Gembloux Agro-Bio Tech
Université de Liège

SAPIENZA
UNIVERSITÀ DI ROMA

UNIVERSITÀ
DEGLI STUDI
DEL MOLISE

Cartiaux, N., Mazzocchi, G., Marino, D. (2017)

Improving urban metabolism through agriculture: an approach to ecosystem services qualitative assessment in Rome.

Colloque international: Agricultures urbaines durables: vecteur pour la transition écologique
Session 4: Circular economy, urban metabolism, eco engineering
8 June 2017 – Jean Jaures University, Toulouse

First: let's review some concepts

Urban metabolism

"Urban metabolism is the study of material and energy flows arising from urban socioeconomic activities and regional and gloabl biochemical processes. The characterization of these flows and the relationships between anthropogenic urban activity and ntural processes and cycles defines the behavior of urban production and consumption."

(Fernandez et al, 2017)

Ecosystem Services

Ecosystem services can be defined as benefits that humans get from ecosystem functions

Millennium Ecosystem Assessment (2003)

including direct or indirect contributions to human well being

The Economics of Ecosystems and Biodiversity (2010)

Urban agriculture

"An industry located within (intra-urban) or on the fringe (peri-urban) of a town, a city or a metropolis, which grows and raises, processes and distributes a diversity of food and non-food products, (re-) using largely human and material resources, products and services found in and around that urban area, and in turn supplying human and material resources, products and services largely to that urban area."

Mougeot (2000)

Summary

PRIMARY QUESTION

What is the state of the urban and peri urban agriculture in Rome and its relationship with land use changes (1960 to 2012).

SECONDARY QUESTION

What is the contribution of peri urban multifunctionnal farms in terms of ecosystem services?

Case study of the young farmers in Rome.

Introduction: World's situation

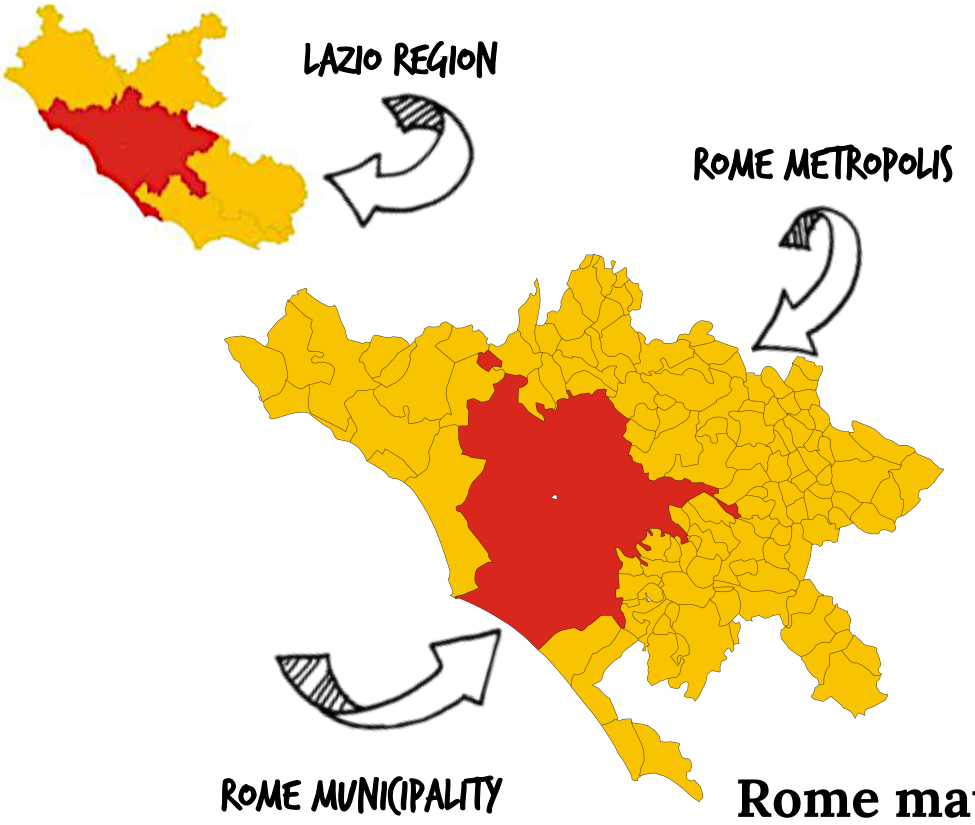
Today half the world-population lives in urban areas and by 2030 nearly 60% is expected to live in cities and towns (Ash et al., 2008)

