

Challenges of Urban Agriculture: Highlights on the Czech and Slovak Republic Specifics

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1. Introduction

Central and Eastern Europe represents a specific geographical, political and social environment. One of its inseparable parts is food production and its changing position in urban environments. In this chapter, we explore the role of urban agriculture practices, including their relationships to the wider peri-urban surroundings and rural neighborhood. We also frame urban agriculture not only narrowly, just as in the food production activities in cities, but also mention other non-production dimensions and values that are difficult to measure or calculate, such as social, environmental, health, educational, aesthetic, and others.

We introduce the topic through a wider discussion on urban planning and sustainable development, as well as future urban-rural trajectories. We provide an input into current trends in urban agriculture in the Czech Republic and Slovakia. Urban agriculture is generally perceived as an engagement in agricultural activities realized within the urban area of cities or their close surroundings. Due to the great diversity of urban agriculture, we primarily focus on the gardening level, the bottom-up approach and the stakeholders' perspective.

In the following paragraphs, we deal with the typologies, dimensions and definitions of urban agriculture and provide a short excursion to the history of urban gardening. We also discuss the role of gardening as a potential contribution to the improvement of individual and household resilience to economic fluctuations, climate variability, and food insecurity. Our aim is to show the main trends and types of food production and its value-added dimensions in the urban environment.

As we describe various forms and types of urban agriculture activities in urban environments, we place attention on the Czech and Slovak experience of the post-communist period and development since the 1990s. In the case of the Czech Republic, we concentrate on educational gardens as a specific, multifunctional and multidimensional garden. Environmental

education constitutes an important pillar of the overall educational system and recently, educational gardens have experienced a dynamic development. In the Slovak Republic, we focus attention on the development of household and allotment gardens as the most frequent forms of urban agriculture in Slovak towns and cities.

The methods mostly consist of applying literature review; a more detailed description of educational gardens in the Czech Republic, and household and allotment gardens in the Slovak Republic is supported by field research. In the case of 10 educational gardens, we employed more detailed field research, accompanied by informative interviews with garden stewards who described garden history, purposes, functions, appearance, structure, educational tools, and activities for the public.

Focusing on current urban issues, European municipalities and urban planners face many challenges about how to ensure sustainable development (Echenique, Hargreaves, Mitchell, & Namedo, 2012; Keivani, 2010) and to guarantee the quality of the environment, well-being and necessary services for urban inhabitants and new incomers, in order to avoid a serious social exclusion while providing and maintaining the vast urban infrastructure and tackling with urban sprawl (Suditu, 2012). These works stress the role of cities and urban environment as being multifunctional landscapes (Deelstra, Bozd, & van den Biggelaar, 2001). In addition to that, European cities also deal with pressure on how to adapt its infrastructure to climate change (European Environmental Agency, 2012). The main adaptation challenges rest on how to regulate flood water, mitigate urban heat, improve air quality, protect vulnerable groups against extreme weather events, or more generally, how to ensure sustainable and climate friendly urban development (e.g. Westphal, 2003).

Moreover, post-communist Central and Eastern Europe (CEE) cities have to cope with contradictory city development, and pressures caused by multiple transformations from former defunct communist methods of controlled urban planning to a new market-oriented environment. These contradictions are still manifested in the urban, social and institutional structures of post-communist cities (Sýkora & Bouzarovski, 2012). A specific problem for post-communist cities, delayed approximately thirty years compared with democratic states, rests on protecting the urban environment and greenfield sites together with the need to regenerate devastated and usually abandoned sites – commonly defined as brownfields (e.g. Dair & Williams, 2007; Dixon, 2007; Duží & Jakubínský, 2013). All these changes also affect existing gardening and food provision practices realized in cities, generally called urban agriculture or urban gardening, depending upon the focus and scale.

2. Position of urban agriculture within urban environments

In this section, we provide a short list of issues connected with urban agriculture and urban planning to show their position. At first, urban agriculture is place and space oriented and related to “greenery” or “green infrastructure”. It is based on a top-down approach through planning instruments and management of land use and nature in urban green spaces or bottom-up initiatives and planning instruments aimed at “greening of cities” (Zareba, 2010; Csete & Horváth, 2012; Tóth & Feriancová, 2013). Urban greenery then provides a large range of ecosystem services and values such as refuges for animals and plants, a place for sport, gardening, recreation and tourism, as well as the working place of urban inhabitants (Librová, 2002; Pearson, Pilgrim, & Pretty, 2010). On the other hand, urban agriculture is not just a green or natural part of urban areas, but is production oriented and rather belongs among “urban productive landscapes” with some proportion of greenery and sense of the rural (Matos & Batista, 2013). Barthel, Crumney and Sveidin (2013) also focus on the connection between food production, ecosystem services and biodiversity.

