# Urban agriculture: an opportunity for farmers? A Swiss case study

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**Abstract**

**Interest in urban agriculture (UA) has considerably increased during the last decade. Research has shown that UA can have several positive impacts on the social and environmental health of a city. Increasingly, the question of the role of professional farmers is raised. The Food Urbanism Initiative (FUI; see www.foodurbanism.org/lausanne) explicitly looks at this via its use of Lausanne, Switzerland as a case study site. In the first phase, the research team assessed the population's attitude towards UA by means of a public survey. It concludes that although UA is not the most important publicly perceived urban issue, it is well supported. Presently, the case study work includes the assessment of the existing physical opportunities and the possible various typologies of urban farming that could apply to the site. Current research is investigating the potential of urban farming for professional farmers. Additionally, the success of a series of city initiated pilot projects (micro community plots/plantages, traditional family gardens, sheep keeping and the pedagogic farm of Rovéréaz Domain) reinforces the importance of UA and its implementation via diverse methods. However, the FUI Lausanne urban analysis so far indicates that although there are many potential sites for UA, many of them are small, privately-owned, and disconnected parcels. There are serious constraints for traditional professional farming in urban areas as far as economic and agronomic aspects are concerned, leaving agricultural production in urban areas to be tended by urban "gardeners" or quasi-professionals. Principal issues concern both the legal limits to professional farming and restrictions related to the scale of a successful agricultural operation. Urban and peri-urban farmers may have increased opportunities for commercialisation and partnerships with urban population. Consequently, the FUI challenge is to find the most applicable array of realistic UA project typologies while at the same time doing so with an expanded notion regarding the future role of professional, semi-professional and "hobby" farmers.**

## INTRODUCTION

Interest in Urban agriculture (UA) has considerably increased, particularly during the last decade. 65% of the world total population is expected to live in urban areas by 2025. The main drivers are the rapid urbanisation, increasing urban poverty linked with food insecurity. UA is more and more acknowledged as being multifunctional, with great potential for increasing urban quality in many aspects such as food security, nutrition and income. In Northern economies particularly, other potential benefits as social integration, ecology, health and even aesthetic are being studied.

In northern countries, city governments are beginning to give weight to the movement. The City of Toronto already has a commercial food production plan (Toronto food policy Council. 1999). Chicago, Tokyo and Atlanta now mandate that a percentage of all new buildings have roof gardens. There are more and more studies about impacts of urban agriculture, new forms of production and potential for self-sufficiency.

Switzerland's interest in UA also increases. The national research programme «New Urban Quality» aims at (further) "developing concepts and strategies for new urban quality and testing the feasibility of the research findings" (www.nfp65.ch). The concepts are to include an interdisciplinary approach. The Food Urbanism Initiative (FUI; www.foodurbanism.org) is one of the five accepted projects. The focus of the FUI is the influence of agriculture on urban design, and in particular new architectural and landscape-planning strategies to integrate food production, processing, distribution and food consumption in Swiss cities. FUI specifically aims at improving urban life quality by creating green areas that produce food using a case study: Lausanne. This town is located in the French part of Switzerland and is the fourth largest town of the country with approx. 130'000 inhabitants. There is a twice-weekly market where peri-urban and rural farmers and retailers sell food. Lausanne also has quite a long tradition in integrating two types of urban family gardening. The first type consists of family gardens of 100 to 300 $m^2$, totalling 11 ha. They were created by rural migrants who needed to complement their nutrition in the beginning of the $20^{th}$ century. The second is a more recent and public initiative named "plantages". These consist of much smaller plots, between 6 and 48 $m^2$, situated in densely populated areas and account for 10 ha in total. They are limited to those living less than 5 minutes away from the plots. Altogether, green surfaces account for 40% of Lausanne's total surface. Lausanne and its area are also pioneers in terms of contract farming. Although there are no detailed statistics, currently there exist approximately 33 initiatives in the French part of Switzerland (www.uniterre.ch) with production occurring in rural and in peri-urban areas though.

Several questions are being raised in this study. What could be the expected urban quality improvement? Does it depend on specific types of agriculture? What are the urban citizens expecting from UA? What should be produced? Who should produce? What is the role of the farmers? What kind of farmers? The latter is the main issue that is developed in this paper. The assumption is that understanding the various types of urban producers will greatly contribute to formulate recommendations for local authorities, NPOs promoting UA, but also those wanting to enter UA. Several typologies have been proposed (Bakker et al., 2000; Smith et al., 2004; Moustier and Danso, 2006; Community Food Security Coalition, 2003). None have been proposed with the aim of looking at their economic potential and motivation. As interest for UA is increasing, this might induce the impression that UA might have potential for professional farmers as suggested by Niwa (2009), based on her work in Tokyo.