Cities claim ecosystem support (including waste absorption) that sometimes is 500–1000 times larger than their own area (Folke et al., 1997)

Urban development often occurs in biodiversity-rich areas with cities tending to emerge in areas with high ecosystem productivity (Ljungqvist et al., 2010)

1

Let’s start with an overview of Rome



Rome mapping

1,285 km²
Municipal extension – largest in Europe

753 BC
Old of 2770 years !

2,869,461
Municipal inhabitants

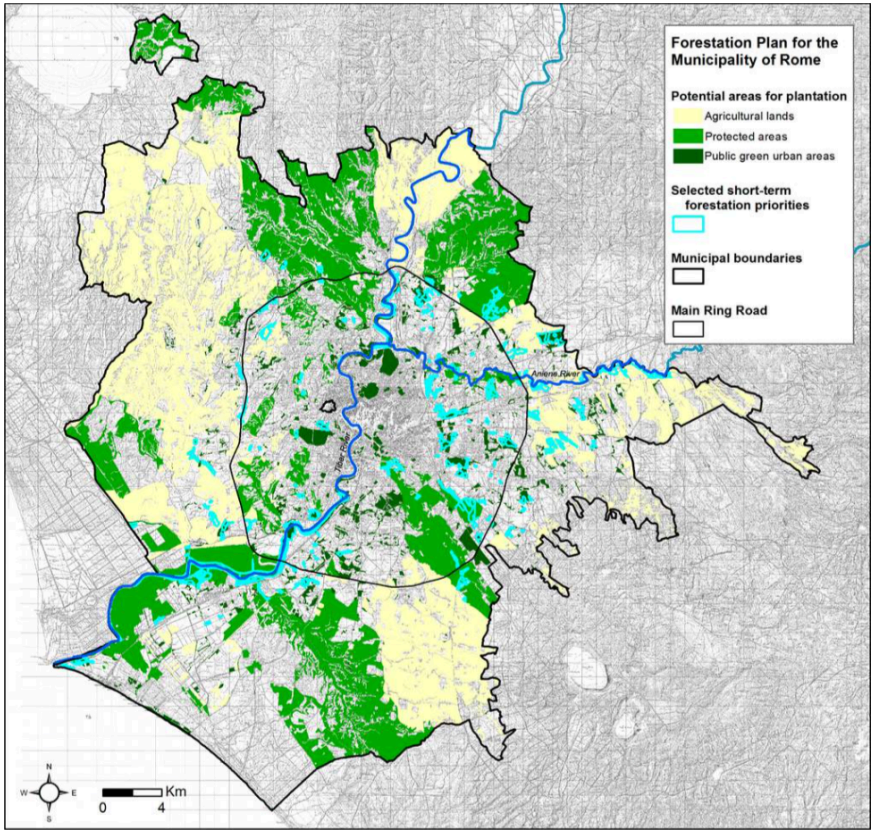


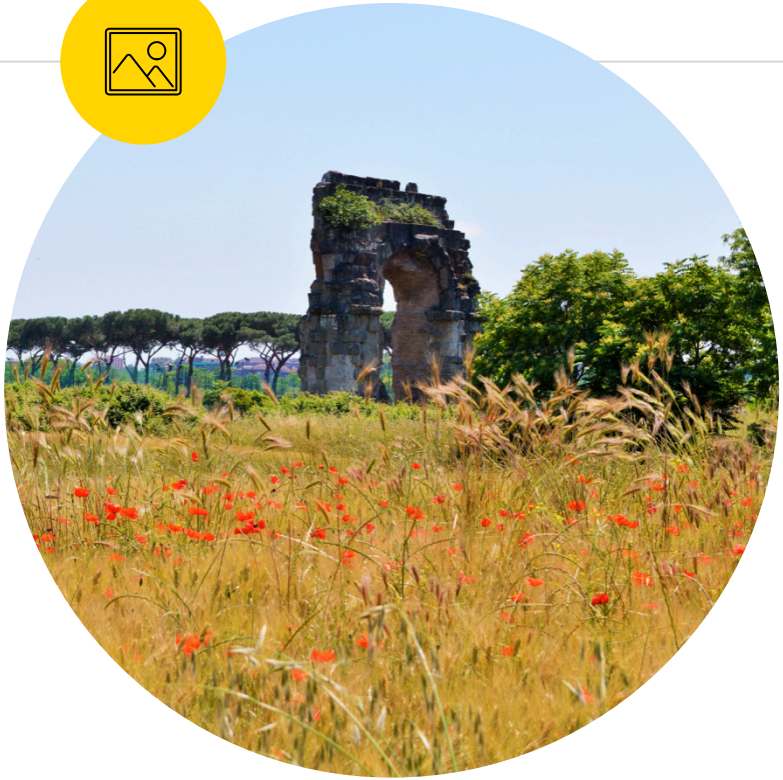
Figure 1.3 Capotorti et al, 2015

64%
Of Rome is protected

39%
Of the farms are in protected areas

1600
Vascular plants – high biodiversity

37.073 ha
Of Ager Romanus



Agro Romano