The second dimension is essentially connected with lifestyles or a way of living in general, specifically spending leisure time, and shopping habits and is stakeholder oriented. Since the 1970s, social scientists, e.g. Inglehart (1990) highlighted evolving post-materialist values among the representatives of post-modern society, including putting more attention on the quality of individual as well as social life. These approaches were manifested in a focus on nutrition and the environmental quality of food production (Librová, 2002; Clayton, 2007; Gerster-Bentaya, 2013; Kiesling & Manning, 2010) and people started to be more responsible and active also in case of shopping, consuming and gardening. Social scientists provide various terms on how to grasp these changes, such as Silent Revolution (Inglehart, 1990), or ecological luxury of a garden (Librová, 2002). Except for a focus on changes, Librová (1994) or Smith and Jehlička (2013) point out some persisting trend in the human way of life, resting on some natural modesty and self-resilience. Smith and Jehlička describe it as “quiet sustainability” (Smith & Jehlička, 2013), Librová (1994) expresses these attributes with the term “colorful”.

The third and most basic issue deals with ensuring food production and nutrition. The question on how to ensure basic needs and to feed people still remains, the simple question of dealing with food production, processing and consumption. Although food production in cities has not always stayed at the centre of the urban management agenda, in the light of the historical development of towns and cities and rural-urban relations, it has never been excluded (for details see Björklund, 2010). But recently, facing economical fluctuations and a rise in global change challenges, more peo-

ple look for a way on how to increase individual or community resilience through food security (Food and Agriculture Organization of the United Nations [FAO], 2008), applying some alternative economic elements, or how to be more independent of external supplies, including food (Redwood, 2009; Grofová & Srnec, 2012; Galhena, Freed, & Maredia, 2013; Johanisová, Crabtree, & Fraňková, 2013). Urban agriculture can bring great value to the current discussion, especially the dimension dealing with self-subsistence and the self-provision of food (see Alber & Kohler, 2008; Rose & Tikhomirov, 1993; Jehlička, Kostelecký, & Smith, 2012; Barthel, Crumney, & Svedin, 2013; Smith & Jehlička, 2013).

We frame urban agriculture in terms of green infrastructure, stakeholders and food production itself. But finally, in relation to stakeholders, we add gardening as an instrument of process and social change, putting social and environmental innovations into practice through grass root activities, community development projects or social programs. Public activities aimed at strengthening social ties, a sense of community or support of the inclusion of socially disadvantaged groups may use garden practices or activities as an instrument leading to the greening or improvement of neglected spaces which are community centered. The results of these processes are mutually beneficial for people and the environment. Thus, urban agriculture brings strong social and community dimension into the discussion (see Seyfang & Haxeltine, 2012; Bendt, Barthel, & Colding, 2013; Kirwan, Ilbery, Maye, & Carey, 2013).

Urban agriculture also comprises a policy dimension and issues related to ownership, land estate and urban planning process. Selectively, some programs and cooperation dealing with urban agriculture on municipality levels, let's mention local food networks and programs¹ and peri-urban regional platforms in Europe, and gathering selected peri-urban regions in Europe.²

Despite the importance and need to create a favorable policy environment for the sustainable development of urban agriculture or incorporation of this issue into planning and policy-making, there is still a lack of structural, political, and legislative support, or even a recognition of their importance. It is therefore a challenge for future urban planning and spatial planning on a regional and local scale.

¹ www.foodlinks.net

² www.purple-eu.org

3. Typologies and definitions of urban agriculture

3.1. Definitions

How can we frame and define urban agriculture? We offer several definitions, concentrated on various aspects of urban agriculture.

Experts from the Food and Agricultural Organization of the United Nations (FAO, 2007, p. v) stress the food production dimension, but also recognize its wide diversity and the difficulty to grasp precisely the issue when they point out: “Urban agriculture is a dynamic concept that comprises a variety of livelihood systems ranging from subsistence production and processing at the household level, to more commercialized agriculture. It takes place in different locations and under varying socio-economic conditions and political regimes.”

Many more issues emerge, but nobody questions that urban agriculture or gardening is an inseparable part of the urban environment. As we mentioned in the introduction, urban agriculture was framed not just as agriculture production in an urban environment, but comprised more functions and dimensions, the most important are social, economic, environmental, health, and educational.

Selected aspects of urban agriculture have become the research interest of a wide spectrum of scientists with wide backgrounds, such as landscape and applied ecology, agronomy, sociology, anthropology, geography, landscape architecture, urban planning, ecology or environmental studies, and others. Specific topics of urban agriculture have even become the topics of students and their final theses.³

Agricultural production practiced in urban environments tends to be strongly context-related (to local markets, citizens, urban spaces, historical traditions, cultural heritage, etc.) and it is widely recognized that it provides multiple effects and services.

Cities Feeding Program (in Mougeot, 2006, p. 79) provides appropriate definitions, while concentrating on a multidimensional scale of urban agriculture and its production and supply function: “Urban agriculture is located within (intra-urban) or on the fringe (peri-urban) of a town, a city or a metropolis, which grows or raises, processes and distributes a diversity of food and non-food products. It (re-)uses on a daily basis human and natural

³ A few examples from the Czech Republic: Klouparová, P. : Allotment gardens as a cultural phenomenon; Frélichová, V.: Food with farmer’s face: Community supported agriculture in the Czech Republic; Hrazdírová, E.: Gardener: Producer of healthy food or lover of chemistry?