This paper aims at evaluating the potential for Swiss "conventional" farmers for entering urban farming by characterising urban farming producers and applying it to the town of Lausanne. It first describes the methodology chosen for FUI in general and for the typology of farmers in particular. The results are then presented. Existing professional farmers are not likely to enter urban food production in the short-term, but are already actively marketing in

the city. This paper concludes that in order to make wide-spread progress in UA, the Lausanne municipal authorities in addition to the regional (cantonal) authorities must formulate specific policies clearly stating the role and the status of existing professional and "new" farmers in urban agriculture and that such framework must fall in line with the federal agricultural policies. In the meantime, entrepreneurs and active citizen in favour of UA have begun to formulate such changes by already defining the UA "terms of engagement".

## MATERIALS AND METHODS

FUI is an initiative and an applied research project. Its interdisciplinary team consists of four different institutions working on agricultural and socio-economics, agronomy, architecture, landscape architecture, urban design and IT-design. FUI has foreseen three main phases. The first phase aims to identify the public opinion with a survey, to establish agronomic criteria and to evaluate the production and urbanistic potentials. The objective of the second phase is to analyse and visualize prototypes and to identify possible sites for these prototypes. Finally, in the third phase, the focus lies on modelling and evaluating proposed pilot projects and developing guidelines for UA stakeholders that are replicable.

The question of opportunities for farmers in cities, in particular Lausanne, is analysed using a socio-economic typology of the UA production units. Characteristics such as producer objective, required up-front investments, required competencies, legal requirement at production and/or commercialisation levels, etc. are investigated. Interviews with relevant stakeholders and a literature review complete the table. This case study is based on a review of Lausanne's policies, laws, regulations and planning documents related to urban food production and commercialisation.

This study defines urban farmers (UF) as any individual producing fruits and/or vegetables within urban borders. Based on empirical evidence, legal review and the results of a survey done within FUI (Haller, 2011), animal production and UA in glass greenhouses are excluded from this study.

## RESULTS AND DISCUSSION

Table 1 presents the developed socio-economic typology of urban agricultural producers. It shows a continuum in production output. The "guerrilla gardeners" are micro-producers while the commercial growers have larger production units. There is also a continuum with the up-front investment costs. Squatting an empty plot for one season requires paying seeds and watering costs for a few square meters. The cost of building a greenhouse on a building roof for profitable business runs at much higher levels.

The table distinguishes between hobby and social farming, on one hand, and commercial farming, on the other. This division is however not a clear-cut one. First, the incentive to cultivate a family garden might not be cash-income. However, the in-kind income may be very relevant for UFs. A study in Geneva, not far from Lausanne, suggests an in-kind income equivalent between US$ 135 and 1'300 /year (Gigon, 2011). This is similar to another study in the US that found US $ 540 /season (Butterfield, 2009). However, the calculations of both these studies do not include labour. Taking Butterfield's financial and labour data, the remuneration would be less than US $ 5 per hour on average.

The so-called "Guerilla farmers" illegally sew or plant flowers mainly on public soil. They do not harvest. The movement has arrived in Switzerland, but does not seem to be present in Lausanne yet. According to Haller (2011), 52% of the population already cultivate on balconies and 44% are active growers in gardens, own or otherwise, and invest 2.5 hours per week on average. Currently, the city of Lausanne allows around 1'000 individuals or families to enjoy communal gardens directly by cultivating. It is acknowledged that there is a waiting list to get land. The survey in Lausanne (Haller, 2011) also confirms that access to land is the main constraint for engaging in or increase the activity. The authorities plan to

augment the current garden surface of one third (www.lausanne.ch). According to the federal and regional legislation, all non build areas may be cultivated, except for specific green zones. No evidence could be found that this opportunity has been used by hobby gardeners or commercial producers. Investment costs for UF in communal gardens are low. It is limited to individual tools and seedling in the plantages, while it might be higher in gardens. Most of the gardeners in Lausanne, but also in Geneva, are allowed to have a shed, a compost, etc. Glasshouses are rare. 61% of Lausanne population agrees with the proposition that plantages embellish their town (Haller, 2011). Land for these plantages and gardens belong to the commune.

