

## Urban and peri-urban agriculture in Sarajevo region: an exploratory study

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### Abstract

In 2010, agriculture share in GDP was 8.6% and 19.7% of the total labour force was employed in agriculture. About 39% of the total population is urban. This exploratory study aims at providing an overview of urban and peri-urban agriculture (UPA) in BiH especially in terms of legal, legislative and regulatory framework, governance and actors as well as the role of extension and advisory services. The paper is based on an extended literature review and on primary information collected by semi-structured interviews, carried out in summer-autumn 2011, with 30 urban gardeners, extension agents, representatives of NGOs and officers in the municipal Departments for Urban Planning and Economy in Sarajevo region. The paper (1) analyses references to UPA in the main agricultural development policies in Bosnia; (2) screens international projects dealing with UPA during the post-war period in Sarajevo region, and promoting and implementing organisations, (3) assesses focus on UPA by extension agents; (4) analyses urban planning and zoning regulations in Trnovo, Istocna Ilidza (Isl), Istocno Novo Sarajevo (INS), Pale, Sokolac, Vlasenica and Milici municipalities; (5) analyses budget dedicated to agriculture in the urban municipalities of Isl and INS; and (6) provides some recommendations for UPA development. Semi-structured interviews focused also on economic, environmental, aesthetical and social (gender, inter-ethnic conciliation and cross-cultural cooperation) benefits of UPA in the post-war Sarajevo and East Sarajevo. UPA can bring about sustainable social, economic and environmental benefits therefore, for insuring its long-term development, legal, legislative and regulatory framework as well as governance should be improved. UPA can not be developed without conducive and enabling land use policies and regulations and frameworks facilitating access to and securing use of urban spaces for agricultural purposes. Governance can be upgraded by designing and implementing strategies and

policies using a multi-stakeholder approach involving all key public and civil society actors at State, Entity and municipality level. UPA development requires a transition in attitude and behaviour of all involved actors especially urban people and local policy makers; which can be promoted by enabling policies and conducive regulations. Moreover, it is necessary to develop a well performing pluralistic, participatory, bottom-up, and decentralized advisory system working as a training and learning tool and aiming also at organizing and empowering urban gardeners.

**Keywords:** urban agriculture, governance, extension, planning, Sarajevo.

## Introduction

More than 50% of the world's population lives in cities (Martine, 2007). Many demographers warn that cities will be unable to accommodate large populations. To feed a 10 million inhabitant-city at least 6,000 tones of food must be imported daily (Drescher, *et al.*, 2000). With the world's cities growing rapidly, farming in urban and peri-urban areas is going to play a bigger role (FAO, 2005). To meet food needs and supplement incomes, many urban inhabitants practice urban and peri-urban agriculture (UPA) on vacant lots, in backyards, along rivers, roads and railways and under power lines (FAO, 2012).

Urban agriculture can be briefly defined as the growing of plants and trees and rearing of livestock within or on the fringe of cities, including related input provision, processing and marketing activities and services (Smit, *et al.*, 1996). The Food and Agriculture Organisation introduced the acronym UPA (Urban and Peri-urban Agriculture) with "urban agriculture" referring to agriculture that takes place within the built-up city and "peri-urban agriculture" to agriculture in the areas surrounding the cities (Nugent, 2000). After a review of the scientific literature on UPA, Mougeot (2000) came to the conclusion that the most striking feature of urban agriculture is not its location, but the fact that it is an integral part of the urban socio-economic and ecological system.

Urban and peri-urban agriculture (UPA) already supplies food to about one-quarter of the world's urban population (FAO, 2005). It has become vital to the wellbeing of millions of people. About 15% of food consumed in cities is grown by urban producers and this percentage will double within 20 years (UNEP, 2002). It has been estimated that some 200 million people are engaged in urban agriculture and related enterprises, contributing to the food supply of 800 million urban dwellers (FAO, 2012).

Urban and peri-urban agriculture contributes to the development of local food systems in urban areas. Local food production is thought to support economic development (Ilbery and Maye, 2005; Martinez, *et al.*, 2010), generate social support networks (Hinrichs, 2000; Sage, 2003), improve dietary habits (Bellows, *et al.*, 2003), have a positive environmental impact (Edwards-Jones, *et al.*, 2008), and generate positive health benefits to urban dwellers (Morgan, *et al.*, 2006; Conner and Levine, 2007).

