ALMA MATER STUDIORUM
UNIVERSITÀ DI BOLOGNA

Strategies for sustainable urban agriculture initiatives

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Outline

- Introduction
- Urban agriculture and sustainable food systems
- Sustainability: what and how
- Environmental sustainability
- Economic sustainability
- Social sustainability
- Conclusions

Food systems transition: the not-so-long term

In less than 100 years food systems radically changed and they keep evolving





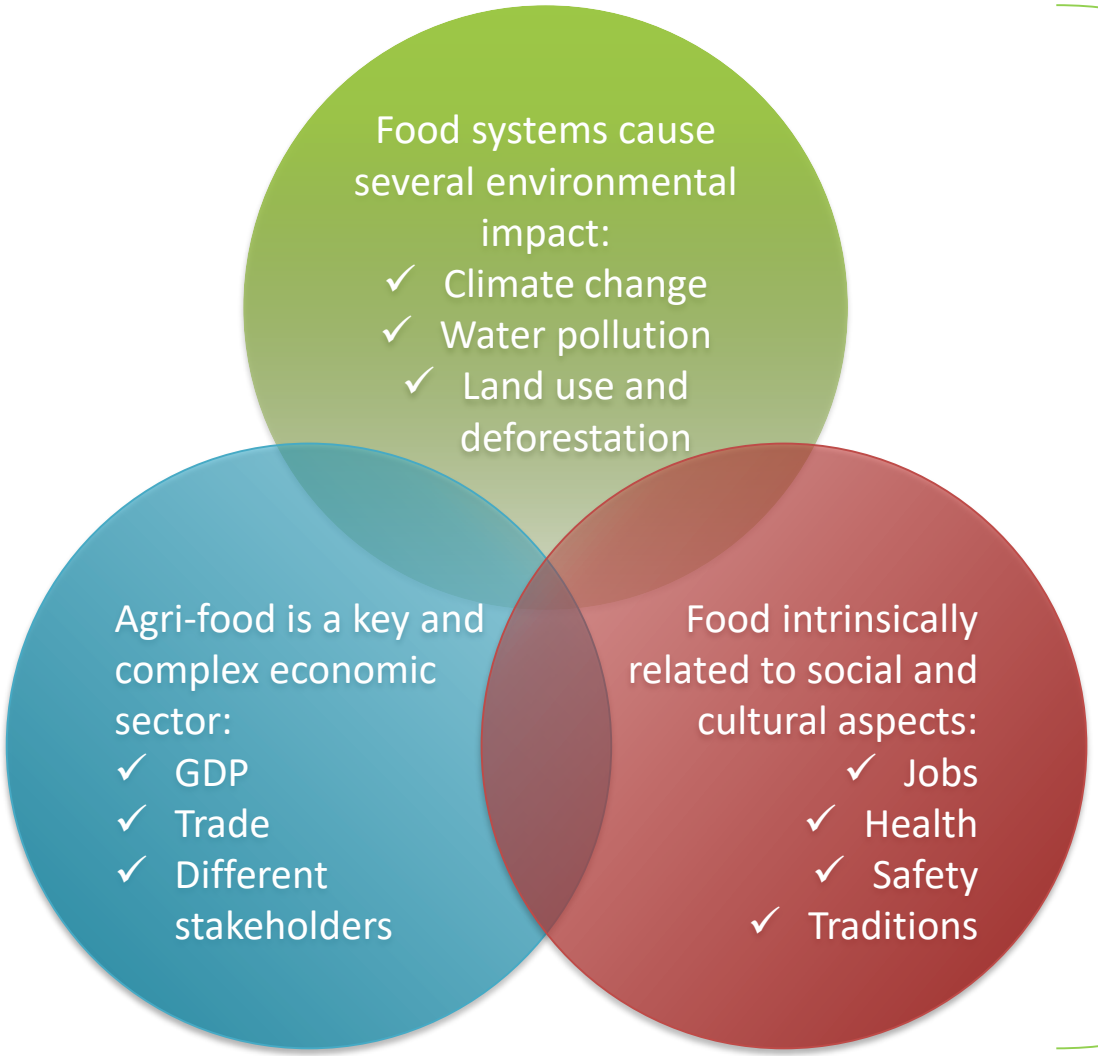




Food sustainability and labelling

Policies and consumers demands drive this trend towards increased communication of food products environmental, socio-economic and cultural characteristics

