

**SUSTAINABILITY CHALLENGES IN METROPOLITAN  
FARMING: FROM MULTI-FUNCTIONALITY TO  
ORGANIC. A SHOWCASE OF BUCHAREST  
METROPOLITAN AREA**

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**ABSTRACT**

The continuous population growth and built-up areas expansion requires an increasing urban demand for goods and services and a high pressure on land resources. As a result, farming adaptation around cities in a multifunctional way is a must in their effort to reach resilience, sustainability and food security. In Romania, agriculture in metropolitan areas is still dominated by small family households owned by undertrained aged people, practicing subsistence agriculture, most of them with little financial resources. Thus, the paper aims to identify and analyze the ways multi-functionality can contribute to sustainable farming by addressing some of the key sustainability solutions in southern Romania (i.e. Bucharest Metropolitan Area) – a region characterized by extended and fertile agricultural land resources, significantly transformed during the post-communist period through land abandonment and fragmentation, but also by land concentration and grabbing to the detriment of traditional farming. By combining quantitative (spatial and statistical analyses) and qualitative (questionnaires & interviews to key actors) approaches, the authors pinpointed critical issues of metropolitan farming (e.g. type of agricultural activities, agro-support services, urban pressures, market access, networking, survival strategies) to support sustainability.

**Keywords:** *metropolitan farming; Bucharest Metropolitan Area; sustainability; multi-functionality; COVID-19*

**INTRODUCTION**

The continuous (sub)urbanization processes are associated with a substantial increase in food demand, which is more likely to further grow in the next half of century when most of earth's population will be prominently urban [1] or urban dependent. This progress has been generally developed in relation to some global imperatives such as climate change mitigation, more equitable economic models or health concerns, placing urban agriculture at the centre of the public discourse [2] and rising the interest and attention in many academic and practical fields [3], [1]. This unprecedented dynamics has raised serious questions related to the food chain,

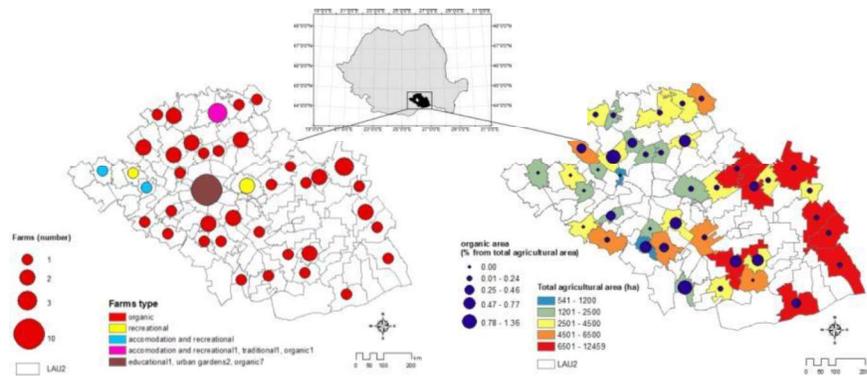
from production and processing to transport and consumption [3]. As a result, the pressure on land resources has increased especially at city fringe where the mix of heterogeneous landscapes is the result of the high degree of land use transition and conversion in favour of urban uses and the existence of idle and marginal open spaces [4], [5]. This calls for the adaptation of farming around cities (i.e. metropolitan areas) in a multifunctional way in their effort to reach resilience, sustainability and food security. In order to produce sustainable urban food one has to consider all pillars of sustainability i.e. environmental, social and economic progress [1]. State-of-the-art narrative of sustainable farming often includes "multi-functional", "organic", "ecological", "resilient", "community-based" etc. among its guiding concepts [6], [7] to achieve the SDG 2 (to end hunger, achieve food security and improved nutrition and promote sustainable agriculture), SDG 11 (to make cities and human settlements inclusive, safe, resilient and sustainable) and SDG 12 (to ensure sustainable consumption and production patterns) of the 2030 Agenda for Sustainable Development. Two complementary concepts - "sustainability" and "multi-functionality" - have developed in response to the consumption-oriented requirements of the urban and metropolitan farmers to provide a useful framework to acquire appropriate knowledge on metropolitan agriculture, to be applied by planners in real situations [4], [5], [7], [8].