Bosnia and Herzegovina (BiH) consists of two governing entities *i.e.* the Federation of Bosnia and Herzegovina (FBiH) and Republika Srpska (RS). Agriculture share in GDP was 8.6% in 2010 (EC, 2011). According to the Labour Force Survey 2010, the

agricultural sector employs 166,000 persons *i.e.* 19.7% of the total active population (ASBiH, 2010). Agricultural land covers approximately 50% of the total area of BiH (MoFTER, 2009). Urban areas cover 19% of the territory. Furthermore, approximately 39% of the total population can be classified as urban (Lampietti, *et al.*, 2009).

UPA can help achieving the sustainability of Bosnian urban ecosystems, improving living conditions and diversifying urban residents' income-generating activities thus representing a very important opportunity in the context of the crisis. At the 5<sup>th</sup> Research Symposium on Cities and Climate Change, held in Marseille in June 2009, it was noted that "*urban agriculture can play a critical role in helping the world's urban poor by providing a practical solution to the food crisis in the shorter term, and by providing a climate change adaptation mechanism in the longer term*" (cited in Naïli, 2011).

Pondering the future of agriculture in the Mediterranean countries, it is impossible not to take account of the areas within and around cities or address the broader issue of urban growth. Cultivated urban and peri-urban areas have always existed, playing an important role in food production and commerce, and are to be found in all eras and cultures (Antonelli and Lamberti, 2011). Agricultural production in and around cities is an ancient activity in the Mediterranean region. It is integral to Mediterranean cultural landscapes and a long standing traditional practice (Nasr and Padilla, 2004).

A growing body of research on UPA continually reveals that it is not just a problem to be prohibited and restricted but has a number of benefits and can provide important contributions to answering a number of key challenges encountered by cities in developing as well as developed countries (cf. De Zeeuw, *et al.*, 2011).

The exploratory study aims at providing an overview of UPA in BiH especially in terms of legal, legislative and regulatory framework, governance and actors as well as the role of extension and advisory services. A special attention has been paid to urban planning and processes and initiatives for the development of UPA in Sarajevo region.

## Materials and methods

The paper is based on an extended literature review and on primary information collected by semi-structured interviews, carried out in summer-autumn 2011, with urban gardeners as well as extension agents, representatives of NGOs and officers in the municipal Departments for Urban Planning and Economy in Sarajevo region.

The paper analyses references to UPA in the main agricultural development policies in Bosnia. The work screens international projects that have focused on or dealt with UPA during the post-war period in Sarajevo (FBiH) and Istocna Ilidža (East Sarajevo, RS) as well as promoting and implementing organisations. It assesses focus on UPA from extension agents. The paper analyses also urban planning and land use and zoning regulations in Trnovo, Istocna Ilidža (Isl), Istocno Novo Sarajevo (INS), Pale, Sokolac, Vlasenica and Milici municipalities and how favourable are they for UPA development; and budget dedicated to agriculture in the urban municipalities of Isl and INS. The work provides some recommendations for the development of UPA based on the needs and problems faced by the interviewed urban gardeners and NGOs' representatives, and actors that according to them should address them.

Semi-structured interviews with 30 urban gardeners in the Mala Bašta (Small Garden) garden at Stup - Sarajevo and Suncokret (Sunflower) garden at Kula – Isl; managed by the Community Gardens Association (CGA) and encompassing some aspects of Therapeutic Gardening and Horticultural Therapy; were performed using a checklist dealing, among other issues, with sources of inputs; main products; destination of production; motives and reasons for practicing UPA; constraints and problems; main economic, environmental and social benefits of UPA with a special focus on gender empowerment, social capital strengthening, social cohesion, psychological and physical healing, inter-ethnic conciliation, cross-ethnic and cross-cultural cooperation in the post-war Sarajevo and East Sarajevo. Urban gardeners that participated to this exploratory analysis were randomly selected. In fact, the community gardens were visited different times during the period summer-autumn 2011 and present urban gardeners were interviewed. Of course, each urban gardener was interviewed only the first time that he/she was met.

The average age of respondents was 60.7 showing that mainly elders are dealing with UPA in Sarajevo region. As for respondents' gender, 70% were women and 30% men. The average surface per respondent is 250 m<sup>2</sup>. No respondent has university degree and third of them have only primary education. The main sources of income of respondents are urban gardens (70%), pensions (86%), and wages (43%). Further information about the interviewed urban gardeners are provided in table 1.