The complex transition towards food systems sustainability



Complexity of food systems and interrelation between impacts require **holistic approaches** to sustainability assessment

Cities and sustainable food systems

In this transition, urbanization is a key issue: Urban areas are the **major drivers of demand** and have a great influence on **how the food system meets these demands**

Barilla Centre for Food & Nutrition, 2018

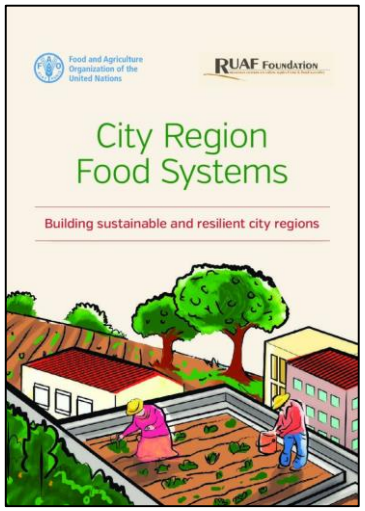
How will we provide sustainable and healthy food for the cities of the future?

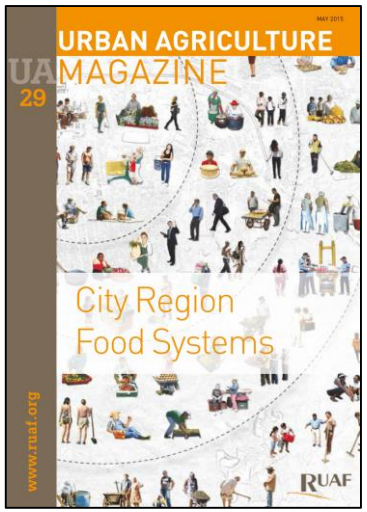
City/region food systems and sustainability food systems

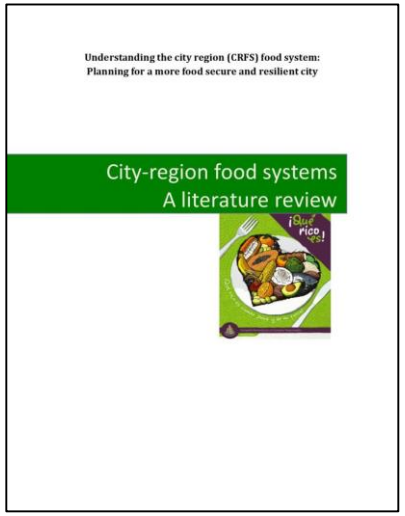
Need for a systemic perspective: the City/region food system approach

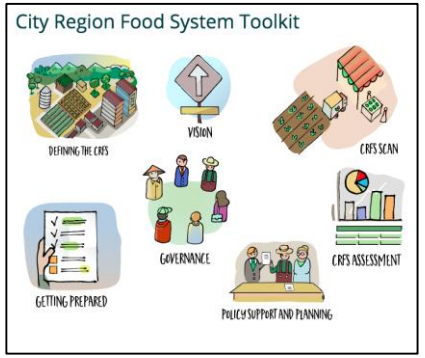
"the complex network of actors, processes and relationships to do with food production, processing, marketing, and consumption that exist in a given geographical region that includes a more or less concentrated urban centre and its surrounding peri-urban and rural hinterland."

Jennings et al., 2015









Urban agriculture and sustainable food systems

- Urban agriculture (UA) is not a new phenomenon (e.g. victory gardens)

- Currently, UA initiatives varies in size, motivation, goals and actors: from educational projects (e.g., school gardens) and food security- and community-directed projects (such as neighborhood gardens) to commercial farming ventures (Sanyé-Mengual et al. 2019)

Is urban agriculture sustainable *per se*?