In Romania, agriculture in metropolitan areas is still dominated by small family households owned by undertrained aged people, practicing subsistence agriculture, most of them with little financial resources. Moreover, the onset of the COVID-19 pandemic has revealed gaps and inconsistencies in the relationship between producers/farmers and consumers which had primarily affected the producers (small farmers, in particular). In this context, Romanian small farmers and landowners need to learn how to implement and/or further develop multi-functional farming techniques in a sustainable way by making use of the best practice examples, state-of-the-art research findings, policy guiding etc. National and European (Common Agricultural Policy-CAP) agricultural policies have undergone changes towards sustainable farming. For instance, the post-2020 CAP includes, among its 9 objectives, activities to support climate change action, environmental care and preservation of landscapes and biodiversity ([https://ec.europa.eu/info/food-farming-fisheries/key-policies/common-agricultural-policy/future-cap\\_en](https://ec.europa.eu/info/food-farming-fisheries/key-policies/common-agricultural-policy/future-cap_en)), which could be achieved by practicing sustainable agricultural practices, i.e. organic farming, in the continuous process of "greening" the CAP [9]. In response, Romania can successfully use organic agriculture to support sustainable development of rural areas, as they provide favourable conditions for large-scale production [10], [11] and quality products for the nearby urban markets.

Within this broader context, the current paper intends to identify and analyze the ways multi-functionality can contribute to sustainable (metropolitan) farming, with a focus on organic farming, by identifying some of the key sustainability solutions in the most dynamic urban-rural system in Romania - Bucharest Metropolitan Area.

## STUDY AREA

Bucharest Metropolitan Area is located in the Romanian Plain (southern Romania), acting as a complex urban-rural structure made up of one core city (Bucharest) and over 100 administrative units (LAU level) with over 2,500,000 inhabitants on a surface of nearly 531,292 hectares. The study area is characterized by extended and fertile agricultural land resources (mainly arable with over 70%) as a consequence of its favourable geographic, social and historical conditions. During the post-communist period, it has been significantly transformed through land abandonment and fragmentation, but also by land concentration and grabbing to the detriment of traditional farming. Currently, the total arable area is of 367,722 hectares. The growing demand for organic products, but also the need for recreation and leisure of the urban population has led to the adaptation of farmers in the peri-urban area in terms of diversification or multi-functionality of farming to meet the population needs. As such, in the Bucharest Metropolitan area the following functional types of farms have developed: 49 organic farms, most of them specialised in cereals, oil plants and vegetables; 3 tourism-based farms (accommodation and recreational services); 3 recreational farms; 2 educational farms and 2 urban gardens (Fig. 1). Overall, 424 hectares are cultivated organically (0.12%) of which 175 hectares are under conversion to organic farming (Fig. 2).



*Fig. 1 Multi-functional farming activities in the Bucharest Metropolitan Area. Types of farms*

*Fig. 2 Organic area (% of total agricultural area)*

## METHODOLOGY AND DATA

The research methodology mainly relies on actor-oriented approach that has the ability to analyze the food supply chain and the role of multi-functionality around cities. This approach focuses on the analysis of multi-functionality and sustainability of agriculture considering the farm and the farmers as units of analysis. To achieve the proposed goal the authors use quantitative (geospatial, statistical, published sources) and qualitative (interviews, questionnaires) data, available or provided by the: National Institute of Statistics (Census Data, TEMPO-Online Statistical Databases, Farm Structure Survey); ESRI Romania (geospatial data); Ministry of Agriculture and Rural Development; Inspection and Certification

Bodies of Organic Operators; Interviews & Questionnaires with all involved actors. The statistical data was collected at local administrative unit (LAU) level. Qualitative data collection methods include document analysis and participatory research via semi-structured interviews and questionnaires (open-ended and closed-ended questions) with organic farmers. Out of the total of 49 organic farms located in the study area, 22 farms/farmers have agreed to participate to the current survey. By combining quantitative (spatial and statistical analyses) and qualitative (questionnaires & interviews to key actors) approaches, the authors will be able to identify critical issues of metropolitan farming to identify the best models to support sustainability.

Most small organic farmers in Bucharest Metropolitan Area are young people with higher education who have moved from city to countryside in order to have a healthier life. Initially, these people had cultivated vegetables on small parcels for self-consumption, then started selling the surplus, first to friends and then door to door through the internet. The delivery is done personally, by courier or in local market in the town, in some days, from where the customers come to take the products, based on a prior phone or online order.