Slovak Republic: Petříková, P. : Assessment of the current private gardens in Nitra; Rzepielová, M.:Urban agriculture in the Slovak Republic; Tóth, A.: Green infrastructure of the rural settlement and its surrounding landscape.

resources, products and services largely found in and around that urban area, and in turn supplies on a daily basis human and material resources, products and services largely to that urban area.”

The international network RUAF Foundation – Resource Centres on Urban Agriculture and Food Security provides a more detailed definition of urban agriculture on its web pages (RUAF Foundation, 2014, paragraph 1). Shortly, urban agriculture can be defined as the “growing of plants and raising of animals within and around cities.” In a detailed definition, it points out interlinks and interactions between urban economics and ecological system: “The most striking feature of urban agriculture, which distinguishes it from rural agriculture, is that it is integrated into the urban economics and ecological system: urban agriculture is embedded in – and interacting with – the urban ecosystem. Such linkages include the use of urban residents as laborers, the use of typical urban resources (such as organic waste compost and urban waste water for irrigation), direct links with urban consumers, direct impacts on urban ecology (positive and negative), being part of the urban food system, competing for land with other urban functions, being influenced by urban policies and plans, etc. Urban agriculture is [...] an integral part of the urban system” (RUAF Foundation, 2014, paragraph 2).

As a result of a long-term discussion among scientists gathered in COST Action Urban Agriculture Europe,⁴ reflecting other typologies and experiences, they define Urban Agriculture in the COST Barcelona Declaration (2013, p. 1) as: “[...] spanning all actors, communities, activities, places and economies that focus on bio-based production, in a spatial context that, according to local opinions and standards, is perceived as ‘urban’. Urban Agriculture takes place in intra-urban and peri-urban areas”.

This definition reflects the multidimensional aspects of urban agriculture, and moreover, highlights the fact that we cannot set up strict borders on where the urban ends and rural starts.

3.2. Types of urban agriculture generally

Due to the significant diversity of its forms and dimensions, it is not easy to set up a clear typology of urban agriculture. Inspired by the literature review (FAO, 2007; Lohrberg & Timpe, 2011; Tóth & Feriancová, 2013; RUAF Foundation, 2014), we have come up with a certain kind of rather open typology, based on the various perspectives mentioned in the introduction.

From a place and space perspective, we can distinguish intra-urban (takes place within the urban structure of a city) from peri-urban (practiced at the urban periphery). As for geopolitical location, there are vast differences

⁴ The project is a part of the European Cooperation in Science and Technology cooperation framework, see <http://www.urbanagricultureeurope.la.rwth-aachen.de/>.

among developing countries, developed countries and countries in transitions – usually from socialist planning to a market-oriented environment (Smith & Jehlička, 2013). Also quite important is the size of the towns or cities.

Urban agriculture may be differentiated depending on size of plots, starting from small-scale, through middle-scale, up to large-scale. For example, Lohrberg and Timpe (2011) found a feasible way to distinguish mainly between the farming and gardening level. On one hand, the farming level consists of mostly professional actors, while on the other hand, the gardening level is characterized by more civil-society actors. Then, they distinguish “rural-like farming”, which rises up to 20–200 ha. “Urban farming” is relatively smaller, from 2 to 20 ha, but more intensive. “Gardening” is performed at a significantly smaller scale, up to 2 ha.

From the stakeholders’ perspective, urban agriculture provides various forms of individual or collective/community farming. An in-depth socio-demographic analysis shows that urban gardeners are not just old fashioned, immigrants or poor people using gardening as a survival strategy (Alber & Kohler, 2008) as it may seem at first glance, but it includes a wide spectrum of people regardless of education, gender, income or age. Some empirical researches confirmed the great variety of stakeholders involved, for example Jehlička, Kostecký and Smith (2012) in the case of Czech and Polish gardeners or Supuka, Feriancová and Tóth (2013) in the case of Slovak urban farmers. When focusing on gardening management itself, there is a wide spectrum of environmental performance from conventional to environmentally friendly or organic practices (for details see Simon, Recasens, & Duží, 2014).

Taking into account the food production perspective (FAO, 2007), we can set up various forms of commercial-market oriented, then traded surplus, or just non-profit or self-provision/subsistence purposes of practicing urban gardening. It is also related to intensive, productive (just food production) or more diverse (ornamental, hobby, natural) purposes. As for the content of gardens, we may differentiate between vegetable, fruit, cereals, vineyard, orchard, flowers, herbs, livestock, or just energetic plants. The main types of urban agriculture can be:

- 1) traditional household gardens,
- 2) community or allotment gardens,
- 3) productive farms,
- 4) institutional gardens (therapeutic gardens at hospitals, school gardens, or educational gardens at Environmental Education Centers).

During the last few decades, new forms of gardening practices using high levels of social innovations, environmental friendly lifestyles and mixed bottom-up or top-down approaches have been emerging; for example, com-

munity supported agriculture (CSA), community composting and gardening, guerrilla gardening and squat farming, urban food strategies, support of small entrepreneurs, local food chains, including market gardens and farmers' markets, the Slow Food initiative, including a revival of local food production and farm shops and markets (Giacché & Tóth, 2013; Spilková & Perlín, 2013). Some of them use the internet as a market tool for online fresh fruit and vegetable shopping, prepared vegetable and fruit boxes.