Lately, the authorities, in collaboration with NGOs and professionals, have developed a production charter in part to improve production competencies (www.potagersurbains.ch). Following soil analysis in urban gardens in Geneva and Fribourg, it had been found that soil was over-fertilised and often contained heavy metals (Blanc, 1997; Julien, 1997) thus leading to the formulation of a charter of voluntary nature (www.potagersurbains.ch). There are also tacit rules, such as tranquillity. This might impede the scaling-up of production with agricultural equipment and/or a selling point. Production in these gardens is mainly for personal consumption. No evidence was found that some might put their output together for commercialisation in Lausanne and in other close-by towns. Collective gardening initiatives are mainly of social, integrative and/or pedagogic nature. For example, some of the Steiner's schools have productive gardens and the authorities are currently looking into integrating UA in public schools. EPER, a NPO, has recently inaugurated a garden that is aimed to facilitate immigrants integration. None with a commercial objective could be found in the area.

There is one large garden centre in Lausanne, 6.5 ha, including a greenhouse. It belongs to the city and is used for production of plants for use in the public realm. Commercial nurseries or garden centres are all outside the town borders.

Commercial agricultural producers are defined by federal regulations. They are all located in peri-urban and rural areas. Most of those farms still have a diversified firm, the production of fruits and vegetables being one of their activities. Large scale agricultural production within Lausanne is not forbidden, but would have to respect restrictions about machine use, pesticides applications, odours, etc. Existing commercial transformation and commercialisation activities are possible, but town planning might be of impediment to newcomers. In Lausanne, a farm bought by the city authorities for 35 mio. CHF in 1988 (Roulet, 2010) has been intended to maintain the city's strategic land and open space reserve (www.lausanne.ch). The farm with its 36 ha and 24 cows has not being profitable for around 10 years and its infrastructure is in need of serious renovation (Roulet, 2010). As the current farmer will retire shortly, the authorities are currently looking for alternative scenarios that would include "proximity agriculture", urban gardens and parks. Haller (2011) found that 78% of the population agree with the proposition to rent the farm to another farmer, those being closer to the farm agreeing more strongly than the others.

It should also be noted that current green roofs are not cultivated for food production purposes in Lausanne. The installation of green roofs is costly. Trépanier et al. (2009) made a guess-estimation of US$ 150 to 450+/$m^2$, depending on the type of installation and production (extensive or intensive). No studies have been made if the structure of specific buildings with flat roofs in Lausanne are suitable for UA: weight, access, water, etc. Prices for hobby greenhouse kits range from a few hundred dollars to well over US $5'000, depending on the size, style, accessories, and type of construction materials, land not being included. Adding environmental control features such as artificial cooling and heating or not, hydroponic, aeroponic, energy and water synergies with the building below, seriously add to these investment costs. They also imply specific management expertise to operate them as well as higher operating costs. In Lausanne, only existing glass greenhouses may be exploited. Further development is only allowed in zones affected to greenhouses building. When

considering acquisition for UA purposes, the land price in Lausanne is high. As an example, a plot for construction in town was estimated at 207'000 CHF/$m^2$ in 2006 (www.lausanne.ch).

The table also highlights that moving from non-commercial to commercial production increases legal requirements, moreover when producers become sellers too. Commercial non-agricultural producers are mostly newcomers in agriculture. They do not have a professional agricultural background, often do not have any farming experience and mostly come from urban background. Examples are numerous in big cities in the US, but none could be found in Lausanne or the area. This is a new type of farming that is emerging. These new farmers are mainly creative entrepreneurs investing in new opportunities. Innovation is often the major driver as well as the idea of food security, ecology and social development, next to financial motivations. The aim is to develop systems to produce fresh, high-quality, pesticide-free vegetables close to market. Soilless production is not a barrier. Currently, legal base is lacking and/or unclear.

Other groups of actors were not introduced in the Table, despite their growing relevance, particularly in America. The first group includes non-agricultural entrepreneurs developing, producing and/or supplying agricultural production with inputs and advice. Some are creating new products for food production, such as new production containers (recycled, transportable, size, etc.) and "farming boxes" (www.urbanfarmers.ch). Others may provide services such as delivery, coaching in design and/or production, or even a full UA service (http://harvestmoonfarmers.blogspot.com/). Urban Farm Certification already exists in the US: www.pricoldclimate.org. These entrepreneurs are not producing and their location is not binding to the producing areas, except for those providing the full service. The second group comprises those dealing with UA commercialisation. Among them, there are the peri-urban and rural farmers diversifying their activities with direct selling. According to Porcher (2008), the motivation of those farms in the French part of Switzerland for this strategy is varied, but is always tied with linking producers and consumers. Organisations promoting and managing contract-farming are generally not producing. Haller (2011) found that 56% of the population would prefer being able to buy food produced from Lausanne and its surrounding areas than from elsewhere. 44% would even be willing to pay higher prices for tomatoes produced in their town. The third group of actors consists of high technological producing farms, such as the aerofarms or vertical farms. They do not yet exist in Switzerland.