Table 1. General information about the interviewed urban gardeners.

Items	Specification	
<b>Age</b>	- Min	46
	- Max	73
	- Average	60.7
<b>Gender</b>	- Male	9 (30%)
	- Female	21 (70%)
<b>Household members' number</b>	- Min	2
	- Max	6
<b>Education level</b>	- Illiterate (no school)	0
	- Primary school ( IV)	0
	- Primary school (VIII)	9 (30%)
	- High school (3 years)	17 (57%)
	- High school (4 years)	4 (13%)
	- College (2 years)	0
	- Faculty	0

<b>Household sources of income (in addition to income from urban garden)</b>	- Providing services on equipment and machines	0
	- Wage	13 (43%)
	- Renting land and property	0
	- Income out of agriculture	0
	- Pension	26 (86%)
	- Social aid programs	0
	- Family and friends living abroad (remittances)	0
	- Other	0

Source: Authors' elaboration based on the survey results.

The lack of updated secondary data on UPA in Bosnia in general and Sarajevo region in particular has been the main constraint faced during the preparation of this paper. During the field research some people were not willing to be interviewed as they were suspicious regarding data collection purpose and their future use. International literature dealing with UPA focuses mainly on developing countries. Initiatives developed in some cities of developed countries can be hardly useful in the case of Sarajevo region.

## Results

The main agriculture development strategies in Bosnia and Herzegovina (BiH) and the two governance entities (FBiH and RS) are BiH Harmonisation Strategy and Operational Programme for Agriculture; FBiH Strategy for Agriculture and Rural Development; RS Strategy for Agricultural Development; RS Strategic Plan for Rural Development (MoFT, 2010). Analysis of all these strategic documents showed that there are no references to UPA.

Urban agriculture initiatives in Sarajevo region depend on a few ambitious NGOs (e.g. Community Garden Association of BiH - CGA; Suncokret, Our Future) supported by international donors (e.g. American Friends Service Committee). CGA guides urban gardeners through working process, monitors their activities and provides them with funds. The main aims of CGA are to promote multiethnic urban gardening, to train participant urban gardeners, and to insure healing therapy for people especially those with post-war syndrome. CGA mainly chooses poor participant urban gardeners upon recommendations from some organisations, mainly religious ones, such as the Red Cross, Merhamet, Caritas, Dobrotvor and Centre for Social Work in municipalities where they got land for use. CGA considers that municipalities, where community urban gardens are located, can solve urban gardeners' problems as they have an officer in charge for agriculture that can provide assistance to urban gardeners. However, it

should be highlighted that most of urban gardeners have low education level which makes communication with and providing support to them more difficult (Davorin Brdjanin, personal communication).

Currently, there are six registered associations that deal with urban agriculture in BiH. Four of them [“Our Parcels” association (Municipality of Jajce), “Family Garden” association (Municipality of Zenica), “Small Garden” association (Municipality of Sarajevo) and, “Linden Tree” association (Municipality of Tuzla)] are located in the FBiH while two [Association for the Promotion of Small- Scale Gardens „Sunflower” (Municipality of Istocna Ilidza) and Association of Community Garden “Sweet Basil” (Municipality of Dobo)] operate in the RS. All of them respect the principle of multi-ethnicity.

Urban producers have specific needs which represent a challenge for extension services that have a new role to play and should develop new advisory approaches and communication methods. Interviews with extension agents highlighted that they do not have any contact with urban gardeners, have never dealt with projects on urban agriculture and they are not so familiar with UPA. All interviewed urban gardeners stated that they do not deal with agricultural extension staff and do not receive any services from them. The main information sources for urban gardeners in Sarajevo region are TV, programs and projects for UPA development and magazines and newspapers (Tab. 2).

Table 2. Information sources used by urban gardeners in Sarajevo region.

Source of information	Percentage
<b>TV</b>	100
<b>Programs and projects for UPA development in Sarajevo region</b>	29
<b>Magazines and newspapers</b>	29
<b>Attendance of courses and conferences on UPA</b>	14.2
<b>Radio</b>	14.2
<b>Friends and neighbours</b>	14.2
<b>Trips and visits to other urban farms</b>	0
<b>Internet</b>	0

Source: Authors’ elaboration based on the survey results.

