# Utilitarian Dreams: Food growing in urban landscapes

André Viljoen and Katrin Bohn



Three basic natural resources – sunlight, water and land – are essential for the success of plants and buildings and therefore for the well-being of people. When designing for a food-productive city, there are trade-offs to be made between the allocation of space for day-to-day urban living and for food growing. These trade-offs remind us that absolute self-sufficiency for an individual building, an open urban space or a planted vegetable patch is not a particularly desirable aim for that city and its inhabitants. Interdependencies, not isolation, make for sustainable and resilient systems. For these interdependencies to happen, urban space must be designed and laid out, so that it encourages and supports urban food-growing activities.

## Land

The 2005 *CPUL* book notes the need to balance a number of factors when determining the scope and scale of urban agriculture within particular cities (Viljoen 2005: 266–8). If, as a starting point, we assumed that the *CPUL City* concept is being applied as part of a transition to cradle-to-cradle systems, then a target could be set to utilise all of a city's existing compostable waste as the nutrient input for urban agriculture. Compostable material – mainly fruit, vegetable and horticultural waste – can be boosted significantly by including safely treated general food waste and sewage. Such an approach would provide a baseline from which to estimate the amount of soil-based urban agriculture that a city can support without external nutrient supplements. The area of cultivation could then be calculated and related to potential growing sites within the city. As far as we are aware, no city has yet completed such a systematic calculation. So far, the scale of urban food production has been small enough that the supply of compostable waste far exceeds the demand (personal communication with Will Allen, Jun 2009).

Apart from compostable resources, other criteria including topography, access to sunlight and building metrics can also be set as starting points for inventorizing suitable land or surfaces for urban agriculture. However, urban land not only needs to be suitable, it also needs to be looked for creatively.

A study by Mikey Tomkins of the amount of land available for urban agriculture in a particular area of South London revealed large discrepancies between official records and the amount actually available (Tomkins 2009). Tomkins identified 21 hectares of open space compared to 14 hectares recorded by the local Council and only 5 hectares recorded by the Greater London Authority. He concludes that 'the more remote the official body, the less accurate the recorded figures for open space', warning more generally of the risk in assuming that official figures are correct. Tomkins further estimated the amount of produce that might be grown on the available land after removing open space that was actively used by residents (for example playgrounds). This resulted in a potential area of approximately 9 hectare, or 4.5% of the entire 191-hectare site. Using standard figures for efficient yields and for vegetable consumption in the UK, these 9 hectares could supply 26% of the vegetables consumed by the residents. This indicates the significant potential for ground-based urban agriculture in appropriate locations and confirms estimates published in our 2005 *CPUL* book.

Studies underway by Tomkins in more densely built parts of central London have found that residents who wish to cultivate crops often need to import soil into the city, either because open space has been paved over or due to concerns about the toxicity of soil (personal communication Jul 2012). Introducing closed-loop composting systems can go a long way towards alleviating such shortages of soil. The scarcity of soil in some areas is also one reason why soilless cultivation, such

as hydroponics and aquaponics, is becoming a popular choice for urban agriculture.

## What makes for a successful productive urban landscape?

In the chapters *Food in space: CPULs amongst contemporary urban space* and *Cuba: Laboratory for Urban Agriculture,* the 2005 *CPUL* book presented an overview and spatial analysis of the characteristics of individual urban agriculture sites. Since then, we have extended and tested our earlier assumptions, and this work has provided one of the sources for the *CPUL City Actions* presented in this book.

In 2006, as part of the *Utilitarian Dreams* exhibition in Havana, we developed a project to register public perception about the spatial and aesthetic qualities of urban agriculture sites. Called *Finding Parque Lenin,* the project invited comparisons between Parque Lenin on the outskirts of Havana and open spaces in the city centre and their related uses and lifestyles (Viljoen and Bohn 2009). Members of the public were surveyed with the aim of finding out if there was an unprompted correlation in the public mind between traditional spaces – such as parks, gardens, squares – and urban agriculture spaces. Parque Lenin was chosen as a reference because of its significance in people's memories as a popular leisure destination, and its extensive heath-like landscape, mixing natural and constructed, agricultural and infrastructural features. The park opened in 1972 in celebration of post-revolutionary socialism and, prior to transportation difficulties starting in the 1990s, was frequently visited by residents of all ages. Of the 268 respondents to the survey only 8 had never visited Parque Lenin, and about 80% would have liked to visit it more often (*Fig 1*). Participants in the survey described the park in terms of open natural landscape and recreation, comparing it to other parks, exhibition centres and amusement parks within Havana. While the general positive attitude to urban parks and being in open space supported the CPUL concept, it was clear that urban agriculture was not thought of as part of the city's landscape or landscape infrastructure. And whilst a 'coffee shop' (named in one questionnaire) qualified as space of similar character to Parque Lenin, a market garden did not.

