THE PRODUCTIVE CITY

The Productive City is the last step of the implementation of urban agriculture inside London. It relies on the experience of the UCL Productive Campus and aims to develop similar projects all over London.

The Productive Campus implemented at UCL exemplified that a significant level (12.5%) of the population could be provided with locally-grown food. However, this figure can still be considered as relatively low in a long-term perspective. Indeed, the "planning and design exercise" presented in the productive introduction demonstrated that the only viable solution for a fully self-sustainable high-density city was the intensive use of vertical farms. But we also saw that the exclusive use of such solutions had a chance to be rejected by local populations. In that matter, the public's negative reaction to MVRDV's Pig City 8 speaks for itself.

Thus, urban agriculture should build on a mix of solutions and consider the city at different scales, in order to be fully accepted and have a chance to be developed. For example, suburban areas offer many vacant lands which could be mobilized for productive sites; in denser parts of the city, urban agriculture could meet other aims, such as people's desire for more green spaces or other environmental issues. Therefore, the final step of this report tries to build a strategy for the implementation of urban agriculture on different parts and scales of the city of London.

I. How is the Productive City implemented?

Learning from the experience of UCL, the Greater London Authority attempts to raise public awareness about urban agriculture and its contribution in solving various ecological issues.

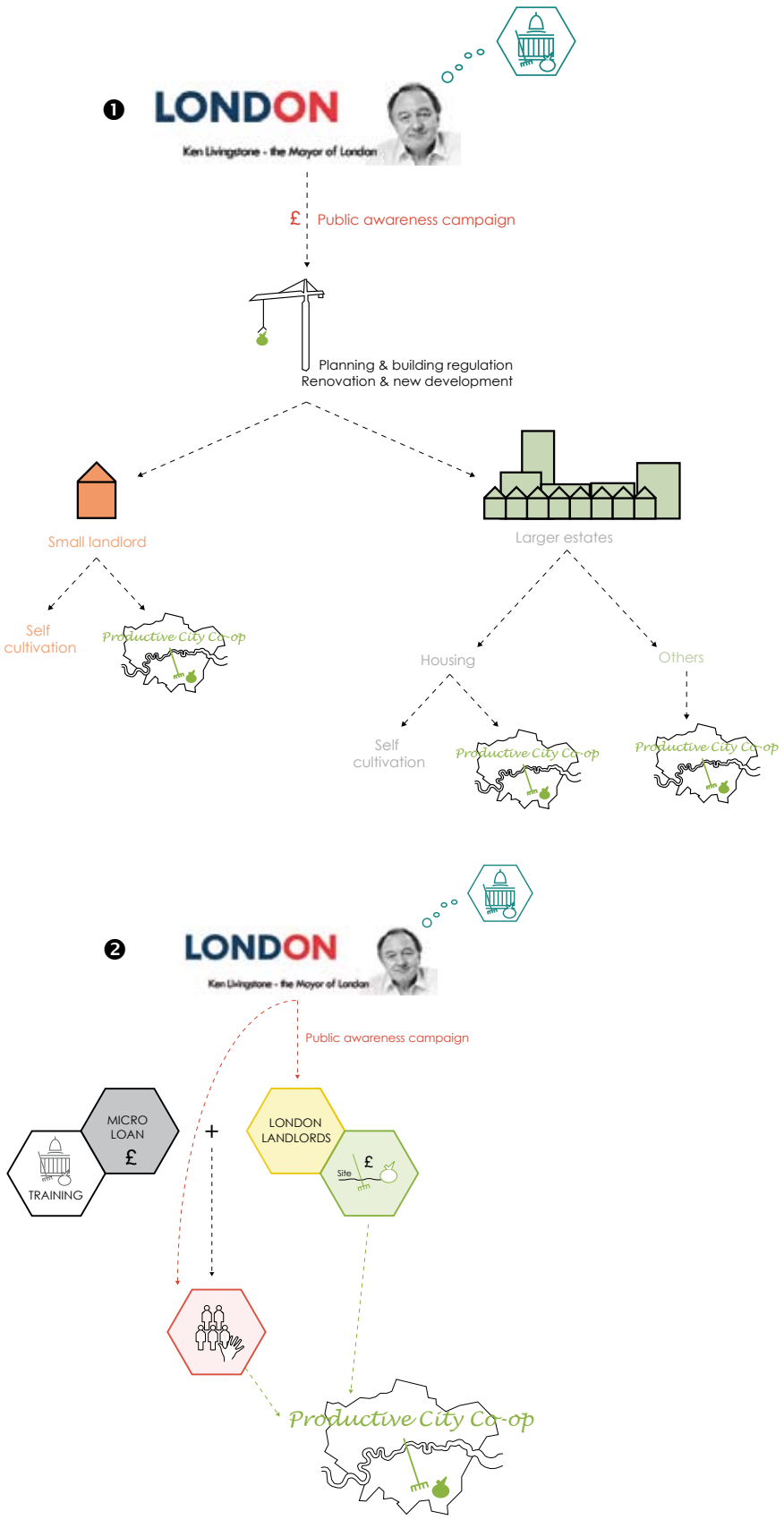
A vast consciousness-raising campaign is launched. Information meetings are organised in the different neighbourhoods and open days at UCL Productive Campus are planned. Interactive internet sites are developed by each borough, which help people to identify all possible options for their homes and to visualise what these could look like if improved into productive homes (See extracts of the internet site on following pages).

