

Contribution of urban agriculture in ensuring a healthy and sustainable food system in the metropolis of Rouen, France

Ouiam Fatiha Boukharta^{1,2}; Loïc Sauvé²; Fabiana Fabri²; Luis Manuel Navas Gracia¹; Leticia Chico Santamarta^{1,3}

¹ Tadrus Research Group, University of Valladolid, Palencia, Spain. Emails: ouiiamfatihasm@gmail.com, luismanuel.navas@uva.es

² InTerACT Research Unit, Institut polytechnique UniLaSalle, Rouen, France. Emails: loic.sauvee@unilasalle.fr, fabiana.fabri@unilasalle.fr

³ International Department, Harper Adams University, United Kingdom, proyectos.gir.tadrus@uva.es

Abstract:

Nowadays, urban agriculture and gardening in cities is increasingly recognized through initiatives such as the Milan Urban Food Pact (MUFP, 2015). Moreover, there is a growing awareness on the part of citizens of the significant and positive contribution that a link with nature can make to our mental health and well-being (Capaldi et al., 2015; Uhlmann et al., 2018). Indeed, urban agriculture is a form of farming that aims to ensure food security, maintain urban ecosystem services and improve the population's quality of life (Boukharta et al., 2024a). The present study focuses on the analysis of two urban agriculture practices in the city of Rouen, France, where an evaluation has been made of the value distribution created by the implementation of these urban agriculture practices, as well as an assessment of the benefits they bring through economic, social and environmental terms. In addition to the benefits, this work analyses the governance structures of these initiatives, in order to identify the feasibility and financing of these urban practices as well as an evaluation of the urban planning and different indicators, that aim and help to implement these projects. The methodology used consists of interviews with stakeholders involved in the operation, including farmers, citizens, project managers, members of the municipality etc., as well as field visits for an analysis and evaluation of each case, where the findings are processed

through an empirical analysis using NVivo software, for its effectiveness in processing qualitative data (NVivo, 2019). The results show that the two social cases evaluated have a common main objective, which is to ensure a better green environment for the city's inhabitants, while reconnecting them with nature and offering them the opportunity to grow their own fresh food and thus improve their health and well-being (Boukharta et al., 2024b). Furthermore, different activities are carried out in the two cases, but in different ways. As far as their governance is concerned, both structures have a well-defined structure that enables them to be well organized and stable, allowing for a better flow and continuity of these urban practices (Halloran and Magid ,2013).

Methodology:

The approach used was to conduct interviews with the stakeholders involved in the operation, in order to gain an in-depth understanding of our problematics. Interviews were conducted with project leaders, managers, farmers, employees and volunteers. In addition, field visits for observation and experimentation were carried out for better analysis and investigation. The two cases evaluated are "Le Champ des Possibles" and "Le Jardin de l'Astéroïde", both located in the Rouen Metropolis (Figure 1).

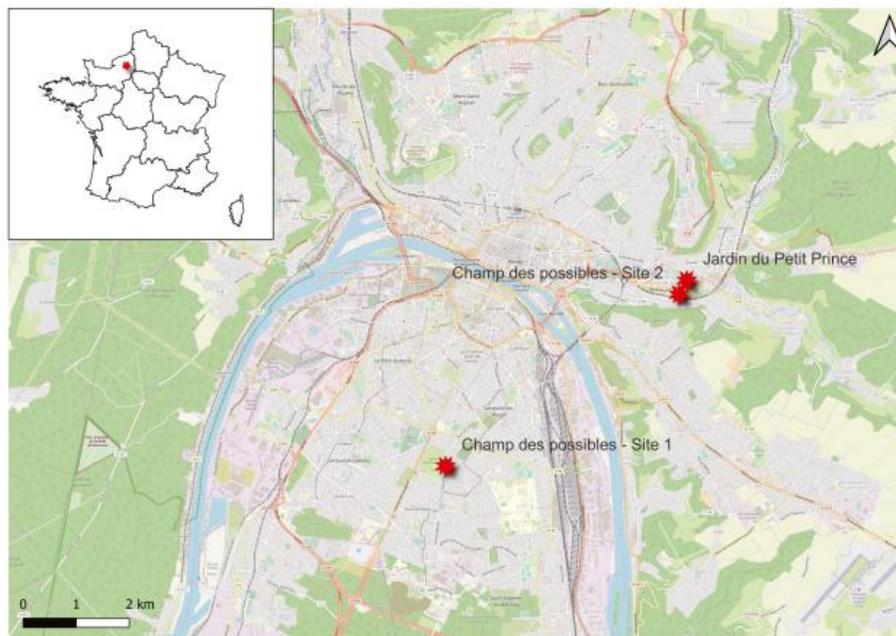


Figure 1: Location of the initiatives evaluated in Rouen using QGIS Software. (Source: the authors)

The first urban agricultural case refers to a community garden where all participants work on the same land and share the harvested products and the second to allotment gardens; where each member has an individual plot to work on his products and harvest them for his own consumption. These two initiatives will be described and presented in greater detail in the "Results" section.