To challenge such an omission of urban agriculture from the public perception of quality open space, designers and planners need to take account of both the needs of urban farmers and those characteristics of open space that people desire.

From the *Finding Park Lenin* project, we concluded that three key issues need to be addressed prior to establishing any CPUL:

1. Utility landscape versus ornamental landscape:
   It is wrong to assume that exposure to urban agriculture alone will result in it being perceived as desirable, as "organic ornament".
2. Working landscape versus leisure landscape:
   Cultural and generational associations with agriculture and working the land, which may carry connotations of poverty and hard labour, need to be taken account of.
3. Accessibility versus inaccessibility:
   In Havana's case, urban agriculture sites, typified by discreetly enclosed organoponicos, do not allow access for mixed use or "adjacent" occupation.

Much of our work outlined in the *CPUL City Actions* addresses these concerns and aims to introduce a *new way of seeing* urban agriculture. Projects like *Unlocking Spaces* in Brighton and *Spiel/Feld Marzahn* in Berlin establish short- and long-term interventions providing working forums and prototypes for residents' input into a dialogue about future development, the ownership of open space and accessibility. The multi-programmed nature of many other urban agriculture sites, such as Berlin's *Prinzessinnengärten* (Clausen and Müller-Frank 2012) or London's city farms (FCFCG *n.d.*) exemplify urban agriculture's potential to include space for recreation and celebration. That said, practice on the ground is just beginning, and we need to continue investigating the inherent qualities of this new and evolving productive urban space.

