and current water restrictions affecting the usage of water in the garden motivated them to install rain water tanks (Figure 3-6) and apply gardening techniques which reduces the evaporation of water from the soil. This can

be achieved through better soil structure and mulching. The environmentally conscious respondents started to utilize grey water in the garden. They collected water from the shower while adjusting the temperature or the last rinse of the washing cycle were the most common sources of water. In the current stage of water restrictions, which is categorized as 3a, they can use water for gardening two times a week for two hours in the morning, usually between 6-8 a.m. But they have to be prepared for a longer dry period if the restrictions go into stage 4 and watering is not allowed at all.

Figure 3-7: Happy pumpkin eaters

The importance of seasonal eating was also shared among some respondents. They believe that we diverged from nature and want to have all kinds of food available at all times. This fosters the increase of food miles so they have decided to eat as much in the season as they can. A kind fellow presented his recent menu of the week where almost all the dishes contained some form of

pumpkin (Figure 3-7). It consisted of pumpkin pie, pumpkin soup and baked pumpkin repeatedly. But he liked to eat his own pumpkin very much and could not wait till the next year's produce. Two people highlighted the importance of the support and maintenance of local plant varieties that are most suitable for the local climate. Also the academic view was emphasized by some of the interviewees, namely that the available space should be utilized for good purposes. If they have a garden or some land, it should be utilized for producing valuable plants.

The importance of urban agricultural practices within the metropolitan area of Melbourne was seen as an environmental benefit by non-governmental organizations, policy makers, associations and people working in the governance. Environmental motivation for people to grow food in their backyard was not the primary purpose but still a very strong reason and this is important especially because they are not environmental professionals. This shows a high awareness of transportation, emission, biodiversity issues related to food production and the current food system. However this was not such an important motive for most people in community gardens, other factors influenced their choice which are demonstrated in the followings.

3.2.1.2 Economic motivations

Beside environmental benefits urban agriculture has a role to play in the family budget of growers. The economy has a great importance from the sustainability point of view. Fostering local economies can create more job opportunities for people living in the neighborhood and can be beneficial for the whole community.

Many officials believed that "growing your own" food does not seem to be a **viable** and money saving solution for individuals or for the local economy. Among all the categories the financial reason for growing food in the city came into the last position. Economic drivers were mentioned in 13% of their responses. The picture would have looked different if the market gardens or other forms of production for market had been considered. Only five respondents mentioned that it was cheaper to produce vegetables, fruits or raise animals in backyards or community gardens. But with the growing prices of food they believed that it will be economically more viable to follow these practices.

Officials meet and face environmental issues during their work and see the problems from a broader perspective and still it was mentioned by only a handful of people that such urban agricultural practices can add to the **offsetting** of some **governmental expenditure**. This can be a good solution if they realized that the gardeners can do for closing the loop.

Gardeners have proved that they can close the loop. First of all they showed that they can use water more efficiently by collecting rain water and using grey water. Secondly the vegetables and fruits do not need transport and this reduces all related emissions and resource use. Thirdly the biodegradable part of the waste generated in the households can be utilized in the gardens and turned into useful input materials, reducing the pressure of waste collection and treatment system. And lastly people eating more fresh produce and doing physical activities would improve their health and this can reduce health related costs but this was not mentioned. Considering all these benefits the assessed schemes can even be economically viable in the urban context.

Growers and officials agreed that the primary reason of growing food is not motivated by financial considerations; however growers can have some economic benefits. Backyard producers can sell their product but they must comply with the regulations, which require registration and completion of courses. The most material benefit that they can get is through **swapping**. That is working very well especially for growers in CGs. Some people grow enough chilies on their six square meter plot to feed a few more families and others had too many eggplants so they gladly exchange their produce with others. Some grassroots initiatives just started up -one called Urban Orchard, the other one is Neighborhood Orchard- where backyard producers can bring their spare fruits, vegetables, seeds or herbs and take other things in exchange needed (Figure 3-8). More and more people are coming for the events organized on a weekly and monthly basis. Such initiatives are not likely to work on a large scale, and this is not the aim either.

Figure 3-8: Swapping food at the Neighbourhood Orchard

People gathering together can help each other in the community in their neighborhood. In two of the visited community gardens there were also commonly owned chickens (in Australia they are called “chooks”) and the members were looking after them in rotation and they were allowed to keep the eggs.

Another often mentioned economic reason is very tangible, it is about **saving money**. The majority of the interviewees follow organic production procedures, not using artificial fertilizers, pesticides, insecticides and herbicides. For them organic produce is very important and if they had to buy the same product in the shop they could not afford it or would have to spend a bigger proportion of their income on that. Growing their own organic vegetables and fruits or keeping animals can offer them a great benefit not only because of health reasons but because of economic affordability. Organic food usually cost twice or three times as much as conventional produce on the market.

Investing in a plot or turning the garden or rooftop into a productive area has financial implications. Renting a plot in a community garden would cost between 0.75 and 16 AUD/m^2 plus some joining fee. The gardens usually have to pay a rent to the land owner, who is usually the council or another authority; they have to pay insurance for public liability; and in most of the cases for the water supply but sometimes it is provided them for free. Gardens managed by the Cultivating Community are in a special situation because the land is provided by the public housing estate for free to the residents living in those houses but the plot holders still have to pay an annual fee for the maintenance.

It was agreed by all stakeholders that people growing their own food in Melbourne today is not primarily motivated by economic reasons. Some people for a few weeks can even reach self sufficiency and be substantial in vegetable or fruit production but it is mainly supplementary.

3.2.1.3 Social cohesion and community motivations

In an urban environment people are living close to each other and they create the basis of the community. But even if a million people were living in a city you can feel very lonely and estranged. A settlement can only function well if the residents can work together and share common values. And the structure of settlements represents the history and values of people living in it as well. The sense of community is *"a feeling that members have of belonging, a feeling that members matter to one another and to the group, and a shared faith that members' needs will be met through their commitment to be together"* (Butterworth 2000). The physical layout of the city or a neighborhood and regulations can enhance or restrict the good sense of community. The livability of the place and wellbeing are closely linked. The community cannot be studied alone without looking at the environmental, economic background and the population's status of health. Here only the social interactions will be analyzed, separated from the enjoyment of growing food, mental and physical health. These related issues are assessed later.

After environmental and health considerations, the development of communities was the second most frequently mentioned topic among the officials. The importance of social and cultural impacts of urban agricultural practices was highlighted in 19% of all reasoning but every single interviewee mentioned the power of UA in community building and bringing people together. Growing food brings like-minded people together. While setting up a garden, digging, planting

and harvesting surely growers face some difficulties and seek for people who could answer their questions. They would find experts in the neighboring gardens, local organizations or people having plots in the same community garden.

Establishing a community garden always follows a bottom-up approach. People interested in gardening and food production have to find each other though networking and approaching the local council or any of the Victorian Government's Corporations obtaining public land. After that it all depends on the willingness of the authorities whether they lease out some of their lands or not. There are some progressive municipalities which are very supportive towards such community initiatives. The City of Yarra is planning to develop a guideline for community gardens, which is aiming to help the establishment process and maintenance of CGs. They have already identified possible sites and they will include CG development project in their Municipal Strategic Plan which will be a strong planning policy document for the following years, as it was shared by an official. Other municipalities like City of Port Philip, City of Moreland and City of Darebin also support such urban agricultural initiatives because sustainable development principles are important for their council.

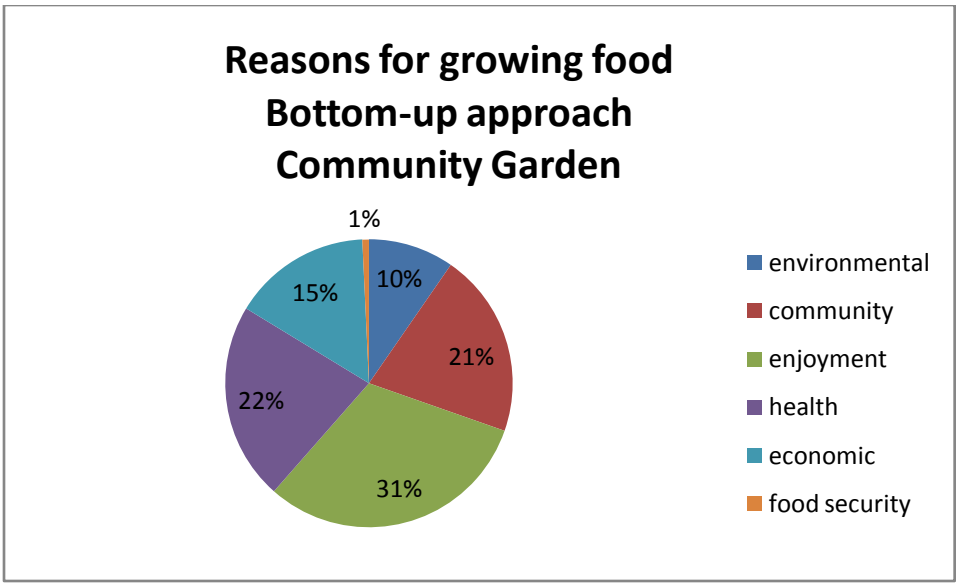

Figure 3-9: Reasons for "growing your own" food, opinion of community gardeners

Growers explicitly said that being a member in a community garden is important because of the community. Three quarters of the community gardeners highlighted the great feeling of being part of a community. In the overall picture this contributes to 21% and ended up in the third place but the power of these gardens to motivate people for common actions is inevitable (Figure 3-9).