Analysis of urban planning and land zoning was focused on Trnovo, Isl, INS, Pale, Sokolac, Vlasenica and Milici municipalities. Six municipalities *i.e.* Trnovo, Istocna Ilidza, Istocno Novo Sarajevo, Istocni Stari Grad, Pale and Sokolac, are included in the Town of East Sarajevo that adopted in 2011 a spatial plan encompassing all above-mentioned municipalities. These municipalities separately do not have spatial plans but most of them have urban plans. There are no zoning plans until now.

Istocna Ilidza and Istocno Novo Sarajevo municipalities use the same urban plan dating back to 2000 and covering the area of both municipalities (2534 ha). According to that plan agricultural land covers 4.4% of the total municipal area. Agricultural areas are located in the outskirts of both municipalities.

Trnovo municipality has an old urban plan dating back to 1986. Total surface of municipality is 138 km<sup>2</sup> while agricultural land covers 154.5 ha. In the master plan agricultural land is located only in the outskirts of the municipality.

Pale municipality has an old urban plan dating back to 1990. Agricultural land is not mentioned in the municipality urban plan.

Sokolac municipality (689 km<sup>2</sup>) has the oldest urban plan in the region dating back to December 1981. Many things have changed with respect to that plan. According to the old plan the total agricultural land in the urban area is 75 ha. However, a part of that land has been already urbanized. Still there are some agricultural plots in urban areas mainly meadows and pastures used to produce fodder. It is necessary to make a new plan but the main constraint is, according to the municipal officers, the lack of funds.

Municipalities of Milici and Vlasenica have the same urban plan dating back to 1986. In fact, during the civil war in BiH, Vlasenica (532 km<sup>2</sup>) was divided in two municipalities: Milici and Vlasenica (234 km<sup>2</sup>). The new plan of Vlasenica municipality will be issued in the next 3 months following a decision of the local assembly in 2011. In contrast, Milici municipality has not prepared a new urban plan. Vlasenica has a spatial plan that was adopted in 2010 for the period 2007-2020. In the old urban plan agricultural land is not mentioned. There is no zoning plan. The spatial plan of Milici municipality was adopted in 2012 for the period 2011-2031.

For all that it is important to have adequate financial resources. Agricultural budget was analysed in the urban municipalities of Isl and INS. In Isl municipality, budget during the period 2008-2011 included two main components: (i) incentives for the development of agricultural production (direct payments mainly to fruit production and livestock breeding); and (ii) credits for the development of agriculture. In INS municipality, in 2008, 2009 and 2010 fiscal years budget was dedicated just to credits for the development of agricultural production. Anybody that could meet bank requirements and had a project idea in agriculture could get max 10,000 BAM (Bosnian Convertible Mark; Currency in BiH; 1 €= 1.955830 BAM) loan from commercial banks. Agricultural producers paid just 3% interest rate; that can be even higher than 10%, and the municipality pays the rest. In 2008, were used 75,000 out of 80,000 BAM; 173,000 out of 190,000 BAM in 2009; 67,000 out of 100,000 BAM in 2010; and 14,250 out of 100,000 BAM in 2011. In 2011, budget was dedicated to financial aid for greenhouses procurement based on co-funding (50% of total investment paid by the municipality and 50% by the applicant). This initiative failed because of lack of interest (Tab. 3).

Table 3. Budget dedicated to agriculture in the urban municipalities of Istocna Iidza and Istocno Novo Sarajevo (in BAM).

Year	2008	2009	2010	2011
Municipality				
Istocna Iidza	40,000	34,000	40,000	40,000
Istocno Novo Sarajevo	80,000	190,000	100,000	100,000

Source: Authors' elaboration.

According to respondents, main reasons for dealing with UPA are profit (57%), personal satisfaction (71%) and healthy food (100%). Respondents also mentioned friendship and as a coping strategy as they have no and/or a low income especially for internally displaced persons and pensioners with meagre pensions.

Main grown crops are potatoes, onions, carrots, peppers and tomatoes. Some of them mentioned as well raspberries, blackberries, strawberries and cranberries. The dominant cropping system is conventional (86%) but organic agriculture is practiced as well. Even in the case of conventional agriculture there is a low use of external inputs especially some pesticides and fertilisers.

Urban gardeners in Sarajevo region face many problems. The main ones are lack of institutional support (14.2%), difficult access to irrigation water (71%), lack of financial resources (14.2%), small plots (57%) and high input prices (29%). Institutions that, according to respondents, should do more to address these problems are municipalities (71%), urban gardens associations (29%) and entities (14.2). Municipalities are the main institutions that 60% of urban gardeners deal with as they provided them with land for urban gardening. They do not consider that extension service or state government can help them in solving problems that they face.

