

# Benefits of Urban Agriculture

The importance of green productive spaces in urban areas



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# 1 Urban Shelter Design Development

More and more people in the world are moving and living in cities and the today urbanization is a clear fact (Tannerfeldt and Ljung, 2008 pp. 19). Approximately 1 billion people are living in informal settlements in the world. This means that one person for every six lives in areas without proper buildings, infrastructure, sanitation, services, vegetation and open spaces (Shah, 2011). The urbanization is reducing the amount of green spaces in the city, as parks and other green spaces are seen as good places for densification of the city. This is a huge problem since green areas for example are important for the absorption of greenhouse gases. (UN Habitat, Climate Change Strategy 2010-2013)

As the climate is changing, the world we used to know is also changing, and in a couple of years it might become a place where we cannot live. Therefore we have to act today. We have to change the cities since they are the most affected places and also the places that affect the climate the most (UN Habitat Climate Change Strategy 2010-2013).

As cities and their population grow, the food security also becomes an important issue. Luc J A Mougeot writes: “*Many must spend up to 80% of their income on this ‘basic luxury’ and, for some, one meal a day is the norm.*” (Mougeot, 2006 p. 59), and this situation is worst in the poorest cities (UN Habitat, 2009 p. 5). Hans Akefors writes in the book *Perspectives of sustainable development, some critical issues related to the Brundtland report* about his concern for the food level in the world, and he means that even if we shared all the food in the world equally it would not be enough (Akefors, 1988 p. 85). What will then happen when cities grow further, and more people need food? Will it be sustainable with the huge increase of transportation of food a growing population requires? The answer is no, (UNDP, 1996 p. 10) but at the same time the food security should be a human right. The question is: What can we do to benefit a sustainable development of food security for everybody?

First of all, we need to change the way of living in urban areas for the future of our children. We need to understand that there is no simple solution to the unsustainable society we have today. The solution is dependent on many different parameters. AnnMari Jansson writes in the book *Perspectives of sustainable*

*development, some critical issues related to the Brundtland report that: “In order to achieve sustainable development it is necessary to completely change the attitude towards environmental management which requires a creative rethinking both from ecologists and economists.”* (Jansson, 1988 p. 31) With that in mind one of the parameters in order to gain a more sustainable development in cities could be the use of urban agriculture. Mougeot claims: *“Cities can never become completely self-sustaining but, as we have seen, they can become greener, cleaner, healthier, and more sustainable.”* (Mougeot, 2006 pp. 50).

Urban agriculture is both a solution for the food security for urban poor but it also increases the vegetation level in the city and thus creates a better microclimate. Urban agriculture can be seen at many different levels but this paper focuses in growing food in urban areas at a family level.

## 2 Factors Shaping Urban Shelter Design

Urban agriculture benefits the urban poor both in a quantitative and a qualitative way. It helps to reduce the hunger among a lot of people and gives the urban poor better food security (UNDP, 1996 p. 160). An example of this is Sweden during the First World War when we had a huge shortage of food. The government decided to rent out allotments to the citizens where they could grow their own potatoes. Those plots helped a lot of families during the war. Later on when the war was over a lot of people abandoned their allotments since they no longer needed them. But at the same time many stayed and continued to farm the land and got an addition to their economy. (Englund & Hallgren, 1974 pp. 44-50). Like the allotments helped Sweden during a tough period, urban agriculture can help the poor citizens in developing countries.

The quality in food produced through urban agriculture produced food is higher since it is not transported a long way. (UNDP, 1996 p. 160). The nutrition in food decreases with time, which means that a close-to-home production of food will improve the people’s health. (Bellows, Brown & Smit, 2004 p. 4)

A close-to-home production of food will also reduce the need of transportation (UNDP, 1996 p. 21). Long-way transported food can be very expensive since a lot of the developing countries lack a proper transportation system. Urban agriculture

can be a simple solution for those who cannot afford the transported food. (Nsangu, 2009 p. 221).

