



URBAN GRreen Education for ENTteRprising Agricultural INnovation

Urban Green Train Modules and Resources (IO2)

Module 1:

Introduction into urban agriculture concept and types



With the support of the Erasmus+ programme of the European Union

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MODULE 1 “Introduction to urban agriculture concept and types”

Coordination: E. Geoffriau (Agrocampus Ouest Angers / Agreenium, FR)

AUTHORS

Chapter 1.1	J. Kuhns (Toronto Urban Growers, CA), H. Renting (RUAF, NL)
Chapter 1.2	E. Geoffriau, L. Vidal-Beaudet, G. Galopin (Agrocampus Ouest Angers / Agreenium, FR)
Chapter 1.3	F. Orsini, E. Sanyè-Mengual, G. Gianquinto (University of Bologna, IT)
Chapter 1.4	J. Kuhns (Toronto Urban Growers, CA), H. Renting (RUAF, NL)
Chapter 1.5	W. Lorleberg, B. Pölling (South-Westphalia University of Applied Sciences; DE)
Chapter 1.6	E. Geoffriau, V. Bouvier (Agrocampus Ouest Angers / Agreenium, FR)

TABLE OF CONTENTS

INTRODUCTION..... Errore. Il segnalibro non è definito.

MODULE 1 “Introduction to urban agriculture concept and types” 6

Aims.....

Structure 6

Learning objectives A FAIRE CF DOC ANCIEN 7

MAIN CONTENT AND RESOURCES 8

1.1 - Urban agriculture concept and environment 8

1.2 - From multifunctionality to ecosystem services of urban agriculture 37

1.3 - Evolution of urban agriculture depending on the context.....

1.4 – Typology of urban agriculture activity 56

1.5 - Bullet points: Remember the economic dimension.....

1.6 - Pratical work.....

INTRODUCTION

This module and the related educational resources have been developed within URBAN GREEN TRAIN (URBAN Green Education for ENTteRprising Agricultural INnovation) a project funded by the European Union and the Italian National Agency for the ERASMUS+ Programme. The aim of URBAN GREEN TRAIN ERASMUS+ project (2014-1-IT02-KA200-003689) is to encourage pioneering business oriented initiatives in urban agriculture based on knowledge exchange and mutual cooperation among different actors, as to meet the global demand for urban green innovation.

One of the main outcomes of Urban Green Train is a set of modules and resources (IO2) especially designed to be a useful toolbox for anybody looking to operate, directly or indirectly, in the world of urban agriculture.

The set includes **5 modules suitable for at presence and at distance learning, for a total duration of 150h**. The modules structure and content have been defined on the basis of an accurate analysis of the training needs of relevant key actors in urban agriculture, carried out by project partners in their respective countries and illustrated in the publication "[URBAN AGRICULTURE INITIATIVES TOWARD A MINDSET CHANGE](#)" (IO1). URBAN GREEN TRAIN modules are the following:

Module 1: Introduction into urban agriculture concept and types

Module 2: Resource use from a challenge perspective

Module 3: Urban agriculture types/production systems and short food chains

Module 4: Networking and governance

Module 5: The world of business and urban demands

The URBAN GREEN TRAIN Modules and Resources (IO2) have been tested within a pilot international course offered from August 2016 to January 2017, both fully online and in a blended modality, to a wide range of participants from different European countries and professional backgrounds, through the e-Learning platform of the University of Bologna. Thanks to the feedbacks of pilot course participants and tutors, the modules and resources have been improved and finalised and made available in the present format to Higher Education Institutions and other private and public adult learning providers with the purpose of offering a complete and structured training pathway tackling all aspects relevant to new ways of doing business in agriculture.

URBAN GREEN TRAIN project is coordinated by the University of Bologna, Alma Mater Studiorum – Department of Agricultural Sciences (www.scienzeagrarie.unibo.it) and developed in cooperation with the following partners:

- Agreenium / Agrocampus Ouest, Paris, France <https://agreenium.fr>
- Vegepolys, Angers, France www.vegepolys.eu
- South-Westphalia University of Applied Sciences, Department of Agriculture, Soest, Germany <http://www4.fh-swf.de>.
- Hei-tro GmbH, Dortmund, Germany www.hei-tro.com/
- Horticity srl, Bologna, Italy www.horticity.it
- STePS srl, Bologna, Italy www.stepesurope.it
- Mammut Film srl, Bologna, Italy www.mammutfilm.it
- Grow the Planet, Italy www.growtheplanet.com
- RUAF Foundation, The Netherlands www.ruaf.org

More info at: www.urbangreentrain.eu

MODULE 1 “Introduction to urban agriculture concept and types”

Aims

The main concepts and challenges related to urban agriculture will be presented, as well as their evolution depending on the historical or worldwide geographical context. Participants will acquire knowledge on cities features, society and professional trends shaping urban agriculture environment. The urban agriculture functions and services will be addressed as a basis for activities development. Types of urban agriculture will be analysed based on case studies. This module will provide a framework for analysing urban agriculture situations.

Structure

Module 1 contents have been organised as follows:

- **1.1 Urban agriculture concept and environment**
 - 1.1.1 Defining Urban Agriculture
 - 1.1.2 Trend in food and non-food consumption
 - 1.1.3 Trends in city development and urban planning
 - 1.1.4 Professional trends in relation with UA
 - 1.1.5 Territorial analysis and governance
 - 1.1.6 Challenges for UA
 - 1.1.7 Diversity and roles of actors/stakeholders in UA
- **1.2 From multifunctionality to ecosystem services of urban agriculture**
 - 1.2.1 Concepts of multifunctionality and ecosystem services
 - 1.2.2 Services from UA
 - 1.2.3 Sustainable development of UA
 - 1.2.4 A framework for urban agriculture analysis
- **1.3 Evolution of urban agriculture depending on the context**
 - 1.3.1 Evolution of UA in Europe, North America and Oceania
 - 1.3.2 Evolution of UA in Africa
 - 1.3.3 Evolution of U A in Asia
 - 1.3.4 Evolution of UA in Latin America and Caribbean
- **1.4 Evolution of urban agriculture activity**
 - 1.4.1 Criteria for types of UA analysis
 - 1.4.2 Diversity and typology of production system in UA
 - 1.4.3 Case studies exercise
- **1.5 Bullet points: remember the economic dimension**
- **1.6 Practical work**

Learning objectives

Main learning objectives of Module 1 are the following:

TOPIC TITLE	TIME	LEARNING OBJECTIVES	LEARNING OUTCOMES
1.1 Urban agriculture concept and environment	6	<ul style="list-style-type: none"> To compare the basis of the various definitions of UA To provide consumption and urbanization context of UA To present the current professional context To provide knowledge about territory diagnostic and governance based on urban or peri-urban context To identify the main challenges regarding UA activities To characterize actors and stakeholders 	<ul style="list-style-type: none"> Participants are able to Identify an adapted definition of UA depending on the objective and context Identify opportunities and constraints for UA Understand professional support for UA Use tools and methods for a territorial analysis Map actors and stakeholders
1.2 From multifunctionality to ecosystem services of urban agriculture	3	<ul style="list-style-type: none"> To explain the evolution between multifunctionality and ecosystem services concepts To present the diversity of functions and services of UA To set the basis for an analysis of UA in regards with economical, environmental and social pillars 	<ul style="list-style-type: none"> Participants are able to: Argue about UA advantages besides production Identify functions and services from UA Evaluate factors of UA sustainability
1.3 Evolution of urban agriculture depending on the context	8	<ul style="list-style-type: none"> To explain the historical evolution of UA in response to economical or political crises and to urban development To present the various forms of UA over time and the technical, economical or political reasons To set the current status of UA worldwide, with a comparison between developed and developing countries situations To analyze the UA evolution in various parts of the world 	<ul style="list-style-type: none"> Participants are able to Identify constant or specific evolution factors Identify constant or specific forms of UA Picture of UA depending on development level Understand UA status in Europe, Africa and Asia
1.4 Evolution of urban agriculture activity	3	<ul style="list-style-type: none"> To identify and organize characteristics for a typology analysis of UA activities To show the high level of possibilities for UA production systems To illustrate one type of UA with a documented case study 	<ul style="list-style-type: none"> Participants are able to Realize a typology of UA activities depending on the objective and context Propose typology of UA production systems Analyse in detail one type of UA
1.5 Bullet points: remember the economic dimension	1	<ul style="list-style-type: none"> To identify possible innovations for main module's subtopics 	<ul style="list-style-type: none"> Participants are able to: Identify main economic factors for UA business Identify economic oriented innovations
1.6 Practical work	4	<ul style="list-style-type: none"> To acquire knowledge about the evolution of the urban landscape and how urban agriculture might have impacted the urban landscape 	<ul style="list-style-type: none"> Identification of the urban agriculture characteristics which have impacted significantly the urban landscapes and its evolution in several countries/cities

MAIN CONTENT AND RESOURCES

1.1 - Urban agriculture concept and environment

Introduction

How we can define what urban agriculture is and what are the driving factors behind the growing attention for (peri-) urban agriculture? And how do trends in food consumption, urban planning and professional trends influence the development of urban agriculture?

This chapter examines how we can define the practice of urban agriculture and identify the main stakeholders and professions. As well, the chapter will discuss trends in food consumption and professionalism associated with urban agriculture. Learning objectives include:

- To identify an adapted definition of UA depending on the objective and context
- To identify opportunities for UA products and trends in food consumption
- To identify opportunities and constraints for urban agriculture projects
- To understand professional trends that support urban agriculture
- To identify methods for a territorial analysis
- To be able to identify and map actors and stakeholders

1.1.1 - Defining Urban Agriculture



Urban agriculture (credit: FAO).

In this sub-chapter we will endeavour to define urban agriculture. This is an evolving concept and alternate framings of the concept will be presented. We will also explore the important distinctions of intra-urban and peri-urban agriculture. Finally, we look at how widespread the practice is as well as the recognition it is receiving from policy makers.



Assignment 1.1.1a.

Before starting the sub-chapter, please describe in one sentence your own current definition (concept) of urban agriculture. Remember that there is no good or bad definition. Your own definition may very well reflect the types and forms of urban agriculture you find in your own city. Later at the end of the sub-chapter, you will be asked to write another definition based on what you have learned in this section.

Definition of UA

Urban Agriculture (UA) is practiced by people from all walks of life. Poor urban farmers and their families in Rosario, Argentina may practice UA in their backyards or open spots in the city for reasons of food security. Slum dwellers in Colombo, Sri Lanka may grow some herbs and medicinal plants on their rooftops and balconies. Middle-class or high-income families in the Netherlands may grow flowers and vegetables on land in allotment gardens for reasons of leisure and recreation, or for therapeutic reasons. Small-scale peri-urban farmers may keep livestock and generate an income in the areas surrounding the city of Nairobi, Kenya. Larger-scale farmers living around Beijing, China may offer agro-tourism services to urban inhabitants.

Other individuals or groups may produce compost to be used in UA, while others again will be involved in transformation and marketing of the produce. National or local governments may actively support these practices or prohibit them. Support organizations like non-governmental organization (NGOs) may provide urban producers with training and support services. Research institutes may investigate the amount and quality of land available for UA, test new production practices or monitor the impacts of UA projects.

We see that UA is a dynamic concept that comprises a variety of farming systems, ranging from subsistence production and processing at the household level to fully commercialised agriculture. UA exists within

heterogeneous resource situations, e.g. under scarce as well as abundant land and/or water resource situations and under a range of policy and institutional environments that can be prohibitive or supportive to its existence and development. As UA takes different forms in different cities, it should be best defined locally.

For the purpose of this course, we will apply the following working definition to urban agriculture, to have a common base for discussion:

“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).

Urban agriculture includes:

- Crop production, animal raising as well as fish-farming in and around cities
- Food production as well as non-food production (flowers, trees, pot plants for example)
- Processing and marketing of food and non-food products produced in and around the urban area
- Uses compost and (treated or untreated) urban wastewater as resources
- May take place on open land areas in the city as well in backyards or on rooftops

However and unless this definition of urban agriculture is further enhanced and made operational, it will still remain of limited usefulness on the scientific, technology and policy fronts. We could begin to operationalize the definition by “breaking down” the common definition of urban agriculture into the following considerations:

- Types of economic activities;
- Food/non-food categories of products and subcategories;
- Intra-urban and peri-urban character of location;
- Types of areas where urban agriculture is practised;
- Types of production systems;
- Product destination and production scale (Mougeot, 2000).