The Ager Romanus (literally, "the field of Rome"') is the geographical rural area extending around the city of Rome, which differs from the Roman countryside as being contained inside the municipal area.

- Cultural and historical lands
- Strong iconographical representations
- Some farms can date back to the medieval times (Blasi et al., 2008)

-31%

Of the used agricultural areas between 1954-2001

+300%

Of urban fabric in 60 years

48%

Agricultural matrix

Rome mapping

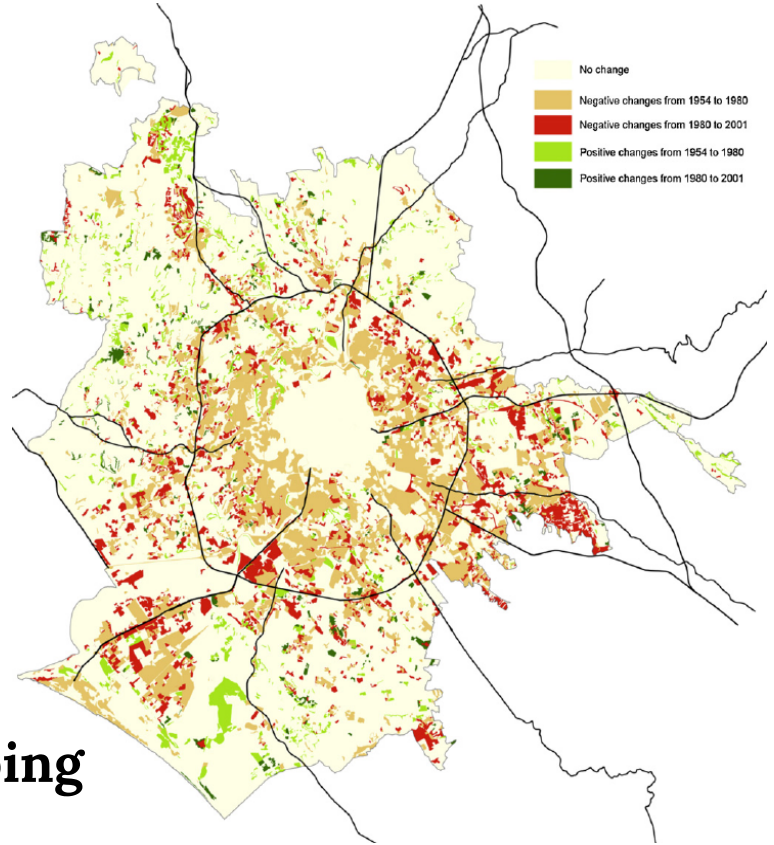


Figure 1.2 Frondini et al, 2011

Rur
al

Peri-
urban

Urba
n

Agriculture with seminatural patterns

Low density urban

High density urban

Coastal resources are managed for biodiversity, storm surge protection and aquaculture, aesthetic and recreational benefits, crops.