New urban planning and design regulations are created in order to help creating farmable surfaces either in London's existing urban fabric or in new developments (see below). Through "green" grants or financial aids for renovation and development, the different landlords of London – small and individual ones as well as large and institutional ones – are led towards the urban agriculture way. ❶

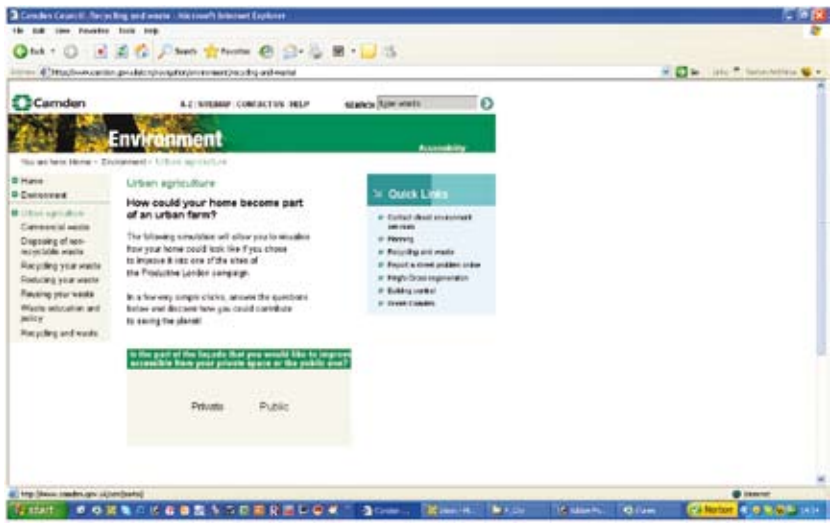
As the management of agriculture surfaces is a complex and technical matter, especially for large surfaces, the Greater London Authority develops a framework aiming to favour the creation of new urban co-ops. ❷

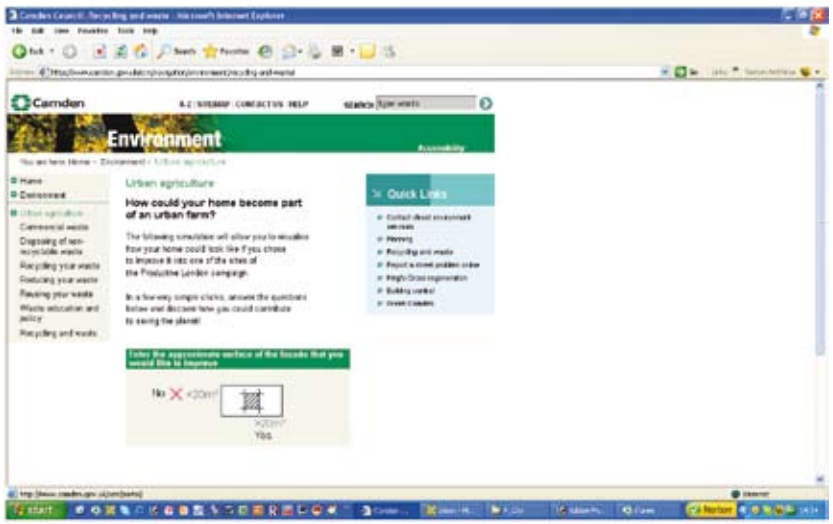
With the help of the main London banks, a micro-loan program is set which enables people from disadvantaged and disabled populations to be trained in one of the new urban agriculture training schemes (at UCL or elsewhere). These newly-trained professionals can then join one of the co-ops. The main landlords, especially the traditional "great estates", are urged to transform parts of their properties (parks, squares or real estate) in order to make them farmable. They are also incited to take an active role in the creation of co-ops that would take care of these surfaces. This fosters the implementation of agriculture inside London's urban core. In return, it allows them to improve their estate in terms of landscape and environmental efficiency, which increases its value, and to offer perspectives for a stable income.