These activities have been developing in large cities (Prague, e.g. the community garden Kokoza, Bratislava – Community Garden Krasňanský zelovoc) and even in smaller cities such as Nitra (Hide park). These activities are very diverse and difficult to catch. Non-governmental organizations use the internet for the online mapping of gardening and they create environmental maps as an instrument for environmentally friendly consumers, gardeners and citizens. Maps include bio and fair trade markets, green sites, natural protected areas, natural gardens – they show localization, provide a short description, etc.⁵

Table 1 briefly summarizes the main types of urban agriculture from several perspectives, especially place and space, stakeholders, food security and social innovation.

Tab. 1. Summary of selected urban agriculture types according to various perspectives

Perspective	Types
Place and space, location	Intra-urban / peri-urban Small-scale / middle-scale / large-scale (gardening level/farming level) Gardens on balcony / wall / roof / land
Stakeholder and organisation	Individual, collective / community Organized / spontaneous Top-down / bottom up / mixed
Food security and performance	Commercial / traded surplus / non-profit / self-provision / subsistence Vegetable / fruit / vineyard / orchard / hop garden / herbs / livestock / energetic plants / flowers Agroforestry / livestock / vegetable /mixed Productive / mixed / non-productive Aquaponic / hydroponic / soil Conventional / environmentally friendly / organic practices

⁵ See www.komunitnizahrady.cz, www.veronica.cz/ekomapa, www.debnicka.sk, www.eko-mapa.sk, www.kokoza.cz, www.kpzinfo.cz, www.prodajzodvora.sk.

Social change and innovations	<p>Traditional forms (household gardens, allotment gardens, productive farms, institutional gardens)</p> <p>New forms (community supported agriculture, community gardens, community composting, urban food strategies, guerilla gardens, institutional educational gardens)</p> <p>Mixed forms (farmers' markets, new forms of allotment gardens)</p>
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Source: Authors' interpretation based on own literature review and field research.

Depending on the geographical dimension, every town features its unique structure, size and historical development of urban and peri-urban environment and then may serve its own typology. For example Tóth and Feriancová (2013) describe the typology of urban agriculture in the city of Nitra as the following:

- 1) Container production on balconies and parapets – mostly vegetable, herbs, less fruit, for self-supply.
- 2) Private/Household gardens – with ornamental, recreational and production functions.
- 3) Production gardens at a blocks of flats – with a spatial division according to ownership.
- 4) Allotment gardens in the intra-urban and peri-urban area of the city – with different forms of spatial arrangement and various proportions of production and ornamental parts.
- 5) Urban vineyards – as residuals of historic landscape utilization.
- 6) Orchards in private and allotment gardens.
- 7) Blocks of fields – agricultural land.

3.3. Challenges and risks

FAO (2007), Gerster-Bentaya (2013), RUAF Foundation (2014) and others summarize the main potentials of urban agriculture for the future. They consider a contribution to food security and healthy nutrition as the most important assets, based on an improved diet, especially of poor urban population, and others. Another challenge is to contribute to the local economic development, increase income diversity and subsistence, and increase family resilience to economic fluctuations. The inevitable potential rests on social impacts, such as poverty alleviation and social integration of disadvantaged groups. Finally, urban agriculture contributes to urban environmental management: it uses organic waste and produces compost, harvests rain water and extends green spaces in urban environments. Urban agriculture also creates aesthetic and educational dimensions, while creating green and varied landscapes, show-

ing urban inhabitants how to grow crops, and raising awareness of the inhabitants about food production and processing.

As we indicated in the previous part, urban agriculture also brings some potential risks and constraints. The most important is to take into account the performance of agricultural production (conventional or environmentally friendly) and the location of agricultural sites. Urban agriculture could be carried out on vacant, derelict or abandoned former industrial places without any available information about safety and a healthy limit for agriculture. The most serious risks could cause contamination of the environment through air, soil or water and subsequently a transmission into the crops, thereby impacting the health of consumers. For instance, a group of Polish scientists conducted a research project dealing with the pollution of allotment gardens located close to an oil refinery and found a range of heavy metals such as cadmium, lead, copper, chromium, zinc and manganese, determined in the leaves and roots of the vegetables. They determined heavy metal accumulation in the soil, dust fall (measure of air pollution), as well as ground water (Mikula & Indeka, 1997). Based on an analysis of several studies (e.g. Mikula & Indeka, 1997; FAO, 2007; Galhena *et al.*, 2013; Šarapatka *et al.*, 2010), we provide a brief summary of these risks as:

- contamination of crops with pathogenic organisms or residues of agrochemicals and other pollutants through contaminated soil, water or air;
- transmission of diseases from domestic animals to people (zoonosis);
- threat of local water sources or underground water contamination due to uncontrolled treatment of fertilizers, pesticides or rich manure from animals;
- lack of information on how to grow plants and keep livestock responsibly, unhygienic handling of crops and animals;
- poor environmental conditions of land, further depletion of soil quality;
- inappropriate drawing of water sources.