Riparian zones are managed for biodiversity, flood control, wildlife and pollinator movement, urban heat island control,

Upland forest provides water harvesting, food control, wildlife conservation, carbon sequestration, scenery & recreation, and timber & non-timber products, landscapes.

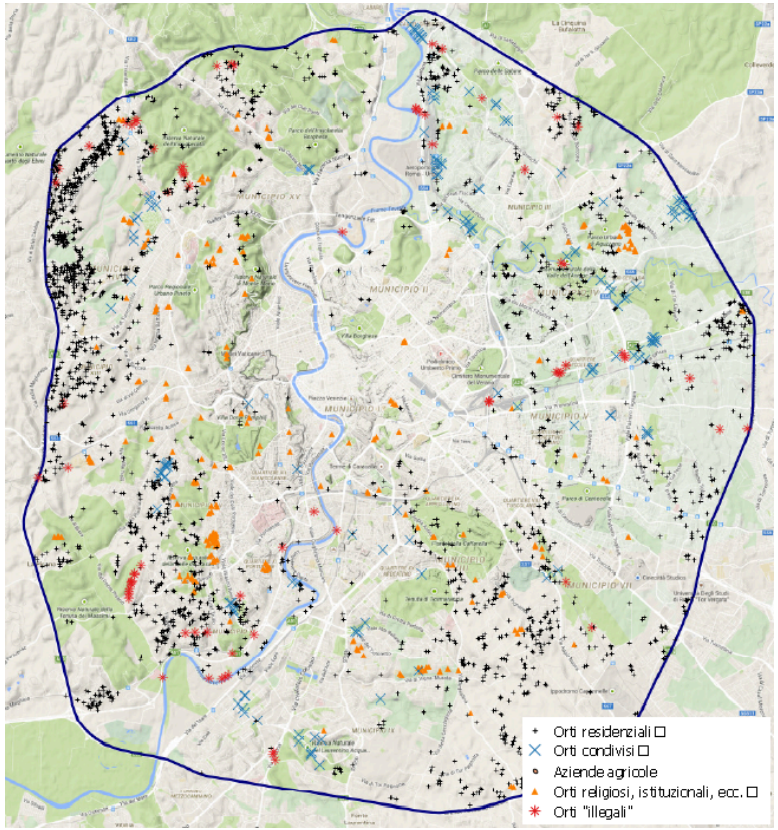
Peri-urban landscape corridors with multi-scale and mixed crop/livestock operations.

Farmers markets, retail & whole-sale markets, food hubs and community gardens in the urban core enable access to fresh, locally produced food resources.

The typology confined within the area of the Rome Municipality's comport 5 categories of urban agriculture: residential gardens, shared gardens, farms, institutional gardens, informal gardens

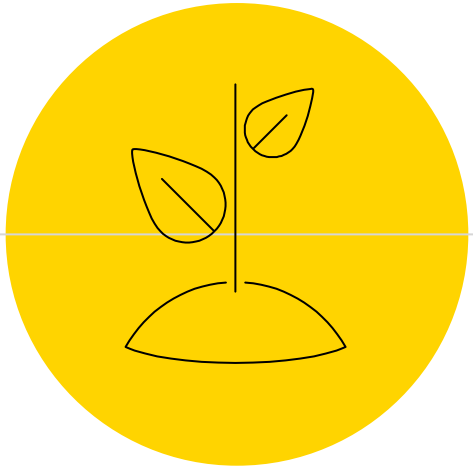
The results indicate that most of the cultivated plots tend to be concentrated in the peripheral areas where the urban fabric is more dispersed and where the presence of available free lands allows the cultivation.