Bringing people together is especially important for Melbourne because of the **variety of ethnicity**. The high rate of immigration brings men and women together from different countries from all around the world. They are seeking for places where they can interact with others and a community garden is a good place for that. Looking at a plot it is possible to tell quite accurately the nationality of the owner. This is also the only way for these immigrants to grow their own varieties of vegetables that otherwise cannot be find on the market. That small piece of land also means home for them because of the special produce. Australians are also welcoming the newcomers because they bring new life, new edible plants, new techniques and interesting

recipes into the garden. An Australian lady stated in one of the gardens that "we would grow only boring tomatoes and potatoes if we had not learned from the Italians and Chinese". Exchanging seeds and produce also builds stronger relationships between neighbors. In the CGs they organize so-called "working bee" days twice or three times a year when they work together to maintain and improve the site and usually the day finishes with collective cooking and barbecue (a "Barbi" as they call it in Australia). In a garden where the majority of people were Vietnamese they celebrated the community with a karaoke party in the garden (figure 3-10). They celebrated their community around food made out of their produce.

Figure 3-10: Celebrating the food and the community together in a community garden

For people having children or grandchildren, CGs or backyards are perfect places for **the family** to do activities together. Many of the grandparents and parents wanted to grow fruits and vegetables not only to have fresh, healthy food on their own table but to show the children the

miracle of life. They want to teach them how the seed develops into food and also to show them what type of edible produce each season can give. This is a great activity for all family members and friends to strengthen their relationships.

Also during the research three backyard gardens and two CGs were visited by the author when they organized **Open Garden** days. This scheme allows other community members and visitors to enjoy the places and gain knowledge about the gardening procedures. The author was told that these events have become more and more popular lately and many people are coming to observe these gardens to request some help for starting up their own veggie garden or CG. Clearly there is an increased interest.

It is difficult to measure ecosystem services but there are even fewer studies on measuring social values and community development. But looking at the new developments of relationships and the green productive gardens where people work together shows that these urban agricultural activities are leading towards strong feelings of belonging and social cohesion.

3.2.1.4 Enjoyment as motivation

This category had to be discussed separately from health or community issues because people working in the gardens, both in backyards and CGs, described their reasons for doing horticultural activities as primarily satisfaction, pride, joy, freshness and a taste of self-grown food. During the interviews 31% of all enumerated reasons of community gardeners and 38% of backyard producers were attributable to some form of enjoyment (Figure 3-11). These feelings are closely linked with mental health and well being.

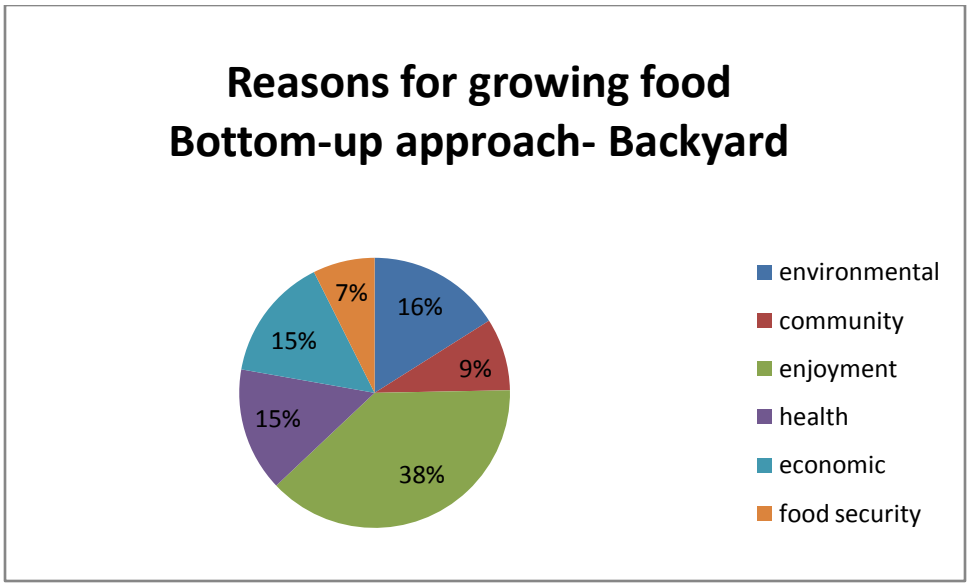

Figure 3-11: Reasons for "growing your own" food, opinion of backyard producers

When the question was asked "why do you grow food?" the immediate answer was "**because I like to grow**" and shortly after they added "it gives me satisfaction". This was the same in both garden types. It was observed that sometimes they struggled with the spade or pulling out the weeds, but after the hard work the grower received his or her prize: the ripened, fresh produce. On average they spend approximately 5 hours per week on digging, weeding, watering and picking. A very kind Italian couple who basically lived in the garden spent their whole day in two and a half hectares land. They were producing enough vegetable and fruits to cover the needs of five families and they were also selling their wine and olive oil on the Farmer's market. They are working so hard every day and even investing their savings because they are passionate about productive gardening. They love to see the plants growing and maturing day by day and sharing the produce with others. An indescribable joy and pride was seen on their face when they shared with me their dinner made out of their produce.

The second commonly given reason within this category was the **taste,** which was an important issue for more than half (53%) of the backyard producers and slightly more than one third (32%) of the plot holders in CGs. It was closely followed by the freshness of the vegetable, fruit or egg. They claimed that their products cannot be compared with others in the supermarkets, because those are picked before their optimal ripeness and transported for couple of days before they got on the shelves. They enjoyed cooking and eating their products which they grew and picked just before the lunch or dinner. It was also mentioned by one of the producers in a CG that it is the greatest thing when he can point at a nice cauliflower in his own plot and say "this is going to be my dinner".

Another interesting point was made by a couple of producers. It was important for them that they could choose **varieties** that cannot be found in the supermarkets because they tend to sell only one or two varieties of the same type of crop.

Many of the elderly and disabled residents of public housing estates visit their plots in the CG because in this way they can get out of their flats and can enjoy life while doing something useful close to their homes. Otherwise they would spend most of their time inside their homes.

Stakeholders in the top down approach believed that people are growing their own food because of their own satisfaction and for hobby but among all the given responses enjoyment was placed in the third position with 18% of all enumerated reasons. "They would not do it if they have not enjoyed it" was the answer in many cases. But even if it was not always phrased in this form, officials treated it as an obvious reason. "This is a choice of the individual" was also stressed. The motivation for gardening must be there. People cannot be forced to do it; they would enjoy growing their food if it was their on choice and willingness.

Growing food in an urban environment is a personal choice, it is a hobby but in some cases this is the only way to obtain crops or varieties that can give the joy of fresh and unique taste. For people living in flats or high rise public houses community gardens are the only affordable options to get a piece of land where they can grow their favorite plants close to their homes.

3.2.1.5 Health motivations

Undoubtedly the environment that surrounds us has a great influence on people's physical and mental health. The good quality of air, the availability of green spaces and the adequate food we eat are all important to live a full life. Sometimes urban environment cannot provide all these necessary elements and this can lead to a poor performance at school, at work and in other everyday activities. But what do the Melbournians thing about that issue?

Surprisingly health considerations are very strongly emphasized in the responses of growers but were less argued by the official. Governmental officials, decision makers, NGOs and associations only mentioned health benefits in 14% of all of their reasoning. More than half of the answers were related to physical health and less to mental health. Those who gave positive feedbacks believe that working in gardens can strongly add to the health of people through increased physical activity. "*This is the answer for urban sustainability*" was claimed by one of the interviewees who argued that growing food not only reduces food miles but builds mentally and physically healthier communities.

Health reasons were the second most frequent reason for plot holders to grow their own food, accounting for 22% of all answers. For backyard producers this was a bit less important, third in the list, but still it was considered in 16% of all reasons.

Figure 3-12: Raised beds for elderly and disabled people

The effects of highly processed and junk food were also highlighted. Many people can afford only cheap food and usually the unhealthy food is the cheapest in supermarkets. Consumers are looking for fast, ready made food because of convenience but these are causing an unhealthy diet and obesity. According to a study almost half (47.8%) of the Victorian population was overweight (32.3%) or obese (15.5%) in 2006. The data also shows that only one out of ten Victorians consume the recommended amount of vegetables, which is five serves daily, and slightly less than half of the surveyed people said they had eaten fruit twice (according to the recommendation) a day and this shows a decline for both groups compared to previous years. But 4.5% of people do not eat vegetables and 15.6% do not get fruit at all on a daily basis (DHS 2007).

Immigrant families especially coming Asian countries grow medicinal plants. An elderly Chinese lady shared her story. She was healthy before she came to Australia, but she got diabetes because of the unhealthy diet that she followed after arriving to the country. She did not find the same vegetables here. “Now me and my husband have our own plot and we can grow bitter melon” and she also listed other plants that do not even have English names and continued: “I do not have any problem with diabetes”. They also produced bau, an edible bottle gourd and gou qi, Chinese boxthorn.

Growing food **organical**ly is a requirement in most community gardens. More than half of the growers were concerned about the heath implications of commercially grown fruits and vegetables and prompted them to grow their own organic food. For many of them the reason for joining a garden was because they wanted to eat organic food but the price was too high for them in the supermarkets so they had to grow their own to make it affordable.

Many gardeners had distrust in the **quality** and **origin** of food in the supermarkets. They were particularly concerned about the chemical residues and heavy metals in imported but also domestic fresh food. They claimed that growing their own could secure them about the quality of the produce.

For elderly people gardening is a very good activity. Especially people living in high rise public houses this it the only available place where they can to do some **physical exercise**. They are not able to go to far away places or do sports. For those who have difficulties with bending over, raised beds are provided in most of the community gardens (Figure 3-12).

In the previous sub-section enjoyment was assessed as a reason for growing vegetable and fruits but this also contributes to improved **mental health**. Especially for elderly and retired people it is a great activity that keeps them busy and gives a mental exercise figuring out the rotation and maintenance of crops. Also gardens are the places where people can relax, enjoy the closeness of nature, interact with others which all benefit the well being of the individual.

Also one of the gardens visited by the author provides some plots for mentally and physically disabled children. This also shows that the members of the community can help each other in many innovative ways.

3.2.1.6 Food security

The importance of having access to adequate, nutritious, fresh and healthy food required a separate category. Food security is a critical issue and it has many implications in urban sustainability. Even in a western society people fail to meet the required minimal food intake because they cannot have access to food due to physical or economic reasons.