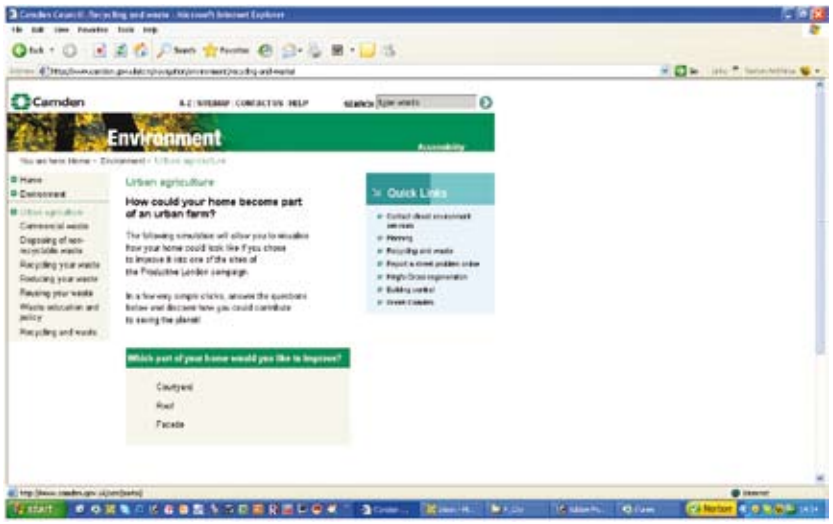
The crops cultivated by the co-ops are then sold on different markets located all over London, providing citizens with part of their intakes. The benefits enable each co-op to pay a lease to the landlord and its members to reimburse their micro-loans.

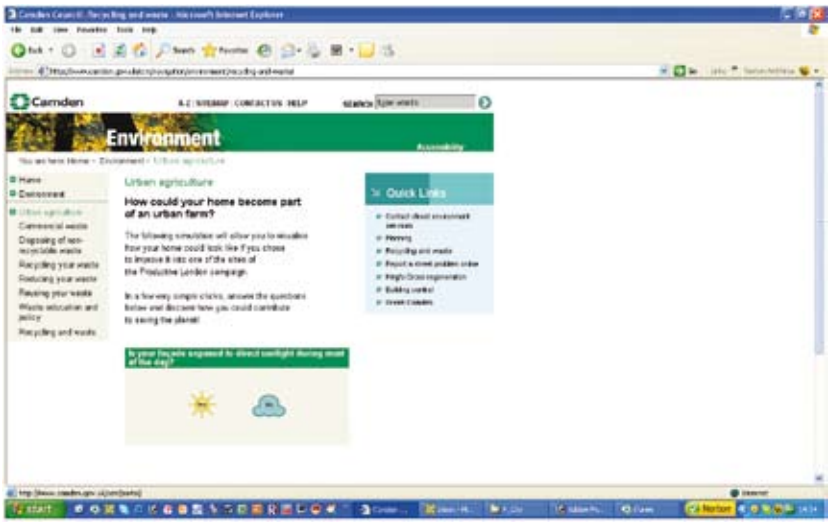


Small landlords who decide to improve their properties with productive surfaces have the choice between two options: they can cultivate the surfaces for their own consumption; they can also decide to make their surfaces available to one of the urban farming co-ops.






Camden
Environment
Urban agriculture
How could your home become part of an urban farm?
Quick Links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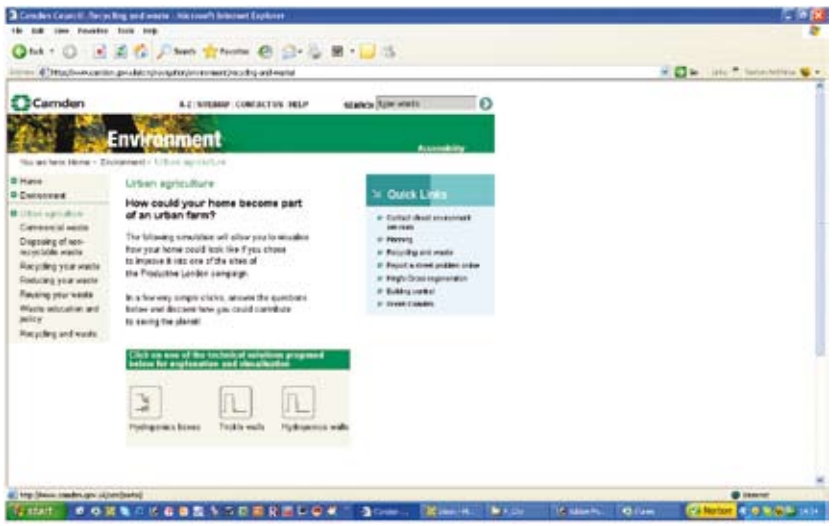
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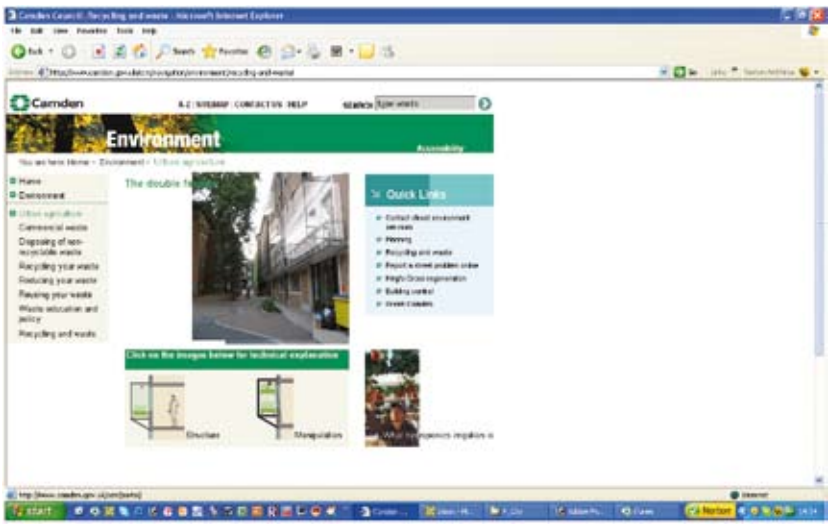