4. History and development of urban gardening types: Highlights of household gardens, allotment gardens and educational gardens in the Czech and Slovak Republics

This chapter provides a description of allotment gardens and household gardens as the most typical types of urban agriculture in the Czech and Slovak Republics. We also mention some specific political circumstances that influenced their development and character. A more detailed analysis is devoted to Czech educational gardens and Slovak household and allotment gardens.

We do not aim at providing an exhaustive description and analysis, but rather a collection of apt and illustrative cases.

4.1. Allotment gardens

Allotment gardens and their supportive associations have a long tradition in most of the countries of Europe, dating to the turn of the 19th century. They draw mainly from two sources, French (Christian-enlightened) and German (educative-modernist). These sources have been permanently penetrated and connected with industrialization, rapid rural-urban migration, and the need to ensure food for the urban poor and promote factory workers; the second source was rather related to the possibility for recovery or the recreation of urban inhabitants (Macl, 2002; Klopárová, 2009; Librová, 2002; Gibas, 2011a; Gibas, 2011b; Gibas *et al.*, 2013).⁶ In times of economic crisis or war, the role of allotment gardens stressed more on the food production and self-provision dimension. A detailed analysis of the history and development of allotment gardens from the European and Czech perspective is provided by the publication by Gibas and colleagues (2013) and is not the core of this chapter. We focus on Slovak specifics, followed by Czech.

During the second half of the 20th century, especially in the communist countries of Central and Eastern Europe, allotment gardens received strong recognition and support from national and regional policies, together with their “organized and controlled character” within the national gardeners’ unions. In the Czech and Slovak Republic, gardening and second living experienced a huge development during the political normalization period of the 1970s and 1980s. The normalization period followed a short period of reform thinking, and democratic enthusiasm evolved during the 1960s but was aborted by the Soviet Army invasion in 1968, setting up a severer political regime. When a complex system of repression took place and the ideas of democracy faded away, some urban inhabitants found escape either to the countryside, to the cottages, or to garden allotments within urban or rural

⁶ In 1819, there was a law enacted which directed officers to offer small plots of land to poor people in Great Britain. In France, Charity Conférences de Saint Vincent de Paul started to distribute some plots for poor people; while in Germany, doctor Daniel Gottlob Moritz Schreber promoted gardening as an ideal way of recovery. The twentieth century brought some new challenges for urban gardening, mainly during the times of financial crises or world wars; let's mention the so-called makeshift and war gardens (for example, Kriegsgemüsegartens in Austria). In 1930, the idea of the “gardens for paupers”, also started in Germany, were known also “Schrebergärten”, initiated by the above-mentioned D. G. M. Schreber. He started with playgrounds for children living in cities. Near the childrens’ playgrounds there were established gardens for the families. In France, there were Labor Garden Colonies; in Poland and Austria, there were gardens set up in the suburb zone. In Switzerland, several well-off people offered their land for common gardens (Benčať, 1997; Gibas *et al.*, 2013).

environments (Eislerová, 2006; Buček, 2012; Benčať, 2007). Moreover, some people used cottage gardens as “a second living possibility”. The gardening movement was strongly organized within the Czechoslovak Union of Gardeners and officially promoted by the communist government.

From the 1990s, and after the split of Czechoslovakia into the Czech and Slovak Republics, the character and number of organized gardeners declined, but unions partly followed new trends (web sites, magazines, Facebook activities, e-promotion). The extent of allotment gardens, located in attractive town environments, has been shrinking due to a clash with development projects and the process of building up city centers. These trends are going hand in hand with changing attitudes, the perception of urban gardening as subsistence rather than to recreation and health (van den Berg, Winsum-Westra, de Vries, & van Dillen, 2011; Peleška, 1997), a generational change, and a shift in how urban inhabitants spend their leisure time.

Allotment gardens represent a type of collective garden which are more organized and connected to the long-term development of many voluntary and organized interested “associations” (hunting, bee-keeping, gardening, fishing, librarian, scientific, etc.).

In the case of both republics, before 1989 the land was given to the members of the Czechoslovak Association of Gardeners without attention to the previous land owner (the land became the property of the state or cooperative societies). In the Slovak Republic, after 1989 the original owners of the land got into a legal conflict with the gardeners who were cultivating “their” plots of land. In 1991, the Act No. 229/1991 had been authorized, thereby adjusting the owner’s rights to land and other agricultural properties. Currently, there is an ordinary Act. No. 64/1997 on land exploitation in allotment gardens and land ownership regulations. In the Czech Republic, continuing discussions about the necessity to adapt laws dealing with urban allotment gardening are taking place, although no result has been achieved yet.

When taking a look at Slovakia, it is, similarly to the Czech Republic, considered as a country of allotment holders/gardeners. This phenomenon rose during the communist era, when people could not travel abroad, so they spent a lot of their free time and holidays in the countryside. In the late 1980s, Slovakia was going through deep political and economic changes which left a visible mark also on the structure of Slovak towns. Allotment gardens – or “garden colonies” as they are called in Slovakia – have appeared as a particularity of cities and urban environments. Allotment gardens, as they are known nowadays, date back to the 1960s. They were set up for cities with over 50,000 inhabitants, but several years after, smaller cities and towns also established allotment gardens.