Beyond these six considerations, another could be added to differentiate among the types of people involved in urban agriculture. Although many urban farmers – especially in developing countries – are from the poorer strata of the population, one will often also find lower and mid-level government officials, school teachers and the like involved in agriculture, as well as richer people who are seeking a good investment for their capital or simply wanting to enjoy gardening as a recreational and leisure activity. Women form an important constituency of urban farmers, as often women have the main responsibility for feeding households. If the plot is close to the home, farming activities can be more easily combined with their other household tasks than if they work in other jobs requiring travel.

The use of these seven building blocks can help us to better define and differentiate among the various types of urban agriculture. Only then, planners, policy makers, development organisations and others can better identify the type of support measures appropriate for the further development of specific types of urban agriculture. For instance, providing micro-credit may not be the best form of financing for a poor family that undertakes UA at subsistence level, on a plot that is not their own, and that is not capable of repaying a formal loan. On the other hand, a small cooperative composed of farmers aiming for expansion of their UA activities would need forms of financial support that go beyond the provision of free access to seeds or other equipment. Thus, it is necessary to get an in-depth conceptual understanding of these types of UA in order to select the appropriate financing and support mechanisms for each of these types.

Other definitions

“The growing of plants and the raising of animals for food and other uses within and around cities and towns, and related activities such as the production and delivery of inputs, and the processing and marketing of products. Urban agriculture is located within or on the fringe of a city and comprises a variety of production systems, ranging from subsistence production and processing at household level to fully commercialized agriculture.”

Source: [René van Veenhuizen, Cities Farming for the Future in Cities Farming for the Future: Urban Agriculture for Green and Productive Cities](#), ed. René van Veenhuizen (RUAF Foundation, IIRR and IDRC, 2006, p. 2).

“Urban Agriculture (UA) and peri-urban agriculture can be defined as the growing, processing, and distribution of food and other products through plant cultivation and seldom raising livestock in and around cities for feeding local populations.”

Source: [GSDR 2015 Brief Urban Agriculture](#)

“Urban agriculture spans all actors, communities, activities, places and economies that focus on biological production (crops, animal products, biomass for energy,...), in a spatial context that, according to local opinions and standards, is categorised as “urban”.

Source: [COST action Urban Agriculture in Europe](#)

Optional material: for further information, a summary of other definitions and terms related to urban agriculture can be found at <http://www.ci.encinitas.ca.us/modules/showdocument.aspx?documentid=4433>.

Intra- and peri-urban agriculture

Urban agriculture can be located within (intra-urban) or on the fringe (peri-urban) of a town, city or metropolis. Let us now look in more detail at the characteristics of such intra- or peri-urban agriculture.



Left: New Orleans, USA (photo: James Kuhns); Right (photo: RUAF).

Intra-urban agriculture takes place within the built-up city. In most cities and towns, we can find vacant and under-utilised land areas that are or can be used for urban agriculture, including areas not suited for building (e.g. along streams, railroads, under electricity lines); idle public or private lands (reserved for future uses, speculation, or lands awaiting construction) that can have an interim use; community lands and household areas. Areas cultivated tend to be (very) small and farming systems mainly have a subsistence or recreational nature (backyard gardening and raising of animals on household plots or balconies, small-scale gardening on vacant public land), or are highly specialised (e.g. nurseries of ornamental plants in parks, production of herbs and medicinal plants on rooftops, production of mushrooms in cellars). The economic effect of intra-urban agriculture is difficult to measure but may be limited, while the effect on food security may be significant.

Peri-urban agriculture takes place in the urban periphery. Peri-urban locations tend to undergo, over a given period of time, dramatic changes: land prices increase; there is an influx of people both from rural and urban areas, density increases, multiple land-uses emerge and construction spreads. Such changes affect the original agricultural production systems. They tend to become smaller in scale with more intensive production and shift from staple crops towards more perishable crops and animal production. Peri-urban agriculture often is more intensive and market-oriented, providing more substantial numbers of jobs and income than intra-urban agriculture.

Lengthy discussions on the precise borders between urban, peri-urban and rural systems are however not very fruitful; in most cases we will find a continuum from intra- to urban and rural agriculture comprising various farming systems. Nevertheless, it is important to build up our understanding of the differences and complementarities between urban (intra- and peri-) and rural agriculture and the conditions under which it is undertaken, as each of these create specific opportunities and challenges for the technical, organizational and institutional management of the related farming systems.

Rural and urban agriculture have much in common. They are however also characterised by some important differences. These are related to:

- The role of agriculture in local livelihoods
- The social context in which agriculture takes place
- The political and institutional context
- The access to and use of productive resources
- The farming types found in the area and the processes of agricultural innovation
- The demand for non-agricultural services.

Diffusione dell'agricoltura urbana e peri-urbana

No firm numbers exist on how many people in the world practice some form of urban agriculture. It has been estimated by Smit et al. (1996) that 800 million farmers are involved worldwide, with 200 million people being full-time farmers. This estimation has not been refuted and is used by sources such as the FAO. Thebo et al. (2014) conducted a global assessment of urban and peri-urban agriculture and concluded that 266 million households worldwide are engaged in crop production in developing countries. The same article shows that within 20 km of urban centres worldwide, 68 Mha are under cultivation, roughly the size of Europe.

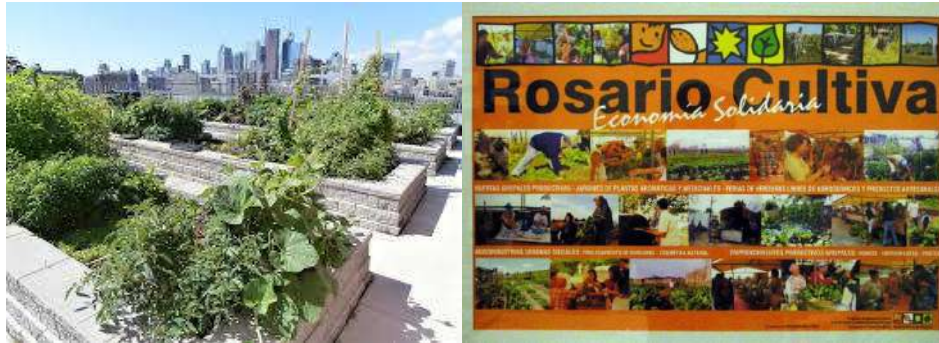
After decades of industrialization of the food system and increased globalization of production, consumers became uneasy about the traceability and safety of food. Food that at one point was produced and processed locally largely gave way to a new, streamlined system that displaced the idea of proximity, of localism. People wanted more information about the origin of their food.

Many became 'locavores', which can be defined as striving to eat food produced close to where they live. In 2007, 'locavore' was named as the New Oxford American Dictionary word of the year. Bestselling books such as *In Defense of Food* by Michael Pollan helped to mainstream the local movement. Urban agriculture is in part a direct response to consumer driven demand for food that meets the objectives of proximity and sustainable production methods.

Growing attention for urban and peri-urban agriculture

Cities in the global South and North are giving more recognition to urban agriculture and food policy in general, and in many ways, this level of government is the most responsive to the needs of its residents when it comes to issues such as food security and environmental management.

This development is expressed by the 2013 Mayors Declaration at the ICLEI Resilient Cities Congress in Bonn (2 June 2013), which states: “We call on local governments to develop and implement a holistic approach for developing city-region food systems that ensure food security, contribute to poverty eradication, protect and enhance local biodiversity and that are integrated in development plans that strengthen urban resilience and adaptation.”



Left: Toronto, Canada (Photo: Joe Nasr); Right (www.thepolisblog.org).

The importance of urban agriculture is also apparent in the October 2015 [Milan Urban Food Policy Pact](#), signed by over 120 cities worldwide. The role that family farmers and smallholder producers play in feeding their families and communities was recognized along with the role they play in providing equitable and culturally appropriate food. The opportunities that peri-urban agriculture offers to biodiversity enhancement and city-region foodscapes was observed. The links between food security and climate change were stated. In all, the pact includes five core actions: engage with relevant stakeholders to ensure an enabling environment; promote sustainable diets and nutrition; ensure equitable access to food; promote rural-urban food production and supply; and reduce food waste.

The world, especially the global South, is urbanizing at unprecedented levels. Currently more than 50% of the world population lives in cities, and it is expected to double by 2050. In 2007-2008, food prices rose rapidly and had a noticeable effect on food security of people living in cities. These occurrences in part are driving the need and growth of urban agriculture. The main drivers of UA growth are food security and nutrition, economic development, social benefits, community development, environmental benefits.



Assignment 1.1.1b.

At the beginning of this chapter, were you asked to write a one-sentence definition of urban agriculture Please repeat your initial sentence. How would you modify it after reading the material in this chapter? Do so by writing a modified definition.

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1.1.2 - Trend in food and non-food consumption

Some of the major trends in consumers' demands and attitudes will be examined in this section. The desire for organic and sustainably produced food comes at a time when competing ideas such as functional food are finding a marketplace. Local food production and the search for authenticity are discussed, rounded out by a brief discussion of the innovative ways, such as the internet, of how people are purchasing food.



Left (Photo: Rhonda Teitel-Payne), Right (<http://theearthproject.com/biofuel/>).

Decades ago, there was a very close link between organic food production and the idea of local. Now, this relationship is changing as agro-industries are embracing organic production, largely in response to growing consumer demand for organic. In 2014, the organic food market grew by 7.4% with sales of €24 billion (www.organic-europe.net). In the United States, sales of organic food and non-food products increased 11% over the previous year (www.naturalproductsinsider.com). With consumer concern with the industrial food system and GMOs, this trend is likely to continue.

Apart from organic food production, functional foods continue to make an impact. Here we refer to foods that are fortified, enriched or enhanced in some manner. With urbanization and busy lifestyles, this type of food is finding a market. However, some people are sceptical of the health claims that accompany these products.

The demand for local food has existed for such a long time and it is difficult to refer to it as a trend. However, not always cheaper, the values behind how food is grown and processed are becoming more significant. How the food is produced, how animals are treated and what the labour standards are for agricultural workers are important values that are influencing food purchasing.

Authenticity and experience are two linked trends that influence food. Food that is true to its source and linked to location is of importance to many consumers and helps fuel gastronomic and restaurant tourism. Heritage varieties linked to place, recipes and artisanal traditions are a vital consideration to many consumers in many age groups.

Healthy food is also a top of mind consideration for many consumers. This results in some foods quickly going in and out of fashion, such as super-foods that purport to have beneficial nutritional qualities like quinoa, goji and haskap berries. Grains are another area where consumers are driving the demand for gluten-free varieties and others such as kamut, amaranth, sorghum etc.



Left: Indigenous grain from Peru; right: amaranth (Photos: Rhonda Teitel-Payne).

Cities around the world are changing population wise and demographically as the shift from countryside to city continues. Immigration patterns means changes in consumer demand and opportunities for producers. The Urban Green Train case study Königshausen, in Germany, is an example of a farm realizing the opportunity that changing demographics brings. This peri-urban farm features livestock for the Muslim sacrifice feast “Kurban bayrami”. As well, the farm grows certain types of vegetables requested by immigrants.

The ways to buy the food are changing in many ways in all parts of the world.

In the global South, a pronounced trend is “supermarketization.” This refers to the growing presence of large-scale supermarkets that sell a more internationalized set of products that differ from those found at small shops, which are now dwindling. This change in marketing has an impact on the food that is being grown and produced, especially in peri-urban areas.

In the global North, many interesting and conflicting developments are occurring. Supermarkets continue to flourish and grow in size, with many branching into the sale of non-food products such as clothing.

Many other buying channels exist that involve urban agriculture. Box schemes exist where produce is delivered to consumers usually on a weekly basis in-season. Many Urban Green Train case studies feature this form of distribution including De Moestuin Maarschalkerweerd, in the Netherlands, and Werkhof Projekt GMBH, in Germany.

Internet shopping is another way consumers can purchase food, thereby changing the reliance that consumers have on supermarkets and smaller, at times more specialized, food shops. Recently, major online players have aggressively entered the market, the most noticeable examples are Amazon and Hello Fresh, in Europe. Other traditional retail stores, such as Walmart and others, are currently unrolling online platforms for food purchasing.

How people experience restaurants may also be changing. Recently Amazon introduced an app that enables eaters to order their meals for delivery. UberEATS is offered in many cities, which sees restaurant meals ordered online then delivered to the consumer’s home. Urban Green Train case Frais d’ici, in France, allows customers to order food, which is then delivered within 6 hours. Local is important with 70% of all their offerings coming from regional producers.

Convenience and fast food continue to be of great importance in how food is consumed as traditional times and places of eating evolve. More and more meals are not prepared and eaten at home. In the global South, many people purchase their food from street vendors. In the global North, street food and food trucks are emerging with creative offerings to appeal to younger generations. Fast food offers convenience for consumers, but the food is not always healthy or creative. The millennial generation tastes are not pedestrian and are likely to drive more creative innovations in the sector. How convenience/fast food is able to respond to challenges of sustainability and transparency will be an issue as often global supply chains are the norm for fast food.