All respondents stated that they have not received subsidies. The members of urban gardens associations stated that they received assistance through project until 2010 (e.g. free tillage, tools, organic fertilizers, professional assistance, home-garden-home shuttle). In the time being they need especially seeds, machines (tillage), irrigation systems, organic fertilizers and tools.

Community gardening helps to build different forms of capital (social, human, financial, economic, physical, natural, etc), contributes to longer-term resilience and can reduce the impact of future shocks (Adam-Bradford, *et al.*, 2009).

Interviewed urban gardeners have also reaped many social benefits (Table 4). Most of the respondents (71%) are members of urban gardeners' associations. The majority of urban gardeners (60%) are satisfied with services provided by them. Some urban gardeners (29%) are members also of pensioners' associations.

Table 4. Perceived social impacts of urban and peri-urban agriculture.

<b>Social impact</b>	<b>Percentage</b>
<b>Psychological and physical healing</b>	86
<b>Better relationship with neighbours</b>	57
<b>Increased trust</b>	29
<b>Friendship and social inclusion</b>	29
<b>Increased solidarity</b>	14.2
<b>Cross-ethnic and cross-cultural cooperation and inter-ethnic conciliation</b>	14.2
<b>Gender empowerment</b>	14.2
<b>Social capital strengthening</b>	14.2

Source: Authors' elaboration based on the survey results.

According to respondents, impacts of UPA include as well health benefits; local economies development; local communities revival; food security; environmental education especially for children; refugees, displaced persons and pensioners living conditions improvement; improving landscape in cities, etc. Income generation from agriculture-based livelihoods play an increasingly important role in developing economic self-reliance amongst refugee populations, and help create an effective transition between emergency relief and longer-term development (Adam-Bradford, *et al.*, 2009).

## Discussion

Sarajevo region was devastated by the civil war during the nineties of the last century with thousands of internally displaced people and refugees. Experiences show that refugee agriculture is not only a survival strategy for displaced people to obtain food but also a valuable livelihood strategy. Urban agriculture can play an important role in all aspects of the disaster management cycle and is a multifunctional policy instrument and tool for practical application. However, when relief agencies depart outside support and resources for UPA decline (Adam-Bradford, *et al.*, 2009).

The reasons to support agriculture-related activities in the post-disaster phase are numerous. Urban agriculture can contribute to food security; provides livelihood and income-generating opportunities and contributes to wider social and economic rehabilitation. Home or community gardening activities help increase self-reliance and can improve skills and knowledge, while potentially contributing to restoring the social fabric of disaster-affected communities (Adam-Bradford, *et al.*, 2009).

Nevertheless, Bosnian urban gardeners in general and those operating in Sarajevo region in particular rely too much on donors and they find it so difficult to keep practicing UPA without their support and assistance. As for SWOT of UPA in Sarajevo region, according to the respondents - including the interviewed urban gardeners as well as the director of CGA - these are as follows:

- Strengths: interest of urban people to deal with urban gardening; high unemployment rate; bad overall economic situation; and many refugees and displaced people.
- Weaknesses: unorganized market; lack of trainings; low education level; lack of information on UPA; and low economic viability.
- Opportunities: funds and technical assistance provided by donors; attention paid by some municipalities to UPA development; and better cooperation between the governance entities.
- Threats: bad weather conditions; land tenure insecurity especially in the case of public plots; unsecure locations; instable political situation; lack of funds for projects; withdrawal of some funding sources because of the financial crisis; and the fact that UPA is just a coping/survival strategy for many urban gardeners that give up once they find a “real” job.

No special attention is paid by extension agents in Sarajevo region to urban gardeners. That is in line with what was pointed out by the FAO (2001). In fact, UPA is hardly ever recognized as being an important subject by extension agents. Extension services for UPA - that are extremely limited to not existent - can help urban producers - through training, education, communication and community organization - to select appropriate crops, achieve integrated pest management, use efficient production and water management technologies, add value to their production through processing, schedule production, improve harvesting techniques while ensuring food safety, etc. They can also help coordinating inputs purchase, transportation, storage, credit and marketing. For that extension staff need a sound necessary background theory and multifaceted practical skills (FAO, 2001).