Camden
Environment
Quick Links

Urban agriculture in Cuba 32

In the early nineties, after the embargo imposed by the United States, Cuba faced an economic crisis. Among other sectors, the transports and distribution systems were impacted. The delivery of fresh food in the cities became increasingly difficult, leading to food shortage and increasing food prices, even if fruits or vegetables were produced in plenty in the country.

In order to face this shortage, many urban residents began to reuse and farm empty plots inside the city. Yet their limited skills combined with insecure access to the land hindered urban residents' efforts.

Recognizing the role that urban agriculture had in helping to solve the crisis, the city of Havana set up government policies and measures to support urban agriculture. An inventory of free areas located in the province was made, and a map was drawn up situating spots that could be used for urban agriculture activities. Funds were given to improve irrigation systems, seeds supplies and even farmers' agricultural skills.The farmers were allowed to sell their products directly from their farms instead of in the government's supermarkets.

By 1993 the government decided to change the land use laws; People could access any unexploited land and become owners in permanent usufruct, on condition that it remained permanently cultivated.

Since the beginning of these initiatives, land for urban agriculture has been completely incorporated into the city's Land Use Plan; 1000 ha inside the city have been devoted to agriculture, providing more that 18 000 jobs and supplying 30% of the citizens food needs. Urban farms inside the city of Havana are now producing vegetables, fruits, herbs, rice as well as medicinal plants or livestock as chicken, rabbits and even pigs.

The example of Cuba demonstrates that urban agriculture, when an adapted, responsive and flexible support is given by the government, can dramatically improve the quality of citizens' lives.

Sources:
Adriana Allen and Nicholas You, Sustainable Urbanization – Bridging the green and brown agendas, (London: The Development Planning Unit of the University College London, 2002)
Urban Agriculture in Havana, Cuba, http://bss.sfsu.edu/raquelrp/pub/2000_aug_pub.html

(1) Andre Viljoen, CPULs Continuous Productive Urban Landscapes, (Oxford: Architectural Press, 2005), p. 151

http://www.pfi.iastate.edu/Cuba/

II. Urban planning and design regulations

II. 1 Planning regulations

We saw that urban agriculture in large and dense cities like London may remain poorly efficient (however important for other reasons) if it relies solely on some sparse spaces claimed back in courtyards, on roofs or on small façades. Thus, it is important to fully integrate urban agriculture within the planning system in order to create the conditions for larger disused spaces to be claimed back.

The first target of the new planning regulations is large vacant lands (requirement #1.1). The criteria used to declare sites suitable for urban agriculture are inspired by those used in Cuba (1). 32

Other regulations aim to ensure that all ancillary services and facilities needed for urban agriculture easily find a place within the urban fabric (guidelines #1.1 and #1.2).

A last regulation emphasized the role of public transports for transporting and selling food (guideline #1.3).

Requirement #1.1

All large (above 1,000 m²) vacant sites meeting the following criteria must be made available to urban agriculture:
- Sites must be empty and disused.
- Water and electricity must be available on the site.
- Sites must be close to consumers or public transports.

This requirement extends to disused sites within urban parks or large squares. However this does not extends to woodlands or forests.

The sites must remain so until a planning requirement is required on the site.

If the land is contaminated, crops boxes or hydroponic methods can be used. Alternatively, the landlord can plant crops with bio-remediation properties and/or crops from which bio-fuel is made. For example, colza meets both conditions.

Sites unsuitable for building can be exploited using more permanent and intensive farming techniques, such as greenhouses or vertical farms. This includes sites situated close to railways, motorways, airports, etc. or beneath HT power lines.

Coin Street Development, South Bank

Belvedere train station, Erith

Guideline #1.1

In large new urban developments, sites should be reserved in order to host local farmers' markets. Some of the retail spaces should also be reserved for local farming co-ops in order to provide them with more permanent and visible selling spaces.