Assignment 1.1.2.

Please view the slideshow ([What the world eats](#)), choose one photo and in a few sentences, state what the photo is and what it makes you think about the food or the food system.

1.1.3 - Professional trends in relation with UA

The changing nature of urban agriculture means that roles and skills set are evolving. In this sub-chapter, we will look at 'the sharing economy' with some examples from Urban Green Train project. The role of technology and soft skills required to be successful in urban agriculture will conclude the discussion.



Left (FAO); right (<http://foodtank.com/>).

The professional trends emerging in urban agriculture are a response to societal and technological changes and especially how people think about the food they consume. In this sub-chapter, we need to begin by recognizing that the roles and level of professionalism are changing for urban agriculture. At one time, rural agriculturalists were seen as professional, while city growers were seen as hobbyists or part-timers.

With the average age of farmers rising sharply in areas such as Europe and North America, the issue of who will farm in the future is emerging as a key policy concern. High land prices makes entry into the field difficult for many. Urban agriculture provides an opportunity for people who want to farm with the many benefits of living in cities. This brings into play new forms of organization not typically associated with rural agriculture, such as the emergence of the 'sharing economy' (discussed in 1.4.2).

This trend is evident in such Urban Green Train case studies such as Food for Good, Het Zoete Land and AMAP networks. Food for Good, in the Netherlands, operates as a social enterprise with the goals of enhancing social inclusion, participation, healthy food and education. Specifically interaction occurs with individuals experiencing homelessness and addiction, vulnerable and lonely elderly people and the long-term unemployed. Volunteers are well represented in these groupings.



Source: <http://www.foodforgood.nl/>

Het Zoete Land, also in the Netherlands, takes a different approach in their initiative. Weekly, the farm informs people electronically with yield shares of the harvest available – with people then picking what they need. A yield share is available for a donation of 180€ for a share. The market target is young families and elderly living in the area.

AMAP (Association pour le maintien d'une agriculture paysanne), in France, is a network of small producers often located in peri-urban locations and consumers that currently number over 1'600 farms in all regions of France. Like a CSA, consumers commit to buying production at a fair price in advance. The relationship between producers and consumers is established by communicating needs and abilities to deliver. A contract is established lasting usually for two production seasons.

In these examples, profit maximization is not the goal. Rather they serve a social purpose by promoting integration, inclusion and other values such as health promotion and mental well-being. Generally, this can be termed as green entrepreneurship, where the goods and services produced either benefit the environment or reduce the environmental impact to some extent.

Examples of green entrepreneurship in UA include for example managing water resources better, transporting crops to market in a more energy-efficient manner and recycling waste. To give back to society, many of the Urban Green Train enterprises have an educational component designed to improve society's stewardship of the environment.



Source: <http://popupcity.net/apps-for-urban-farmers/>

Urban agriculture requires skills not always associated with rural farming. For example when practiced in densely populated cities, soft skills, such as self-management, teamwork, problem solving and communication, gain importance.

Knowledge of how to use social media is vital to the success of any enterprise and agriculture is no different. This is especially for marketing of the crop or service provided. Platforms such as Facebook and Twitter among others provide unique opportunities for growers to market their products in creative ways and to communicate with customers and gain new ones.

This is backed up the results of Urban Green Train case studies in the four partner countries. Results show the importance of soft skills with respondents indicating communications (70%), creativity (64%), teamwork (58%) being the most important.

How urban agriculture is practiced has been evolving rapidly in the past decade. At one time, when people thought of urban agriculture, community gardens and growing in and around the house or apartment is what came to mind. Now, we see highly capitalized and technologically advanced enterprises is a new trend. In Europe, an example of this would be UF002 De Schilde in The Hague. Examples from North America include [Bright Farms](#) (USA) and [Lufa Farms](#) (Canada). Of more relevance are some of the businesses featured in Urban Green Train that provide services for growing in and on buildings. In some circles, this is known as ZFarming (zero-acreage farming).

Some businesses featured by Urban Green Train are participating in new cutting-edge production methods. Hei-tro Aquaponik GmbH, in Germany, has been developing aquaponic systems for community and private use. The value propositions are many and include providing healthy food produced locally and doing so in an energy-conserving manner.



Source: <http://www.hei-ro.com/UrbaneLandwirtschaft/aquaponik/>

Ferme Urbaine Lyonnaise, in France, is a company with an experimental prototype of how to produce vegetables in the most energy efficient and sustainable way possible. This company will design for vertical farming projects.



Concept boards of the production module (<http://www.proietful.fr/>)

All of these innovative companies highlight the multi-faceted contributions that urban agriculture makes to the sustainability of cities, food security and poverty reduction.

Reference

Urban Green Train (2016). *New urban agriculture initiatives toward a mindset change*, retrieved from http://www.urbangreentrain.eu/imgs/dwnld/13/IO1_New_UA_initiatives_toward_mindset_change_UGT_pg.pdf.

1.1.4 - Trends in city development and urban planning

How cities develop and govern themselves has a direct impact on urban agriculture. In this sub-chapter, we examine how food planners can have an important effect on the development of urban agriculture. Tools such as city and regional planning will be highlighted. Finally, emerging planning models such as Continuously Productive Urban Landscapes and Blue Green Cities will be discussed.



(Photos: RUAF)

The issue of sustainable cities emerged in Rio de Janeiro with the Agenda 21 Conference (1991) and continued at the 1996 UN City Summit in Istanbul, Turkey. The Habitat Agenda, signed in Istanbul by 180 nations, reaffirmed a world-wide social commitment to improvement of quality of life in human settlements and highlighted the role and importance of local authorities in the struggle to improve human settlements. The Habitat Agenda specifically mentions the role that UA, along with other activities and initiatives, can play in contributing to the future sustainability of cities.

How to plan cities without explicitly looking at the food system is not easy to do. The 1999 article by Pothukuchi and Kaufman, “The Food system: A stranger to urban planning”, was an important turning point on how cities are viewed. Planners quickly began to realize that planning cities without having knowledge of how the food system functions in the city would result in less than optimal policies and designs. Now, food planning is emerging as a sub-discipline in the world of planners.

When viewed through a food lens, the importance of city and regional land use planning becomes clear. Attempts by land use planning to take into account future demands on land have faced many challenges, whether in terms of forecasting needs, planning at the metropolitan or regional scales, or implementing such plans. Despite these challenges, there are increasing instances where all these have been realised successfully. Done properly, it can have a positive impact on how people live and how their needs are met, for example housing, transport, environment and food security. However, many jurisdictions lack the resources to create and implement plans. Powerful economic actors and influences often trump the plans of government officials, a situation prevalent in both global North and South. While it is challenging to take into account future demands on land at a regional or city level, attempts must be made to ensure cities and regions to develop sustainably and orderly.

One important tool that can have a direct effect on the food system is zoning, which touches on everything from the ability to grow food to where people can have access to markets. Zoning needs to accommodate for the future by setting aside lands for production, as well as considering how land contributes to the value chain and transportation infrastructure.

Aside from zoning, city planning can help to shorten food supply chains, by making land available for farmers’ markets and by procuring food that is produced locally, thereby helping to ensure that land in peri-urban areas has a strong reason to stay agricultural.

Tax incentivizing is an important tool that can be used to help a city develop in a sustainable way by mandating certain infrastructure for a city. An excellent example is green roofs on new buildings. Many cities including Toronto, New York, Copenhagen and Singapore either mandate or give tax breaks for buildings with green roofs.

How a city develops and evolves while taking into account the environment can be termed double track planning, where physical and green infrastructure design happens in parallel, with agriculture being an integral part of urban planning. The approach of a blue-green city is one way a city could approach this, with the aim of recreating a naturally-oriented water cycle while contributing to the amenity of the city by bringing water management and green infrastructure together (See BlueGreenCities at <http://www.bluegreencities.ac.uk/bluegreencities/about/about.aspx>).



Please watch the video <https://www.youtube.com/watch?v=1tiD49SkXv8&feature=youtu.be>

Emerging Urban Planning models

Many various kinds of planning models and philosophies have emerged in recent years. Smart growth has the goal of limiting sprawl of urban areas in favour of more compact development. Guidelines for smart growth have a direct impact on how urban agriculture can develop. Mixed land use, preserving open space, farmland and areas deemed to be significant to the environment speak directly to the food system and how it can be strengthened. Encouraging residents to participate in the development process is another tenet of smart growth.

Other models have emerged that are sympathetic to smart growth. New urbanism is a planning model that emphasizes mixed-use and diversity in building types, mixed housing with respect to people's income, walkable neighbourhoods, green transportation options and increased density among others. An idea linked to this with impacts on peri-urban areas is new ruralism, which can be defined as *the "preservation and enhancement of urban edge rural areas as places that are indispensable to the economic, environmental, and cultural vitality of cities and metropolitan regions."* (<http://frameworks.ced.berkeley.edu/tag/new-urbanism/>).

In recent years, sustainability has been a motivating force for ways cities can be planned. An interesting model developed in the 2000s was the concept of Continuously Productive Urban Landscapes (CPUL) by [Bohn & Viljoen Architects](#). CPUL is a design concept advocating the coherent introduction of interlinked productive landscapes into cities as an essential element of sustainable urban infrastructure. Central to the CPUL concept is the creation of multi-functional open urban space networks, including urban agriculture that complement and support the built environment. The CPUL concept puts food back into the centre of planning theory and practice.

Optional material:



For further information, for those interested in exploring the concept of the CPUL approach, please watch this video of a lecture by [Andre Viljoen](#)



Assignment 1.1.4.

Name a few obstacles that the planning model or procedures may pose for urban and peri-urban agriculture in your city or region.

References

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1.1.5 - Territorial analysis and governance

In this sub-section, we begin by examining the concept of city-regions and how it impacts on food, nature and people. Tools that can analyze the situation on the ground such as participatory mapping will be presented. We then turn to the Multi-stakeholder Action Planning (MPAP) process and how it affects governance. Finally, we identify direct and indirect stakeholders in the value chain.



(Photos: RUAF)

Specific territorial and governance conditions have a profound impact on how urban agriculture develops, in both a positive and negative sense. In much of the global North as in the South, regional planning and other approaches to manage urban expansion have generally been ineffective. This is leading to a renewed interest in instruments for governance at the metropolitan or city-region scale. How to enhance food security while acknowledging urban spatial growth and accommodating for it, is likely to remain among the greatest challenges globally (and in Africa in particular) for years to come.

Peri-urban land presents a particular area of contention. It is where transformations in every aspect are typically greatest, whether in population, demographic characteristics, land use, land coverage or ecology. Regulatory shifts such as the introduction of greenbelts or changes in zoning permitting uses such as housing or industry often result in increases in land value, which again increase the pressures on agricultural and natural lands.

One approach to territorial analysis that has sought to emphasise the connections between the urban and rural settlements is that of the city-region food system. This approach emerged recently to offer “a spatial representation of food and agriculture for policy consideration at local, national and international levels.” City-region food system was defined in a 2013 FAO consultation as “the complex relation of actors, relations and processes related to food production, processing, marketing, and consumption in a given geographical region that includes one main or smaller urban centres and surrounding peri-urban and rural areas that exchange people, goods and services across the urban rural continuum” (Quoted in Forster and Getz Escudero, 2014).

Many tools exist on how to conduct territorial analysis. City and regional land use planning are land tools that influence how resources are used and flow in peri-urban and intra-urban land. Food policy councils are an excellent way to bring diverse stakeholders together to work on creative solutions concerning the food system. Cities can furthermore pro-actively support local agriculture by embedding local procurement in their institutional purchases.

Participatory community mapping is a useful tool that gathers data on the food system, and the data collected can have an impact on how land is governed. During community mapping exercises, data could for example be gathered on elements of the food system such as: where food is produced; where food is purchased; identification of key food related infrastructure (e.g. storage and transportation facilities). This

information will provide important baseline data that can be used to inform citywide and regional land use planning.

City governments attempt to deal with the food system but often this is difficult. To take urban agriculture for example, responsibility usually lies with many city departments such as parks, water, planning, environment etc. Of course, not all civic bodies and departments work well together. Solutions to this problem are difficult but not impossible. In Toronto, Canada, the Toronto Agriculture Program was announced in 2013, which brings together all departments with a role in urban agriculture along with some civil society members to work through issues facing urban agriculture at a high level. In Rosario, Argentina, the Urban Agriculture Program (*Programa de Agricultura Urbana*, PAU) is able to coordinate among various departments to make a positive contribution on how urban agriculture is governed and managed.