The United Nation declared in 1948 that it is a basic human right to have adequate food. According to official data one out of twenty Victorians were affected by food insecurity at least once in the year 2005. They responded yes to the question "did you run out of food in the last 12 months and were not able to buy food" (VicHealth 2007). This means that about a quarter million people are exposed to food insecurity was highlighted by one of the interviewees. Most of these people are reaching family members, welfare agencies or social security to overcome the difficulties. They are also likely to skip meals or reduce the variety of food. But only a small percentage of people are trying to have better access to food though growing their own food

(VicHealth 2007). Probably they are not choosing this option because they do not have access to land or find the initial cost too high to start up the production or they do not have enough knowledge.

Food security as a reason for growing food in the city was mentioned by 41% of the officials and accounted for 8% of the overall responses. In the City of Moreland the Community Health Service is just about to launch a pilot project, where ten households dealing with food insecurity are involved. The health service is setting up vegetable patches in the gardens and teaches the owners how to manage the production so than people can even swap the produce among them selves. They have realized the potential of growing food in the backyards for allowing people to have adequate access to nutritious, fresh food.

Clashing opinions were also raised. Two officials argued that this is not the solution and food security cannot be solved by non-commercial urban agricultural practices. They would solve it differently maybe by collection and distribution of the leftovers from the wholesale market or some other ways. But using any ways would be beneficial for those who are insecure.

The research found that 30% of the backyard producers are growing food partially because of food security considerations but it contributed to 8% of all responses. Some of them cannot afford to buy enough vegetables for the family which led them to growing their own. Not knowing the future and being afraid of the high petrol and food prices motivated people to go towards self-sufficiency (Figure 3-13), where they do not have to depend on the industrial food system and can be secured even if a food crisis appears. This problem was not expressed strongly by the plot holders in CGs.

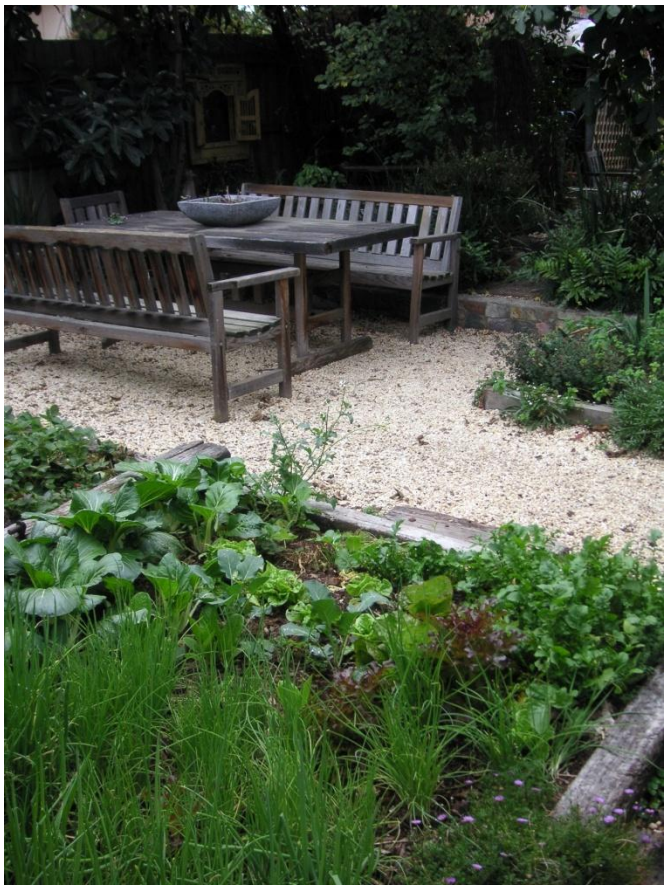

Figure 3-13: An edible backyard: preparing for self-sufficiency

A backyard gardener explained how she started her own productive garden. She never had any problem with the accessibility of food; she could always afford to buy what she wanted. “My son was born and I started to worry about the quality of food”. She wanted to feed her family with safe and nutritious food. She also added: “I was afraid from the future, I wanted to be sure that we will always have food”, so they decided to buy a house with a large garden. She immediately started to organize the garden and planted vegetable, fruit trees and bought a chicken. “I also do guerrilla gardening on the street” and she showed the edible bushes and plants on the street, that she planted.

Food growers are less concerned about food security than official people. It is interesting that many of the garden owners have some fear of the unknown future, where being partially self-sufficient might be a great advantage. NGOs and health organizations see the problem on a larger scale and advocating for local and urban agricultural practices as a good solution for food security.

3.2.2 Barriers and challenges

People are growing their own food for various reasons. These can be motivated by environmental, economic, social, health, food security considerations or simply by enjoyment. But these motivating forces never stand alone, they are interlinked and one supports the other. Many reasons come together before an individual starts planting the first edible plant. This also means that they have to face different everyday challenges. Officials view the barriers from a different perspective because they have knowledge about the different systems and can see the interrelations of the work done by governmental bodies and other actors. They can be powerful actors in fostering policy changes and following up implementation procedures. During the interviews with the different stakeholders the following barriers and challenges were outlined in relation to urban agricultural practices.

3.2.2.1 Availability of space

Availability of space and land was clearly the most frequently raised barrier to urban agricultural production in Melbourne by officials and growers as well.

It can be clearly seen how the **population** of Melbourne has occupied more and more territories since 1851 with the highest increase after the Second World War (Figure 3-14). Hundred and

fifty-six years ago the settlement laid on 14 square kilometers large land and was home of 29,000 people, while in 2004 residents were living on 2 100 km^2 territory with a population of three and a half million people. But the population is expected to increase by 900,000 new residents by 2031 (DSE 2006).

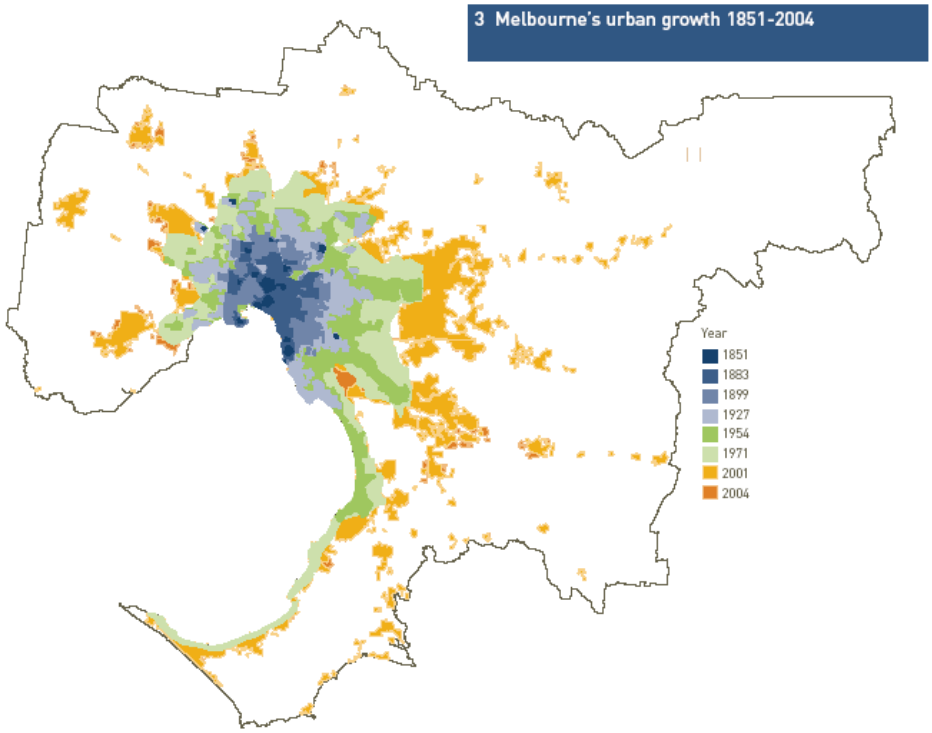

Figure 3-14: Melbourne's urban growth, 1851-2004

Source: Melbourne Atlas (DSE 2006)

"Finding space between housing developments" is a big barrier because there is a competition between housing areas and green spaces, was expressed by an official. In addition the "green spaces have to satisfy the needs of wildlife protection, sport activities and recreation". Melbourne is placed on the best agricultural land. This issue was brought up by many. Because of the new housing developments the agricultural producers, farmers were pushed further and further out and now they have to work on less productive land. These lands were very suitable for quick and inexpensive building sights because they were usually established on a flat area.

The Melbourne 2030 policy framework fixed the policy directions to adopt a permanent urban growth boundary and to protect the green wedge zones around the city (DSE 2002). This would possibly enhance denser building development and rehabilitation of existing houses, but still 600,000 new dwelling are proposed to be established within the next twenty years (DSE 2006). Also the small single houses are now turned into multiple room houses or the estates are subdivided (DSE 2007). This also means that the houses are getting larger on the same size of land leaving less space for garden area.

In case of community gardens the **land tenure** is an issue because they get a lease from the local municipality for five years (usually) but after that period an extension is needed. The Ringwood Community Garden had to move in 2003 and be reestablished because the garden was on a public property that was turned into a highway. In these circumstances they cannot plan for long term and have to accumulate some capital to be prepared for a new flit.

There are lesser green spaces available for urban agricultural practices in the inner areas in general but some new development projects are incorporating CGs, orchards or community supported agricultural initiatives. VicUrban, the Victorian Government's sustainable urban development agency, is one of those developers who are trying to convince the local municipalities that not only "housing, transport and energy use have the main impact on environment" but also "food consumption is as big" of an issue, was stressed.

