Assessing the food supply capacity of peri-urban agriculture through a case-study in the Baix Llobregat region

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Introduction

The ratio between urban and rural populations has never been so high. [1] Vast amounts of land are required to support this urban activity. [2] With food consumption being a major contributor to the ecological footprint of cities, peri-urban agriculture plays a strategic role in increasing the sustainability and food supply of urban areas. [3,4] The research is driven by one question: *What potential do peri-urban regions have to provide food for urban areas?*

Objectives		Methods	Limitations
General	**Specific**		
To assess the Food Supply Capacity (FSC) of Baix Llobregat, in the context of sustainability	To evaluate qualitatively the FSC	Selection and assessment of indicators	Indicators with many interactions
	To evaluate quantitatively the FSC	Adaptation of standard ecological footprint methodology [5]	Difficulty in quantifying certain parameters

Study area

Notable regional features:

1. High population-density
2. Regression on agricultural land
3. Economic activity based on industry
4. Presence of Baix Llobregat Agricultural Park (BLAP)

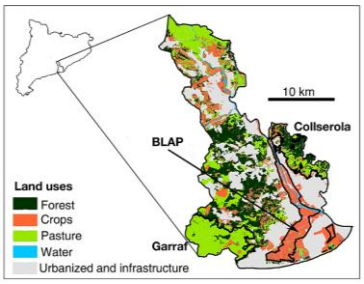


Fig.1. Main land-uses and regions with urban protection in the study-zone.

Fig.2. Productive structure of the study-zone.

Case Study

Qualitative evaluation

Step1: Literature review to identify the main factors affecting the agricultural sector.

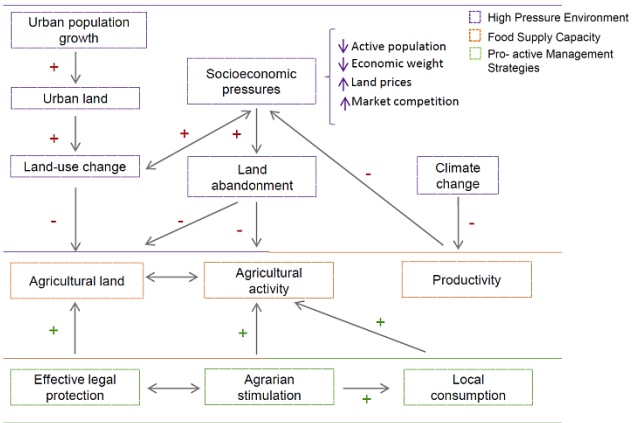


Fig.3. Network of interactions between assessed attributes in the FSC context. +/- means directly/indirectly proportional, respectively. Red/green represents negative/positive effects for FSC, respectively.

Step2: Selection of 48 indicators classified into 22 generic attributes.

Step3: Assess their tendency and global contribution to FSC and sustainability.

Step4: Information contrasted with two regional spheres: Catalonia and the Metropolitan Area of Barcelona.

Selection of studied attributes			Assessment
Agriculture	Agricultural land	Total Organic agriculture Urban protection Land abandonement	▽ △ ● ●
	Socioeconomic aspects	Economic weight Active population Mean land prices Land–use change	▽ ▽ △ ▽
Consumption		Local Organic Correlation local/organic	△ △ ●
Population		Urban Density	△ △
Climate	Climate change effect	Crop production Economic weight	▽ ▽

Trend information:
△ increase
▽ decrease
○ no–trend available
Global contribution to FSC and sustainability:
positive – green color
negative – orange color

Quantitative evaluation

Step1: Selection of indicators – population, agricultural land, crop production, consumption.

↳ Under two premises, assessed indicators must be: **(a)** physically quantifiable, **(b)** able to convert to a biologically productive area.

Step2: Definition of three socioeconomic scenarios.

↳ Valued as pessimistic **(E1)**, moderate **(E2)** and optimistic **(E3)** regarding their contribution to FSC and sustainability.

Step3: Estimation of the possible evolution of indicators in the three scenarios.

↳ Through calculations based on pre-existing models and currently available data.

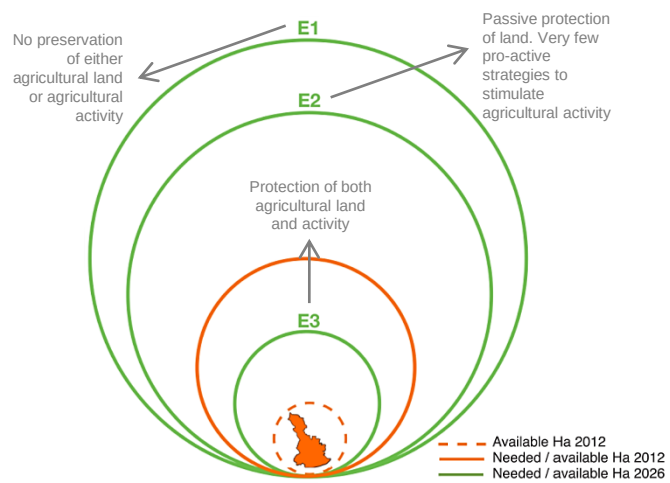
Step4: Estimation of acreage required to supply the quantity of fresh fruits and vegetables consumed by Baix Llobregat residents.

↳ Now (2012) and in the future (2026).

Step5: Considering both, assumptions and limitations of the methodology used to evaluate results.

Step6: Comparison, needed and available hectares.

Available acreage is insufficient to supply local consumption of fruits and vegetables. Differences between scenarios are large.



Conclusions

Baix Llobregat peri-urban agriculture is under great pressure, which threaten its long-term sustainability and FSC.
It is important to promote new strategies that not only protect agricultural land but also recognize farmers and agrarian activity as essential elements for the FSC.

Taking BLAP as a model, these strategies should include a value added to agricultural products, which could increase consumer appreciation, understanding that eating is also an agricultural act.

Although this study has focused on a local perspective, it is important to take its global perspective into consideration: ensuring food provisions to an increasing urban population worldwide. This should be performed based on environmentally-sustainable and socially-fair methods.

[1] UNFPA, 2007. *State of the world population 2007: Unleashing the potential of urban growth.* United Nations Population Fund. **[2]** FAO, 2003. *Food insecurity in an urban future*. FAO Newsroom. **[3]** Roca, A. & Tous de Souza, C. (Coord.), 2013. *Percepcions de l'espai agrari periurbà* **[4]** Paül, V. & McKenzie–Haslam, F., 2013. Peri–urban farmland conservation and development of alternative food networks: Insights from a case–study area in metropolitan Barcelona (Catalonia, Spain). *Land Use Policy*, 30: 94–105. **[5]** Relea, F. (Dir.) & Prat, A. (Real.), 1998. *La petjada ecològica de Barcelona: una aproximació*. Ajuntament de Barcelona.