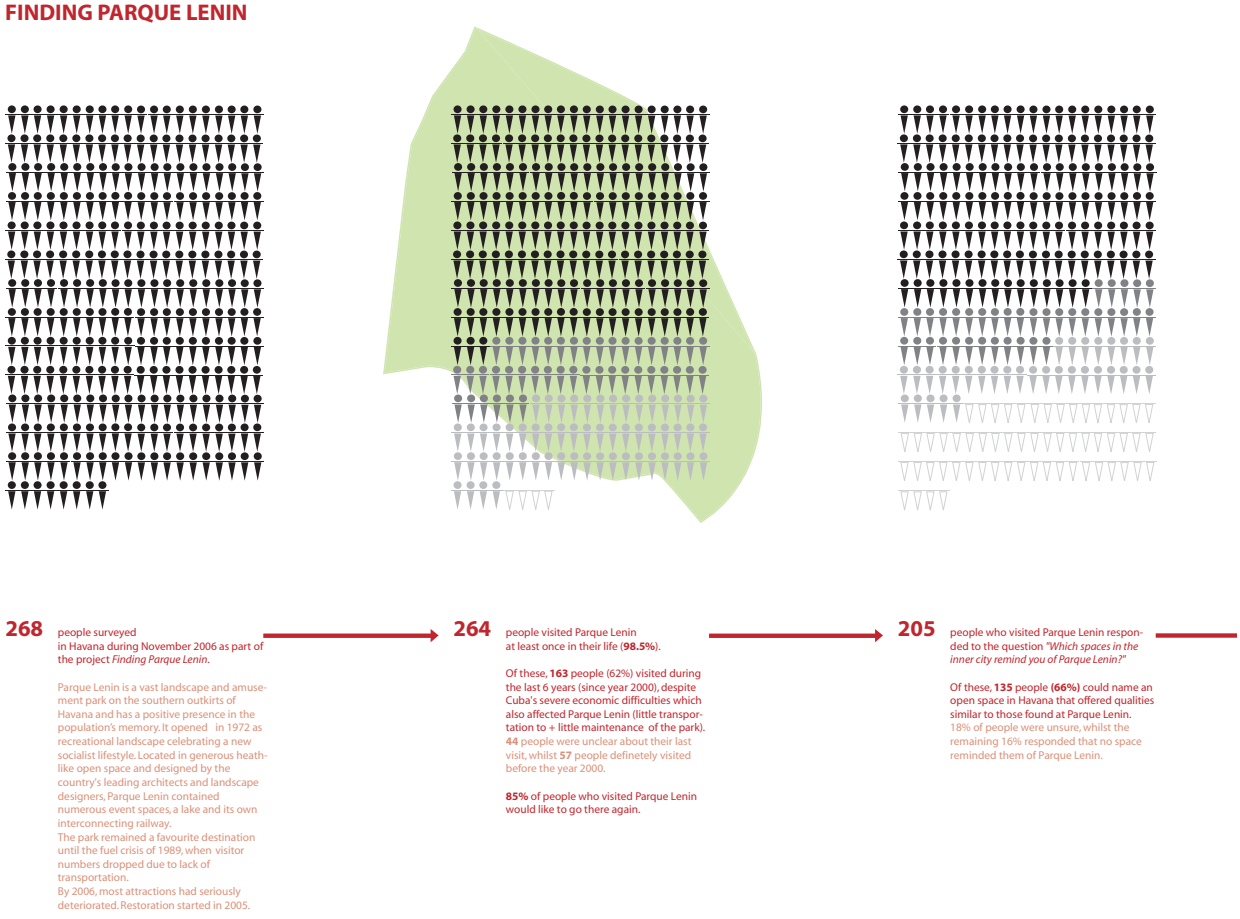


**Fig 1: Finding Parque Lenin.** A public survey undertaken in Havana as part of this 2006 project asked respondents about their perception of Parque Lenin, a large and popular park on the outskirts of Havana. The aim was to see if people valued open urban space and if a connection was made between the qualities of the park and the city's urban agriculture. 268 people completed the survey, of which 264 had visited Parque Lenin at least once in their life. Of these, 62% had visited it in the previous six years, i.e. since the park suffered from lack of access by public transport. 205 people responded to a question asking if they could name another space in Havana that reminded them of Parque Lenin and 135 of these named an open space. No respondents said that an urban agriculture site reminded them of the park.

## Urban scale: paths and fields

The network of paths and fields that make a CPUL provides cities with more than circulation routes. As proposed in our early work, CPUL networks facilitate flows of food, people, primary elements such as air and biodiversity and – in spatial terms – take account of rural hinterland, city centre and the wider urban fabric (Viljoen *et al.* 2004).

CPUL space is green infrastructure that can protect and improve the functionality of ecosystems. It includes biodiversity conservation (see chapter *Diversity*, p. 60), contribution to human and social health and well-being, sustainable agriculture and water management, climate




**135** people who visited Parque Lenin and could name another open space in Havana that offers qualities similar to those found in Parque Lenin responded as follows:

**46** votes went to the 3 most popular spaces
**27** votes went to the next 3 popular spaces
**43** votes went to 15 open spaces with more than 1 person voting for each of them

The remaining votes (**14%**) named various open spaces once or were unspecific.

**0** people who visited Parque Lenin and could name another open space in Havana that offers qualities similar to those found in Parque Lenin considered one of the city's numerous urban agricultural sites.

"Organoponicos" are the most frequent types of urban agricultural landscape in Cuban cities and are familiar to inhabitants. They happen everywhere, i.e. right in front of your doorstep, and in lots of different sizes and shapes. Their commercial urban farmers are very visible members of the urban population. Urban agricultural sites produce significant amounts of fruit and vegetable in Havana, and people buy from them on a daily basis.

change mitigation and adaptation and support for the development of a green economy.

The *CPUL Opportunities Map* created for Middlesbrough (see *CPUL CITY Actions*, p. 188), shows one example of how such a network can be created, in this case following the lines of small streams that run through the town. The *CPUL City* concept is starting to be used to inform planning strategies aimed at creating and interconnecting open urban space for a number of ambitious new developments. As this book goes to press, the West African Municipality of Bobo-Dioulasso in Burkina Faso, working with a number of agencies including UN HABITAT, have defined as a vision and a goal the creation of 'a mosaic of connecting green spaces inside and at the periphery of the city' explicitly using the CPUL concept as a model (Baguian 2013). The concept is also being applied within Europe as indicated by the inclusion of urban agriculture in the draft strategic vision for the Dutch city of Almere: 'The city's ambition is to develop this area towards a so-called continuous productive urban landscape producing food, energy, resources and water within and for the city (based on Viljoen, 2005)' (Jansma and Visser 2011).