UPA can not be developed without conducive land use and allocation policies. The development of UPA depends on policies for managing urban areas and coordination and information sharing among authorities dealing with agriculture, forestry, parks and gardens, public works, transportation, urban planning, etc. Municipalities should formulate and implement urban development policies that take into account the need to dedicate areas for UPA.

The main requirements for planning and implementation of UPA are awareness raising, creation of a municipal institutional framework, and identification of stakeholders, main constraints to agriculture and greening, current and potential sites for UPA, and potential cultivation practices (FAO, 2001). In order to integrate UPA in urban area it is necessary to provide a clear policy and new regulations encouraging UPA; to provide incentives to public and private developers to encourage them to include UPA in the new residential and commercial projects; to use public buildings and land for small demonstration

projects; to develop trainings for extension staff, urban planners and producers; to establish partnership with NGOs to develop a culture celebrating local food, etc. Moreover, UPA should be regulated by municipalities and included in urban development plans dealing with political, legal and regulatory issues (Cabannes and Dubbeling, 2003).

Defining a well tuned land use policy means to establish a municipal committee for UPA, and to initiate a process of public consultation involving all relevant stakeholders. The policy should encompass regulatory and legal frameworks, and planning and management tools to pave the way to the development of UPA. UPA should be included in municipal urban development and land use plans. Land use plans should clearly delineate spaces that could potentially be used for UPA and allow an easy and secure access to land suitable for UPA. Apart from land ownership there is a wide range of arrangements that can be applied for insuring an easy access to land by urban producers such as economic and usufruct rent or lease, licensed and unsanctioned farming, and informal agreements (Boland, 2005). Planning and management tools allow the legal and regulatory frameworks to be implemented effectively and efficiently. It is important to register urban agricultural land. Geographic Information System (GIS) use can allow improving land use monitoring (Cabannes and Dubbeling, 2003).

Urban and peri-urban agriculture bring about many benefits to urban dwellers in Sarajevo region especially the poor and food insecure ones. As a matter of fact, economic crises result in rising food prices, declining real wages, and cuts in food subsidies due to reduced public expenditure. In these situations the urban poor frequently resort to informal livelihood activities including urban agriculture.

Urban agriculture offers the potential to play a significant role in food security. UPA has been recognized as a stepping stone for building an asset base and for investments in other activities related to agriculture but also as a key instrument for development. It is a source of economic growth and employment and a tool for food security and natural resources management (Tawk, *et al.*, 2011). UPA may be regarded as a multifunctional undertaking, which not only produces food but also provides landscape and environmental services. It guarantees that territorial land is properly managed and relations between the town and the countryside are maintained (Rejeb, 2011).

Agriculture, rural and urban, is by definition multifunctional, producing food while at the same time providing other goods and services (Antonelli and Lamberti, (2011). In urban and peri-urban areas, amenities and positive externalities can be used to develop very fruitful relations between the city and the cultivated areas, where production is associated with other areas of interest to the community: protection of the environment, inclusion of marginal groups, promotion of local culture, or provision of leisure and educational activities. In this sense the shift towards multifunctionality in agriculture would offer an opportunity to develop a single sustainable agro-urban area (Pascucci, 2007).

UPA can be made to perform functions of common interest other than food production. The activities it gives rise to are often enriched by new forms of social relationship between farmers, citizens and economic operators, who come together in a way of life in which environment protection, food safety, and local culture promotion, as well as

marginalised or deprived community social strata integration are of fundamental importance (Antonelli and Lamberti, 2011). Ellis (1998) argues that urban farming represents an important opportunity for women to be part of the informal economy of a city.

UPA contributes to addressing key urban challenges such as poverty, social exclusion and food insecurity. It also helps cities to improve the urban environment and become more resilient by: reducing vulnerability, maintaining green open spaces and enhancing vegetation cover in the city, reducing energy use and greenhouse gas emissions by producing fresh food close to the city, and fostering decentralized reuse of wastewater and composted organic waste (De Zeeuw, et al., 2011).

Agricultural production in and around cities reduces food transportation costs, and can improve access to fresh food, thus reducing vulnerability of the poorer groups in cities, while also improving the general urban ecology and environment (Hopkins, 2008). UPA can increase the resilience of the urban poor to external shocks by buffering the adverse food security and income effects of crises and economic upheavals thus contributing to food security, nutrition and livelihoods (FAO, 2012). Urban agriculture fosters also processes of technological, organisational and institutional innovation (Adam-Bradford, et al., 2009).