Data collection and analysis

The in-depth analysis used in this investigation is based on the three-pillar approach to sustainability, involving in particular the combined environmental, social and economic dimensions (Bastian et al., 2013), and which is most often used in the field of urban agriculture (Artmann and Sartison, 2018; (John and Artmann, 2024).). For this research study, the steps followed are intended to start with a definition of the research problem and objective, then the formulation of relevant elements and the definition of the hierarchy, and the comparison of results based on responses and other sub-criteria. In order to achieve these objectives, there is first a selection of the case study cities, then of the various stakeholders with whom the interviews were conducted, the design and implementation of the interviews and the conduct of the interviews and analysis.

Results:

1- Presentation of the Cases

Case 1: « Le champ des Possibles »

The first evaluated case is "Le Champ des Possibles" which is a non-profit association that aims to help people eat better by educating them about dietary diversity, food consumption and food processing at all stages, while integrating cooking into their activities. It covers two sites that were previously industrial estates, both located in the Rouen.

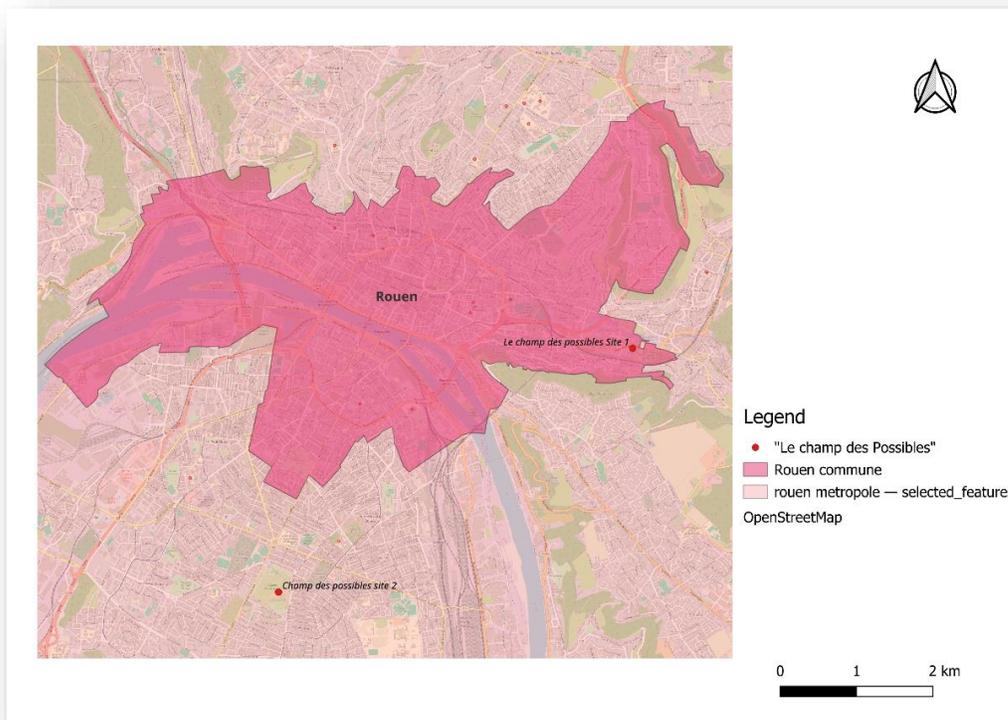


Figure 2: Location of both sites of "Le Jardin de l'Astéroïde" in the city of Rouen and Rouen Metropolis using QGIS Software. (Source: the authors)

The association focuses on the educational and social aspects, where they organize constructive weekly activities and workshops for residents, as well as educational sessions for children. In addition, they apply the "farm to fork" concept, where all the produce harvested from the garden is cooked by the members, in a kitchen they have within the community garden (Figure 3). This helps create social bonds, fraternity and sharing between members, along with the effect it has on people's well-being and self-confidence (Boukharta et al., 2024a).