The connecting routes that run between individual urban agriculture sites are an essential part of CPUL space and give spatial coherence to the entire network. These "thin productive connectors" accommodate pedestrian, cycle, wind and water flows, as well as creating

**Fig 2: Madison's *Capital City Bike Loop*.** Parts of this cycle route combine pedestrian and cycle ways with communal food-growing spaces adjacent to housing and wildlife planting. The ensemble of planted areas shows similar seasonal characteristics to landscape architect Piet Oudolf's 'new perennial' planting approach as found, for example, on New York's *High Line*.

wildlife corridors that encourage biodiversity. An innovative and very successful example of such a connector has been created in the North American city of Madison, in the state of Wisconsin *(Fig 2)*. Madison's *Capital City Bike Loop* provides a cycle and pedestrian route running round the city's centre, passing through large residential areas, parts of which, adjacent to St Paul Avenue, have been developed as a productive landscape, flanked by communally managed food-growing sites and areas of wildlife planting for local prairie plants.

Another example of what might be called "prototype" CPUL routes is the *Dequindre Cut Greenway* which runs from Detroit's river front on the route of a disused railway line inland towards the city's Eastern Market (*Fig 3*). It borders both an urban farm used as a training centre by the Greening of Detroit organisation (see chapter *Detroit*, p. 130) and Mies van de Rohe's residential development *Lafayette Park*, set within a richly layered landscape by Alfred Caldwell to a master plan by Ludwig Hilberseimer. Together, these spaces demonstrate the potential for a seamless urban landscape connection between the domestic sphere, public urban space and a productive green infrastructure.

New York is already implementing a *Greenway Plan*, which proposes '350 miles of landscaped bicycle and pedestrian paths crisscrossing New York City' (NYCDCP 1993). Bringing together the *Greenway* with ground-based and building-integrated urban agriculture sites would offer the potential to create a coherent three-dimensional CPUL network integrating pleasant and health-enabling circulation with productive and socially active urban agriculture fields.

## The agricultural and architectural scale within productive urban landscapes

The chapter *Food in space* in our 2005 *CPUL* book, referred to at the start of this chapter, compared European open urban space and CPUL space under the headings of *Spaciousness*, *Occupation* and *Ecology*. Today, ten years on from this conceptual start, we are applying the same three criteria to actual locations in order to assess how well, together, they inform a new dynamic productive urban landscape.

### Spaciousness

If urban agriculture fields reach a certain size, their sheer dimension could negatively result in the de-urbanisation of cities, by virtue of the physical distance created between one part of the city and another. However, this concern need not prevent the integration of large fields into the city, because it is their plan form and their horizon that largely determine if they disconnect or connect built-up areas. Two examples, Berlin's disused Tempelhof Airport (approx. 370 hectares) and *Central Park* (approx. 340 hectares) in New York demonstrate this characteristic in different ways as "oasis" and "bridge".

Tempelhof's vast flat plane presents an archetypal "field" in the city. Unlike most other urban parks that use the verticality of planting or topography to animate space and create enclosure, the sheer horizontality of Tempelhof creates an oasis of tranquillity within the city. It has three distinct edge conditions: a hard urban building line, a railway line forming a low, non-permeable barrier, and a near seamless blending into adjacent park-like spaces. These characteristics are most comparable to the positive isolation of rooftop farms. Within Tempelhof, one is unaware of the city *and* "nature", it is in a positive sense "apart" from the city.

*Central Park*, by contrast, is embedded within the city. Its edges, defined by the city's grid, remain permeable with many points of entry, and the park provides both routes across the city and a refuge from the street. Its plan form – an elongated rectangle with proportions of roughly five (North–South) to one (East–West) – alternatively provides a sense of enclosure in nature along its long axis and sense of urbanity through views out and into the city across its short axis. This phenomenon has the unique characteristic that the park can become both a connective urban tissue within the city (you know that you are in the city, that you walk in the city) and, by just turning 90 degrees, an "escape" from the city into a constructed second nature *(Fig 4)*.

In summary: We will continue to think *"Spaciousness"*. We add: "oasis", "bridge", "field", "nature", "apart", "escape", "sense of enclosure" – all part of an urban agriculture that contributes to urbanity and food sovereignty.