In the literature, UA often regarded as an innovative and sustainable farming practice

- Multi-functionality and production of non-food and non-market goods
- Environmental impacts: reduction of food miles and transport emissions, saving and recycling of local resources
- Social impacts: UA often provides chances for food education, direct connection to food, and increased food security of neighborhoods
- Economic impacts: improved local economies and small businesses, local provision of commodity outputs, and increased resilience

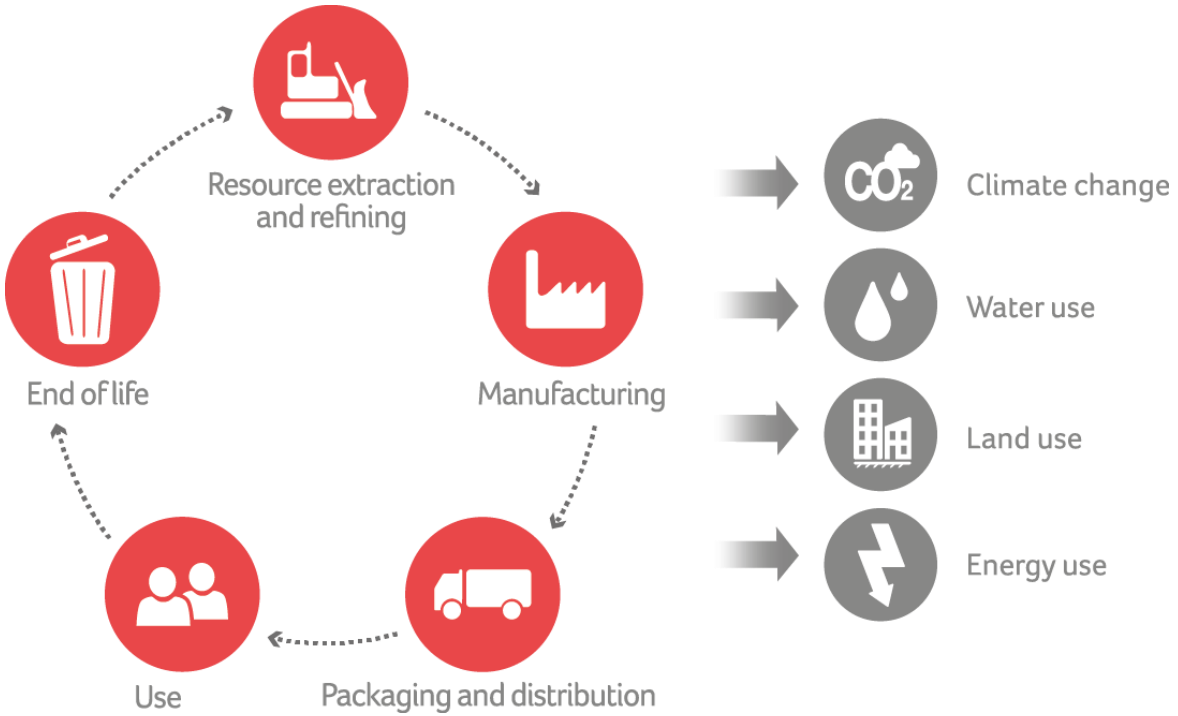
At the same time, major risks and concerns related to UA remain, especially in terms of urban integration, the production systems, the food products, environmental issues and economic issues.

Also, many UA projects are motivated by social and environmental goals and foresee the active engagement of civil society, so sustainability is an integral part of their business model

Sustainability: what and how

Need for holistic perspective of sustainability, a Life Cycle Thinking approach

Approach to the evaluation of products and services that takes into account the whole system (life cycle) from raw material extraction and processing, to transportation, distribution, consumption, reuse/recycling, and disposal.



Life Cycle Thinking: what

	Traditional approach	LC approach
Wheat cultivation	Only impacts from farm activities	All impacts from input production (extraction of fossil fuels, production of chemicals,…) and transport, agricultural activities, final waste disposal
Flour production	Only impacts from milling site	All impacts from wheat cultivation (including upstream processes), milling (including input extraction, production and distribution), packaging and waste disposal
Bread consumption	Only impacts from purchase and consumption	All upstream impacts (all stages and inputs) and impacts from purchase transport (e.g. car usage), home storage and consumption, packaging and waste disposal