Figure 3: "Le champ des Possibles" (source: site web: <https://www.lechampdespossibles-rouen.org/>)

In addition to the social, educational and environmental aspects, "Le champ des Possibles" is also promoting an economic aspect, where they sell the seedlings at local markets, on-site, at open days or directly to clients, as well as renting and paying for certain equipment that enables them to make a profit. The interviewees say that this sale "isn't enough to pay an employee", but that it can still help them to have a small economic side to their business.

Case 2: « Le Jardin de l'Astéroïde du petit prince »

The second case evaluated is "Le Jardin de l'Astéroïde du petit prince", an urban garden also located in Rouen (Figure 4), whose focus is on renting individual plots to local residents so that they can grow their own fruit and vegetables. Before the garden was created, it was an abandoned area where cars used to park.

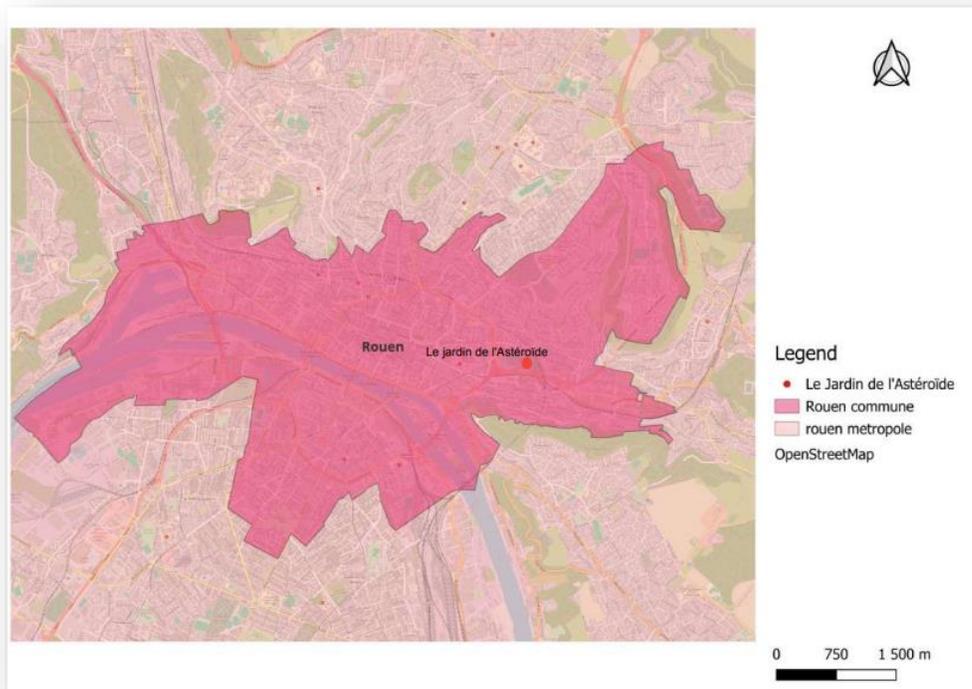


Figure 4: Location of both sites of "Le Jardin de l'Astéroïde" in the city of Rouen using QGIS Software. (Source: the authors)

"Le Jardin de l'Astéroïde" does not organize social or educational activities for external guests. Only members can benefit from the advice of an agronomist engineer who supports them and shares his knowledge, and also members can help each other (obviously each plot has its own owner). Members are not allowed to use chemicals, and composting is generally done by members or other volunteers (Figure 5).



Figure 5: "Le Jardin de l'Astéroïde" (Source: <http://www.jardin-asteroide.fr/>)

The use and consumption of harvested produce is solely for personal use or exchange between members. In fact, each member with a plot has the right to harvest all his or her own produce and use it for self-consumption. Unlike "Le champs des possibles", "Le jardin de l'Astéroïde" does not sell fruit, vegetables, plants, herbs or seedlings.

2- Economical, social and environmental aspects:

When conducting the in-depth interviews, interviewees were asked a number of questions about the social, economic and environmental impacts of their involvement in these projects and the resulting contributions. Figure 6 gives a clearer picture of these three key aspects, drawn from the results of interviews, and where the arrows refer to the link between each aspect to the other.