The first guidelines for allotment gardens in Slovakia were approved by the Slovak Association of Gardeners and Fruiterers in 1957. Between

1965 and 1968, the establishment of allotment gardens was extended while between 1979 and 1984, another expansion is dated. In this period, 109,000 new gardeners were recorded. After ten years, the number of members increased twice – to 220,000, with a total area of 5,500 hectares of gardens (Benčat, 2007). This expansion strove to elaborate on expanded guidelines of the aesthetic and planting regulations for allotment gardens; including a catalogue of the architectural design of cottages suitable for allotment gardens, and depending upon localization, was published in 1977. There were 24 types of garden cottages for the lowlands, uplands and mountain regions. For beginners and those who wanted to have a garden, some model allotment gardens were established in the exhibition area of Agrokomplex in Nitra in 1982. There you could see 12 different types of gardens, with an area of 400 m² (Benčat, 2007).

The following types were presented: a vegetable type, a vegetable type with greenhouse, a multifunctional garden in the lowlands, a multifunctional garden in the upland, a fruit type, a vineyard type, a garden in the suburbs in the heights, a garden in the suburb near a stream, a recreational garden, a garden with animal breeding, a private garden in the lowlands, and a private garden in the heights. These types have been recently supplemented with a bio garden, and examples of bio-composting, types of mulching, plant allelopathy, suitable garden equipment, etc. (Bihuňová & Kubišta, 2009).

The size of allotment gardens varies between 250 and 400 m². Each allotment garden is connected to a water supply system and electricity is available. The allotments are used as fruit and vegetable gardens, vineyards, as well as recreational and flower gardens. There are no regulations stipulating the minimum area of the plot, which has to be actively used for production (fruit, vegetable). There are only building restrictions. Cottages can have a maximum size of 40 m², there are no limitations regarding cottage height. There are many different types of cottages, ranging from a simple garden shelter, up to summer cottages where the gardeners can live during the summer months.

Currently, the Slovak Union of Allotment and Leisure Gardeners has 82,000 members and 1,380 associations. The Czech Union has 170,000 members, 2,700 associations and 17 special organizations (*Český zahrádkářský svaz*, 2014; *Slovenský zväz zahrádkárov*, 2014). The unions offer advice on ecological cultivation and the protection of fruit, vegetable and perennials, as well as legal advice for free. They provide the material and financial support of several activities. Members organize diverse exhibitions of fruit, vegetable and plants; wine competitions; educational events, as well as thematic visits and excursions.

Most of the recent garden owners have inherited them and therefore their connection with garden work and affinity for gardening can vary be-

tween none to serious. Their role has changed from a focus on food security or escape in the past, to more diverse purposes nowadays, but gardeners spend a significant part of their time in their gardens. It is a place where they can discover a sense of their everyday lives and become an active part of the community.

4.2. Household gardens in the context of the predominantly rural landscapes of the Slovak Republic

Home or household/private gardens have been an important part of the local food system for centuries, regardless of their urban or rural location. Their role is emphasized especially in developing countries as an instrument on how to avoid malnutrition or the food insecurity of urban inhabitants (FAO, 2008; Galhena *et al.*, 2013). But they play a serious role in developed, and an even more important role in post-communist, countries where they help inhabitants to overcome economic transitions and difficulties (Sýkora & Bouzarovski, 2012). Self-provision, household resilience and other activities are widely discussed by social scientists, especially when dealing with motivation. Jehlička and Smith (2012, 2013) introduce three or four main streams and concepts regardless of geographical location, type of political regimes or existence of economic crisis):

- coping or survival strategy of the poor (e.g. communist or post-communist “shortage”);
- “fashion” or trend of middle class;
- socio-cultural reaction to short-term crisis (2008, potential change after abatement);
- quiet sustainability (ongoing and sustainable trend of sharing, repairing, gifting and bartering).

Home gardens are predominantly small-scale subsistence agricultural systems, with a potential for some trade surpluses and usually consist of small plots around households. They may be distinguished as kitchen, backyard, farmyard, compound or homestead gardens (Niñez, 1987; Galhena *et al.*, 2013). The main differences from other types of agricultural systems (especially commercial farms) are their size; they occupy a small area and purpose; production is rather supplemental than a main source of income and they are located near households (Marsh, 1998). Moreover, home-owners usually grow more sorts of plant and ensure themselves day-to-day access to fresh and nutritious food from home production (Bentanya, 2013), with possibilities for fresh food storage or processing.

During the period after WWII, quite a different situation developed in the former communist Central and Eastern Europe when compared to the western cultures of Europe, dated from the second half of the 20th century

to the 1990s. Household gardens, especially those bigger and more commercial ones (close to farming scale), faced some contradictions in the form of a strong regime pushing them to shift to collective forms of farming, in accordance with the Soviet Union model, mainly in peri-urban and rural areas. Swain (2001) describes this process and highlights some differences between countries, especially fewer regulations in Hungary and Poland. During the 1990s, the process of restitution enabled some former farmers and gardeners or their descendants to get back their assets. They can treat them according to their consideration.