Life Cycle Thinking: why

A life cycle approach allows to…

- Provide a measure and certify the full impacts of a product:

  e.g.: amount of direct and indirect carbon and water footprint of a T-shirt

- Identify complex consequences of actions:

  e.g.: indirect impact from daily mobility routines

- Avoid shifting impacts (between processes and/or geographical contexts):

  e.g.: climate change effect of biofuels at cultivation vs. at the pipe

- Identify possible tradeoffs between resource and/or cost efficiency:

  e.g.: purchase and use costs and impacts of different dishwashers

Life Cycle Thinking: how

Various tools depending on the scope of the analysis

- Life Cycle Assessment

  analysis of environmental impacts caused by a product/service/activity

- Life Cycle Costing

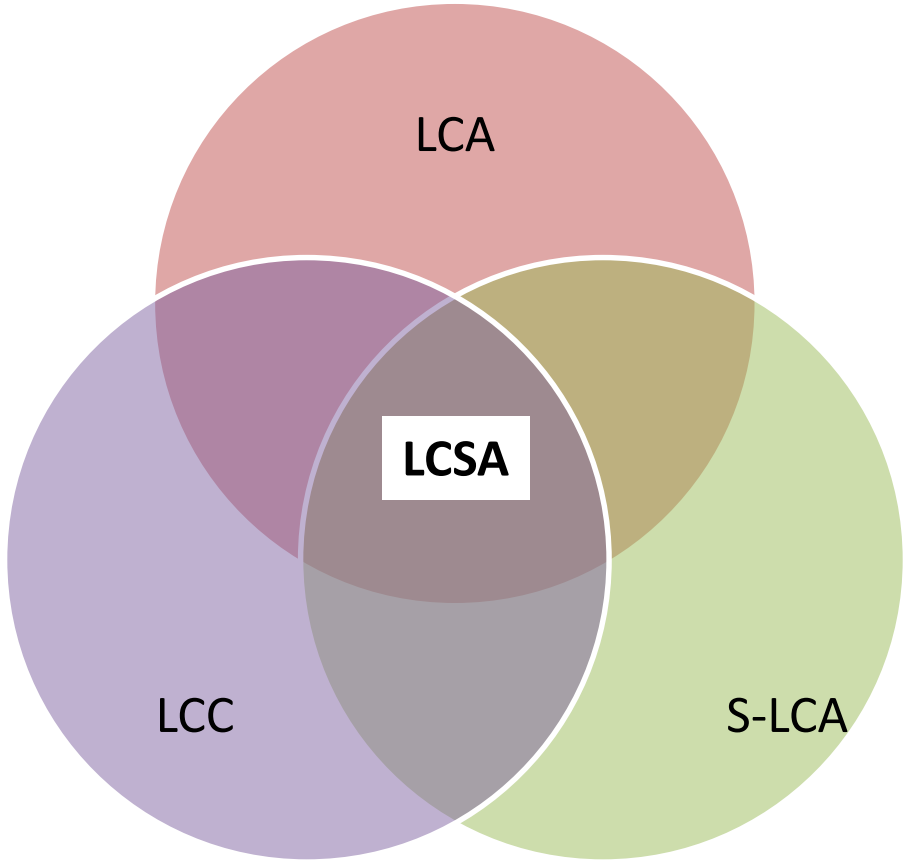
  analysis of costs associated with the life span/cycle of a product/service/activity

- Social Life Cycle Assessment

  analysis of social impacts per different stakeholders and categories

- Life Cycle Sustainability Assessment

  integrated assessment of environmental, costing, and social impacts in a life cycle perspective



Environmental sustainability - LCA

Mandatory section of the call (2° round)

This section must contain details regarding:

1. Energy (energy efficiency, use of renewable energies)

2. Water (water efficiency, use of non-conventional water - rainwater, grey water, reclaimed water...)

3. Materials (minimization of use, premises, low impact, reused, recycled, recyclable...)

4. Emissions (carbon footprint of the life cycle of the project focusing mainly on materials and their use)

5. Waste cycles

You are not asked for a complete LCA, but a LCT approach is best when dealing with the 5 points and related impacts.