Figure: Lupia, 2016



Urban Agriculture

2



Ecosystem services contribution

Study of peri urban multifunctional farm in Rome

2012: Societal demands and activism from cooperative, farmer's group.

- Low job opportunities and high youth unemployment
- The fact that the Municipality held lands from diverse compensating plans (1993-2008)
- Demand from the citizens

2014: The decree "Terre Vive" (living lands) adopted in 2014 has allowed 5510 hectares of land for agricultural use to be sold or leased to new farmers of less than 40 years of age (*Ministero delle politiche agricole, alimentari e forestali, 2014*).

2014: Two programs have been launched, one directly from the Municipality "*Roma, citta da Coltivare: terre pubbliche ai giovani e agli agricoltori*" (Rome cultivating the city: public lands for the young and the farmers" and the other from the Lazio Region "*Terre ai giovani*" (Lands for youth)

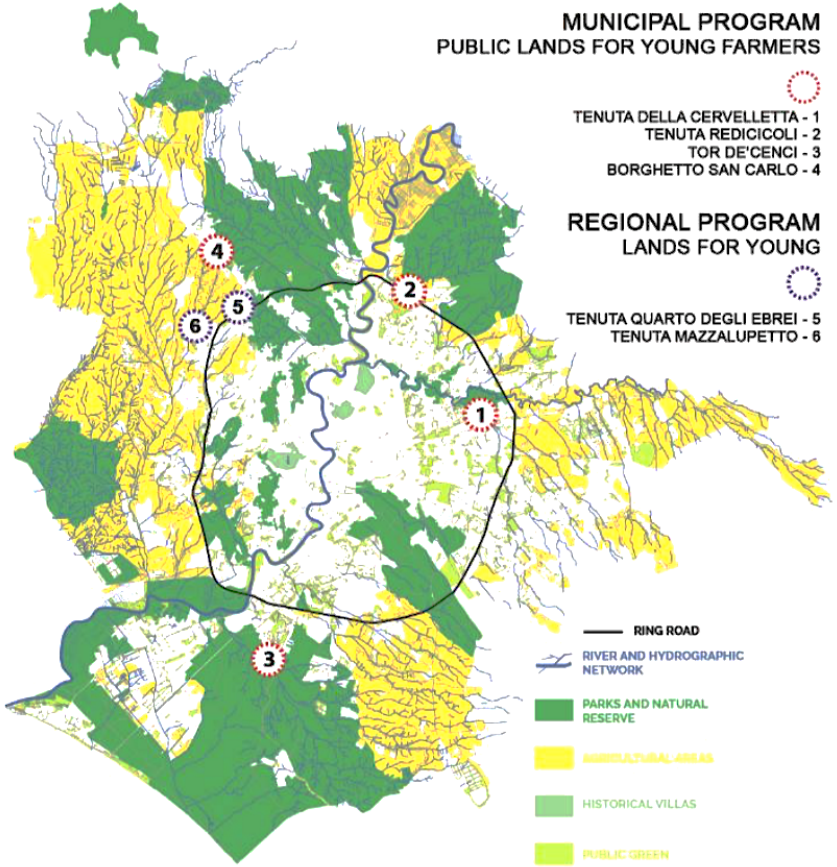
Societal inclusion, organic, multifunctional
Win><Win

>40 years
Aimed directly at youth

± 200€
Of rent by hectares loaned

15 years
Of rent !

150 hectares
Of pilot farms



Location

Pic-nic area creation

Seminar

View on the “Casale”

Pictures retrieved from the facebook of the “Cooperativa Agricola Coraggio”, check it out !