For fostering UPA development in Sarajevo region, thus bringing about all the above-mentioned benefits, respondents recommend to raise interest of local community in UPA and to provide better financial support and technical assistance to urban gardeners. It is also necessary to have more NGOs dealing with UPA. Improving and strengthening cooperation with local authorities, especially municipalities, is crucial.

Castillo *et al.* (2013) identified seven barriers to urban and peri-urban agriculture in the greater Chicago metropolitan area as perceived by urban planners and farmers. These are, taking into consideration the results of this exploratory study, valid to a large extent also in the case of Sarajevo region. All seven perceived barriers involve unclear or agriculture-unfriendly regulations governing urban and peri-urban agriculture: lack of clear, agriculture-inclusive ordinances; zoning that makes agriculture a special use; limited access to land; high costs and lack of funding; lack of farmer training and certification; limited access to water; and difficulty to find appropriate insurance schemes and products.

The absence of initiatives and suitable policies and strategies dealing with research, extension on and resources for UPA means an increasing abandonment of existing urban agricultural lands which hinders food security and resilience. Legislation that supports nascent UPA organizations and their entrepreneurial activities is much needed as well as immediate restrictions of the re-zoning of agricultural land for non-agricultural use and the development of informal housing in or near agricultural areas. Facilitating integration of urban agriculture in urban policies and programs, building capacity among local authorities and other local stakeholders and facilitating multi-stakeholder policy making and action planning is crucial (Tawk, *et al.*, 2011). Governments and city administrations must recognize the opportunities offered by UPA to improve urban food security and livelihoods by adopting policy responses that better integrate agriculture into urban development (FAO, 2012)

Pollution; mainly that produced by road vehicles; may hinder the effort to upgrade urban gardeners' knowledge, capacity and behaviour thus standing in the way of improving urban gardens quality. The future of urban agriculture and growers depends on the ability of the local governments and institutions to define and implement effective policies to reduce the negative effects on the food supply chain (Antonelli and Lamberti, 2011). In fact, urban agriculture emphasises the use of space-confined and low-space technologies and local resources to minimise health and environmental risks (Adam-Bradford, *et al.*, 2009).

A series of 'best bet' recommendations have gradually evolved as policy measures at local and national level of high relevance to the development of sustainable UPA. These aim at facilitating optimal benefits while preventing or reducing any associated risks (De Zeeuw, *et al.*, 2011; Dubbeling and de Zeeuw, 2007).

## Conclusions

Urban and peri-urban agriculture (UPA) can bring about sustainable social, economic and environmental benefits to urban areas and dwellers in Sarajevo region. Evidence shows that UPA can contribute as well to inter-ethnic reconciliation in the post-war Bosnia in general and Sarajevo region in particular. Therefore, for insuring its long-term development, legal, legislative and regulatory framework should be improved; governance should be upgraded by designing and implementing strategies and policies using a multi-stakeholder approach involving all key actors at State, Entity and municipality level; and the role of extension and advisory services in promoting UPA should be fostered.

Extension agents should advise urban producers on the use of appropriate small-scale and intensive production methods and techniques and GAPs and also on how they can reduce the negative impacts of their activities on their urban neighbours and the urban ecosystem mosaic as a whole.

UPA can not be developed without conducive and enabling land use policies and regulations and frameworks facilitating access to and securing use of urban spaces for agricultural purposes. Municipalities have a crucial role to play from this viewpoint. In fact, apart from providing urban gardening associations with land municipalities should also provide financial support and technical assistance especially after the withdrawal of many donors and international organisations from Bosnia in the context of the global financial and economic crisis.

UPA development requires a transition in attitude and behaviour of all involved actors especially urban people and local policy makers; which can be promoted by enabling policies and conducive regulations. These policies should be developed in a participatory and inclusive way involving all relevant and influential actors. Urban gardeners should be involved in consultations and roundtables, organized by public institutions, and capacity building activities and trainings, organized by civil society organizations.

To our knowledge – despite its exploratory character and nature - this is one of the rare studies regarding urban agriculture in Sarajevo - that represents a peculiar post-war

context - which tries to adopt a multidisciplinary approach by highlighting the main social, economic and environmental impacts of UPA taking into consideration the opinions and perceptions of urban gardeners.

However, in order to get more insights about the multifaceted impacts of urban and peri-urban agriculture as well as the policy and regulatory interventions and instruments that can foster its development in Sarajevo region more extensive field studies involving a larger number of stakeholders are necessary.

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