## RESULTS

The complexity of multi-functional farming has already been addressed in literature e.g. [4], [5], [7], [8], yet almost unanimously agreeing upon the environmental, social and economic benefits through the functions and services they provide: e.g. recreation & leisure, food security and safety, healthy and organic products, job opportunities, farm-based tourism. Organic farms, in particular, are an important part of multi-functional agriculture [4], [8], [12], a model for sustainable agriculture practices [12] and an alternative for the survival, stability and development of small farms, guaranteeing socio-economic and environmental sustainability. Moreover, it is highly appreciated by urban residents, being at the same time another approach to environmental oriented farming [4]. Hence, the key benefits of organic farming are way contributing to sustainable farming through the activities and services they provide (environmental benefits, in particular), then the multi-functional (Tab. 1).

*Table 1. Key benefits of multi-functional and organic farming*

Benefits		Multi-functional farming	Organic farming
<i>Environmental</i>	Energy saving	-	i
	Organic waste recycling	-	i
	Biodiversity	-	i
	Land use saving	i	i
	Landscape protection	i	i
	Climate change resilience	-	i
	Healthy food provision	-	i
	Herbicide and pesticide use reduction	-	i
	Soil and water protection	-	i

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<b>Social</b>	Psychological/Spiritual health	i	-
	Job opportunities	i	i
	Visual amenities	i	-
	Education	i	i
	Leisure	i	-
	Food Security improvement	i	i
<b>Economic</b>	Energy cost minimization	i	i
	Community economic growth	i	i

i – positive; - - neutral

Adapted after: [1], [3], [4]

The interviewed farms were generally organic (specialised in vegetable, cereal, legume, dairy), conventional, mixed or specialised (e.g. leisure, didactic, adventure). The key identified issues refer to both intrinsic, but more to extrinsic factors which were grouped into several categories: the agro-support service, urban pressures, market access, needs, networking, survival strategies and the COVID-19 pandemic resilience (Tab. 2).

The agro-support services, as perceived by the interviewed farms, were considered insufficient or irrelevant. Small farmers (organic or traditional) are characterized by a poor organization which leading to limited access to markets. In the absence of critical supporting functions – such as infrastructure and service provision – farmers struggle to shift from subsistence to more productive agriculture. Thus, there is a need for an active involvement of local, regional or national authorities in providing agro-support services to small producers in order to associate/to create groups of producers for improving, first of all, of raw materials transfer from producer to processor, distributor and consumer.

The location within the metropolitan area of Bucharest has made farmers identify the continuous urban pressure (i.e. urban expansion/sprawl) as a growing threat to the agricultural land resources, the first to be consumed as land resource in the urban sprawl process. As a result, the farmland is under pressure of being converted, reduced or lost, fragmented, while farmers had to adapt their practices in terms of changing of crop structure, farm types (e.g. organic, leisure, didactic farms) etc. [14].

In the general context where the food consumed in urban and rural areas is, to a large extent, imported from other parts of the world [14], the interviewed farmers pinpointed their reduced capacity of entering the market because of the competition with the "low quality" foreign products which come at lower prices. Generally, the market delivery is more oriented to small groceries, specialised markets, home delivery, than the large chain supermarkets.

Among the identified challenges, farmers acknowledged as the most important: the lack of advice and guidance, the limited funding, the large bureaucracy, limited access to the wider market. Organic farmers are facing particular challenges related to crops damaging, since they are not using chemicals the products "*have a shorter shelf life than conventional food*" and there is no official information available on this issue, "*nothing is centralized at the country level*". As the "*pests are becoming increasingly damaging each year*", they are using natural treatments, "macerated,



aromatic plants" as pest repellers and "sheep and/or cow manure" as fertilisers. There is limited access to improved seeds (e.g. drought-tolerant, pest-resistant): *"we get our own seeds from previous crops; we also make our own seedlings"*.

The needs identified by both multi-functional and organic farmers are generally related to the market access, support for resilient (seeds) crops, support and assistance in case of crops damage (e.g. drought, pests), the limited specialised labour forces, especially for organic farming.

Networking is a critical issue especially when referring to small farmers. It provides support and assistance to overcome most of the identified challenges and meet their short-and long-term needs [15]. The questioned farmers work individually, without being part of an agricultural association or other type of networking which is partly affecting their market access and their adapting capacity in case of extreme weather events (e.g. drought, heavy rainfall, hail) or prices volatility.

Apart from the fact that networking itself is among the key surviving strategies for small-farm businesses, the questioned farmers stated that they adapted their business to provide additional revenue from food processing *"tinned vegetables, jams, everything that is seasonal"*. Also, unsold products are often canned or frozen. Multi-functional agriculture per se, though the variety of functions it engulfs, has the capacity to easily adapt to both to urban market demands and potential economic challenges.