There are many available **unused spaces** where food can be grown. "Why do not we grow food on rooftops or on horizontal spaces?" was asked by an official. He could easily imagine having vegetable plots, fruit trees and even beehives on top of houses. Planners and decision-makers do not thing of such spaces as usable areas, was also mentioned. One of the gardeners also

mentioned that “I wanted to grow pumpkin but I did not have any place for that in the garden, so I decided to grow it on the roof”. And she successfully managed to put some pots on the flat roof are using low-tech solution. “Even a television channel came to see it”, she added.

Smart, creative and innovative solutions are needed, which are adapted to local conditions in order to be beneficial for the communities from environmental, economical and social point of view.

3.2.2.2 Availability of resources

The unavailability of environmental and economic resources was also highlighted. Different stakeholders from the officials and growers agreed on the existence of similar problems. Growers were talking more about everyday problems, while officials saw them from a different perspective.

The availability of **water** was the main drawback of urban food production and this view was supported by all stakeholders. The current long-lasting drought period forced the government to apply strict restrictions on water use starting on 1 April 2007, when Melbourne entered into stage 3a category. This means two times two watering hours a week. Residents are using 60% of drinkable water and out of that the highest portion is used in the garden (35%) (DSE 2006). The level of the water storage system is shown in Figure 3-15.

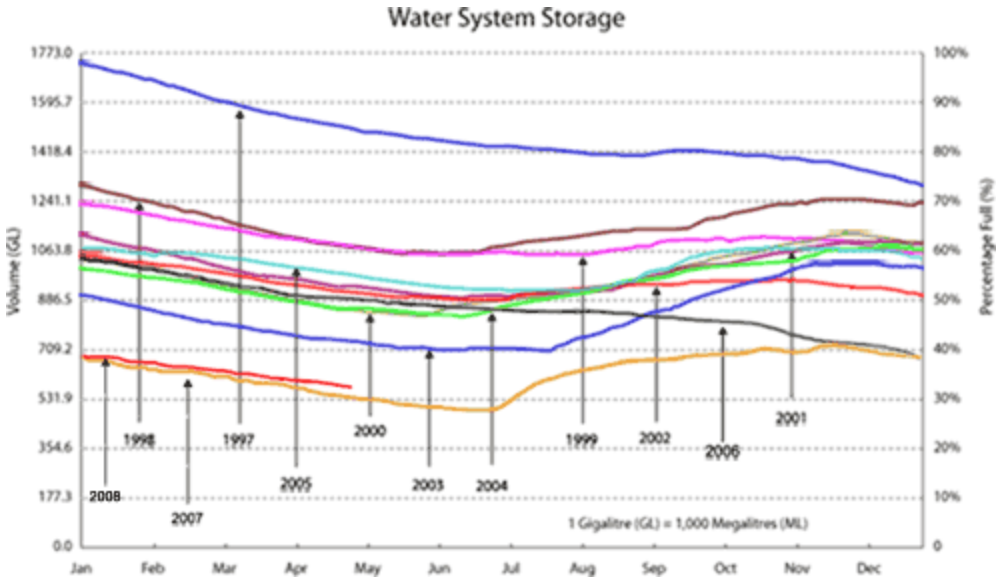

Figure 3-15: The water system storage

Source: Melbourne Water official web site (www.melbournewater.com.au)

Growers were arguing that they have to organize their whole life around those times when watering is allowed and this is causing serious difficulties. This inconvenience discourages people to establish new veggetable plots but still passionate growers are resiliant to these barriers and manage to get up early or ask a friend to do it for them. It was interesting to see that actually this restriction brought people together because all gardeners have to visit their plot within the given short time frame and in this way there is a greater chance to meet the others. But on the other hand producers are experiencing lower yields and plants may dry out as well.

NGOs and local residents wrote a petition and collected 2500 signatures requesting the Victorian Government to change the regulation and allow more water use for vegatable plots and fruit trees (Gadd 2008). They also believe that every person has the right to decide what to use the water for. They found it contradictory that people can still use as much of water within their homes as they want while those are punished who are growing valuable food. Water use in bathrooms and

toalets are consuming 45 % of residental, drinking water (DSE 2006). An allocation system might be a solution but further studies are required.

Economic barriers were named as other difficulties. First of all the **cost of establishment** was mentioned mainly by the officials. It costs 5000AUD in public housing estates to lay dawn the exact plans of a new community garden. For public housing residents it is usually paid by the Department of Human Services, but other gardenes have to find their own way to raise founds or get support. They usually gat some support from the local government for fencing and landscaping but the rest of the cost has to be beared by them.

Joining an existing CG usually has a joining fee and an annual fee for the plot. Part of this fee goes to the owner of the land. In case of the Nunwading Community Garden the annual cost is 600AUD, which has to be paid to the local council as pay rates but others pay 120AUD (Hawthorne CG) or 135AUD (Ringwood CG) lease annually.

In backyards the owner or the tenant has to bear the cost of setting up a veggetable garden. Some people are discuraged because they believe that it is time and resource consuming to start up a productive garden. The officials working in the Moreland Food Access Project decided to establish vegetable patches in backyards rather than opening a CG because they believe that it is much more efficient in terms of initial cost. They estimated that one vegetable garden would cost 100AUD, was higlighted during an interview. The produce in these backyards will be beneficial for urban poor, who will be able to access fresh, nutritious food.

Many growers were concerned about soil contamination. Because of the high **price of the test** they were not considering to have it checked in the near future. Some of them were contented by

the fact that their house was standing on an area, which has always been a residential zone for a long time. Others intentionaly used raised beds so that in any cases they can be secured from soil contamination. “The others say that the vegetables are organic, but I personaly do not belive it. I think that it contains all kinds of chemicals from the soil, from the manure and from the air. We cannot be sure.“ This was told by a young fellow from a community garden, where organic production methods are used.

The “private CGs”, those that are not managed by the Cultivating Community have to be covered by public liability **insurance** because they are liable for accidents and injuries within the garden. It is not obligatory, however it can be risky not to have it. The Ringwood CG has to be insured up to $20 million. The lease and the insurance are the biggest expenses for the gardens. In many cases the water is provided for free as of now but they cannot be sure that it will stay like this.

The gardeners have to be prapared for longer dry periods as well and almost every garden invested in small or big size **water tanks**. In most cases the local municipalities or autorities were supportive and gave founding for the purchas but in some cases the plot owners had to collect money for the purchase. Currenty the tanks are not large enough to keep up the garden and new investments are needed.

If food is sold on **low prices** then less people are motivated to grow their own food. “Despite increasing prices the cost of food is still extraordinarily cheap per work hours by historical standards” was mentioned by an official as an issue. If all external costs of the current food system were reflected in the price then the product would be more expensive.

Another barrier is the **lack of time,** which was interestingly mentioned not by the growers but by the officials. Some believe that growing food takes too much time and working people would not have enough time to manage the garden. "Low income people usually have 2-3 jobs and […] with current water restrictions it is difficult for them to adjust time", was mentioned by an official.

Time was mentioned in relation to the establishment of community gardens. From idea till opening two or even four years can pass due to the slowness of administrative work. A committee member from the Dig In Community Garden explained that even if the municipalities were supportive, it is a slow procedure for them to get things organized and start the actual building process.

Lack of resources can be a significant barrier discouraging people to start up gardening. Even so enthusiast gardeners find solution even if it takes longer time and they have to apply low-cost technical solutions. But help is needed. Clearly local governments and NGOs were mentioned as main actors, who could provide financial help.

3.2.2.3 Legal and policy barriers

The difficulties regarding getting adequate amount of **water** was discussed earlier, but it had to be mentioned as one of the biggest challenge for the growers. The current water restrictions do not encourage the growers, but rather discourage them. Some said that the government purposefully does not want to support these kinds of agricultural activities in the city. Whether this is true or not officials and gardeners all agreed that this is a problem that has to be solved either by changing the regulations or to get support from the government to install rainwater tanks.

Keeping animals in an urbanized area always cause conflicts between neighbors or between the owner and the authorities. Regulations are different in every municipality but keeping roosters and large animals in residential zones is restricted by all in general. Usually five chickens are allowed and also beehives, but keeping goats or sheep depends on the area. Sometime these regulations could mean barriers for owners.

It was mentioned by growers and also by officers that **supportive policies are lacking**. It is believed that the current system is not set up in a way that it would support such initiatives. They both mentioned that most of the local councils do not see the benefits of growing food for self consumption but rather they find it as an unnecessary and risky activity in terms of food quality. One or two councils, like City of Yarra, Moreland, Darebin, are very active in pushing forward sustainability issues but it really depends on attitude and willingness of officials working there.

Another issue was also raised. Tenants renting a house are usually not allowed to change the look of the garden by establishing vegetable gardens or keeping animals. It was argued that people should have their right to produce their own food if they wanted to. One of the interviewees found it positive that in their newly rented house the vegetable beds were already there, so they could take advantage of that.

3.2.2.4 Attitude and awareness

"The **mindset of people** that food should come from outside of the city" was mentioned by most of the officials. Some of them believed that growing food for self consumption is never going to be a mainstream activity but rather a supplementary thing. It is difficult for an urban dweller to be entirely self-sufficient. Others argued that a great portion of food could come from backyards

and community gardens but people are not aware of the effects of the current food system and see agricultural production as a rural activity. “Even if the price of food goes up they would work more and have supplementary income to afford food” was also mentioned. “It is unconventional for people” to see agriculture as an urban activity.

Officials highlighted that people do not have enough **information** about food production. They were never taught how to dig, plant and grow, they feel distanced from such an activity. Officials believed that many people think that it is a time-consuming and difficult activity. Urban agricultural advocates welcomed the growing interest of gardening papers towards food production. During the research period in Melbourne, six out of ten garden magazines included articles about the establishment and maintenance of edible gardens.

Backyard gardeners had problem with **wild animals** damaging their plant and produce. Possums, snails and pest were mentioned as the main enemies. One community gardener explained that they had problems with rats in the garden because they came to find food in the compost bin. She has heard that “snake pooh” frightens them away. “I could not believe it, but it worked! I have a friend who have snakes so he supplies me with the pooh and now I will try it out against the possums.” People have innovative solution agains animals.