Multi-stakeholder and action planning

A planning approach that can be effective in solidifying the place of urban agriculture is by making the planning participatory in nature, rather than top down. Multi-stakeholder and action planning (MPAP) is an approach that has been successfully used in many locations. As a first stage, critical areas such as land use, identification of direct and indirect stakeholders and assessments of the current state of policy and the urban farming system are explored.



Photos (James Kuhns)

An MPAP process has many benefits and frequently results in better decision-making as key issues and needs of all stakeholders are better understood. By necessity, this process is participatory in nature, and therefore the people most affected by the resulting changes will feel part of the process.

Stages of a MPAP include:

- Preparatory activities
- Situation analysis
- Broadening commitment and participation
- Establishing of a multi-stakeholder forum on urban agriculture
- Development of a City Strategic Agenda on urban agriculture
- Operationalization
- Implementation and monitoring; adaptation/innovation

Optional material: for further information on MPAP, please read chapter 2 of the following publication:

<http://www.ruaf.org/publications/cities-poverty-and-food-multi-stakeholder-policy-and-planning-urban-agriculture>



Assignment 1.1.5.

Think about the specific context of your city and name what are relevant contributions of UA at the territorial scale.

References

- Dubbeling, M., De Zeeuw, H, van Veenhuizen, R. (2010). *Cities, Poverty and Food: Multi-stakeholder Policy and Planning in Urban Agriculture*, Warwickshire Practical Action Publishing Ltd.
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1.1.6 - Challenges for UA

In this section, we look at the common challenges for urban agriculture, starting with what is often the most limiting, land. Agricultural waste, input supplies are also discussed. We round out the discussion by viewing other challenges, such as urban policies, health and social issues. After completing this sub-chapter, you should be able to understand some of the constraints that urban agriculture practitioners face and you will be able to think of some solutions.



Left (photo, Roy Maconachie); right (FAO)

Introduction

There are numerous challenges that urban agriculturists confront on a daily basis. These challenges are extremely diverse. We can discuss the types of factors that can act as constraints on the practice of urban agriculture. Writers who have tried to find some order across these varied factors have attempted different forms of categorization. For instance, in chapter 9 of *“Urban Agriculture, Food Jobs and Sustainable Cities”*, Smit, Nasr and Ratta proposed the following broad categories to classify the constraints to urban agriculture:

- Sociocultural biases and institutional constraints
- Constrained access to resources, inputs, and services
- Special risks of farming in the city
- Post-production constraints, particularly in processing and marketing
- Organizational constraints.

In 2004, Henk de Zeeuw of RUAFA wrote *“Local Factors Constraining and Facilitating UA Development”* in which he proposed the following categories of constraining factors:

- Prohibitive urban policies and regulations
- Limited access to productive resources and insecure land tenure
- Lack of support services and appropriate technologies
- Lack of organisation among urban farmers.

Constraints and opportunities for urban agriculture

The first section will focus on resources, inputs and services for urban agriculture. Aside from land, urban agricultural production requires inputs (seeds, feed, fertilisers, pest control, equipment, tools etc.), labour, finance and capital, information services.

Land

Land along with water is an irreplaceable necessity for urban agriculture, though this should not necessarily be equated with ground surface: everything from rooftops, to walls, balconies, even interior surfaces (in front of windows, or even sunless areas for producing everything from mushrooms to small livestock) can

be used for farming purposes. As used here, land refers to this full range of possible surfaces in urban areas that may be put to use in agriculture.

Access to land is commonly depicted as the most significant challenge for a greater presence of urban agriculture in cities. This may be related to actual availability of plant-growing or animal-rearing surfaces, but it may also be a question of access to such surfaces, to security of tenure on these surfaces, and to trade-offs in use of these surfaces for food production versus other uses. Here, the matter of pressures on productive land and other surfaces to be transformed into other functions is central – particularly as these pressures discourage productive activities due to the uncertainty that hangs over the future use of these surfaces.



Photo left (James Kuhns); right (RUAF)

While the constraints on the use of all surfaces are worth considering, it is evident that of particular concern would be areas that are already in agricultural use but where this use may be threatened by “urban sprawl”, such as peri-urban land. This is a challenge that is being confronted around every city across the globe today, and no doubt will continue to be in the future.

These questions may be general questions, but they need to be addressed in the specific context. Thus, you may wish to consider in relation to your own city, questions such as:

- What are the specific mechanisms that are resulting in the abandonment of productive activities on lands in and near your urban area, and ultimately in the conversion of these lands into other (built-up) uses?
- What roles do public actors (including planners) play in these changes?

We can see here that we are just scratching the surface of the big question of access to land as one of the dominant constraints on urban agriculture. Before closing this section, it is important to keep in mind that urban areas represent not only many constraints related to land used for urban agriculture, but also endless opportunities in this regard.

Urban farming is increasingly recognized as an excellent utilization of unused or underused surfaces around the city, including where urban abandonment has occurred. Moreover, it is frequently the highest and best use of many marginal lands around the city that are not suited (or even unsafe) for buildings. Even where lands may be planned for future built-up uses, these transformations may not happen for years, allowing urban agriculture to take place for a certain duration. When starting to seek opportunities of placing lands into agricultural use, one can see then that these opportunities are very diverse and present even in the most unlikely places.



Growing Power, Milwaukee USA (Photos: James Kuhns)

Waste

Waste can be a significant problem or an opportunity as it pertains to urban agriculture. Waste can represent a significant opportunity for urban agriculture and serve as an asset for the city, yet this area of activity frequently encounters numerous challenges that prevents limits or make difficult its utilization for agricultural production.

There are of course very different forms of waste. The three principal ones that have a bearing for urban agriculture are agricultural waste coming from the farm, wastewater and solid waste.

Vegetable matter can be recycled into compost, which is an input needed for organic production.

Moving to greywater (domestic wastewater from the kitchen, shower, etc, excluding “blackwater” from toilets), this is increasingly seen as an asset that can be used in urban agriculture upon treatment. This use however often confronts a multitude of challenges. Constraints can relate to *availability*, as modern sewer systems rarely separate greywater from blackwater, making safe reuse without substantial treatment processes impossible. Even if greywater were collected separately, it would have to be treated to assure its safe use. A variety of affordable treatment systems is available but these are often not in place. Secondly, even where such a resource is available, there can be problems of *accessibility* since there can be any number of factors, ranging from prohibitive regulations to inflexible infrastructural systems, that prevent potential users from having access to this source.

These multiple challenges have not precluded the use of greywater in urban agriculture. In fact, this is a practice that is becoming increasingly common, especially in arid and semi-arid areas, where pressures on domestic water sources are becoming progressively graver.

Urban policies and regulations

Although activities such as home gardening and urban livestock keeping may be well known by policymakers and planners, in many cases this knowledge does not result automatically in the recognition of urban agriculture as an important element of the city economy and a permitted land-use.

Cities are often perceived as solidly built up with no area to spare. Agriculture and urbanization are viewed typically as conflicting activities that should be separated. Fear of contamination by urban agriculture and use of unclean water for food production have become institutionalized in law, and led to reluctance by many local governments and to contemplate the potential benefits of urban agriculture.

In many cities, agriculture still has an “illegal” status, although it may be tolerated in practice. Such biases, sustained by the limited exposure of policymakers and planners to scientific information on urban agriculture and on ecological and participatory city development in general, have led to important legal restrictions on urban agriculture.

Limited access to productive resources (inputs)

Next to land, the access to water and nutrients (especially manure and compost of good quality) is crucial to urban farmers. For example, in some North American cities, compost programs exist but the compost that emerges is not fit for food growing. Use of water sources is often informal (e.g. tapping off wastewater disposal pipes and canals). Measures to enhance access to these productive resources is vital if the potential of urban agriculture is to be realized.

Lack of support services and appropriate technologies

Because policymakers, planners and support organization generally have little understanding of the potential of urban agriculture, urban farmers are viewed as a target group for support services such as training and extension, veterinary services, technical assistance and credit services, or for supporting infrastructure such as water points and market facilities. Urban farmers especially highlight the lack of access to credit. However, with innovations such as crowd funding, urban growers have a few more ways to secure the capital they need.

Projects oriented at technology development in urban agriculture are very scarce. There is a great need for easy-to-operate and low-cost technologies for recycling urban biological wastes and to improve delivery of adequate support services to enhance the productivity and economic viability of urban agriculture.

Even if such support services exist, they are often oriented at larger-scale and (peri-urban) commercial farmers. The participation of often non-organised and more vulnerable groups of farmers, the urban poor, women and youth or recent migrants, in urban agriculture programme, planning and policies will need specific attention. Gender equity and social inclusion should be considered.

Potential health and environmental risks

Urban agriculture may have negative health and environmental impacts. Soil erosion may occur and groundwater may be polluted if production methods are poor or occur in unsuitable locations. If high amounts of fertilizers and pesticides are used, in urban agriculture health impacts could be felt, especially by those applying it.

If contaminated wastewater (untreated or insufficiently treated) is used for irrigation of food crops (especially green leafy vegetables) or when fresh organic wastes (not composted or not properly composted) are used as fertilizer, the production, processing and marketing of food may become contaminated and the health of agricultural workers may be negatively affected. Certain diseases can also be transmitted to humans by livestock kept in close proximity to them, if proper precautions are not taken. Development of safe and sustainable forms of urban agriculture should be promoted by taking measures to reduce the health and environmental risks associated with urban agriculture.

Other urban agriculture challenges

Sociocultural biases may arise from views of what a city should be (generally anchored in desires of modernity and preconceptions of aesthetics, efficiency, and hygiene that assign to agriculture images of rurality and traditionality). They may also be related to local cultures. These biases have generated a multitude of institutional constraints, which are encrusted in the political and regulatory framework in place – including planning practices and long-established laws and regulations.

Urban farmers are often scattered and isolated, even where they are numerous in a given city. Efforts are needed to form urban agriculture networks so the sector can advocate for itself properly.

We have sketched out here the categories of constraints that go beyond those related to the direct means of production. It is possible to conceive of a similar set of opportunities as counterparts to the constraints we have just mentioned. These can include: newly emerging attitudes by urban residents that favour “local food”, protections offered by neighbours who bring a sense of belonging to urban crops being grown near them, special marketing possibilities derived from the proximity of farmers to consumers, and access to urban forms of organizations that may not be exclusive to farmers.

Optional material: for further information, please read:



[1.1.6 Vacant Lots to Vibrant Plots: A Review of the Benefits and Limitations of Urban Agriculture.](#)

References

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1.1.7 - Diversity and roles of actors/stakeholders in UA

After identifying what a stakeholder in urban agriculture is, we move on to discuss who direct and indirect stakeholders are as it pertains to urban agriculture and what their many roles may be. We end by recognizing that a range of groups may require specific attention from the larger body of direct stakeholders, namely those who are vulnerable from social or economic reasons.



Photos by James Kuhns

Introduction

In *Cities Farming for the Future*, Dubbeling and Merzthal state:

“Urban agriculture takes place in a multi-sectoral environment, touches on a large number of urban management areas [...], and involves a large diversity of systems and related actors [...]. Urban agriculture can thus be seen as a cross-cutting issue involving a wide range of often disconnected actors or stakeholders needed for effective implementation, policy making and monitoring”

This quotation implies that many different people and professions are involved in urban agriculture.

Who are stakeholders in urban agriculture?

The concept of stakeholders is emerged in the last decades as crucial for understanding decision-making and has influences in any range of human activities. In the case of urban agriculture, the concept refers to all individuals – and by extension, organizations – who play a (direct or indirect) role in the production, processing and marketing of food and other farming products within or near urban areas. This includes people who influence a decision, or can influence it, as well as those affected by it.

Stakeholders in urban agriculture would therefore include, among others:

- Urban farmers and all those involved with them in the production process and those who depend in any way on the results of this production
- Those who supply inputs, resources, services, to urban farmers
- Processors, distributors, marketers, recyclers who deal in any way with the outputs of urban farmers’ activities
- Those who establish modify or implement the various frameworks (judicial, regulatory, political, economic, socio-cultural) that enable or hinder the activities of urban farmers (e.g. including NGOs, community-based organisations, research institutes, local and national governments etc).

This appears to be an endless list. It is valid to consider in fact who is not a stakeholder in urban agriculture – indeed, what is the utility of such an inclusive approach to the definition of urban agriculture stakeholders? On the other hand, how can one understand and plan urban agricultural activities without a full, proper accounting of all people and institutions with a stake in these activities?