When discussing the impacts of COVID-19 pandemic in the study area, the immediate effects have revealed a strain on food supply chains due to the limitations related to the distancing between producers/deliverers/consumers, safe transportation, access to open markets etc. The non-agricultural (e.g. leisure, tourism, didactic) component of multi-functional farming has been mostly hit, especially during the lockdown, but also afterwards.

Social distancing measures have significantly limited farm visits, farmers' access to open markets and involved additional costs related to sanitation. Organic farmers, which regularly have an established clientele, managed to keep close contact and extend the door-to-door delivery. Although they had to close the grocery stores (where existed), *"the deliveries increased, the requests were many, I had to refuse some customers"*. In addition, *"new customers have appeared compared to the ones we had"*. The lockdown period, in particular, determined a larger number of customers to choose the home delivery, a practice maintained hereafter. Overall, the questionnaire survey has revealed that organic farming was/is more resilient during the COVID-19 pandemic despite the mono-functional profile. Due to the constant and selected clientele and the *"same delivery method, at the customer's home"*, they manage to better cope with this crisis.

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Table 2. Critical issues of multi-functional and organic farming in Bucharest Metropolitan Area

Critical issues of metropolitan farming		Multi-functional farming	Organic farming
Agro-support services		short supply chain; inclusion of small farmers in decision making process; assisting of European grants beneficiaries	the lack of coherence of policies, insufficient subsidies and late payments
Urban pressures		land fragmentation, threat to agricultural land	threat to agricultural land, environmental pollution
Market access		limited access to local markets	less competitive products compared to the conventional; shorter shelf life; limited sales market
Needs		support for market access; lack of advice and guidance; bureaucracy	access to improved seeds; support for market access; low resilience to crops damage; specialised labour force
Networking		advice and support for people who live in or manage peri-urban land for primary production, biodiversity or lifestyle goals	partnership and networking programmes to link farmers/producers-researchers-stakeholders-consumers
Survival strategies		multi-functionally inside the farm	food processing; selling other goods, other than farm-grown
COVID-19 pandemic	challenges	no/limited farm visits; restricted farmers' access to open markets; closed the grocery stores (where existed); additional sanitation costs	additional sanitation costs; no/limited access to open markets
	resilience	online platforms initiated by volunteers; door-to-door delivery (where the case)	door-to-door delivery; maintaining close contact with regular costumers; empirical online platforms initiated by volunteers and social media advertising

As a result, the critic challenges of multi-functional and organic farming in Bucharest Metropolitan Area are quite complex, ranging from the impact of policy-related issues (e.g. agro-support services, strategies) to the spatial and functional process taking place in the urban-rural fringe and even the current issues, such as the impact of the COVID-19 pandemic (Tab. 2). With slight differences, they are all affecting both multi-functional and organic farming in the study area.

## **CONCLUSION**

Multi-functionality is a key characteristic of urban, peri-urban and metropolitan agriculture since it is trying to make most of the agricultural space inside and outside the city limits, which due to the proximity to the city, has particular features related to size, fragmentation and use/functionality - generally dictated by the urban needs. In response to providing sustainability farming inside and around cities, organic agriculture seems to be one of the generally agreed types of multi-functional agriculture.

The proximity of the Capital-city and the increasing demand of the urban residents for quality products and outdoor activities have also influenced metropolitan agriculture by opening the door to a new mixture of land use – agricultural practices – recreation leading up to a variety of types and functions. As a result, multi-functional farming in Bucharest Metropolitan Area is the expression of the diversity of functions and services (e.g. organic, leisure, didactic) driven by the demand and supply coming from the consumers and the producers (here farmers). Organic farming, in particular, is the greatest contributor to sustainable agriculture. However, this research has revealed an increased interest of Bucharest residents for organic products. The strong support of the post-2020 CAP to key components of sustainable agriculture (e.g. organic farming, biodiversity conservation, climate change) will provide the knowledge and the financial support for effective farm management and the supply of quality food products for urban residents, in particular.

In order to meet the identified critical issues of multi-functional and organic agriculture (e.g. urban pressures, market access, networking, survival strategies), supporting the food pools within and around important food consumers (i.e. cities) has become a critical concern when trying to achieve resilience and food security in urban and metropolitan areas.

## **ACKNOWLEDGEMENTS**

The current research was carried out under the project "The geographical study of man-environment relationships in metropolitan areas", made under the research plan of the Institute of Geography, Romanian Academy.

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