Community gardeners also have to face loss caused by animals but more importantly they have to deal with **vandalism and theft**. One third of the gardeners mentioned that they were very upset about that. Usually vandals are coming from outside of the garden but theft occurs among members as well. Sometimes gardens are so big that people do not know each other and do not respect the others’ hard work. For that reason some people started to apply nets protecting the produce from men and animal.

Some **neighboring issues** were also highlighted by backyard gardeners and officials as well. Swapping food with neighbors is a good way to strengthen the community but at same time people living next door are not delighted about fact that branches of fruit trees are hanging over into their garden. Keeping animals is even a bigger problem. Sometimes people complain about the smell, but it was argued that a chicken cause less problem and less dirt then a dog.

3.2.3 Future

The current state of food production was displayed in the previous sections giving a clear view about the reasons for people growing food. Also barriers and challenges of backyard and community garden production were highlighted. Different stakeholders were asked what they thought about the future of growing food for self-consumption in backyards and community gardens.

Almost all producers believed that more people are going to grow their own food, but interestingly approximately three quarter of officials shared the same opinion. This thesis clearly showed that people were not growing food primarily because of economic reasons, but in the future this seems to be the main motivating power. Those officials who responded positively believe that the current level of rural agricultural production cannot be sustained in the future due to the negative effects of climate change. Draught is a critical issue beside high salinity level of agricultural land. Today 670,000 hectares of land at risk of becoming saline and it could reach thee million hectares by 2050 (DSE 2005). They explained that although carbon emission of agriculture is not considered in the first round of the carbon trading scheme but will be included later and as a result of that the price of food will increase. Already a clear rising trend can be seen in the prices due to increased fuel prices and drought (Quiggin 2007).

Some people (both official and grower) even see a future food crises and the collapse of the food system. They see that the system is so much dependent on oil that it would take too much time to set up an alternative centralized system. They see the future in re-localization and decentralization. Also some of the backyard producers started to establish their own edible garden to be prepared for future challenges.

Three officials argued that less people are going to grow food. They see the trends from a different perspective. People are seeking for easy, convenient solutions and rather would work more in the office to earn more then starting up their own vegetable patch. They believe that the existing economic system can solve these problems and food price would never go up so high that it would force people to grow their own.

Only two backyard producers saw decline in home food production because of the attitude of people. They see that people are isolated and do not care for each other and they would not cooperate and help each other out or share food. A young community gardener who studies finance shared his experience. Once, university students were asked if they had been involved in food production. Only him and another fellow raised their hands and all the others were laughing at them. This sort of activity is not appreciated among finance students, it seems. They are thought to solve problems differently.

All the other backyard gardeners (15 people) were hoping that more people are going to produce food in their gardens or in community gardens. They already see growing interest. There are more television programs and magazine articles are talking about the methods of production. “If growing food becomes fashionable and trendy more people will do it” was argued. They believe that there is more information about environmental issues and people are more aware of the

effects of the current production system so they expect more people to become a gardener because of environmental considerations.

Australia already experienced food shortages in the Second World War and as a response people started to grow their own food. Some officials highlighted that people would grow only if there is a war situation or a food riot. People would grow for necessity in that case. They think that a shock is needed so that people can value food more.

It is not possible to predict the future but people and governments have to be prepared for upcoming challenges. Despite the barriers and challenges of growing food in urban areas majority of the respondents believe that backyard and community gardening practices will grow in the future mainly driven by economical and environmental reasons.

4 CONCLUSIONS AND RECOMMENDATIONS

As it was demonstrated throughout the research community gardening and backyard production can significantly add to the livability of Melbourne and they can foster long term sustainability through empowerment of local communities, increased ecosystem value and local investment. It cannot be expected from every citizen to start up their own vegetable garden or raise chicken in their backyards, but future challenges like increased price of fuel, food and water might force individuals and governments to consider such activities as viable solutions. The aim is not to go back 10,000 years in time but to use the available space and resources of the city in an innovative way and also to mitigate some of the global challenges acting on local level. Helping individuals and empowering local, urban communities to enhance social cohesion and fostering environmentally and economically sound practices will be beneficial not only for the urban citizens but for the whole society. Adaptation to unknown, ever appearing challenges is an essential requirement today and in the future, but it can only be a useful process if there is resilience in the food system. There is no silver bullet to all problems but re-localization and decentralization can improve resilience.

4.1 Conclusions

Urban agricultural practices can be significant contributors of urban sustainability. Global trends, like increasing number of urban residents, increased distances of food transport, increasing ecological footprint and food insecurity, are all present in Melbourne, the capital city of Victoria. All of these phenomena are connected through food. Production, processing, distribution and consumption of food are all connected to these problems. The current food system contributed to the appearance of these issues but in the same time it can be the solution to them if the system is

re-located and re-designed. The setup of the food system has effects on the ecosystem, society and economy. A poorly structured system can cause many unnecessary problems that have to be solved in the future. Urban agriculture might not be the overall solution to all problems, but it can play a key role teaching the society to use resources of the city wisely and mitigate emissions in a creative way.

Growing food in community gardens and backyards in the city are considered as forms of urban agriculture and they can be parts of the solution. People growing food for self consumption might not be fully aware of the overall societal, environmental or economical benefits of their actions. They are all affected by urban problems, which encourage them to make decisions for their own benefit. Urban dwellers have to consider many factors before becoming a grower. They have to allocate time, money and energy to start producing vegetables, herbs, fruits or keep animals. The motivating factors do not stand alone but are interrelated.

The success of the gardens depends on the enthusiasm of the gardener. Those CGs are functioning well which are led by two, three key motivated people. They devote their extra time to the development and management of the gardens. They have to be tolerant and helpful but at the same time straightforward and strong-minded. This is true for the backyard gardener. Those gardens look nice and are productive which are led by a devoted owner.

Motivations for growing food were assessed in Melbourne in a qualitative study. Australia is a "western" type of welfare country and still many people are growing food. The research intended to answer the question: why are people motivated to grow their own food in an urbanized area like Melbourne? Different stakeholders were asked to give their opinion and views on the subject. Members of community gardens and backyard gardeners were the main actors. They are

the ones who are actually growing food. They were named as gardeners or growers within the thesis. People from governmental bodies, local authorities, non-governmental organizations, associations and the academic field were interviewed as well resulting in eighteen interviews. They were referred to as officials in the research. The second research question was aiming to find the difficulties that growers have to face. The question sounded: How do different stakeholders see the barriers and challenges for growing food in Melbourne? Observations and documentary data also contributed to the analysis. The responses were grouped and categorized giving the following five categories (see also Appendix1): environmental, economic, health, community, enjoyment and food security reasons.

4.1.1 Reasons for growing food

The motivations of backyard and community gardeners showed similarities however they were ranked slightly differently. The reasoning was almost the same but the importance was a bit disparate. After the growers, the opinion of the officials is also presented.

For backyard producers enjoyment seemed the most significant motivation. Environmental, economic and health reasons shared the second place; these motivating factors were mentioned almost equally frequently. These were than followed by the importance of the community and lastly the food security.

For community gardeners enjoyment of growing food was also highly prominent resulting in the first place. Health and community represented the second most important reasons sharing the second place. Economic considerations fell a bit behind followed by environmental motivations and lastly came food security.

People were motivated to grow food for a variety of reasons. Most of the responses given by the growers (both backyard and community gardeners) showed that their main reason for growing their own food was *enjoyment.* They like to see how the seeds become plants and the produce give them satisfaction and pride. Also they highlighted the fact that their own vegetables have great taste not like the ones in the supermarket. They can pick the produce fresh and in the optimal ripeness. The freedom of being able to grow varieties that cannot be bought in the shops was also mentioned among motivating factors within the category of enjoyment.

The second most frequently mentioned category contained answers related to *health.* Both physical and mental health reasons were given. Growers were concerned about the health implication of industrially produced food. They prefer to grow fruits and vegetables following organic methods, which is a requirement in most of the community gardens. Growing food and caring for the produce requires the owner to do some physical activity and it is also a mentally challenging exercise.

However when the two grower group's result was looked at separately it was seen that *environmental* considerations of backyard producers were a slightly more significant. They were more aware of environmental problems such as food mile, resource conservation and also with the effects of the current food system. They were also advocates of seasonal eating.

The great feeling to be part of the *community* was strongly stressed by community gardeners. They like to share and swap their food among each other and organize events together. They can exchange knowledge through showing different gardening practices or teach new recipes. For backyard gardeners this was not so frequently mentioned. Some of them work alone in their own

garden, but some are active in community events and promote food swapping schemes in their neighborhood.

Economic reasons were more important for backyard gardeners than for community gardeners. They were able to make a good contribution to their food needs. Some kept chicken and had big fruit trees. In the summer some could be self-sufficient for many weeks regarding vegetables, fruits and eggs. In community gardens most people emphasized that it was cheaper to produce for themselves. It was true especially for organic produce, because it would have cost them a lot of money if they had to buy it on the market. High value crops were grown usually.

According to the literature, urban agricultural practices are promoted mainly because of *food security* reasons, so that urban dwellers can have adequate, nutritious food to meet their needs. These have to be physically and economically accessible. This reason was ranked lastly by both gardener groups, but it was mentioned more often by backyard gardeners. They might not have problems to buy fresh food now but they are afraid of the future. They want to be prepared if the current food system experience some failure.

It was interesting to see that officials had a different view on the subject. They believed that people in Melbourne are more strongly motivated by environmental reasons. They also highlighted, that growing food at home or in community gardens can significantly reduce food miles and foster sustainability in and around the city. Officials also agreed that growers are motivated because of the enjoyment of growing food and also because of community feeling. These models have great, positive impact on the social setup. The health reasons for growing food came only later. The research showed that officials are aware of the fact that people's main motivation is not economical in nature. Some believed that food can be cheaper if it was

produced by individuals, but some did not. Food security advocates saw that many people live in food insecurity and growing their own food is a good solution for them.