When focusing on Slovak specifics, in many cases it is difficult to clearly determine whether a household garden has a predominantly urban or rural character. Besides traditional forms of agriculture, urban agriculture is also present in intra-urban areas of small towns and villages which stand for small urban centers in the agricultural landscape of Slovakia, which represents 49.2 % of the overall territory (Klinda *et al.*, 2011). This percentage of agricultural land use is similar to the Czech situation, where agricultural land consists of 53.5 % of the overall land (*Souhrnné přehledy o půdním fondu z údajů katastru nemovitostí za rok 2014 v České republice*, 2014).

In larger towns and cities, the need for productive land is partly satisfied by the allotment gardens which were formed at the urban fringe, usually connected to grey infrastructure elements. As mentioned before, agriculture has the largest proportion in Slovak land use. Therefore, the Slovak countryside has always been formed and influenced by agricultural land use. The footprint of agricultural production can be clearly read on current landscape and settlement structures as well. In terms of urban agriculture, production outside the built-up area is of no relevance. Smaller urban settlements like towns and villages, especially those located in the Danube Lowland (the southwestern part of the country), were formed by the intensive growing of crops in private gardens within the intra-urban area of the settlement. For the largest villages of this region, large gardens at private houses with a very high amount of polytunnels (hoop greenhouses) were characteristic.

The most intensive growing took place in the second half of the 20th century. Heading to the turn of the century, it became consecutively less intensive, and nowadays we can see a significant conversion of urban agriculture in intra-urban areas of towns and villages. There were several factors and circumstances which caused a downgrade of personal agricultural production in small urban settlements, among others lowering the prices of crops by big supermarket chains and thereby disturbing the local markets. This relationship between villager and land has a long tradition and deep roots in the history of the Slovak countryside. In the past, people were also cultivating the land outside the built-up area with their own hands. This

changed significantly with the phenomenon of agricultural collectivization after World War II. Villagers lost their piece of land outside the village and all that was left was the personal garden at their houses. As they were fundamentally bounded with land cultivation, the urban agriculture underwent a first significant change (from growing for own use in orchards and vegetable plots to intensive farming and trading with crops).

After the mentioned conversion of urban agriculture by a changeover to a market economy, a lot of urban farmers lost their motivation to grow crops. There is also a special type of urban gardening in Slovak villages in the form of production plots at blocks of four or eight flats. These gardens and their gardeners are still productive as they grow vegetable for their own use. Their character is similar to community gardens in bigger towns and cities. Concerning an overall state, urban agriculture in small Slovak settlements faded and its potential is currently not fulfilled. Therefore, we now face a great challenge: How to bring back urban agriculture to the scene of small Slovak urban settlements? Which tools would be applicable and which approaches would contribute to the sustainable development of small urban settlements in Slovakia?

We have to find out how to re-motivate the urban gardeners of Slovak towns and villages. According to contemporary approaches, we can consider agritourism and local markets to be a contribution to the sustainable development of small urban structures. By some initiatives, through top-down approaches we could stimulate several bottom-up reactions (e.g. establishing of local markets to enable trading with bio-products of local farmers and afterwards promoting and supporting agritourism to increase the demand from local to micro-regional or regional would motivate urban gardeners to produce bio-products like vegetable, fruit, cheese, honey, eggs, etc. and to sell them on local markets to local people and visitors as well). Another positive impulse for urban agriculture would be its integration into the education process of primary schools.

To sum up, household gardens represent outdoor living spaces for humans where they spend a part of their leisure time and have production, recreational and social functions. During the last few decades, the original perception of the private gardens with the main production function was changed, on behalf of recreational and ornamental function. We can remark on it mostly in intensively urbanized areas (Bihuňová & Kubišta, 2007). But on the other hand, the inhabitants of the urban and industrial areas are interested in planting their own bio-products influenced by the initiatives of a short supply-chain and slow food (Tóth & Feriancová, 2013).

Picture 1. An intra-urban production garden with exterior and interior (greenhouse) production at housing estates in the small town Tvrdošovce



Author: Attila Tóth.

4.3. Specifics of the Czech Republic – Educational gardens

Both the Czech and Slovak Republics have a long tradition of institutional gardens with educational potential. Traditionally, botanical gardens were established by universities and especially school gardens for basic and secondary education, and even a school subject “gardening” was established as an obligatory part of the educational system. A quite high proportion of schools is endowed with school gardens.

In this part we focus on the Czech situation, especially from the 1990s to now. According to representative empirical research, around 80 % of schools still own gardens (Burešová, 2005). School gardens as an educational tool are honored in other countries, some authors use the term “garden-based education” to describe the process of learning and activities being done in school gardens (Williams & Dixon, 2013; Dilafruz & Brown, 2012).

There is also a strong historical background of environmental education and “eco” pedagogy reaching back to the beginning of the 20th century, persisting during communist times and newly supported by the Ministry of Education, Youth and Sport and Ministry of the Environment since the 1990s (Aleš Závěský, Aleš Máchal, Květoslava Burešová, Danuše Kvasničková, and many others). Moreover, a network of various environmental education centers, mainly non-governmental or school organizations has been developing, mainly since 1989 (currently with 38 official members). Most of them established gardens to serve as multiple educational tools in terms of

the complex fulfillment of educational goals, such as knowledge (information), attitudes (values), and practices (skills) (Ministry of Education, Youth and Sports, 2008). Educational gardens are concentrated in Prague (Toulcův Farmstead) or Brno (Lipka, Rozmarýnek, Kamenáčky, etc.), but many of them are also located in rural areas and small towns.