Some tips

- Materiality approach, look for what really matters: known hotspots from the literature and secondary data
- Indirect emissions can be higher than direct ones: take care ab. source of your inputs
- Durable materials can have a longer life cycle than your intended use: what happens(-ed) next/before?

Economic sustainability - LCC

Useful for the economic section

Life Cycle Costing (i.e. measuring cost for the life cycle of the project) can be applied to evaluate the financial viability of your project, e.g. to calculate:

- Net present value
- Internal rate of return

Some tips:

- Economic sustainability is not only about cost minimization
- If your project is including more than 1 actor, LCC can also assess potential cost and profits distribution along the chain
- Environmental impacts can be regarded as externalities, so external costs deriving from them can be also included/compensated

Social sustainability – S-LCA

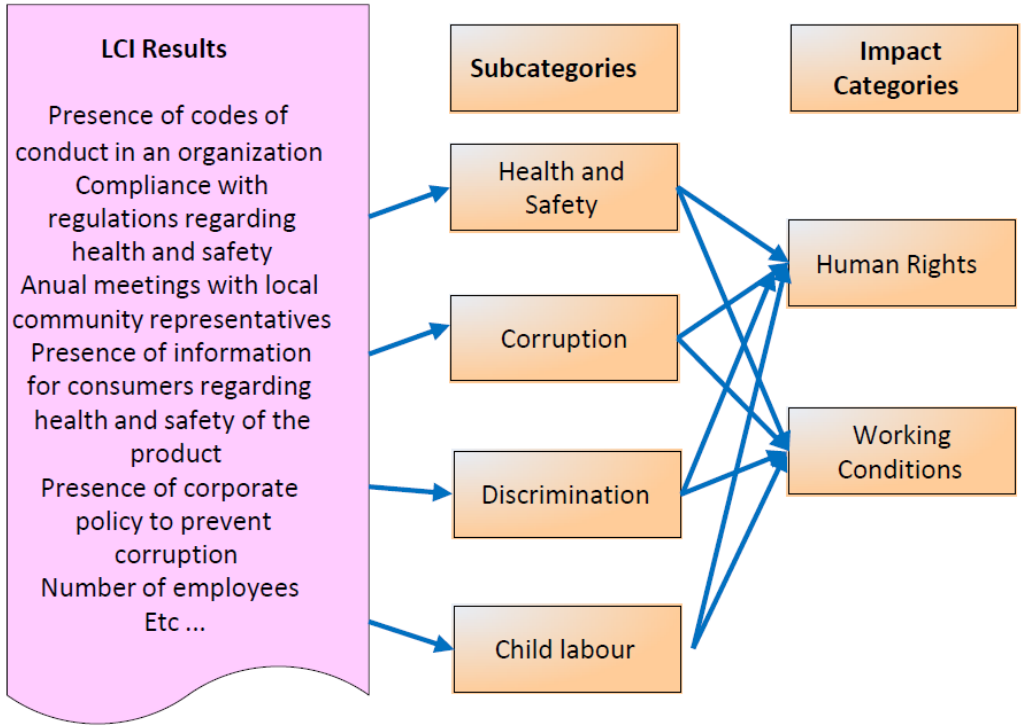
Useful for the social and educational section

S-LCA is still under development, since:

- deterministic approach of LC thinking is not always applicable
- many social issues are not easy to quantify