4.1.2 Barriers and challenges

The second part of the research was focusing on the barriers that growers have to face and the challenges of the expansion of grow your own food schemes in Melbourne today. The opinion of the different stakeholders was demonstrated and also perceptions arising from observations and data analysis.

Growing food in backyards and in community gardens is not a new phenomenon and some barriers still exist today. The oldest community garden in Australia is located in Melbourne and has a thirty year old history. Problems have always been there and new challenges appear with time. Barriers are summarized in a Figure 4-1 to get a clear overview. Each will be mentioned in a brief summary.

Barriers were grouped in four broad categories: availability of space, availability of resources, legal and policy barriers, and attitude and awareness. The key findings are presented accordingly.

Availability of space is a clear physical barrier for growing food in the city. **Population** of Melbourne has been increasing rapidly in the past fifty years pushing the boundaries of residential area further and further out. On average the percentage of green areas increased but the available space for establishment of community gardens did not. Also it is a trend that bigger houses are built on smaller parcels, leaving less space for backyard gardening.

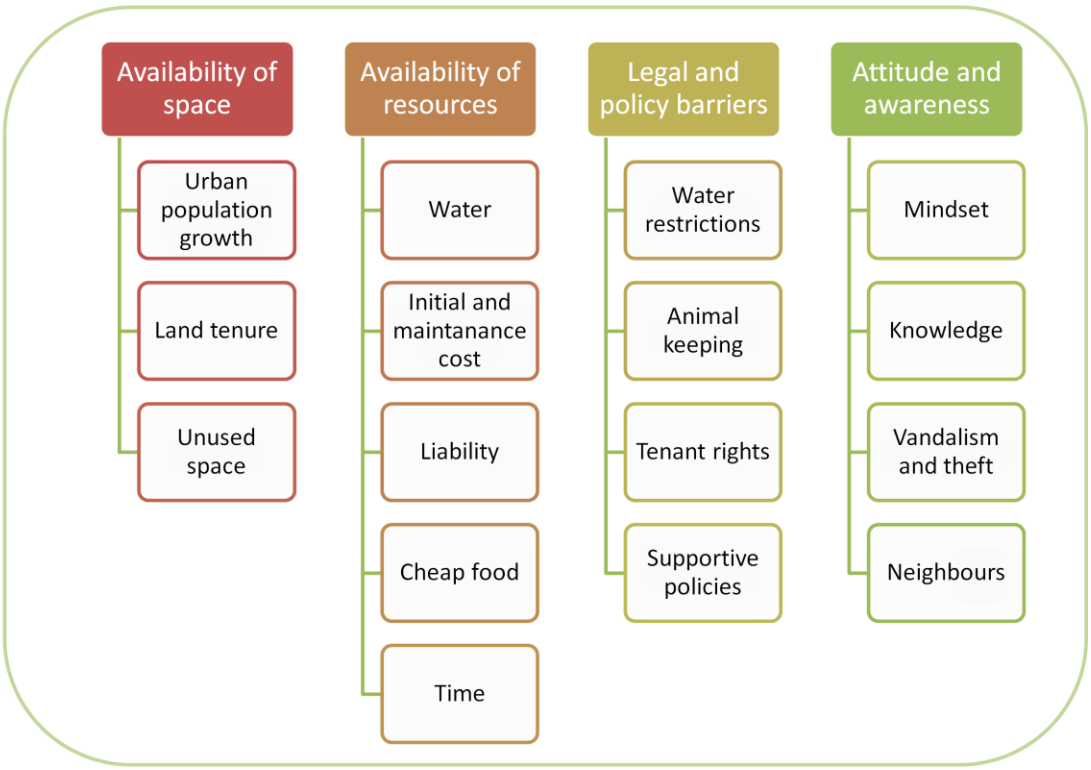

Figure 4-1: Summary figure of barriers and challenges of growing your own food schemes

Community gardens have a three or five year contract with the local municipality and they can be asked to move away any time if development takes place on the **land**. This unsecure position is the main concern for community gardeners, because they have to put aside some money in case they have to be relocated.

At the same time there are many **unused spaces** within an urban area. Rooftops, vacant lots, walls of houses, streets and parks could be turned into edible landscapes. Officials see these unused areas as wasted land.

Availability of resources in terms of natural and financial resources also influences the existence of the food production schemes. Draught and **water** scarcity resulted in lower yields in rural agricultural production and as a consequence food prices rose. Lack of rain also effects people

growing food in their gardens. Water restrictions are in force. Most of them do not want to rely on drinking water and they invest in rain water collecting tanks.

The **cost** of establishment of a community garden is high and most of it has to be beard by the members of the garden. Community gardens located on the land of public housing estates are paid by the Department of Human Services, but the maintenance cost is still has to be paid by the tenants. For backyard gardeners there is no support from the government or others, they have to rely on their own income.

For community gardens, other than the ones on public housing estate's land, **liability** is prerequisite for operation. They have to pay sometimes very high insurance to cover unexpected injuries. This is usually the highest cost for plot holders.

Some officials mentioned that the relatively **cheap food** is a barrier for people to get involved in food production. The trouble is that the highly processed, unhealthy food is the cheapest one and this is a precursor of health related problems such as overweight, diabetes and heart disease.

Good, productive work needs **time**. In most cases it takes more than two years to get it started because of red-tape. Due to water restrictions all growers have to adjust their everyday life around the allocated time. Officials believe that it takes a lot of time to do work in the garden and this discourages people. Growers argued that three or four hours work per week is enough.

The third group of barriers and challenges were related to the regulatory system. **Water restrictions** have been applied allowing backyard and community gardeners to water only twice a week for two hours in the morning. Allocation of time causes trouble for the growers. They argue that production of food is different from having a lawn and also that while they have to

save water on the garden people can use as much of water within the house as they want. They would like to have longer and flexible time for allowance.

There are restrictions on **keeping animals** in urban areas. The regulation differs in each municipality. Large animal are not allowed in residential zones.

When renting a house **land tenure** issues are not clearly settled. In many cases people are not allowed to modify the garden and grow their own food if they were willing to. It depends on the kindness of the owner.

Many highlighted that **supportive policies** are missing. Only some municipalities are considering including food security and health promotion issues in their regulations. Promotion of sustainable development through urban food production is rare.

The last group of barriers includes issues related to people's attitude and awareness. **Mindset** of urban dwellers and policy makers was the most frequently mentioned barrier. There is a distinction between urban and rural areas. Citizens believe that any kind of agricultural production can be done only outside of the city.

As a result of urban life people are distanced from nature and do not **know how** to grow food anymore. It is a life skill mentioned and can be attained again, but people need help.

Vandalism and theft was a great concern by community gardeners. Affected people were very upset about the problem knowing that sometimes it is done by the members of the garden. Also strangers climb over the fences and take or destroy the produce.

Lastly, **neighbors** complains can be discouraging for growers. An overhanging branch, smell of the compost or animals can cause trouble between residents.

Knowing the reasons and barriers for growing food in Melbourne today, recommendations for actions can me made, which would be helpful solutions for further development of community gardening and backyard production schemes.

4.2 Recommendations

Melbourne was studied more closely but also other Australian cities have similar problems regarding environment, social structure and food security. Urban agricultural practices particularly backyard and community garden food production can provide multiple benefits for the individual and the whole community. These schemes have a significant potential to mitigate urban problems while fostering sustainability goals. Such local, grassroots initiatives need support from the community, NGOs, business, local authorities and governmental bodies. First and foremost the availability of space and resources are prerequisite to start up and maintain food production. To overcome challenges and barriers the following recommendations are given below. The recommendations are grouped according to main areas, where actions can be taken.

4.2.1 Infrastructural recommendations

Create a database about unused space

There is a need not only for a wisely structured city plan but also for evaluation of unused spaces. Different stakeholders enumerated different locations where food production could be established. There are available, vacant places on rooftops, park areas, next to sport centers and also brown fields, industrial buildings subjects to demolition and even transformation of parking

houses into productive multi-storey agricultural building. Some of the proactive municipalities, like the City of Yarra assessed possible CG sites, where development could take place in the future as interest appears. A database should be created where all the vacant places should be registered. Developers and residents should be able to access the database and select the adequate site for development of new community gardens or other gardening activities.

Create a tool sharing model

All growers need tools for working in the garden. Spade and smaller equipments can be obtained by the households but larger machines like excavator, cultivator or chain saw are too expensive. Local "sheds" should be established and run by NGOs or by the Neighborhood Houses, where these tools could be kept and borrowed for a small fee. Surplus tools and machines could be donated by local authorities, businesses or residents. Also community gardens could be the hosts of the sharing model. They already have a shed for tools and in this way they could raise some extra income for the garden.

Support food sharing

Backyard gardeners usually do not grow enough produce to share and sell their produce through formal channels. They produce enough food for themselves but in most of the cases some surplus remains but they do not know where they can take the extra produce. There are only two places in Melbourne where food can be shared weekly or monthly (Urban Orchard and Neighbourhood Orchard). More of these initiatives are needed. And also households should have more information about place where food can be donated to.

Create networks for compost, fertilizer and mulch supply

Members of community gardens regularly order compost fertilizer and mulch collectively. Backyard gardeners also need these inputs for growing food in their own garden. These materials usually can be bought in garden centers in small packages but they are costly and sometimes larger quantities are needed. Community gardeners and backyard producers should create a network and order these materials together for a lower price.

4.2.2 Financial recommendations

Raise funds through community events

Community gardens always need some money if they want to invest in infrastructural development. Some gardens want to install rainwater tanks, new irrigation system or compost toilet. Without increasing the plot fees they cannot afford to buy the new equipments. Veg Out Community Garden give place to farmers' markets, Cultivating Community organize Open Days in their gardens and create some income from that. Other gardens should follow the same strategy organizing events for the neighboring communities. They could have cooking competitions, where also backyard gardeners could show what they can create from their seasonal produce.