Urban agriculture can also benefit the ecology of urban areas by reusing the citizens' daily waste and transforming it to compost and fertilizer. This will both benefit the environment and increase the harvest. The reuse of sanitation water and garbage help to close the ecological loop within the city. (Tannerfeld and Ljung, 2008 pp. 104). *See figure 1.* If the loop can be solved on site where the waste is produced it will additionally lower the need of transportation (Eriksen-Hamel and Danso, 2009 p. 35). This subject is huge and could be the topic of a separate paper but it is mentioned here since it is important to have it in mind when discussing and planning for urban agriculture.

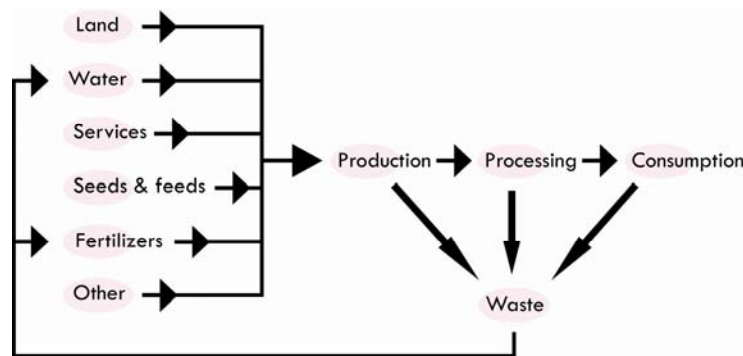


Figure 1. Ecological loop (UNDP, 1996, pp. 19)

Urban agriculture has many other positive effects. We know that people feel better in green areas and parks. In China there is an expression that says: “*Grow your garden and you will remain happy*” (Englund and Hallgren, 1974 p. 96). Urban agriculture will also bring neighbours together since they have something in common to do and talk about. A stronger together-feeling will occur which will strengthen the neighbourhood and to some extent reduce criminality. (Bellows et al, 2004 p. 8).

Vegetation in cities also benefits the biodiversity, it creates more aesthetic and beautiful areas to live in and it affects the microclimate. By using permeable ground materials like grass and vegetables, the indirect radiation from the sun and rain are absorbed and risk for floods is reduced (Johansson, 2011).

A problem with vegetation in cities and new areas is often the lack of maintenance. No one takes responsibility for the newly planted trees and plants.

An example of this is in the resettlement *National Bilibid Prison housing area*, south of Manila in the Philippines, where trees were planned and planted in the area. The problem was the location of the trees, they did not plant them where the people lived or in areas people used, instead they planted them in the corner of the area where no one usually went. This location resulted in no maintenance of the trees and they all died. If the trees instead would have been planted in front of each housing unit or along the main road someone would have irrigated them and taken care of them since they know that the trees will give them something back in the future, for example shade. (Åstrand, 2011).

Urban agriculture can be the answer to this lack of maintenance problem in newly built urban areas, since the people will take care of their own plots. If the plots are combined with bigger trees the maintainer might also irrigate the nearby trees which will benefit the whole area.

### 3 The Role of Architects and Planners

The book *Urban Agriculture, food, jobs and sustainable cities* tells us that if we do not plan for urban agriculture the poor people will find other places to grow vegetables in the city to expand their income and food security of food (UNDP, 1996 p. 17). This tells us as planners the importance of having urban agriculture in mind when we plan for new urban areas in poor countries. This is not something we can just ignore because we as architects or planner might not like it. As shown above the people then will find other places for growing food, and those spontaneous places for urban agriculture can be very unsuitable. They can either be on polluted or toxic ground or too close to a big road etc. (UNDP, 1996, p. 7).

A common place to grow food is along roads, and that type and place of urban agriculture has a lot of problems with pollution, traffic and irrigation and rainwater (UNDP, 1996 p. 82). But at the same time it is important to not blame the people farming there, they are only trying to get some extra income and this might be their only option. We as planners can help them to reduce this risk by planning new sites for housing well by including areas for urban agriculture. We as architects and planners have the power to help people to get healthier and nontoxic food.