## CONCLUSIONS

Urban agriculture is booming in cities in western countries as in Switzerland. In Lausanne, popular and public interest is growing. Currently, UA is mainly done by hobby and social producers and the city aims to increase this. There are, however, no current plans for commercial urban farming and/or an urban food policy. The current legal framework does not explicitly favour UA. Existing commercial initiatives may be continued, but new ones might have difficulties to obtain the required authorisations. Income generation is not the first objective of the hobby and social producers. The rare economic calculations suggest that the existing gardens are not economically profitable.

However, the whole UA movement certainly induces a new way at looking at food, food production and agriculture in general. Commercial agricultural production and commercialisation in urban areas will have to be redefined if it is to be scaled-up. The current agricultural legislation does not define urban agriculture. The concern has been to protect family farm-firms on agricultural land from urban growth, allowing them to diversify with food preparation, selling, storage (Etat de Vaud, 2003). The reverse trend is new. In case of increasing urban food self-sufficiency, the profession and probably identity of farmers will have to be re-considered (Darrot and Boudes, 2011). Current new comers in commercial UA seem to have different motivations and way of life than "conventional" farmers. Both types of producers are entrepreneurs, but the perception of their job is very different. Shaping a food

producing Lausanne will require the involvement of a variety of actors. Existing farmers in peri-urban and close-by rural areas, already producing food, should also be involved in the UA debate. Their integration requires social innovation.

The developed typology shows that urban food producers may have very different profiles, strategies and constraints. It also suggests a continuum from those sewing a few aromatic plants to those making a living out of it. Furthermore, it permits to show that the various producers have different motivations for UA. The typology might also contribute analysing impacts of UA on urban quality. Its construction has certainly acted as a dynamic, interdisciplinary and iterative platform for the FUI team.

UA is in demand and represents a great chance for agriculture. Food is a prerequisite for life and pre-occupation for rural and urban populations alike! By bringing closer together urban population and food production, professional farmers may increase recognition and reinforce through demonstration of the multifunctional role of agriculture in society.

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Table 1: Socio-economic characteristics of urban food producers or farmers (UF). Source: Crole-Rees A. and Heitkämper K., 2012.

| Characteristics | Motivation | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Hobby and social | | | | Commercial | | | |
| | ***Types of urban food producers*** | | | | | | | |
| | Guerilla farmers | Micro-producers | Individual meso-producers | Collective meso-producers | Commercial collective growers | Non professional farmers | Entrepreneurs non prof. farmers | Professional agricultural entrepreneurs |
| Soil | Yes | Yes / no | Yes | Yes | Yes / no | Yes | Yes / no | Yes / no |
| Production location | Any open public space (U) | Balconies, boxes, roof (U) | Private plot, own garden (U-P) | Collective plot (U-P) | | Private plots (U-P) | (U-P): Roof, greenhouse, inside buildings | Private land (P-R) |
| Producer | Town citizen | Town citizen, family | Town citizen, family | Town citizen, family | Individuals, family | Individuals, family, firm | Entrepreneur | Farmer |
| Regulations | - | - | NPO | NPO | NPO, cooperative | NPO, private firm | Private firm | Farm |
| Starting costs | Minimal | Low | Low-middle | Middle | Middle-high | Middle-high | Very high | High |
| Output use | None (not harvested) | Personal consumption | Personal consumption | Personal consumption, exchange | Personal consumption, on-farm selling | Personal consumption, on-farm and markets | Urban niche markets | Urban and on-farm markets, retailers |
| Producers' objective | Desire for action, aestethic | Hobby, personal consumption, outdoor activity | Hobby, personal consumption, outdoor activity | Hobby, personal consumption, apprenticeship, etc. | Social, income | Life-style, income | Innovation, income | Income generation |
| Seasonality | Yes | Yes | Yes | Yes | Depends | All-year | All-year | All-year |
| Legal requirements | None | None (green thumb) | Garden charter (green thumb) | NPO by-laws | NPO by-laws, agriculture, commercial | n.a. | Construction, commercial | Agriculture, commercial |
| Public's objective | - | - | Social integration, health, landscape | Social integration, health, landscape | Social integration | | (Urban food policy ) | (Urban food policy) |
| Public support | None | None | Plot availability | Plot availability | Depends on city | Depends on city | Depends on city | Economic |
| Minimal area | < 1 m2 | < 10 m2 | < 300 m2 | | n.a. | n.a. | n.a. | > 20'000 m2 * |
| Lausanne | Yes | Yes | Yes | Yes | No | No | No | (Yes) |

Legend: UF: Urban Farmer; m2: square meter; NPO: Non-Profit Organisation. U: urban; p: peri-urban; r: rural.
* Guess-estimates.