Allocate grants

Setting up a community garden or a vegetable patch in a backyard requires investment. Local authorities and governmental bodies should realize the health and nutritional benefits of urban food production. Growing nutritious, fresh, healthy food reduces the risk of food insecurity as

well. Small grants should be allocated for the assistance of urban growers. It could be a non-repayable grant or a loan with low/zero interest rate.

Assume liability

Community gardens have to be liable and have to sign public liability insurance if they do not want to take risk for injury within the garden. The liability should be taken over by the municipality or the insurance could be covered by NGOs. Companies and larger organizations could also incorporate the insurance cost of the garden within their own risk coverage if there are willing to support such community initiatives. In return for this courtesy gardens could organize some communal events for the workers.

Absorb the cost of soil and food quality test

Many gardeners were concerned about the contamination of the soil. The cost of a soil test is high and gardeners do not even know where to ask for the test. In community gardens the municipality usually carries out a soil test prior to the establishment of the garden, but backyard gardeners have to do it by themselves. The municipality should absorb the costs of the test. Local and state governments are usually concerned about the quality of home grown food they treat it as a risk for food-borne diseases. Therefore they should support growers by giving them the opportunity to have their produce also checked for free of charge.

4.2.3 Policy and legal recommendations

Include urban agriculture in urban planning

During the interviews most of the stakeholders mentioned the importance of urban planners. The increasing population and the pressure on planners to build houses quickly and inexpensively do not allow them to consider urban agricultural models. Moreover they do not see benefits in horticultural practices. Cooperation of different departments of local and state governments is necessary and the involvement of sustainability issues, health promotion and food security should be basic criteria in planning regulations. They play a key role in the development processes and they have the power to make a difference. Urban planners should participate on trainings, where the benefits of urban agriculture are highlighted. Sustainability issues and urban agricultural schemes should be incorporated into the Municipal Strategic Plan of each council.

Secure longer land tenure

The short 3 or 5 years land tenure contracts were a concern by most of the community gardens. They cannot plan for long periods and they are afraid to make big infrastructural investments. Longer land tenure should be provided for the gardens. If the land is needed for development in the future then the owner of the land (usually the municipality) should provide a security and relocate the garden for free of charge.

Create a Food Policy Council

City of Toronto established the Toronto Food Policy Council incorporating councilors, business, non-governmental organizations, farmers, community developers, food security experts and

consumers. They do not act as an authority; therefore they cannot pass or enforce laws. Their role is to develop policies and action plans fostering public health, equitable food system, environmental health and community development. A similar body is needed in Melbourne, who is able to act as an independent catalyst between the parties. They should include areas of food security, health promotion, urban agriculture, equity, environmental protection, urban planning and community development. This cooperation would result in innovative, effective and integrated policy development on a higher level considering the total metropolitan area of Melbourne. Not only the state government but local municipalities should have council.

Provide water supply

Water restrictions make it difficult for backyard and community gardeners to grow food. Not necessarily more water is needed but the allocation of drinking water should be changed. Authorities should allow more watering days for food production purposes. The total amount of water consumption should be restricted in the households and a choice should be given to the individual to decide for what purposes they want to use the water.

Create 1% tax law

In Hungary a law exist which say that 1% of the residents' annual income tax payment can be offered and allocated to non-profit organizations. A similar law should be passed where not only NGOs but liable community groups, like community gardens should be able to receive funds. This could be a useful model for the empowerment of the civic organizations.

4.2.4 Community involvement recommendations

Support communal celebration of food

Communal celebration of food is part of the culture. Harvest festivals are organized by some of the community gardens and local municipalities. There are also some big events, like the Food and Wine Festival, the Sustainable Living Festival or the International Flower and Garden Show, which are good places to promote urban agricultural production practices, but more frequent and localized celebrations are needed. Competition of home grown food could be part of the event so that backyard producers could be proud of their activity.

Assign landscape architect students

People who are willing to start up a community garden usually get some support from the municipality. The area is fenced and leveled but the rest has to be done by the members. Landscape architect students should be assigned to design the gardens. This would be beneficial for the students, because they can learn how to plan in a real life situation and members of the community gardens should not pay for the planning. The same scheme could be applied for backyard owners. Involvement of the backyard and community gardeners is also essential so the construction work should be done together.

4.2.5 Educational recommendations

Sharing information-know how

Information is very valuable and can help to achieve better management of the gardens and can improve productivity. There is a definite need for better networking because many great

solutions exist in different gardens but the knowledge is not shared. Every community garden and backyard gardener faces everyday difficulties while growing food but do not know where to look for answers. The internet and local papers are good media to share information. There is a good internet site for backyard gardeners (www.growlocal.net.au) to find each other by typing their postal code in but gardeners do not know about it. Promotion of such sites or establishment of information within the web-site of the municipality would be a good solution. But for those who do not have computers information could be provided through other channels, like the municipal newsletter.

Establish twin-community model

Different community gardens face similar problems. They would need a place, a web-site, a common paper where they could share their concerns and solutions. Cultivating Community establishes and maintains gardens on public housing estates, but the rest of the gardens are left alone. The Australian City Farms and community Gardens Network provides some valuable information but it is difficult to reach them or other gardens with the help of their web-site. Following the model of twin-cities, twin-community gardens network could be. The members of the gardens could visit, help out each other and organize events together on a regular basis.

Include it into school curriculum

Every school should include food production and preparation into the curriculum teaching children where food is coming from. Some successful examples exist (Cultivating Community, Stephanie Alexander Kitchen Garden foundation) of school gardens but they should be expanded

and promoted more. It is important to teach citizens how to follow a healthy diet and produce nutritious fresh food as early as possible.

Educate citizens

Citizens are not aware of production opportunities and practices. Demonstration gardens should be established, where they could learn about everyday techniques but also about the implications of the current food system. Workshops could also take place in these gardens and they could serve as knowledge centers. These gardens could be managed by NGOs or municipalities. Through education the negative mindsets of people could be diminished and urban agricultural models could be fostered.

The aim of the recommendations was to foster the viability of the "grow your own" food schemes in Melbourne. The strength of these schemes is that although they serve the needs of the grower but they are also beneficial for the community, the urban environment and the economy. Therefore the promotion of these schemes would be beneficial for the society. The feasibility of these recommendations was not tested and need to be done prior to the application. Also further research is needed to provide

5 FURTHER RESEARCH POSSIBILITIES

Many aspects of "grow your own" food schemes can be studied in more details. There have been some studies and book written about community gardens, history of backyard production and the food system, but still further studies are needed in Melbourne. Seeing the positive effects and benefits of community gardens another research should be done in Budapest analyzing the possible establishment of such urban agricultural activity.

5.1 Further research in Melbourne

This thesis was focusing on qualitative methods to analyze the barriers and challenges of food production for self in Melbourne. Opinion of people growing food in backyards and community gardens was assessed. Officials working for governmental bodies, local authorities, non-governmental organizations, associations and universities were also asked to share their views. This qualitative research showed that many people have interest in urban agricultural production. Growing for self and also for the market has great potential in Melbourne. People are concerned about environmental issues, health and food security. Public participation is also a strong motivation that can foster urban sustainable development within the city.

Further, more specific research should be done using qualitative methods. The benefits of the two schemes should be presented also in financial terms. Economic evaluation of health benefits, ecosystem services and positive social implications should be done. Offsetting of health related cost as a positive externality has to be evaluated. Having estimated financial data on the effects of backyard and community gardening would be a good basis for further policy development.

A life cycle analysis would be beneficial to compare the effects of different production methods of selected foodstuff. The study should consider all the inputs and outputs of these schemes and other production systems specifically focusing on Melbourne. This comparison would be able to rank the different methods according to their effects on the ecosystem.

The focus of this thesis was on people actually growing food, but as a part of another study the attitude of non-growers could be also assessed. It would be interesting to know the opinion of people who are not growing food. Some people surely are not interested in growing plants at all, others might find it difficult or costly but there must be a number of people who are willing to do it. Knowing the opinion of those willing to participate in growing their own food could be a valuable input for the "demolition" of barriers and for the development of supportive policies.

5.2 Further research in Budapest

Being a Hungarian and a resident of Budapest the development of the capital city always played an important role. Bringing new positive ideas into a new sphere is always challenging but can be beneficial for the society. Having a great opportunity to see community gardens in Melbourne immediately raised the question: so why community gardens are not present in Budapest and how could this scheme be implemented in the Hungarian context?

At the beginning it was intended to develop a case study in Budapest about the feasibility of the community gardens, but it was not possible to carry out the research and fit into the scope of this thesis. Before going to and after returning from Melbourne several interviews were conducted with different stakeholders about the subject. The aim of the discussions was to gain knowledge about the situation in Budapest and the possible establishment of community gardening schemes.

Unfortunately the analysis of the interviews could not be part of the current research, but can create a strong basis for a future doctoral dissertation or a development of a strategic policy paper and action plan. The following people were interviewed in Budapest:

- Dr. József Ángyán, Head of the Institute of Environmental Management at the Szent István University, Gödöllő
- Matthew Hayes, the founder of the Open Garden Foundation, Gödöllő, Hungary
- László Kocsis, the CEO of the Horticultural Public Company of Budapest (Főkert)
- Dr. Péter Roszik, vice-president of the Hungarian Biokultura Federation, Budapest
- Erzsébet Beliczay, deputy chairman of Levegő Munkacsoport (Air Working Group NGO)
- Kristin Faurest, landscape architect, Studio Metropolitana
- Péter Radnóczi, Head of subdepartment at the Department of Environmental Protection of the Municipality of Budapest
- Dr. Kinga Szilágyi, senior lecturer of landscape architect at the Corvinus Univerity
- Discussion with several officials at the Municipality of District XI.