The Slovak Republic faces a little delay in educational gardening, however we can mention some developing projects of educational gardens in Bratislava, the farm in Stupava, Mašekov Mill, or the Eco center Sosna Košice.

The ownership of gardens stands as a strong educational tool for schools as well as environmental centers. They can be used as an information platform for the public, open air classroom and background for education, a living textbook of biology and other subjects, a place for practical gardening, education courses and excursions for the public, open access spaces, an example of good practices, a place for gathering, games and a practical gardening workshop for children (Carney, 2001; Burešová, 2005; Fančovičová & Prokop 2011; Williams & Brown, 2012).

We reviewed approximately 30 gardens in the Czech Republic and based on literature review, enriched by our observations and interviews with selected representatives, we have created a short summary of the main garden types. We also point out that most gardens usually contain more garden types or elements together. Table 2 shows a great variety of gardens and their characteristics.

Tab. 2. Types of educational gardens

Type of garden/element	Characteristics
Playing Garden	Garden dedicated to children, containing a number of playing elements for children to support engagement of human senses.
Biotope Garden	Main purpose of the garden is to run biological observations, it serves as a mosaic of biotopes typical for Europe: mixed forest, meadow, steppe, lake, wetland, also gardens etc.
Permaculture / Natural Garden	Close to environmentally and climate friendly garden types. Besides food production, they include natural elements, ecological practices and combine old and new approaches. Czech natural gardens are inspired by the Austrian project of natural garden promotion “Natur im Garten” and try to follow their rules and principles. Although, each garden is unique and entails a footprint on their founders.

Food garden	Garden focused on the production of mainly nutrition rich plants (containing high amount of proteins), to ensure food and seed security.
Garden of old sorts and cultivars	Gardens oriented especially to revival of old and regional varieties of fruit trees, plants and crops.
Old times garden (Grandmother's Grandparent's Garden)	Old farmsteads or parts of gardens, enriched by current environmental practices. The aim is to show traditional ways of farming. Besides this, various art and craft courses are offered (wool processing, pottery, herbal medicine).

Source: Authors' own interpretation based on literature review and field research.

In most of the analyzed gardens, we observed a strong environmental dimension, based on proper natural resource management, support of diversity, soil protection and an overall responsible approach. For instance, they focus on a closed cycle of various nutrients (composting), rain water harvesting, use of human work rather than mechanization. The garden usually includes more biotopes such as a vegetable garden, an orchard, a flower bed, bodies of water, a small forest, bushes and shrubs, herbs, lie-fallow elements, places for useful predators and pollinators to live and hide: hiding places for birds, reptiles, amphibians, insects, plant rotation, combination of various sorts of crops in garden beds, including edible weeds and edible forests, etc.

These environmental attributes correspond with the principles of environmental friendly gardening (Vlašínová, 2006; Šarapatka *et al.*, 2010; Simon, Recasens, & Duží, 2014). The innovative dimension is very important. Educational gardens invite natural elements and promote a change of garden perception – to be considered not only as a place for the production of food, but a certain kind of natural ecosystem. Moreover, some gardens introduce “chaos”, “wilderness” and “lie-fallow part” as an inherent part of the garden. From our perspective, these gardens could serve as a strong example of environmentally and climate friendly gardening, which is strongly needed to be managed in urban and rural environments.

Picture 2. The Educational Herbal garden Tíree Chmelar is located in Valtice and is managed by the non-governmental organization Herbal Garden (it holds a Natural Garden certificate)



Author: Barbora Duží.

5. Conclusion

We tried to cover the vast diversity of urban gardening through the example of the Czech and Slovak Republics (the former Czechoslovakia) as post-communist countries. Our findings are based on an extensive literature review on the elaborated issue, with a particular focus on the works of Czech and Slovak authors.

The chapter introduces and analyses the issue of urban agriculture in both countries and explains ongoing trends and tendencies. We point out that urban agriculture or gardening has never been excluded from the urban environment, quite the opposite, gardening has been developing and changing in urban and rural environments and has not yet disappeared. Depending on the specific type of gardening, each kind of garden diversely focuses on the use of place and space, food security, the stakeholder's engagement or introduction of environmental and social innovation.

From the vast diversity of urban gardening, we put more attention to allotment and household gardens and education institutional gardens. The

Slovak Republic especially shows a prevailing rural and agricultural character of the country with difficulties to distinguish between rural and urban agriculture due to small-scale settlements. Even though dramatic changes towards market oriented and globalization tendencies have been developed in the Czech Republic and Slovakia, old forms of gardening such as allotment gardens or household gardens have persisted or have been transformed into new forms. Moreover, issues like food security, environmental quality and health are becoming more important and concrete in periods of incessant economic imbalances and fluctuations.

Educational gardens are presented as a unique garden type of the Czech Republic with a strong potential for raising public awareness and environmental education and spreading ideas and practice of environmentally and climate-friendly gardening. Although we are aware of the risks connected to gardening in urban environments, we perceive them as a challenge for future improvements.

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