## Occupation

We will also continue to think "occupation" because CPUL space is productively and publicly occupied. Productive space may be separated from public space by means of level changes, gaps or visibly permeable boundaries, but the two operate as adjacent types and together create a new typology of urban place. The design vocabulary for these spaces is emerging. They may be larger fields or intimate spaces or examples of "hands-on urbanism"*(Fig 5)*. They may be located near to paths or set at vantage points *(Fig 6)*, allowing for views over the urban agriculture fields and out to the city. Some of these spaces invite informal occupation.

We can experience the sensation of adjacent occupation, when, for example, sitting under the water tower on the *Brooklyn Grange* rooftop farm or when looking across the East River in one direction and productive fields in the other from the corner of *Eagle Street Farm* (see chapter *New York City*, p. 122).

## Ecology

Highly complex urban ecologies continue to be better understood as research and practice grows within a spectrum ranging from "organic" forest gardening – for example as practised by adherents to permaculture – to industrialised techniques – as, for example, in aquaponic systems. The inclusion of urban agriculture into cities requires that the public accept and appreciate a more seasonal and formally cultivated landscape. The processes of growth, blossoming, die-back and germination will all be visible, far more so than in municipal parks that follow familiar and managed ornamental aesthetic. Closed-loop, no-waste food systems utilise the interdependencies within cycles of consumption and production, and this will be mirrored in the new urban landscape. The change is already underway as, for example, in the recognition of the need for bee habitats (see chapter *Bricks and Necter*, p. 84) or in the interest expressed in the work of plantsman Piet Oudolf and his practice of the so-called "New Perennial Movement". Oudolf's planting is found on New York's *High Line* and in London's *Potters Fields Park*, both of which celebrate a plant's entire life cycle (Oudolf and Kingsbury 2010). And both the *High Line* and *Potters Fields* place people in the centre of rich and dynamic landscapes, constantly in states of flux, seasonally with slow changes from an abundant summer growth to a frugal winter landscape. These are like agricultural landscapes, where soil, wildlife and plants are each highlighted at different times.

**Fig 3: Detroit's *Dequindre Cut Greenway*.** This open space network can be understood as a prototype CPUL, connecting recreational areas, like the river front, residential areas, such as Mies van de Rohe's *Lafayette Park* [to the left], the city's urban agriculture hub, Eastern Market, and Greening of Detroit's urban farm that lies ahead.