There are some places in cities that are not suitable for housing and buildings, like floodplains and steep slopes and those areas could be used for urban agriculture. Also land around institutions and public and semi-public areas can be used for urban agriculture, since they are 'unused land'. (UNDP, 1996 pp. 91-93). "*Universities, schools, factories, churches, ports, airports, hospitals, prisons, military bases, parks and recreation areas*" are mentioned as examples on where urban agriculture can take place in the city. The owner of the land will then both get extra income from the farmers but also get someone who will maintain the land. (UNDP, 1996 p. 80) It is a win-win situation.

We, as architects and planners, also have the responsibility to help to inform the governments about these opportunities and needs. In developing countries there are only a few governments that support urban agriculture (UNDP, 1996 p. 47). Why only a few? My answer would be that they lack knowledge about its benefits. We, as architects and planners need to help increase this knowledge about the benefits from urban agriculture. We need them to understand and make urban agriculture to a land use category in planning and see it as a well-functioning income generating activity worth putting money in (Mougeot, 2006 p. 65).

It is also important to educate the people moving into those areas where planned urban agriculture is offered in order to increase the profits from it. In the article *Urban Compost: a socio-economic and agronomic evaluation in Kumasi, Ghana* one can read about the people's skepticism to use compost. The reason why many of them did not want to use compost or believed it made a difference was their lack of knowledge in the subject. (Eriksen-Hamel and Danso, 2009 p. 42) Knowledge is a part of the whole solution and it is necessary to plan for education and direct it to everybody in new areas where urban agriculture is offered.

Tannerfeldt and Ljung write in *More urban less poor* that "Poverty is manifested in different ways: hunger, ill health, ignorance, discrimination and exclusion, denial of dignity etc." (Tannerfeldt and Ljung, 2008 p. 39) As architects and planners we cannot change the whole situation but we can help a bit. We can help the poor people to get a better life by offering them a safe place

to live with the opportunity to grow their own food for the security of their nutrition and food intake.

## 4 Criteria for Design of Sustainable Shelter and Neighbourhoods

Now when we understand the importance of vegetation and urban agriculture in cities, the challenge is how to design and plan for it in the best way. Today the most used place for growing vegetables is the yard around the building, and the second place where people are growing their food is in community gardens. The community gardens are perfect spots for information on how to grow. If then both community gardens and plots around the buildings are offered the information regarding how to grow will be increased since the people will learn from each other. (UNDP, 1996 pp. 76-79).

It is important to promote the education part in the design of new sites, either with a community garden center, a learning center or just another way of giving the inhabitants an opportunity to learn more about how to grow.

Urban agriculture is in most cases not the only source of income or the main occupy but an avocation and to make the maintenance easier it is important to locate it near where the users live, this will also both reduce the time spent on transportation and increase the time for farming and harvest. (UNDP, 1996 p. 54). In *Urban agriculture, food, jobs and sustainable cities* they give the advice to not locate urban agriculture on front yards or other easy accessible places as they mean that those locations will benefit the thieves and facilitate vandalism. They continue to declare that the best location for urban agriculture is on a place where the user can see the plot from home. This constantly supervision of the plot will reduce the risk of thieves and damage on the crops. (UNDP, 1996 p. 76)

*“In a 130-day temperate growing season, a 10x10 meter plot can provide most of a household’s total yearly vegetable needs...”* (Bellows et al, 2004 pp. 2).

These measures can be good to have as a guideline when planning for urban agriculture. It can also be a good idea to place trees and shrubs in connection to the urban agriculture plot since it is more likely that those trees and shrubs also will be irrigated and maintained by the plot user. To increase the effect of urban

agriculture additionally the trees and the shrubs in the neighbourhood design could be edible.

#### 4.1 Techniques for urban agriculture

Since land in cities is expensive and there is a tough competition between other more income generating activities (UNDP, 1996 p. 74) it is important to find new ways of using the space in urban areas. As Luc J. A. Mougeot writes in *Growing better cities urban agriculture for sustainable cities*: “Space, after all, is three-dimensional and space embraces the build-up area as much as the unbuilt area. Space in this context encompasses rooftops, walls, fences, sheds, shelves, basements, ponds, and even window boxes.” (Mougeot, 2006 p. 54)

##### **Movable boxes and pots**

When travelling in developing countries it is amazing to see all different solutions on how to grow plants and vegetables. It can be done in plastic bottles reused to pots, in reused cans, suspended soil bags or many other ways, it is just the imagination that is the limit. Movable boxes, containers and pots gives the flexibility to have urban agriculture on places where the soil is polluted or toxic (Bellows, 2004 p. 10). This solution also gives the opportunity to grow food in urban areas where it is lack of land or the land is too expensive.