London farmers' markets - http://www.lfm.org.uk/

Guideline #1.2

In large new developments, sites should be reserved in order to build community composting facilities, especially when situated beyond range of municipal organic waste collection. Collective facilities enable the use of techniques more efficient than "backyard" composting.

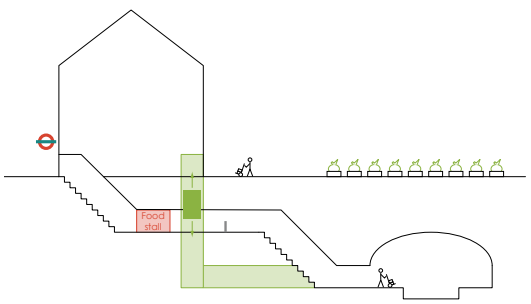
http://www.recycle.ubc.ca/

See Nicolas's Erith Productive City for an illustration of the use of public transports in selling urban crops

Guideline #1.3

Train and tube stations should take the opportunity of any refurbishment works to include the following facilities and services:
- Freight elevators (able to carry a hand truck);
- Stalls for farming co-ops in the station's entrance lobby.

Doing so, trains and tubes could be used for transporting food during off-peak or night hours and stations, which are naturally attracting crowds, could become very profitable selling points for farming co-ops.



II. 2 Building design regulations for all buildings

It seems unrealistic to impose the creation of farmable surfaces each time a planning permission is required for a new building or a refurbishment. Yet, many of the urban agricultural architectural features described in the Productive Lab and the Productive Campus also happen to play a very positive role in other environmental aspects, such as energy preservation, rainwater retention, etc. The idea is thus to take advantage of reinforced environmental regulations (that are necessary anyway) in order to angle architects and developments towards urban agriculture features.

The following building regulations illustrate some environmental regulations which could foster the development of urban agriculture.

Requirement #2.1

All new buildings (or buildings undergoing major refurbishment works) must reach the following requirements for thermal insulation:

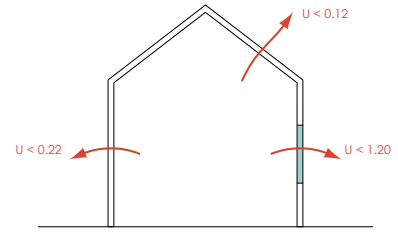
Max. U-values (W/m².K) (1)

Walls	0.22
Roofs	0.12
Windows	1.20

Max. U-values (W/m².K) in actual building regulations (2006) (2)

Walls	0.30
Roofs	0.16-0.20
Windows	1.80

Sources:
(1) Based on: Randall Thomas (ed), Sustainable Urban Design: An Environmental Approach, (London: Spon Press, 2003), p. 47
(2) Building regulations, part L, accessible from http://www.planningportal.gov.uk/england/professionals/en/1115314110382.html



Requirement #2.2

Up to 97% of urban areas are impermeable due to buildings, tarmac, paving and parking. (1) This increasingly causes flooding issues as well as risks of pollution when sewers get saturated after a storm and are by-passed, causing wastewater to flow directly into watercourses.

Consequently, no new development (or development undergoing major refurbishment works) is allowed to discharge rainwater into sewers. Natural drainage into the soil and/or rainwater run-off retention must be provided within the development. Water tank storing rainwater for watering or irrigation can also be installed.

However, whenever applicable, direct discharge into a separate surface rainwater sewer or a watercourse is allowed.
This goes beyond the actual building regulations (2), which do not ban rainwater discharge into sewers but state that other more sustainable options must be preferred.

Sources:
(1) Christina von Borcke, Landscape and nature in the city, in Randall Thomas (ed), Sustainable Urban Design: An Environmental Approach, (London: Spon Press, 2003), p. 38
(2) Building regulations, part H, accessible from http://www.planningportal.gov.uk/england/professionals/en/1115314110382.html

Requirement #2.3

Vegetation in urban settings plays an important role in:
- drawing CO2 from the air;
- binding airborne particles and numerous urban pollutants;
- absorbing noise;
- absorbing rainwater;
- making the ambient temperature more temperate;
- breaking the wind;
- providing habitats to various species, fostering biodiversity.

Beyond strictly environmental issues, vegetation also plays a crucial role in people's well-being and may to some degree influence human behaviours (1).

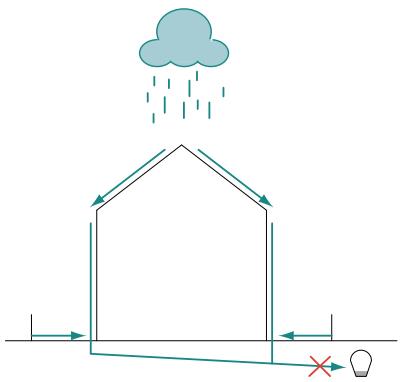
Therefore, at least 25% of all surfaces of new developments (or developments undergoing major refurbishment works) should be planted. This applies to all external horizontal surfaces (courtyards, gardens, roofs) as well as façades. This also applies to glazed surfaces covering plants such as greenhouses, planted atriums or planted double façades. No such regulation exists today in the UK.