Ecosystem services assessment

We have to better understand what really does contribute to sustainable human well-being, and recognize the substantial contributions of natural and social capital

Although the value of economic goods and services are reliably established by markets, the value of many goods and services provided by nature are not captured by the market and remains unclear

Researchers and practitioners have recently begun to recognize that agricultural ecosystems can be managed to maintain or even improve the provision of ecosystem services

Policy makers need the support of objective valuations if ecological assets have to be incorporated in the design of land-use strategies that already comprise the consideration of economic and social variables

Provisioning services

Various products, job employment



Social services

Health, well-being, education, tourism



Regulating services

Water management, carbon sequestration, disaster prevention, soil management, efficiency of natural resources




Support services

Conservation benefits, low carbon transport and energy


Categories of Ecosystem services	Green Infrastructure provision	Urban agriculture quantitative project input	Quantifiable benefits	Current importance	Envisioned importance
Provisioning services	Multifunctional, resilient agriculture and forestry	A biological farm with cultivation of cereals and vegetables at the local level; side products such as honey, processed products such as bread or biscuits and other non-food benefits described below; resiliency supported by a low amount of food system nodes and links	Production surface (ha) and yield (t), number of plants, biological label, common "Young Roman farmer" label	XX	XXX
	Investment and employment	Agricultural employment and/or voluntary work, general land management and economical regeneration	Number of employment (+1) farm and persons involved in the project as volunteer or as part of the cooperative.	0	XXX
Societal services	Tourism and recreation	Enhancement of the traditional Roman agricultural landscape character, local quality products and food labeling, natural reserve and park entrance "door", diverse events,	General approbation and support from the neighborhood and agri-tourists, branded Roman products	XX	XXX
	Education	Farms as a teaching, research and environmental education labs available for school pupils, students and adults.	Conferences, seminars and workshop organized by the cooperative (2015-2016), a large food event with more than 500 persons, participation in the GLAMUR project.	X	XXX
	Health and well-being	Development of publicly accessible urban gardens for inhabitants and visitors with payment of fees (entrance, events, accommodation, etc.), facilities such as electricity and water. Pathways and usable green spaces	Activities and manual work available for interested people, number of users and general feedback of the users of the natural parks	0	XX
Regulating services	Enhanced efficiency of natural resources	Biological practice with no use of phytosanitary products, reclamation and improvement of the lands.	Yield of bio food, soil, water and crop samples and general tenure of the lands.	XX	XXX

	Climate change mitigation and adaptation	Innovative practices at farm sites such as green stormwater retention elements, windbreaks, hedgerows, etc.	Stormwater and sewage cost reduction, microclimate and temperature measurements and observations	0	XX
	Water management	Stormwater collection and utilization for crop watering	Amount of water saved thanks to reuse	X	XX
	Land and soil management	Land consolidation, ploughing techniques, enhancement of the local landscape character	Reduced surface water run-off and deprived land at risk	0	XX
	Disaster prevention	Local food resiliency in case of extreme events causing food shortage	Amount of food supplied locally in extreme situations	X	XX
Habitat or supporting services	Conservation benefits	Uses of old species related to the Ager Romanus agro biodiversity, protection of unfarmed green areas within the farmland (grasslands and woodlands)	Cultural and natural biodiversity observations	X	XX
	Low-carbon transport and energy	Short food supply chain, on-site consumption, low amount of food system nodes and links, producing and using green energy	Market and distribution point at kilometer zero or use of distribution point nearby the farm area, distribution aimed at the neighborhood	XX	XXX

Legend

0	Not existing or not significant
X	Weak
XX	Medium
XXX	Important

Results

Negative

- Slow start, mainly due to the numerous “everyday” problems and the reclaiming of the lands
- Lack of support from the authorities
- Lack of facilities
- Lack of communication between the institutions
- Lack of funding
- Some projects failed

Positive

- The offer is smaller than the demand
- The users and consumers are particularly happy
- Contributed to the awareness and visibility
- Social aspects are particularly relevant

Last words

Those programs play the role as a first experience for state investment directly aimed at the development multifunctional urban farms as well as to youth employment and could definitely be seen as a model for further development of similar initiatives it also shows an interesting approach of local governments who are trying to rebuild their food systems through innovative public policy.

Thanks!

Any questions ?

You can find me at

- @nicolas_cartiaux
- cartiaux.nico@hotmail.fr

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Sources

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