Photos by RUAF

One may answer these questions by realising that considering the stakeholders in urban agriculture is essential to intervening in any way to enhance its viability. To develop new farming techniques, urban farmers may need support from research institutes or extension services. To develop policies for “scaling up” productive activities in urban areas, a range of actors could either enable or hinder the successful realization of such actions. To develop the capacity of consumers to obtain the fruits (and vegetables) of the urban farmer’s hard labour, one must deal with any number of entities who may serve as mediator between producer and consumer.

There are different levels of involvement by different stakeholders in urban agriculture. It can be particularly useful to distinguish between direct stakeholders (various types of actual urban farmers / groups / organizations or categories of the population with a strong interest in practicing urban agriculture) and indirect stakeholders (individuals or organizations who play a role in the development of urban agriculture).

To go effectively from such an analysis to such support, it is fundamental to develop what has come to be referred to as “multi-stakeholder processes”. As summarized by Dubbeling and Merzthal, these processes are forms of social interaction that aim to involve a range of stakeholders in improving situations that impact them by enabling them to enter into dialogue, negotiation, learning, decision making and collective action. Here, we will lay the ground for this by introducing different categories of stakeholders.

Direct stakeholders: urban producers

The first trait that we may want to consider is the role of the urban farmer within the urban farm, garden, orchard or production area. In this locus of productive activity (which is as varied as urban producers themselves are), the actors that we can refer to collectively as urban producers or farmers or gardeners play a multitude of roles. Farmers are labourers (applying their labour to generate products from the soil or on land or water surfaces), but they may also be:

- Managers (planning and coordinating actions related to production)
- Purchasers (acquiring inputs, resources and services that are needed in the production process)
- Marketers (offering the products of their labour to others – either for sale, barter or gift – and convincing customers to purchase the products)
- Distributors (getting these products to their destinations)
- Overseers (directing others in any part of the process of acquisition, generation or disposal of their products)
- Communicators (conveying information to others about their products and the value it bears)
- Stewards (sustaining the productive capacity of the resources they use)
- Recyclers (disposing the waste by-products of their activities)
- Technicians (building up and transmitting the knowledge that enables them to undertake and improve productive activities).



Photo left (James Kuhns), Photo right (Rhonda Teitel-Payne)

Another aspect to consider as pertaining to urban producers is their income. Income level of the farmer or the farming household clearly bears on a multitude of aspects, including the roles mentioned above. We can quickly contemplate one other aspect: the chief aim of urban farmers. For low-income farmers, they may cultivate crops or raise animals for sustenance (basic food provision), revenue generation. For middle-income farmers, urban agriculture may represent a supplement to earnings that may be unstable, an opportunity to supplement the household diet with luxury food items, or an enhancement of the nutritional intake of the family. As for higher-income residents, working in their garden may be a source of leisure and fitness, and putting financial resources into farming activity (especially when undertaken by others) may be a pure investment decision.

Form of organization is another major variable among urban producers. In other words, we may wish to figure out what the “unit of production” is in each context – even, say, in a backyard garden belonging to a well-off family that is planted in a mixture of ornamentals, herbs and vegetables. In such a garden, there would be decisions that have to be made regarding who does what when and how. This means choices about forms of organization of space, time and labour, among others.

If an urban farm or garden is thought as a unit of production, one of the most immediate questions that arise is the scale of the unit. Eight types of production units are:

- Individual farmer
- Familial garden
- Extended family operation
- Cooperative
- Small farm
- Medium-scale operation
- Large farming business
- International agribusiness.

Tenure is interesting because it pertains simultaneously to time and space. It helps define the relationship of the urban producer to land: whether one is an owner, the holder of a long lease, or a short-lease grower, is without a doubt one of the most significant variables among urban producers. At the centre of the impacts of this variable is the way it bears on the commitment of the producer to his or her activity, which of course has a multitude of repercussions on the activity.

Let us add one more way for considering producers: the basic orientation – or central purpose – of the organisations that represent them. Three main orientations are identified for such entities: socially oriented, economically oriented, and politically oriented ones. It is therefore important to consider what the main purpose of any grouping of urban farmers is in seeking to influence some facet or another of urban agricultural activities.

It is essential not to view urban producers in a static way, but instead consider them in dynamic contexts. We can consider, for instance, social changes that affect urban farmers. In an article on urban farmers and social changes in the Middle East, Thierry Boissière identifies some transformations that have consequences on urban producers in that region. These include:

- Access to land
- Access to water resources
- Demographic importance of urban farmers and their ability to self-mobilize and act as an organized group
- Impacts on urban economy
- What other activities urban farmers are involved in, or what others in their household and community are involved in.
- The identities of urban farmers, their self-representation and their representation by others.

Indirect stakeholders

In chapter 6 of Smit, Nasr and Ratta's *Urban Agriculture* "organizations that influence urban agriculture" are sorted according to the following classes:

- Support organizations: these contain for example farmers associations and non-governmental organizations;
- Governments and public authorities: local and national governments should be highlighted, but other intermediate scales (such as regional governments) should be considered too;
- Public and semi-public institutions: sub-categories here would be institutional providers and research institutes;
- Private sector entities;
- International development agencies;
- Other stakeholders.

The chapter also considers the different roles for the indirect stakeholders. The main roles can be defined: regulating, facilitating, providing, partnering.

Vulnerability and capacity of stakeholders

We will bring this sub-chapter to a close by deliberating on which particular groups of stakeholders require special consideration when developing urban agriculture projects and policies. Yet, it is vital to distinguish such characteristics to give specific attention to social inclusion of vulnerable individuals and groups. These groups can be deemed vulnerable from the perspective of:

- Urban poverty
- Gender
- Race
- Class
- Age (children, youth, the elderly...)
- Origin (indigenous, immigrants, migrants...)
- Physical/mental challenge (the disabled, the ill – including HIV-AIDS infected).

Vulnerability needs to be placed in the context of actions and capacity, where questions of vulnerability may be pertinent. It is useful to consider all the traits in the list above in the ways they interact with the following issues and challenges:

- Access to and control over productive resources
- Access to and control over the benefits of production
- Decision-making (in other words, how these traits relate to the ability to and means for making decisions regarding urban agriculture)
- Division of tasks (which tasks fall on whom, and why).

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1.2 - From multifunctionality to ecosystem services of urban agriculture

1.2.1 Concepts of multifunctionality and ecosystem services

Introduction

Urban agriculture presents many positive impacts, implemented or potential. During the last 20 years, the analysis mainly based on functions has evolved towards the concept of services. An integrated service-function-process-benefit is nowadays accepted in the framework of the Millennium Ecosystem Assessment (MEA).

Charles Perrings (2006) said that “The MEA by connecting ecological functioning, ecosystem processes, ecosystem services and the production of marketed goods and services, has identified ecological change as an economic problem. It has also draw attention to a new dimension of the environmental sustainability of economic development”.

The main idea of ecological economics is that “to protect something we have to give it a value”, but it is difficult to evaluate ecosystem services on ecosystems which are dynamic systems. The MEA looks like an anthropocentric approach of biodiversity for human well-being at the expense of other species. However, the utilitarian nature of the monetary valuation of ecosystem services in ecosystem approaches is problematic because of its influence in political decision-making.

Multifunctionality

The multifunctionality concept has indeed been used for many years about agriculture in rural areas. It integrates all the other functions of agriculture beyond the production of agricultural goods. However, a revival of this concept has been observed with the increasing interest in peri-urban and moreover in urban agriculture (Fleury 2005 ; Zasada 2011). Actually, the identification and valorization of all the other functions than the productive one was crucial for the acceptance and recognition of agriculture in urban contexts and development projects. Externalities are all the transformations of the physical and social environment caused by the farming activity beyond the productive system. The multifunctionality concept for promoting urban agriculture intends to integrate all the positive externalities.



Please watch this video at <https://www.youtube.com/watch?v=yOGMJvkSbGo>

Optional material: for further information read multiple functions of urban agriculture in :



[UA magazine N°15](#)

Concept of ecosystem

The ecosystem consists of an environment (biotope) and a living being community (biocenosis) acting in interaction as functional unit and allowing the development of life. The ecosystem is estimated for the goods and services, which it supplies to human with as objective to maintain or to increase these services while preserving the spaces.

The definition of an ecosystem is complex and can vary according to the author (ecologist or user), the spatial and temporal scales. A way of defining the ecosystems, such as realized in the MEA is to answer two questions for a given ecosystem:

- Is the ecosystem sustainable? Is it vulnerable? Why?
- Does the ecosystem answer to expected ecosystem services?

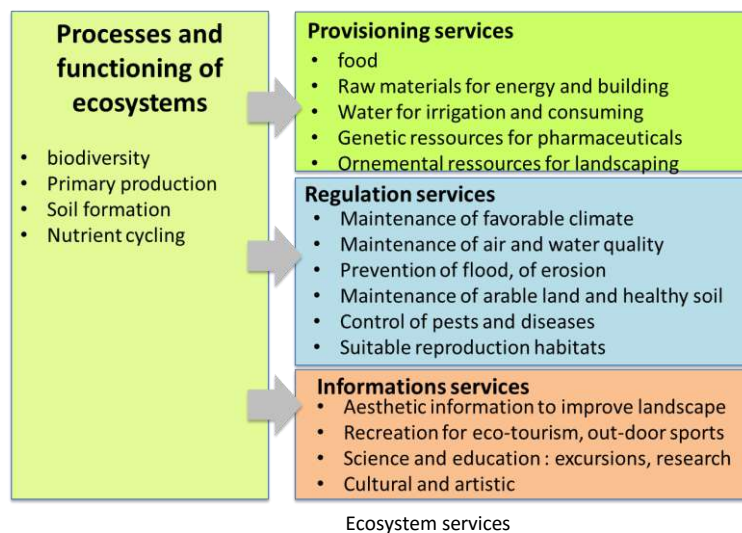
The urban ecosystem is identified as one of 17 ecosystems at the world level. Considered by the ecologists as a particular ecosystem, it is anthropological, created by the people and for the profit of the people. The city, at its origin, is not an ecosystem. It was built by the people to protect themselves, at first from wild animals and barbarians. It is a place of human taming, life and survival.

It is only at the end of the 19th century, when the nature reinvested the city to decorate it that started a viability concern on hygienic, social and cultural points of view. During the 20th century, the city became more and more a place of concentration of human population with its economic development and its necessary social organization. Since the beginning of the 21th century, more people live in cities than in rural areas. In this constructed ecosystem in permanent evolution, the nature has a preponderant place, under unusual forms, with interactions, balances and dynamics between certainly different species with regard to an undisturbed ecosystem. Considering the city as an ecosystem means to make the bet of a viable and sustainable city.

Integration in the ecosystem services approach

The ecosystem services define the services provided to the people by the ecosystems (MEA, on 2005) and are estimated as the services brought to the living in the form of service (profit) or of disservices.

By explaining these services of provisioning, supporting, regulating and social, we could better manage the ecosystems and assure their durability.



The notion of service requires two conditions: a function and a use. If these two conditions are not combined, the components of the ecosystem will not bring service of living of the ecosystem.

The notion of service is attached to the use and to the benefit for the user. It is particularly important in the ecosystem where the people are dominant, with strong evolutions, which induce a permanent instability and where it is sensible to estimate the durability within the framework of three pillars of the sustainable development: economic, environmental and social. To live in urban area, people need services provided by the natural area close to the urban system or very distant from the city (for example, forests). For every landscaping type, we should estimate the services, which will benefit to people. Urban agriculture is one of the components of the landscaping projects, which can guarantee the sustainability of an urban area.

The concepts have evolved from functions (and multifunctionality) to ecosystem services as a more integrative approach. However, the concretization of benefits still needs to be assessed.



Assignment 1.2.1. Answer the following questions:

- What is the difference between functions and services?
- What is necessary to obtain benefits from a given service?

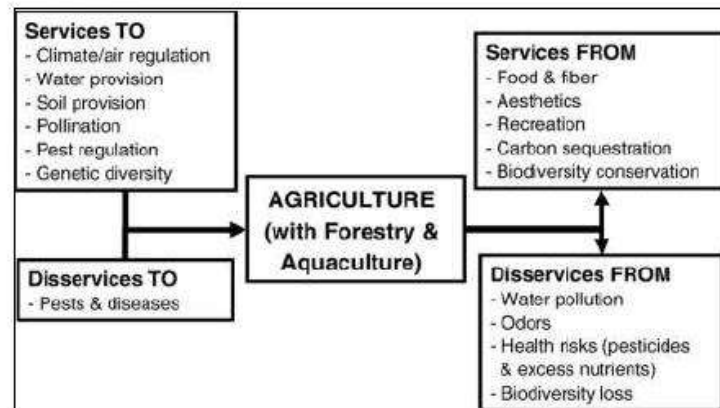
Optional material: for further information read

- Millennium ecosystem assessment <http://www.millenniumassessment.org>
- [Cultural ecosystem services](#) by Dr Kai Chan, British Columbia

1.2.2 Services from UA

Introduction: ecosystem services of agriculture

MEA suggests connecting the ecosystem services with the agricultural practices and thus the associated agri-environmental politics. Agriculture benefits from ecosystem services of the system in which it is acting, but it can also supply some services.