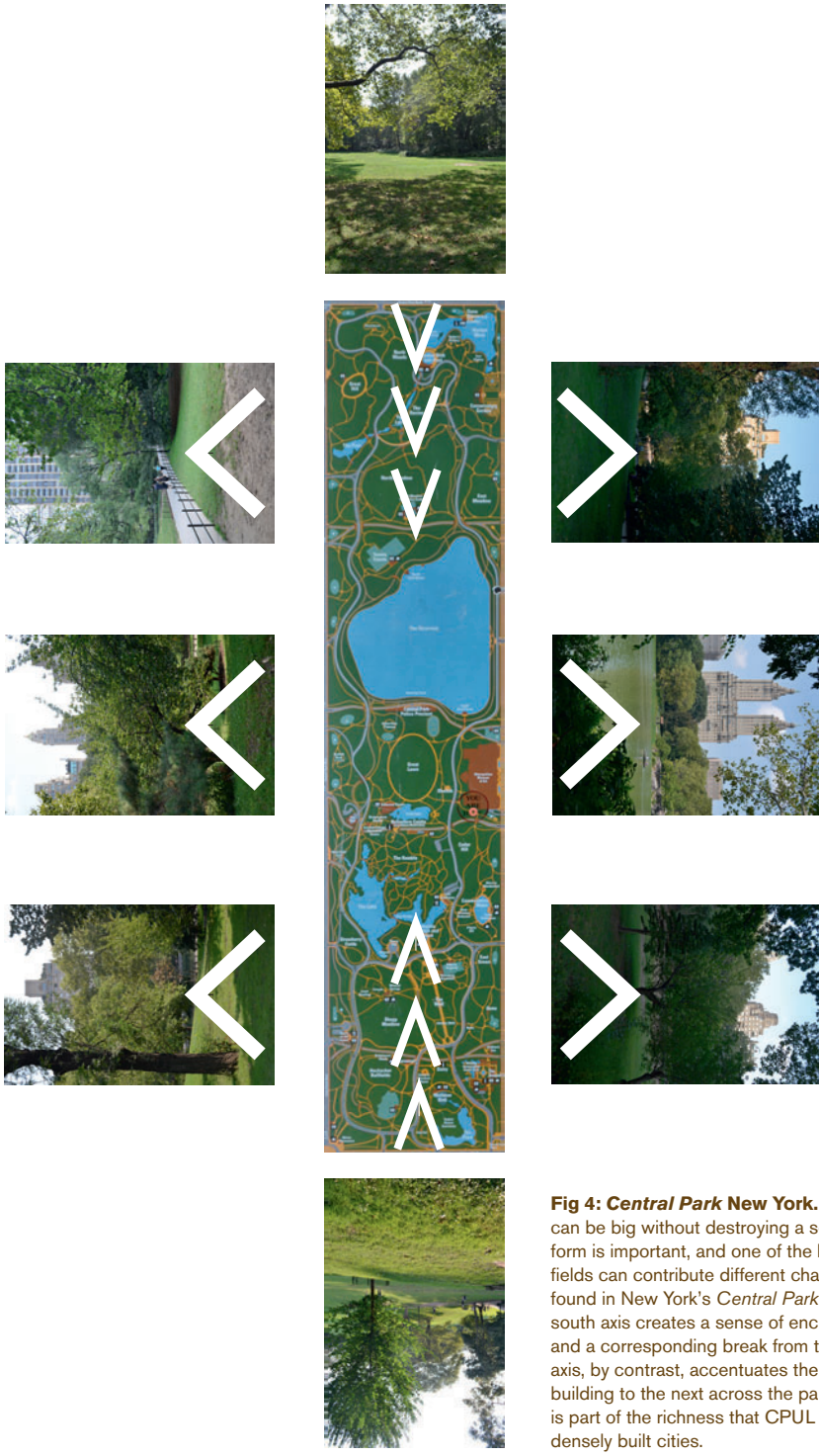

**Fig 4: *Central Park* New York.** Urban agriculture fields can be big without destroying a sense of urbanity. Plan form is important, and one of the best examples of how fields can contribute different characteristics to a city is found in New York's *Central Park*. Here, the long north–south axis creates a sense of enclosure within nature and a corresponding break from the city. The east–west axis, by contrast, accentuates the connections from one building to the next across the park. This dual perception is part of the richness that CPUL space can also bring to densely built cities.

## Growing livelihoods in urban landscapes

A prime example of multi-use productive spaces that provide food and income can be found in the Argentinian city of Rosario, where three spatial types have been defined and implemented: large public Garden Parks 'in which recreational, productive, educational and commercial activities are developed', neighbourhood-scale Educational Productive Squares, and Productive Streets. Significantly, the Rosario project includes a supportive municipal framework, and the productive infrastructure integrates regular urban markets, product processing (vegetable boxes and cosmetic products) and skills-capacity building for participants (Dubbeling 2011). The Rosario project has developed with the support of the international network Resource Centre on Urban Agriculture and Food Security (RUAF) within a context of poverty and scarcity for the urban farmers who, by working and engaging with wealthier inhabitants as clients, generate food for themselves as well as income from the sale of produce.

Providing for urban lives is the ultimate test for productive urban landscapes. The urban contexts of such landscapes will change from city to city, but what will remain for their users is the pleasure of working the land, being in it or seeing it being worked on – combined with the pleasure of tasting the land's produce – or earning a living from that land.

**Fig 5: *Allmende-Kontor* Berlin.** Intimate "self-built" spaces for seating and planting constructed as part of Berlin's urban agriculture *Allmende-Kontor* [Bureau of the Commons] project on the site of former Tempelhof Airport. This arrangement of seating areas for relaxation embedded within and directly adjacent to food growing areas represents a primary configuration of small gregarious spaces set within larger productive fields.

**Fig 6: *High Line* New York.** Vantage points along this regenerated former railway line provide the catalyst for spaces accommodating individuals and groups, allowing for sitting and lying, looking out beyond, over and into planted areas. All of these are also characteristic of CPUL space. The popularity of New York's *High Line* demonstrates the desire for coherently designed urban landscape combining paths, planting and spaces for stopping.