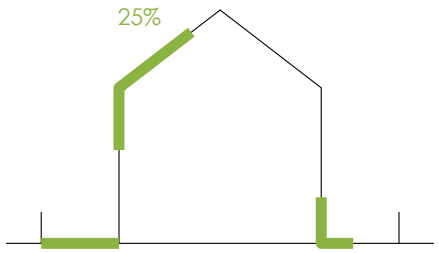
Source:
(1) Christina von Borcke, Landscape and nature in the city, in Randall Thomas (ed), Sustainable Urban Design: An Environmental Approach, (London: Spon Press, 2003), p. 33-45

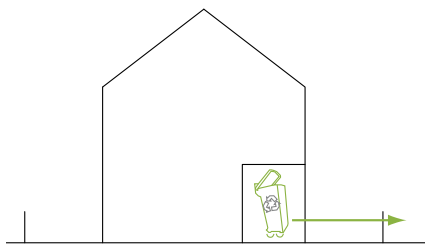
Requirement #2.4

All new buildings (or buildings undergoing major refurbishment works) must include a special small room or shed able to host the various bins used for waste sorting, including organic waste. 33

Buildings or developments situated beyond range of municipal organic waste collection should also include local composting facilities (cf. guideline #1.2).







The Toronto Green Bin Program

33

The Green Bin Program was initiated in Etobicoke in September 2002 and extended to Toronto in September 2004. On 25.10.2005, 510,000 single family households were involved. Pilots are underway in 30 multi-unit buildings to test the feasibility of collecting organics from multi-unit complexes.

This program allows residents to dispose of their organic materials (which extends to meat, fish, dairy products, paper towels, tissues and packaging…). The residents are given green recycle bins to put in their home along side their usual garbage and recycling bins. The residential compost materials are picked up weekly. The material is then transported to the new Dufferin Organics Processing Facility. Upon arrival, the compost is visually inspected to remove large unwanted items. A hydropulper (similar to a large blender) is then used to spin the organics into a liquid pulp. Unwanted materials such as plastic, glass and metal are removed from this pulp through two processes - screening and settling.

Anaerobic digestion takes 15 days to convert the pulp into two things: an organic solid material that can be turned into compost; and biogas. The organic solid material is loaded onto trucks and taken to a number of composting facilities in southern Ontario for further processing. The finished compost can be used in landscaping, agriculture, soil erosion control and soil remediation projects. The biogas is used in order to produce electricity.

Sources:
City of Ontario: Solid Waste Management – Green Bin Program, http://www.toronto.ca/greenbin/index.htm

www.flickr.com/photos/moderntimes/

Guideline #2.1

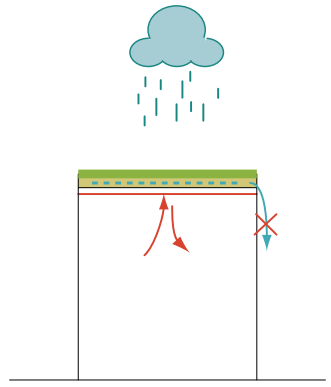
Green roofs should be developed in priority as means of meeting at the same time requirements #2.1, 2.2 and 2.3.

Indeed, the soil of green roofs holds rainwater and provides at the same time an additional insulating layer to the roof.
Guideline #2.2

Greenhouses on roofs, planted atriums double façades or green walls (for blind façades) contribute to meeting requirements #2.1 and 2.3. In the case of greenhouses on roofs, the rainwater falling over the greenhouse area should be collected and stored for watering or irrigation.
Guideline #2.3

Large impermeable surfaces such as parking lots should be covered with a green roof in order to contribute meeting requirements #2.2 and #2.3.
Guideline #2.4

All green spaces mentioned in the previous guidelines should be opened to urban agriculture in order to compensate their cost: they can either be exploited by occupants for self-consumption or be leased to a farming co-op.



II. 3 Urban design regulations for new major developments

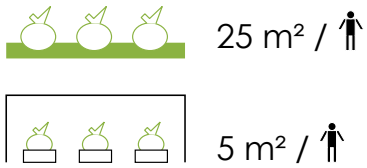
Major new urban developments are a unique opportunity to push further the promotion of urban agriculture and experiment at the same time new ways of living, working or having fun in direct relationship with productive activities. Therefore, urban design plays a crucial role in the development of urban agriculture. Masterplans and design guidelines have to be imagined accordingly.

Here is an example of possible urban design requirements and guidelines for new productive developments. They must be understood as a draft and would actually require more refining and testing than possible within the timeframe of this report.