The establishment of community gardens is based on the willingness of residents, it is a movement from the ground up therefore the attitude of people living in Budapest has to be accessed and the level of volunteerism has to be analyzed. The community garden movement in Australia was also developed by the active members of the civil society thirty years ago. Public participation is the main motivating power ever since. As it was shown in the Melbournian case study the success of community gardening depends on a handful of like-minded volunteers who are willing to take actions and fight for their idea of growing food on communal or private green spaces.

Non-governmental organizations (NGOs) are also key actors in the process of community involvement. They have the ability to enforce interest and participation of local resident in

community programs, and also to educate people. The number of NGOs, foundations and associations started to increase significantly after the change of the system. There are approximately five times more civil organizations in Hungary now than in 1989 meaning slightly more than 52,000 organizations.

Community gardens as a form of urban agricultural practice can be a great tool for the development of livable neighborhoods and encouragement of community development. Leaving the difficulties of the past behind community gardens can bring together like minded people in order to surmount societal inequities and hostility. Establishment of community gardens can be encouraged by environmental groups, churches and governmental bodies dealing with health care, disadvantaged groups, urban development, consumer rights and gardening.

A problem is already emerging. Budapest is lacking of green spaces. The biggest portions of green areas are forests (5900 hectares) located mainly in the Buda side. The area of public parks and gardens is 673 hectares (ha) and the total area of green communal space for public purposes is 1200ha. This means that the available public garden and park area is 6.2 m^2/person (FKKB 2002). The availability of green space was 14.4 m^2/person in average in 2003, but this number varies in different parts of the city. In the downtown areas people must be satisfied with 0.4m^2/person. Increased car use and the declining availability of green areas are causing environmental problems especially high level of air pollution. Generation of new green areas is not possible without demolition of existing buildings and infrastructures.

Residents of Budapest who were willing to grow food for themselves did not follow the western European style allotment gardens nor the American type of neighborhood community gardens schemes. In other Central and Eastern European countries there are associations organized by the

allotment movement. Such schemes exist in the Czech Republic, Slovakia and Slovenia but also in the neighboring Austria, where the Central Federation of leisure gardeners was found in 1916. In Budapest these schemes have not developed but residents could find other solutions if they were to grow their own fruits, vegetables, herbs or keep animals.

The most obvious way of production for self is having an own garden. There are gardens in the inner and outer areas of Budapest. The inner areas are residential territories, which has all necessary infrastructures and production of fruits and vegetables can take place without restrictions. But in case of keeping livestock the local, municipal regulations apply. The area and the amount of food production have not been accessed recently. The outer areas also belong to the settlement but they do not enjoy the existence of utilities. These gardens are smaller than 1500m^2 and are presented in the property registry as "garden land use" cultivation mode. The total territories of such gardens are about 35.5 thousand hectares in Hungary today.

It can be clearly seen that people willing to grow their own food are able to do it mainly on their privately owned land within the city. Promotions of "grow your own" food scheme cannot be done without proper assessment of the current environmental, economical and societal circumstances. Prior to the assessment of the applicability of community gardens the setup of the current food system has to be studied. There are not calculations on the food mile of a typical food basket or on the ecological footprint of Budapest regarding to food. We do not know the overall effects of our food system. A recommendation is given to assess these considerations in a form of doctoral dissertation.

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APPENDIX

Appendix 1: Guiding questions to interviewees: top-down approach (officials)

1. What do you mean by urban agriculture?

2. What is your area of work and how is it related to urban agriculture/food?

3. Is urban agriculture considered in your current activities (ie. supporting) if so how?

4. Do you think interest / activity in urban agriculture is increasing particularly focusing on production in backyards and community gardens? What do you think are the drivers of this?

5. What are the barriers? Are policies interfering with agricultural production within the city? Land use policy, urban growth management, environmental protection, water use, etc

6. What are the opportunities for growing food in the city?

7. Could any reasonable proportion of urban food consumption be met through urban food production? How much of the local needs could be covered though this scheme?

8. Why and in what circumstances grow/would people grow their own food?

9. Is the interest increasing (trends)? If yes why? If no why?

10. How do you see the future of such initiatives (community garden, backyard production, CSA, farmers)?

Appendix 2: Guiding questions to interviewees: bottom-up approach (growers)

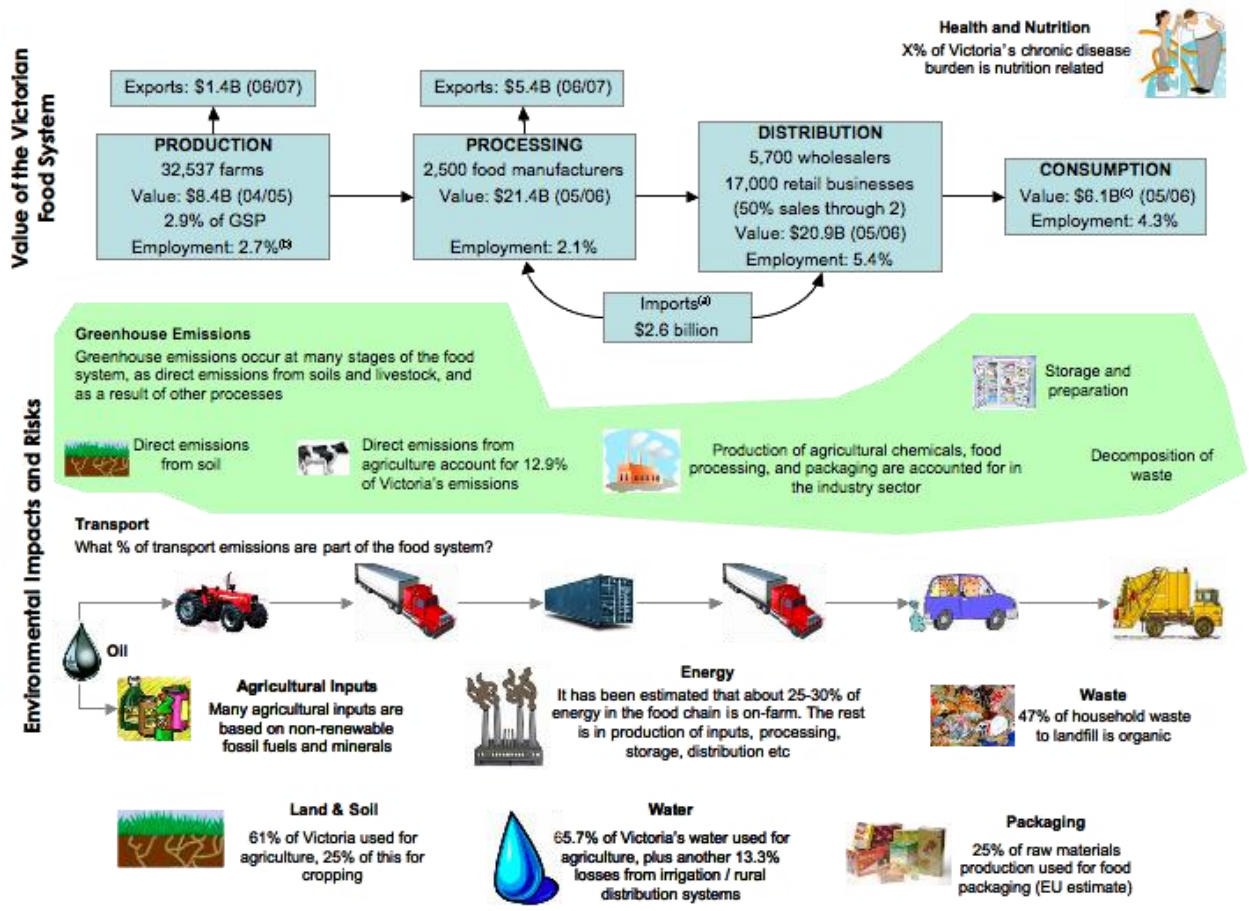
1. In which suburb do you grow food?
2. Where do you grow?
    a. A, backyard
    b. B, balcony
    c. C, rooftop
    d. D, community garden
    e. E, other, please specify.....
3. Do you grow food on your private property or on public land?
4. How many people are there in your household?
5. What are your reasons for growing food?
6. What is the total area of your garden? (estimate in m2)
7. What is the total area where you grow food? (estimate in m2)
8. What do you grow?
    a. veggies:…..
    b. fruits:…..
    c. animals:……..
9. What percentage (%) of the vegetables and/or fruits and/or animals you (your household) eat is grown from your garden? If you also share/swap food please indicate.
    a. veggies:…..
    b. fruits:…..
    c. animals:……..
10. What is the estimated value of the vegetables/fruits/animals you've grown? (in $)
11. What did you find as difficulties or barriers for growing your own in the city?

12. In your opinion how urban agricultural production could be promoted in Melbourne?
13. How do you see the future of food production for self-consumption in Melbourne?

Appendix 3: Criteria for evaluation

Themes of groups	Answers of interviewees
Environmental motivation	• Food mile • Ecological footprint • Sustainability • Current food system • Support local varieties • Seasonal eating • Use of suitable space • Composting/waste reduction • Urban heat island effect
Economic motivation	• No need to drive • Helpful supplement • Cheap • Gives food beside aesthetics • Sharing the knowledge • Reduction of import
Enjoyment	• Like to grow • own produce/pride • Looks nice • Taste • Freshness • See the mysterious process • Means home • Freedom of choice of variety
Social and community motivation	• Swap and share • Being part of the community • Cultural exchange • Celebration together • Seen friends doing it • Bring children/grand children
Health motivation	• Organic • Knowing the origin • Physical activity • Mental activity • Relaxation
Food security motivation	• Would not be able to buy

Appendix 4: The Victorian Food System



NB. Figures in this diagram come from a range of sources and cover different years. Their values are intended as indicative only, not as exact proportions.

(a) Reports in early 2008 state that imports have surged due to drought shortages, the strong dollar and subsidised international production - see *Global Competition*

(b) Percentage of Victorian total employment, these averages are much higher in regional areas eg. employment in food production accounts for up to 22% of total employment in some areas.

(c) Includes cafes, bars and restaurants, as well as turnover by hotels and clubs