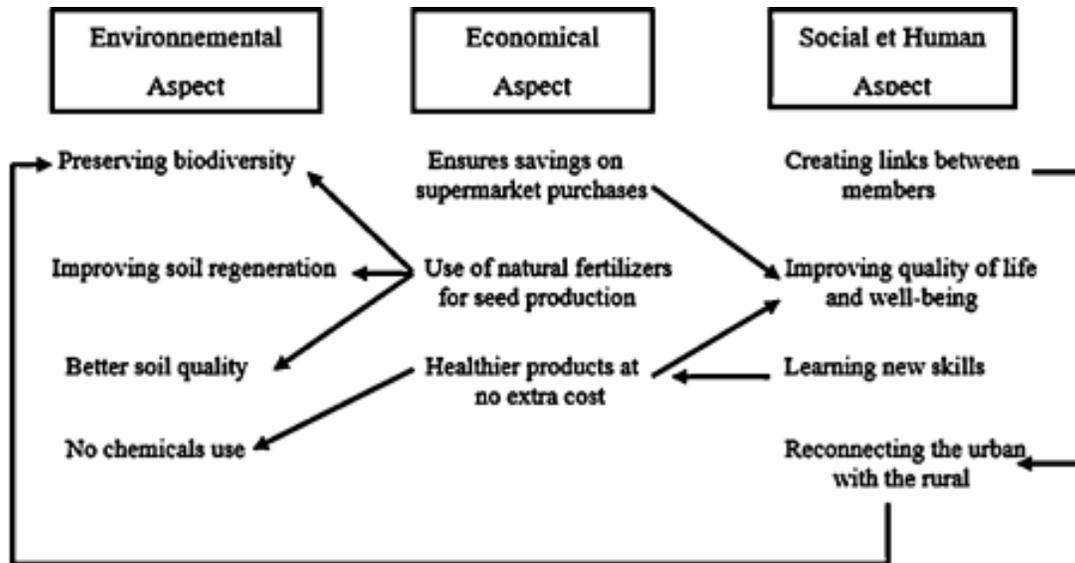


Figure 6: Economic, social and environmental aspects identified from the interviews (Source: Boukharta et al., 2024b, based upon the interviewees responses and further literature research)

Regarding the environmental aspect, both initiatives agree that the use of natural, relatively inexpensive fertilizers for food production helps to improve soil quality while providing better air purification. Another important aspect is the social aspect, which involves creating links between different participants, which will help to ensure good social inclusion as well as reconnecting urban areas with rural areas. The same applies to the economic aspect, which involves making savings on supermarket purchases, thereby improving the consumer's quality of life and well-being. Indeed, all the interviewees agree that their implementation within those initiatives allowed them to improve their quality of life and living conditions.

3- Governance structure and coordination mechanisms

The governance of "Le Champ des Possibles" can be considered a non-profit association, since it carries out its educational and learning activities, while also having a developed economic component. The association is financed by the Metropole and the city of Rouen, as well as by donations from volunteers and participants. As far as "le Jardin de l'Astéroïde" is concerned, it is a non-profit association, as none of the participants has the right to sell the produce. This urban garden currently receives no support from any entity, as they believe that

the annual fees participants pay to rent the plot each year are sufficient. Concerning the organization of the value chain, both entities have a well-structured office consisting of a president, director, employees and interns, and where each employee has his or her own task, but always strives to help the other achieve its goals.

Discussion and conclusion:

Urban agriculture in cities has attracted growing interest due to its potential benefits in terms of socio-cultural development, public health, the environment and the economy (Santo et al., 2016). In this study, we explain that urban agriculture offers various benefits and contributes to our quality of life, health and physical and moral well-being, demonstrating the importance of involving and integrating urban spaces into our daily lives. The case studies evaluated were carried out in Rouen, a metropolitan region whose main objectives are to support the environment and agriculture within cities, in a context of industrial transition. To this end, local authorities are encouraging these projects and increasingly setting up subsidies to facilitate their involvement within cities, with urban agriculture now becoming a key research area due to its relevance to current challenges (Türker and Akten, 2022). What's more, the structure of governance mechanisms is well defined in both cases, enabling initiatives to identify their needs with the state, the metropolis, the towns of Rouen, etc., and thus obtain subsidies and advance their projects, with the aim of creating sustainable, green cities. Finally, the results of the interviews made it clear that there is in fact a ranking of importance between the three pillars of sustainable development, where the economic dimension of urban agriculture was rated as the least important, and which is in line with the work carried out by John and Artmann (2024) and Boukharta et al., 2024b. Indeed, the suggestion would be that the approach to the three pillars of sustainability needs to be reconsidered, bearing in mind that a successful economy and a healthy society depend on a safe environment (John and Artmann, 2024).

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