Ecosystem services and agriculture (Swinton et al, 2007).



Assignment 1.2.2a.

After reading the material, adapt the above scheme (Swinton et al, 2007) to urban agriculture:



[1.2.2 \(1\) Ecosystem services and dis-services to agriculture](#)

[1.2.2 \(2\) Ecosystem services and agriculture](#)

Services of urban agriculture

Urban agriculture is a domesticated nature, essentially rationalized for the services it can provide to human in the urban ecosystem. There is not always a strict correspondence between services, functions and benefits, as a function can participate to several services and a benefit can result from several services.

The terms and concepts applied to urban agriculture services are illustrated by the following three services' categories:

Service category	Ecosystem service	Function	Usages	Benefits
Provisioning	Local supply	Food supply	Local supply Geographical proximity Proximity producers-consumers Short chain organization	Access to fresh products Social link between farmers and consumers and between consumers
Regulating	Flood risk management	Buffer role Water infiltration	Differentiated management of urban spaces Urban policy (zoning...)	Flooding prevention Impact reduction on populations (security)
Sociocultural	Human health	Structures supporting participatory activities	Active and collaborative participation to production and distribution activities	Physical and psychological well-being of dwellers and farmers

From the abundant literature, the main services attributed to urban agriculture are detailed below. Their importance depends on the contexts, which can be very diverse in the world. The benefits can be intangible (cultural values) or tangible (food production).

Provisioning services

Food supply

The original service of agriculture is to provide food. Urban agriculture provides especially fresh products due to its proximity to consumption centers and contributes to food security and dietary equilibrium. If urban agriculture is essential for providing food in southern countries for long time, there is a renewed interest in northern countries to include it in resilient cities scheme. However, the exact impact of urban agriculture in food security is questioned and might be over emphasized in southern countries (Zecca & Tasciotti, 2010; Badami & Ramankutty, 2015). A high level of food self-reliance of cities in northern countries seems to be theoretically possible but would necessitate significant commitment (Grewal & Grewal, 2012).

Urban greening, embellish urban neighborhood, landscape

The quality, the esthetics and the planning of urban spaces favor rest, relaxation, walking, social link and finally the well-being. Diverse functions converge on a common service bound to the viability of the people in the urban space. The urban agriculture can contribute to this service if all the management policies of spaces, greening, urbanization and urban agriculture are reasoned and coherent.

Energy

The urban and peri-urban agriculture is a source of energy stemming from the city and used in short cycle for the city. This service is connected to several functions and uses such as the production of compost, the production of biomass by trees and shrubs or power production by the closed urban greenhouses. The use is also diverse with the supply of the woody central boilers or the production of electricity and heat.

Regulating services

Regulation of water and flood risk

Cities are very often situated close to rivers or are crossed to rivers. Therefore, they are exposed to flooding risks due to storms or seasonal events. Cultivated areas, usually in lowlands, represent important buffer zones. They allow water infiltration whereas built areas are artificialized and waterproofed. In case of river

flooding, they act as expansion zones and therefore protect urban populations and housing. In Antananarivo (Madagascar), rice production areas have been protected by city planning for their role as water flooding buffer (Aubry et al., 2012). However, the reverse is also true: in Northern countries where flooding risk regulation is stronger and stronger, this risk represents a protection of urban agriculture zones from city expansion through reinforced land zoning.

Climate regulation

Urban agriculture plays a great role for mitigating the negative effects of climate change in cities and especially moderating the urban heat island effects thanks to land cover by crops and trees. Agricultural lands with other urban green spaces decrease actively solar radiation, increase evapotranspiration, provide shade, facilitate faster cooling at nighttime and reduce energy use.

Regulation of city expansion

Urbanization is increasing at fast rates. The natural trend of cities is to increase their surface by nibbling agricultural areas. In a country like France, it is estimated that the equivalent of a department of agricultural land disappears every 7 years due to urbanization. Cities realize that a continuous expansion is not sustainable, and start to consider dynamic peri-urban agriculture as a tool to help limiting this expansion and to force to find new models of city development. City planning needs to incorporate the services and amenities provided by peri-urban farmlands, as evaluated by Brinkley (2012).

Liquid and solid waste management

Urban agriculture is an intensive production system, which tries to find alternative fertilizers derived from different types of waste (solid waste, horticultural and agricultural waste, agro-industrial waste, sludge and bio-solid, wastewater). However, the use of urban waste and wastewater for food production needs required treatment capacity to prevent risks for human and environmental health.

Energy conservation

Since agricultural goods are produced in or around the city, there is a reduction of energy needed both to transport goods to the city and for dwellers to get them, but also from inputs and packaging. The local origin of food makes consider that urban agriculture contributes to so-called “foodmiles” reduction. However, this still needs to be precisely evaluated as several studies demonstrate that a well-organized long distance logistics lead to lower transport impact on a unit basis (kg). Urban networks need to be organized to get an efficient distribution of urban goods.

Biodiversity preservation

Biodiversity is a regulating service at the level of the flora and fauna, of the soil and the atmosphere. It is also a supporting service of an anthropological ecosystem, which was previously presented within the framework of the definition of an ecosystem. Then raises the question of biodiversity conservation and its increase or decrease. In the regulation process, the services have to favor the balance. In the uses, biodiversity conservation is materialized by ecological corridors and green wefts. Urban agriculture may be an ecological corridor if environment-friendly practices are used, with a wide plant diversity and the reasoned use of balanced predatory-auxiliary couples.

Socio-Cultural services and amenities

Monetary income and poverty alleviation

Urban agriculture provides employment for farmers and jobs for urban unemployed people, and therefore contributes to the local economy. Numerous studies claim that urban agriculture has a significant impact on poverty reduction, especially in southern countries. In a set of 15 worldwide developing countries, the share of urban households earning income from agriculture varies from 11% to 70% (Zezza and Tasciotti, 2010). However, the income share coming from urban agriculture ranges from 1 to 27% (the highest being in Africa), stressing out that the potential of urban agriculture to alleviate poverty should not be

overemphasized. Urban agriculture can also be a marker of poverty increase: since the economic crises began in 2008, the vegetable gardening has significantly increased in Europe as an alternative of food supply.

Social insertion of disadvantaged people

Urban agriculture provides jobs for people without qualification. Moreover, many projects target not only production of goods but integrate social objectives, such as the participation of people with disabilities in the production process. It helps to reduce inequalities. In some situations, urban agriculture promotes gender equality since women get access to activities and income while providing food to the family.

Community building and socialization

The sense of community has been jeopardized in some cities. Gardening and farming provide social activities and contribute to community building, especially in more and more ethnically diverse cities. Sharing knowledge, food and labor in gardens at the foot of buildings create links between inhabitants and favors insertion through the development of social networks.

Education of children and adults

Children and adults learn about plant cultivation and food production, but also related issues such as nutrition and cooking, food waste management, environment, economics and city sustainability. Green classes for children and participatory activities help transform the consumer in a responsible actor. Northern societies may be vulnerable, as people have lost the knowledge of how to grow food, in case of dramatic crisis. Community gardens and other participatory forms of urban agriculture help the transmission of such knowledge.

Human health (physical, psychological)

Human health is a state of complete physical, mental and social well-being, and does not consist only of an absence of disease or infirmity (World Health Organization, 1946). Gardening is an activity favorable to human health. Therapeutic gardens are built in hospital centers specifically in this purpose. Urban farming corresponds to a big therapeutic garden for the health of the farmer and all the participating people. (See [Farming and health – Nature and health](#)).

Cultural heritage

Agriculture in and around the cities are part of the city's history and identity. Some vivid traditional events and local fests are an illustration of this link. Actually, the peri-urban growers were the first breeders, looking for locally adapted varieties. As dwellers are from diverse origins, urban agriculture can provide diverse ethnic foods and therefore a link with culture.

Leisure and recreation

The participative, collective, community, associative, worker gardens are a part of urban agriculture. They are places of leisure and exchange with neighbors. They can integrate rest and entertainment areas in the middle of the production spaces.

The various services provided by urban agriculture are crucial to promote a viable urban development. Urban agriculture has to be seen as an essential city infrastructure as well as streets or networks of gas and electricity or internet. It contributes to the reduction of city's ecological footprint.

Urban agriculture might represent potential risks

There are still challenges to promote urban agriculture based on services, since disservices and risks should be evaluated (Lin et al., 2015). The risks can be associated to the sanitary quality of produced food: heavy metal content from polluted soils and somehow the atmosphere, the bacteriological load of irrigation or washing water are the two main concerns. An increased biodiversity and favorable environment such as

standing water may favor pests' dissemination and disease transmission through increased mosquito population. Finally, the scarcity of water in some situations could result in competition for water between agricultural and human use.

The objective is to reduce the risks. A risk management approach should be developed, which is a challenge as types and agricultural practices are diverse. Such an approach should be based on competencies analysis and building of professional farmers but also gardeners and new urban farmers.



Assignment 1.2.2b.

Go to www.urbangreentrain.eu. In the video "[Jardin de l'avenir](#)" and "[EtaBeta](#)" identify:

- the respective services and benefits provided by these urban agriculture systems
- the main services of urban agriculture depending on the various stakeholders point of view

Optional material: for further information read the following publication



[1.2.2 \(3\) Peri-urban agriculture - Review of social demands and the provision of goods and services by farming.](#)



[1.2.2 \(4\) Evaluating the benefits of peri-urban agriculture](#)

1.2.3 Sustainable development of UA

Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. The sustainable development principle applied to urban agriculture is a process in which the resources are used in a way to meet future needs. The sustainability of urban agriculture depends on the costs (inputs and outputs) and benefits, but also on the access to resources. In comparison with rural agriculture, a multiple combination of services is necessary for a sustainable urban agriculture.

The dimensions of sustainability are economic, social and environmental, but also spatial and temporal.



[1.2.3 PPT presentation](#)

Aubry et al. (2012) consider that urban agriculture presents two types of sustainability:

- Internal sustainability (farm level) : environment respect, economic viability and social acceptance of the farm activity and the production system
- External sustainability (territorial level) : contribution of agriculture to the sustainable development of a territory



Assignment 1.2.3.

Identify the essential components of urban agriculture sustainability in your opinion.

Optional material: for further information read:



[1.2.3 \(1\) Sustainable urban agriculture in developing countries](#)



[1.2.3 \(2\) Reaching for a sustainable, resilient urban future using the lens of ecosystem services](#)



[1.2.3 \(3\) 1.2.3. \(3\) Sustainable urban agriculture: stock take and opportunities](#)

1.2.4 A framework for urban agriculture analysis

The identification and evaluation of the various services are important to understand the role of agriculture in urban environment and for a more rational urban development. This approach constitutes a framework for a costs-benefits analysis of urban agriculture extended to quantify the social, economic and environmental impacts (Nugent, 1999). However, this analysis needs to recognize also the non-monetable and non-quantifiable values of UA.

The global objective is to establish a diagnosis and provide information to the various stakeholders (extension services, city planners, dwellers) and decision or policy makers.

The benefits have been presented. The costs can be divided in two classes:

- inputs: natural resources (land, water), labor (wages, volunteered or unemployed labor), capital and raw materials (seeds, fertilizers and pesticides, machines, energy)
- outputs (related to disservices): potential pollution and wastes

The precise identification of right indicators depending on the objective is crucial for such analysis. Depending on the type of service or disservice, indicators might be for example: plant carbon absorbed, soil fertility, Shannon diversity index, property value, health expenditures, additional income, water bacterial charge, yield m⁻².

Types of urban agriculture can be characterized by services and benefits, and a typology (see chapter 1.4) can be established based on this framework. All types include regulatory services, efficiency resources, and employment for example. However, local food farms are based on multifunctionality, low carbon and energy transport. Leisure farms, community gardens and allotment gardens are characterized by social services and benefits from recreation and tourism.



Assignment 1.2.4.

- Define suitable indicators for food production and climate regulation services provided by UA.
- Realize a SWOT analysis (strengths, weaknesses, opportunities and threats) of urban agriculture (proposed scheme for comparison can be provided).