*Growing plants in pots and one type of vertical growing, Manila (photo: Marit Hedlund)*

##### **Vertical gardening**

Using vertical extensions such as walls and fences etc. for growing food will both give more space for urban agriculture but even reduce the temperature in the air and create a more comfortable environment (White, 2002 p. 199). Many different



solutions on vertical gardening are out on the market today and some of them are more suitable than others.

### **Roof gardening**

Green roofs both give the opportunity to farm more land but they also reduce the effects from urban heat island. One important thing to have in mind when planning for a container garden on a roof is the heat, there is a considerable difference between the ground and the roof, and some kind of weather shelter could be necessary (Alward, Alward, & Rybczynski, 1976 p. 9).

### **Temporary allotments**

Locating plots on places that are not yet exploited, but will be in the future, is also a way to fit in more allotments and growing places in the city (UNDP, 1996 p. 80). This is only a temporary solution and it is important to over time change it into something more permanent, either on the spot or on another location.

## **5 Conclusions and application of urban agriculture**

This part of the paper is an example of how urban agriculture can be practiced in a real project. The site to be in mind is Oviedo property located in Quezon city, Manila in the Philippines. The climate is hot humid and the area suffers from many tropical storms every year.

Since the Oviedo property is going to be a relocation site for 500 families it is important to use the land in an efficient way. The recommendations for land use in Philippines has the ratio 60/40 (housing/open space) (Galingan, 2011-03-01), this means in theory that the site would have a lot of space that could be used for urban agriculture. The reality tells something else, with the 500 units that will be located on the site it is difficult to save land for urban agriculture. But as I have written above urban agriculture is important and should somehow be planned on every new site. This dilemma needs to be solved with new ideas and new techniques.

As I have written above walls, fences, roofs and balconies are good spots for growing food. There are plenty of eatable climbers and vines, cucumber and melons are two examples on suitable vegetables for vertical growth (UNDP, 1996, p. 76). Green roof and roof gardening might not be the best solution in the

Philippines since such roofs often have problems with leakage during the monsoon period (Galingan, 2011-03-01). But the roof can still be a place for growing vegetables in pots and containers that are movable. This is both a cheaper, more flexible and more secure way of using the roof.

In the Philippines you see a lot of different solutions on pots, it can be everything from an old plastic bottle to a tin, they are good in reusing materials for growing plants. This means that encourage and planning spots in the area where they can grow plants and vegetables might be enough for them to start, those spots can be balconies, roof terraces or similar places as I mentioned before.



*Growing plants in plastic bottles, tires and hanging bags in Manila (photo: Marit Hedlund)*

It is also important to plan for facilities that make the farming process easier, eg. water taps or grey water filter system, compost, a shelter for tools and so on. I have also had a long discussion above about the importance of teaching the residents in how to grow vegetables in an efficient way. In Oviedo property this could be solve with a learning centre in connection to the centre of the neighbourhood. Other ways the education can be solved is having workshops for everybody that moves into the area or put up learning signs explaining the basics in growing vegetables in connection to the allotments.

What else is most important to have in mind when planning for new residential with urban agriculture on this site is the heavy rainfalls that comes every year during the monsoon, the extreme and hot sunshine and the concept of having a allotment plot you easily can watch and protect from thieves and vandalism. All those aspects affects the choice of the location for the allotments. The monsoon

demands a good storm water drainage system; the sunshine demands some kind of protection to give shade, eg. trees, roofs or temporary shelters.

At last the most important thing to remember when planning for urban agriculture on this site and every other site is to have the user in mind all the time to make it as user-adapted as possible.

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