Some tips

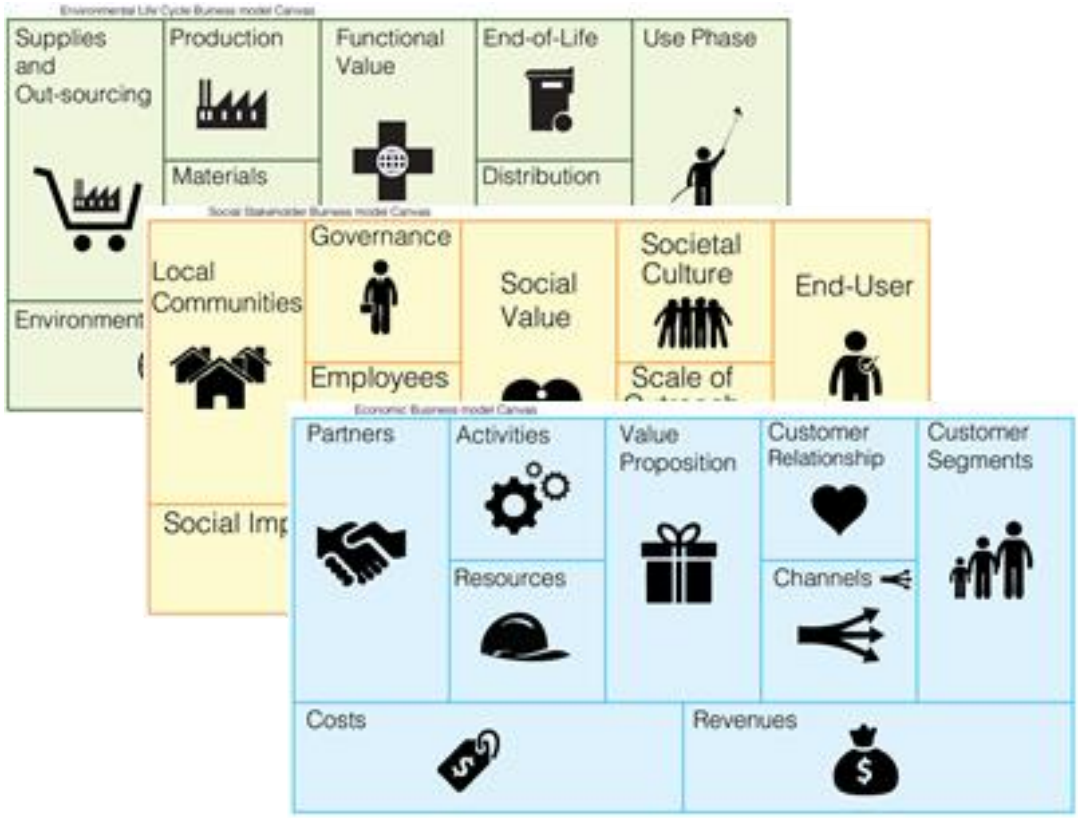
- Identify the stakeholders involved in the project
- Identify how the project is going to affect them
- Identify a quali/quantitative relation and related indicators
- Categorize in impact categories

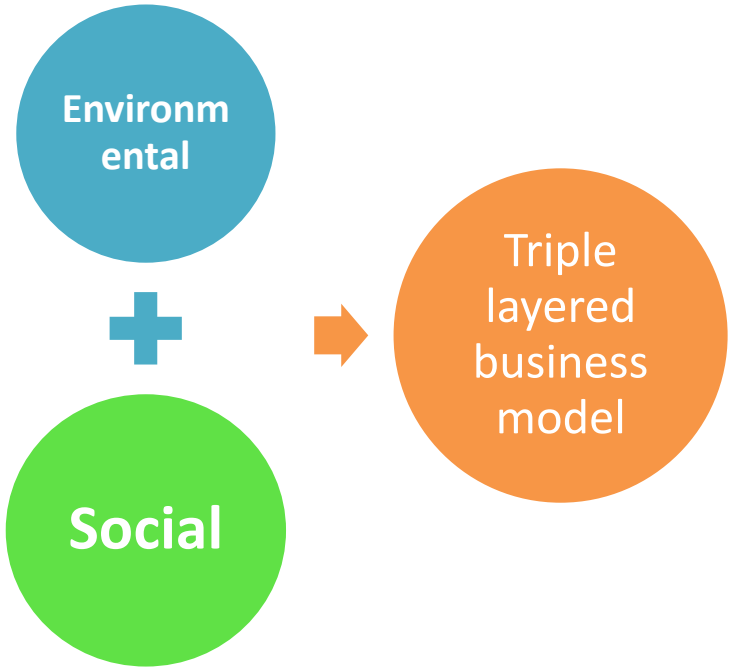


Final tip

Sustainability of your project can be built within the value proposition of your business model:

Joyce, Alexandre & Paquin, Raymond. (2016). The triple layered business model canvas: A tool to design more sustainable business models. Journal of Cleaner Production. 135. 10.1016/j.jclepro.2016.06.067.





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Thanks for your attention and good luck with the competition!

Questions?

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