Conclusion

Urban agriculture tends to be theorized in a general metabolism approach. The concept of “metabolic rift” originates from Karl Marx work pointing to a rupture in nutrient cycling between town and country and between humans and nature under capitalism (McClintock, 2010). It describes the disruption of forms of exchanges of humans with nature (agriculture, resource use...), jeopardizing the human social existence. Urban agriculture is a way to mitigate the metabolic rift in its various forms.

The second important concept deriving from sustainability is circular economy. Instead of a linear process, activities should be organized in a way that an output from a system is not a waste but an input for another system, resulting in a limited resource use and ultimate waste generation. Many opportunities exist to insert agriculture in an urban circular economy. Urban agriculture needs to take advantage of these opportunities.

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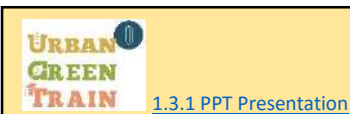
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1.3 - Evolution of urban agriculture depending on the context

Introduction

This chapter addresses how urban agriculture has evolved in the different parts of the world. The students are guided through a comparative analysis of UA forms in the Global North and the Global South, with a contextualization of the objectives and forms that UA assumes in the different regions.

1.3.1 - Evolution of UA in Europe, North America and Oceania



Assignment 1.3.1.

After viewing the above presentation, answer to the following questions

1. Urban agriculture was promoted during war times for improving city aesthetics.
 true
 false
2. In Germany the first urban garden association was established in 1940 by Dr. Shreber.
 true
 false
3. The Liz Christy garden was established in the seventies in New York City.
 true
 false
4. Adam Purple is the so-called father of guerrilla gardening, which is a political non-violent action.
 true
 false

1.3.2 - Evolution of Urban Agriculture in Africa

Growing Greener Cities in Africa



Assignment 1.3.2 (1).

After reading the introductory section of the FAO report



[1.3.2 \(1\) Growing greener cities in Africa](#)

please select two of the studied countries, read the corresponding sections and shortly describe them as in the example below and try to make a comparative analysis on the following topics:

- *Policies for urban agriculture*
- *Urbanization trends and projections*
- *Import of fruits and vegetables*

Examples:

Algeria

- After independence, rural population was 70%, but in 10 years it went down to 60 and then to 50 in 1990, and is now down to 23%.
- Since 1962, 250'000 ha of agricultural land have been lost and transformed into constructed areas.
- Since the '70, industrial plants were promoted at the expenses of farmlands
- Urbanization was further promoted by the intense civil conflicts in the '90.
- The agricultural land area per capita has fallen from 1 ha (1962) to 0.25 ha (today).
- In 2009, Algeria imported 5.4\$ food, including \$550 million of fruits and vegetables.
- Currently, there are not policies for promoting urban farming in any city, although a commissioned study highlighted the importance of "incentivising policies that would encourage high-yield agriculture around large cities".
- The government has approved laws that forbid the transformation of agricultural to building use of recently purchased land, and that promote the revitalisation of urban areas. However, it also approved new building plans for social housing of low-income classes.
- Now cities are strictly dependent for their vegetable supply to rural areas with great load of transport and post-harvest costs (half of the price).
- Small significant steps include the construction of 500 ha greenhouses in el-Mitidja, an inventory of prime farming land in Blida, public lands for agriculture in Set if, and programme for upgrading waste-water for use in irrigation in Oran.

Growing a sense of place and community in Cape Town



Assignment 1.3.2 (2).

After viewing the following article answer the questions



[1.3.2 \(2\) Growing a sense of place and community in Cape Town](#)

1. What are the Harvest Hope aims?

[Promoting biodiversity](#)

- true
- false

[Providing a sustainable market for urban farmers](#)

- true
- false

[Respect official food certification schemes](#)

- true
- false

[Reduce poverty and improve livelihood of urban farmers](#)

- true
- false

[Reduce foodmiles](#)

- true
- false

[Ensuring year round food availability to producers and their families and the local communities](#)

- true
- false

[Promote individual entrepreneurship](#)

- true
- false

2. Here below are the four stages of the development chain methodology as described by the NGO Abalimi. Please relate each stage with each description.

[Survival](#)

- Food is produced and consumed, partially sold. Money saving.
- Food is produced, consumed and sold. Money saving, reinvestment, profit, informal job-creation.
- Food is produced, consumed and sold. Money saving and reinvestment.
- Food is sold and profit is created. Reinvestment. Formal job creation.

Subsistence

- Food is produced and consumed, partially sold. Money saving.
- Food is produced, consumed and sold. Money saving, reinvestment, profit, informal job-creation.
- Food is produced, consumed and sold. Money saving and reinvestment.
- Food is sold and profit is created. Reinvestment. Formal job creation.

Livelihood

- Food is produced and consumed, partially sold. Money saving.
- Food is produced, consumed and sold. Money saving, reinvestment, profit, informal job-creation.
- Food is produced, consumed and sold. Money saving and reinvestment.
- Food is sold and profit is created. Reinvestment. Formal job creation.

Commercial

- Food is produced and consumed, partially sold. Money saving.
- Food is produced, consumed and sold. Money saving, reinvestment, profit, informal job-creation.
- Food is produced, consumed and sold. Money saving and reinvestment.
- Food is sold and profit is created. Reinvestment. Formal job creation.

1.3.3 - Evolution of urban agriculture in Asia

Evolution of Urban Agriculture in Asia

Cities in Asia have grown faster than any other urban areas in the world. Indeed, urban planning was often disregarded until too late. While in 1950 only one megacity could be found (Tokyo), 12 are present in 2015 and by 2025 there will be 21 (ADB, 2016).

Unplanned urbanization comes with costs. Noise and congestion are among the most apparent features of Asian cities. Living in a city results in higher costs for housing, raising children, and health care. In addition, income inequality and crime rates are higher than in the rural environment.



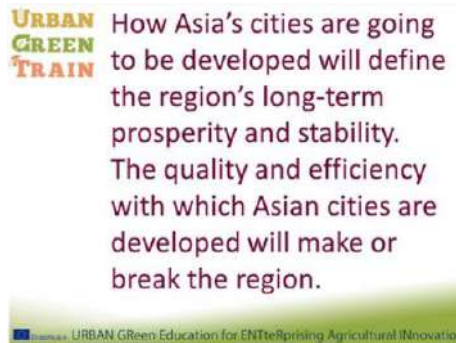
Asia has already been facing enormous environmental challenges. Three of the top five carbon dioxide (CO₂) emitting economies and 11 of the 20 most polluted cities in the world are in Asia. In many Asian nations, losses from traffic-related congestion amount to 5% of GDP (gross domestic product).

The situation is particularly worrisome in poor cities that experience rapid growth, where pollution is becoming extremely serious, infrastructure supply lags behind demand, and basic public services such as water connections and solid waste disposal do not reach the majority. In addition, many residents live on marginal lands where they face risks from flooding, disease, and other shocks.

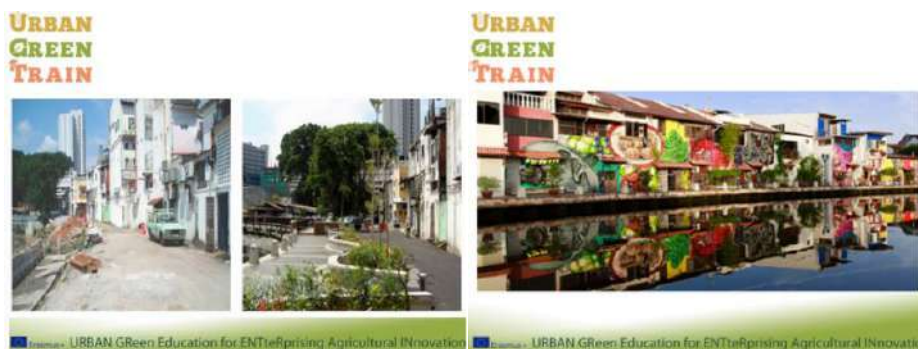
Urbanization effects on the city resilience to Climate Change in Asia

Urbanization increases vulnerability because life and asset losses are much larger in cities than in the countryside when a disaster strikes. In this context, the issue of climate change becomes particularly relevant to cities. Climate change is recognized as the cause to both extreme weather and sea levels raise. While there are many unknowns about the extent and timing of these impacts, the challenge is today real and imminent, and that different cities will face urgent challenges.

Poorer cities that are below sea level are the most susceptible to the sea level raise and intense floods. This is especially true in Bangladesh and in the Pacific Island countries. Many Asian cities, and especially some megacities, have been built in the deltas of major rivers where ports could link the cities to the global economy. This, on the other hand, makes them flood prone. Some such cities may have extensive experience dealing with floods. For example, Dhaka has an elaborate set of mud banks for protection. However, increased flooding induced by climate change may well push these cities' infrastructures beyond their current capacities, as occurred in Bangkok in late 2011. Developing further coastal engineering protection will place an increasing burden on the resources of such cities.



In Melaka, Malaysia, historic neighbourhoods with longstanding walkable areas are being nurtured and developed with less need for automobiles. The culture and history of the city is being protected while it is being made more livable.



The Melaka river, previously a polluted drainage canal, has been transformed onto a tourist attraction and enjoyable green space for city residents (Photos).

The city is also developing projects on the integration of solar power and other renewable energies, with the aim of keeping the air clean for generations to come. All these actions are underway or planned, and part of the Melaka Green City Action Plan.

Similar actions may be found in the city of Hue, in Vietnam. An old historic colonial district is being preserved and revitalized as a walkable area for residents and a tourist attraction. The city is planting trees and creating more green spaces while at the same time encouraging more cottage industries, rather than large scale factories. In India, the government has rehabilitated pumping stations at Bhopal's Upper Lake. Other than providing six million gallons of water per day for the city of Bhopal, they also act as a tourist attract and green area for local residents.

If these innovative urban policies will be applied all over Asia, there will be a major impact on the liveability of future cities. Instead of polluted rivers there will be green areas and tourist attractions. Cities will be walkable by pedestrians, rather than being overloaded with traffic burden. The whole city will become more resilient to disaster, the air will be cleaner and the environmental impact will be reduced.



Assignment 1.3.3.

After following the lesson, please reply to the following questions by marking the correct response(s).

1. What is included in the city action plan of Melaka?

- Creation of green urban spaces
- use of renewable energies
- Reduction of food transport costs
- Promotion of urban agriculture

2. Why Asia cities are prone to food risks?

- Many plains are located below sea levels
- Some are built on rivers delta for easier link to global economy

1.3.4 - Evolution of UA in Latin America and Caribbean



Assignment 1.3.4.

Please read the book below, choose two cities and highlight their similarities and differences with the City of Quito. Please carefully report the discrepancies between market oriented and self-sufficiency oriented urban horticulture in the dedicated forum.



[1.3.4 Growing greener cities in Latin America and the Caribbean](#)

1.4 – Typology of urban agriculture activity

This chapter will begin the exploration of the various types of UA activities there are along with an introduction to the many production systems that exist. By the end of the chapter, participants will be able to realize that UA activities depend on the objectives and context. As well, participants will be able to analyze the various types of UA.

1.4.1. Criteria for types of UA analysis

With an understanding of urban agriculture and how it has evolved in different parts of the world, we now turn to an introduction of the various types of urban agriculture that exist and explore how we can best analyze this diversity. Urban agriculture is a multi-dimensional activity, as such analysis can be multi-layered and complex. We will begin this sub-chapter with an exploration of various dimensions that can help us in our analysis of urban agriculture. This will be followed by a slideshow of the various types of urban agriculture that exist.