Requirement #3.1

At least 25 m² of farmable surface per new resident (for housing developments) and/or 8 m² per worker (for commercial developments) must be created in the new development. This ensures that at least 20% of the local needs are met, based on the assumption that people spend an average 3/4 of their meals at home and the rest on their workplace. The surface calculation is balanced by an index depending on the type of technique used, similarly to what was done for the Productive Campus. Thus, for example, if hydroponics is used, only 5 m² per resident (a fifth of 25 m²) are required.

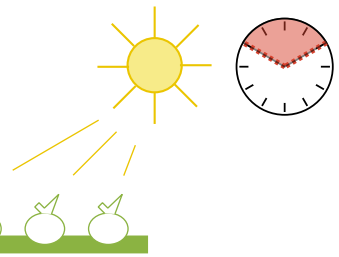
Those figures can be modified in order to take the density of the development into account: they can be lowered in dense developments and raised in low-density developments.



Requirement #3.2

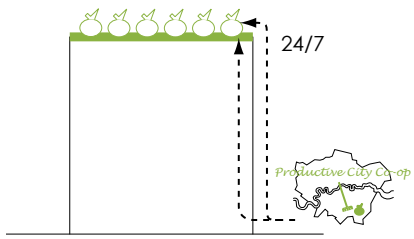
Is considered "farmable" a surface that receives direct sunlight at least 4 hours a day between the 1st April and the 30th September.

Is also considered "farmable" a surface that receives light indirectly from reflectors or reflecting surfaces. A detailed study is then required in order to prove that the light conditions are sufficient.



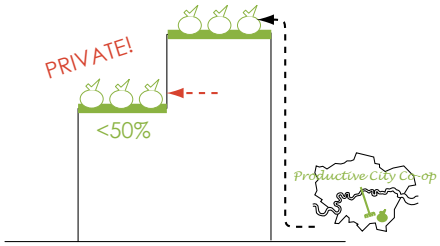
Requirement #3.3

The access to the farmable surfaces must be insured at all time to farming co-ops from public or semi-public space. However, if this is compatible with the use of the building (i.e. not offices or administrations holding confidential data or money, for example) the access may also be provided from semi-private space.



Requirement #3.4

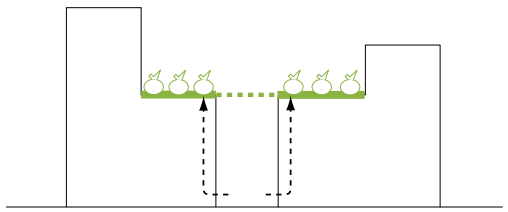
In residential developments, up to 50% of farmable surfaces can be "privatised" and devoted to self-cultivation by residents. In that case, they may be accessible from private space only.



Requirement #3.5

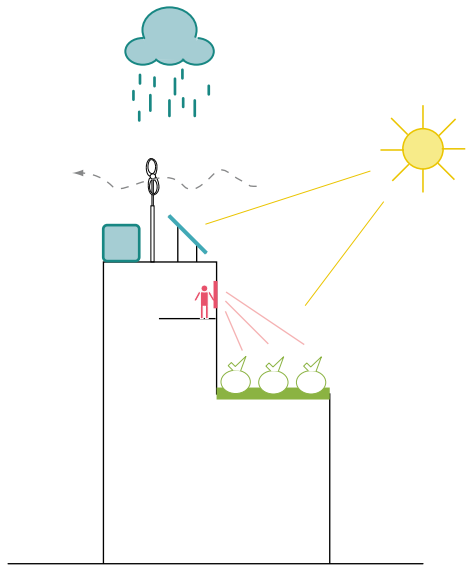
All farmable surfaces located on the roofs of different buildings belonging to the same "cluster" must be at the same level and linked by footbridges, in order to make their cultivation by farming co-ops easier. This does not apply to "privatised" farmable surfaces.

However, for safety reasons, the farmable roof of each building must have its own independent access from the ground.



Guideline #3.1

Generally speaking, farmable surfaces should be made visible from windows. Therefore they should not all be situated at the topmost level of buildings. Hence most buildings would preferably have two roof levels: one low and productive (common to all buildings situated in a same "cluster") and the other one higher and used for water harvesting and/or sustainable energies (wind, solar heating, PVs).



Guideline #3.2

Farmable surfaces can be access-restricted by gates and/or fences. However, it is preferable if ground-level surfaces be accessible to the public when a "natural" surveillance is possible (from very busy paths or from neighbouring windows). Similarly, roof surfaces should be accessible to residents or workers.

Conclusion

BACK TO THE THAMES GATEWAY...

As illustrated previously, new major urban developments are one of the keys to foster the implementation of urban agriculture. Indeed, as farming is integrated from the very beginning in the design process, it can accurately be mixed within urban spaces. Such developments also allow opportunities for experimentation, enabling to set innovative examples.

It is also clear that urban agriculture is a means of dealing with environmental, social and economic issues at the same time.