Photos: Urban Green Train

Relevant dimensions of UA

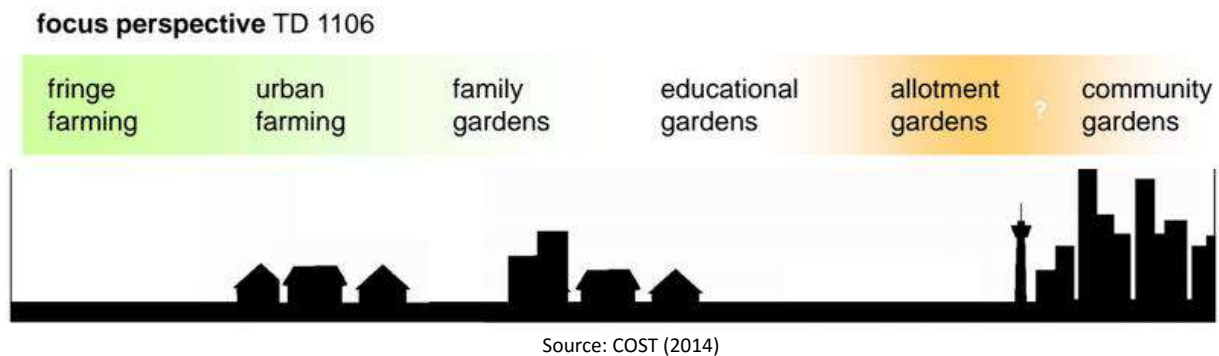
By thinking about various dimensions of urban agriculture, we can get a picture of what urban agriculture is and more importantly, what its potential is. Important work done by RUAFA, the COST Action Urban Agriculture in Europe, Urban Green Train and the SUPURBFOOD project has resulted in different typologies being developed concerning how we can class the different production systems of small and medium sized enterprises (SMEs). In order to identify different types and models, many factors concerning the activity and setting need to be considered. Urban Green Train identifies some relevant dimensions recognizing the diversity of UA enterprises. These include:

- Market orientation (home consumption, direct marketing, anonymous markets)
- Quality of produce (generic, specific, labelled quality)
- Single or multiple products and services
- Degree of dedication (hobby, professional, part-time, full-time)
- Enterprise / community-based (individual, family based, community-based)
- Location (inner city, peri-urban, multiple locations)
- Technology level / production method (low-tech / high-tech)
- Traditional / Innovative (established methods / new, innovative methods)
- Public or private
- Horticulture basis (specialised horticulture, horticulture as secondary activity)
- Place bound (placemaking)

- Building bound (rooftop, vertical walls or industrial site)
- Open field
- Financing modes
- Resources / (re-)use of inputs/outputs
- Transport modes

What type of urban agriculture is practiced will dictate which indicators may be of value when doing an analysis. For example, someone growing around the home will not be impacted by market orientation, financing or transport. For a small or medium sized enterprise, however, many of these dimension will be of relevance.

Earlier work by the COST Action Urban Agriculture in Europe identified a typology to help categorize entrepreneurial urban agriculture activity geographically. The idea of a continuum is introduced to help identify how entrepreneurial the farm or urban agriculture project may be and how it is related to its geographical location in relation to the city and its surrounding countryside. This diagram maps it out for us:



When we examine the different types of urban agriculture, thinking of these dimensions will help us understand the motivation behind the activity and help us begin to understand what the potential may be.

URBAN GREEN TRAIN 1.4.1 PPT Presentation



Assignment 1.4.1.

After viewing the slideshow, please the following questions:

- What do you think are the main characteristics, potentials and support needs?
- Does this type occur in your city/country?
- Does this type in your city/country have the same characteristics, potentials and support needs or (Also) others?
- For what reasons and under what conditions local policy makers might support this type of farming?
- After watching the slideshow, are there other types of urban agriculture that should be mentioned?

Reference

Simon Rojo, M. (2014). COST Action Urban Agriculture Europe: French programs to facilitate periurban agriculture, Short Term Scientific Mission, available at http://www.urbanagricultureeurope.la.rwth-aachen.de/files/stsm_report_avignon.pdf.

1.4.2. Diversity and typology of production systems in UA

In this sub-chapter, we begin to develop a typology for the different kinds of production systems that are used in UA. We pay particular attention to the many different types of urban farms that exist. The concepts of multifunctionality and specialization are raised. Finally, the 6 business models that Urban Green Train have devised are introduced.



Left: [Eta Beta](#), Right: De Moestuïn (<http://www.vanbergenkolpa.nl/postbus/website/NFSL.pdf>)

There are many different types of urban farms that we can identify. [The COST Action Urban Agriculture in Europe](#) has listed the following as types of urban farms:

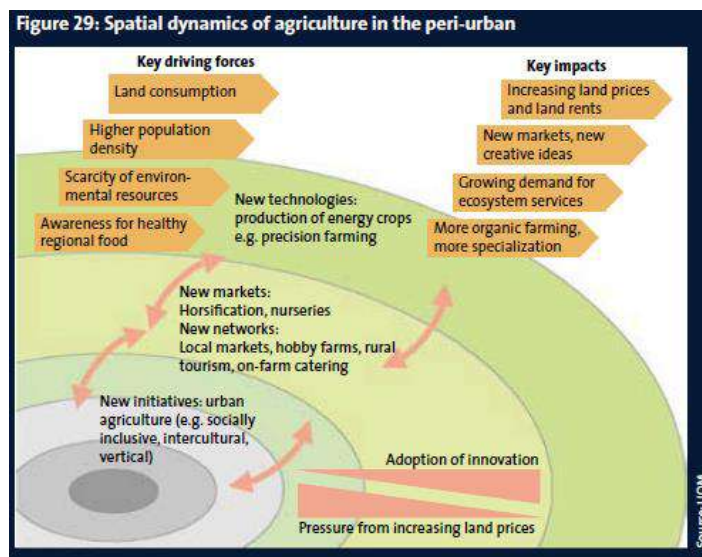
- Local food+farms
- Leisure farms
- Educational farms
- Experimental farms
- Social farms
- Therapeutic farms
- Agri-environmental farms
- Cultural heritage farms

The business models of these farms are driven by the fact that they are close to large markets. Frequently, in peri-urban areas these farms are being repurposed from former use as conventional farms. As this process occurs, production systems will change as well as the business (crops grown, services provided) change. At one point a rural farm would frequently specialize in bulk production of a very few crops, not immediately destined to reach urban consumers. With farms now being repurposed to take advantage of nearby consumers who live in cities, urban farms geared to consumer demand will likely diversify what they produce and offering different services.

Multifunctionality is likely to be present in many types of urban farms. For example, leisure farms, aside from producing and processing crops, want to provide an experience for visitors and make the visit as pleasant as possible. They are telling a story and going beyond what a traditional farm markets. Social farms have many important benefits that they provide. UGT case studies Eta Beta (http://www.urbangreentrain.eu/en/?id=UA_Enterprises&category=415&product=1737) in Italy and Moestuïn Maarschalkerweer (http://www.urbangreentrain.eu/en/?id=UA_Enterprises&category=415&product=1738) in the Netherlands are excellent example this. Eta Beta offers therapeutic and rehabilitative programming in an attempt to foster social inclusion in the community. De Moestuïn Maarschalkerweer offers services for mentally challenged people at nearby schools and tries to teach them skills that can be used in the labour market.

As well specialization is likely to occur for many of these businesses. Here the farm will try to differentiate what they produce. This can be done in a variety of ways. Finding niche markets by producing unusual

products or specializing in heirloom varieties are examples of how this can be done. The motivations behind this can be seen in the following diagram:



Source: Piorr et al., (2011)

The diagram begins in the intra-urban area in the bottom left and gravitates out toward the rural lands. Suburban and peri-urban areas are the dynamic place where new production systems and approaches arise as they adapt to the consumer demands of those city dwellers.

Urban Green Train have modified the work of COST and others and arrived at 6 different business forms:

- 1) Cost efficiency (low cost, bulk production)
- 2) Product differentiation (niche markets)
- 3) Enterprise diversification (multifunctional agriculture)
- 4) Shared economy (social inclusion, participation)
- 5) Experimental (new production methods, innovation)
- 6) Experience (selling a story rather than a product)

These will be dealt with extensively in chapter 5. For now, it should be noted that rarely does an SME fit neatly into only one category. Still at this early stage, this typology is useful to keep in mind as we further explore urban agriculture.

References

- Piorr, A., Ravetz, J., Tosics, I. (Eds) (2011). Peri-urbanisation in Europe: Towards a European Policy to Sustain Urban-Rural Futures: A Synthesis Report. PLUREL consortium, Copenhagen.
- Simon-Rojo, M., Recasens, X., Callau, S., Duzi, B., Eiter, S., Hernandez-Jimenez, V., Kettle, P., Laviscio, R., Lohrber, F., Pickard, D., Sacazzosi, L., Vegre, H., From Urban Food Gardening to Urban farming in Frank Lohrberg, F., Licka, L., Scazzosi, L., Timpe, T. (eds.) (2015). *Urban Agriculture Europe*, Jovis, Berlin.
- Urban Green Train (2014). New Urban Agriculture Initiatives Toward a Mindset Change, available at http://www.urbangreentrain.eu/imgs/dwnld/13/IO1_New_UA_initiatives_toward_mindset_change_UGT_pg.pdf.

1.4.3. Case studies exercise

The Urban Green Train project performed an inventory of existing UA enterprises (http://www.urbangreentrain.eu/en/?id=UA_Enterprises). 27 enterprises were identified and the inventory includes a full description of each case study and YouTube videos for many of them.

The case studies provides an introduction to the 6 indicative business models that Urban Green Train proposes, which will be dealt with in depth in chapter 5. The business model canvas presents a snapshot of each business using the following aspects:

- Key participants
- Key activities
- Key resources
- Value proposition
- Customer relations
- Market segments
- Marketing channels



Assignment 1.4.3

Please visit the [website](http://www.urbangreentrain.eu/en/?id=UA_Enterprises) and familiarize yourself with some of the enterprises. Then perform the following tasks :

1. Review the case studies and choose one that interests you and is also one that you are not currently familiar with. Then answer briefly the following questions concerning the enterprise.
2. What aspects of the enterprise you chose did you find interesting and innovative?
3. We have identified many dimensions that can be used to analyze an enterprise, for example location (along the rural-urban continuum), specialization, diversification, community based or strictly entrepreneurial etc. Please choose what you think are 3 key dimensions for enterprise you chose and explain their impact on the business model they follow.
4. Name one key learning about the enterprise that has impacted your thoughts on business of urban agriculture.

1.5 - Bullet points: Remember the economic dimension

Urban agriculture concept and environment

- UA definitions – with (slightly) different foci – developed over time
- Wide range of urban agriculture practices exist; key differences to be considered:
 - developed and developing countries
 - intra- and peri-urban environments
 - UA for self-sufficiency, commercial, and/or hobby/leisure-time
 - Regarding these key differences the economic relevance varies strongly, ranging from no to complete economic thinking
 - Intra-urban areas: mainly subsistence or recreational purposes, but partly highly specialised activities with clear economic foci
 - Peri-urban areas: primarily farm businesses with commercial goals, which have adjusted to the urban environment over time in various ways; tend to be more intensive, providing more jobs and higher turnovers than intra-urban agriculture
 - Urban agriculture plays an important role on the global scale; 68 million hectares of farmland (size of Europe) are estimated to be located in cities plus 20 km buffers around these cities

From multifunctionality to ecosystem services of Urban Agriculture

- Sustainable development in urban agriculture; two types (Aubry et al., 2012):
 - Internal sustainability on farm level: economic viability, social acceptance, environment respect
 - External sustainability on territorial level: UA contribution to the sustainable development of a territory
- Parallel to providing food, UA practices incorporate various economic, social, and environmental services; partly as a business (like agri-environmental measurements, care farming, education, etc.), but often without an economic benefit
- Thus, the quantification or even monetarization of the so called multifunctionality or ecosystem services is crucial, but at the same time challenging
- Ecological economics: “to protect something we have to give it a value”

Evolution of Urban Agriculture depending on the context

- Traditional connection of cities and farmland / gardens disappeared in the 20th century, but returned in times of wars and crises
- In the 21st century, UA – here intra-urban agriculture – is progressively promoted as a crucial element for multifunctionality reasons; here often social and environmental
- In different regions of the world, UA follows different key goals; partly they are economic (especially in the peri-urban zones of many city regions worldwide), partly non-economic, but than for self-sufficiency (developing countries, poor people in developed countries), social, and environmental reasons

Typology of Urban Agriculture Activities

- Regarding the economic dimension, these aspects are most important:
 - Degree of market orientation
 - Professional vs. subsistence or hobby activity
 - Integration with other production activities or services
- Common, primarily business oriented UA types:
 - Small specialized producers
 - Large scale farming in the urban fringe
 - High-tech urban farming in/on buildings (so far often in the R&D stage)
 - Metropolitan Food Clusters

- Six different business forms:
 - Cost efficiency (low cost, bulk production)
 - Product differentiation (niche markets)
 - Enterprise diversification (multifunctional agriculture)
 - Shared economy (social inclusion, participation)
 - Experimental (new production methods, innovation)
 - Experience (selling a story rather than a product)

>> More details are following in the final module 5, which focuses on the economic dimension of urban agriculture

1.6 - Pratical work



Assignment 1.6.

The objective of the practical work is to acquire knowledge about the evolution of the urban landscape and how urban agriculture might have influenced the urban landscape.

1. Please choose a city in your country and justify your choice.
2. Identify the various forms of urban agriculture in this city in a time frame, from their emergence until our days (or a contemporary key moment)
3. In parallel in this time frame, identify the various urban landscapes and characterize them concerning:
 - Landscape atmospheres
 - Relations with city planning
 - The associated practices
4. Through a cross analysis, identify the urban agriculture characteristics which have impacted significantly the urban landscapes, and therefore could explain its evolution.