This echoes strangely with the current needs of the Thames Gateway… The way it is planned and implemented today puts emphasis on the regeneration of brownfield sites, but lacks to seriously address other issues, such as climate change or unemployment. In addition, its complicated and fragmented institutional framework leads to design a collection of independent projects with few or no relationships with their environments and the actual communities. Moreover the different projects completely lack to address the issue of the identity of the Thames Gateway. Why people would stay or go there? What would make this place unique?

We think that urban agriculture could help to address the environmental, social as well as economic issues of the Thames Gateway, in addition to provide a sustainable and attractive identity.

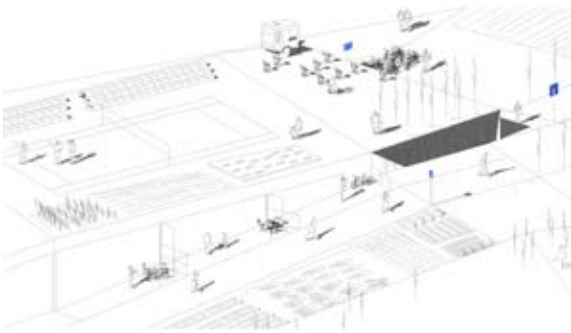
It is then quite natural to "end" this report imagining that, in parallel with the campaign for the development of urban agriculture launched by the GLA in the Greater London area, the different bodies in charge of the implementation and design of the Thames Gateway decide to refocus on urban agriculture.

More specifically, they decide to launch two pilot projects in two different contexts:
One, situated in Havering, deals with a careful integration of built form and farming activities within a sensitive natural context. It creates a manifold urbanity closer to nature, as well as a shared habitat enhancing community life and exchanges between its inhabitant and the existing surroundings.

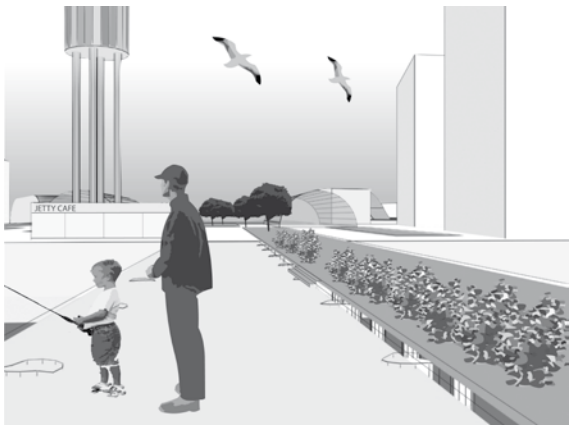
The other one is located in a declining industrial estate in Erith and emphasises the integration of productive surfaces within a brand new and high density development.

Both projects are described at the very beginning of this report...

The loop is looped...



Anna
Socio Land Lab



Nicolas
Erith Productive City

In a way, it is strange that we actually started at the end, working our way backward. Indeed, both the projects that we designed separately during this year can be seen retrospectively as a natural culmination of the narrative process which we went through this summer.

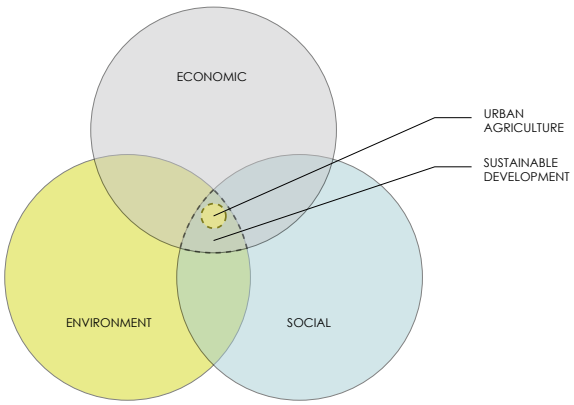
We can only regret that we did not have more time to push further the ideas developed in the last section of the report ("The Productive City"), which are the most related to the scale and scope of urban design. The guidelines drafted there would have required so much more testing. Our sites in the Thames Gateway would indeed have been very appropriate for that.

Yet, it seems to us that it was absolutely necessary to go through all the steps of the Productive Lab and Productive Campus. The necessity to go back and forth between different scales of time and space is after all proper to urban design.

Looking back to the topic we chose, and after all the investigations we made, we both have the feeling that it is a great topic. Well, we probably would not admit the opposite is true… But we honestly think so. Not only because it enabled us to make nice collages of the UCL campus.

We think urban agriculture is a great topic because it is one of the few that is really at the meeting point of environmental, social and economic issues. As such, it is really a sustainable topic, in the full meaning of the expression.

Anna Gasco & Nicolas Rougé



General bibliography

This bibliography only lists the main and most general books and websites. See also the detailed bibliographies in the margins of the report and at the end of the case studies.

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Note: all websites mentioned in the report were accessed between 15.07 and 15.08.2006.