# Utilitarian Dreams: Productive life in the city

André Viljoen and Katrin Bohn

We have argued elsewhere that, in urban agriculture, scarcity and abundance can lie very close to one another because with few resources urban agriculture can enable abundance (Viljoen and Bohn 2012). At the same time, developments within the past few years have demonstrated that culturally and economically vibrant cities also have a great desire and ability to support ambitious urban agriculture proposals. Whilst these proposals usually originate from individual initiatives, it is also true that a supporting infrastructure is necessary to create stable and resilient urban food systems. This is one of the things that, for example, Cuba, as a nation, and New York City have in common. We can see that the food-productive life in our cities depends on and varies with social and economic conditions and these will determine the appropriateness of different types of urban agriculture.

With reference to projects already underway in Milwaukee, New York, London and Berlin, we aim to illustrate a variety and richness of approaches typical of any movement in the transition between a pioneering phase and the establishment of norms of practice.

## Economic approaches

Currently, the economic models for funding new urban agriculture projects are converging towards either social enterprise or straight commercial models, with food markets often providing crucial support for both.

The organisations *Growing Power* in the USA and *Growing Communities* in the UK both demonstrate the possibilities from a long and steady growth of social enterprises, if guided by clear agendas, leadership and management. Whilst set up with somewhat different, less vigorously urban agriculture-oriented aims, *Agrarbörse Ost* in Germany, is of similar character. Established respectively in 1993 (Growing Power *n.d.* b), 1996 (Growing Communities *n.d.* a) and 1990/1996 (Agrarbörse *n.d.*) all promote sustainable and healthy local food systems with urban agriculture as a core activity. *Growing Power* also developed and now actively pursues an explicit socio-political agenda aimed at empowerment and equality, whereas *Agrarbörse* originally had – and still does to some extent – a political/economic aim and later reoriented towards more social and ecological interests.

A number of common strands for setting up urban agriculture projects become evident when analysing the business models of these social enterprises:

- All started with **access to land**. In *Growing Power*'s case, an existing 0.8 hectare [2 acre] market garden with greenhouses in Milwaukee, and in *Growing Communities'* case, a modest space within an existing London park and two small sites nearby. The sites were not ideal, and needed much work to make them productive. *Agrarbörse* acted as public agency for several charitable projects, which often involved the construction or maintenance of public sites.
- Compared to conventional enterprises, each organisation spent **a prolonged time developing** and refining their practice. Over more than ten years, *Growing Power* developed low-impact, intensive growing techniques and established vegetable markets in poor neighbourhoods as well as a second centre in Chicago, thereby extending practice beyond its base in Milwaukee. *Growing Communities* established over a similar period a sophisticated organic vegetable box scheme utilising a *Food Zone* model (Growing Communities *n.d.* b) to determine how its own produce could be combined with supplies from adjacent farmers to minimise environmental impact and offer an adequate quantity and variety of produce. Although, in detail, each organisation has different modes of operation, important common factors are their long-term persistence and clear agendas.

- To be economically viable, an urban agriculture project needs **reliable leases** for the urban space it is occupying. *Agrarbörse* is lobbying the Berlin municipality for minimum lease times of 12 to 15 years for urban agricultural uses (TUB 2011).
- Julie Brown, one of *Growing Communities'* founding members, has always been adamant that **yields and economies of production matter**, something which can get lost in arguing for the social and communal benefits delivered by urban agriculture and urban food systems projects. Annual reports published by *Growing Communities* record a consistent growth in the sale of their organic vegetable box scheme by about 30% per year between 2005 and 2009 (Growing Communities 2009). Although these percentages are high, the actual amounts remain modest when compared to more commercially oriented vegetable box schemes.
- At a time when the cost of imported food and the salaries of market gardeners are extremely low, many urban agriculture projects will **rely to some extent on grants and volunteering** in order to build economically competitive business models. It is likely that this situation will change in the future as food prices rise. *Growing Communities* are clear about their relationship to the status quo when stating that 'this approach of getting on with creating a viable alternative to the current food system is in the spirit of Buckminster Fuller who said: "You can never change things by fighting the existing reality. To change something, build a new model that makes the existing model obsolete"' (Growing Communities *n.d.* a).
- Unlike in most rural agricultural enterprises, urban agriculture often takes on **roles in environmental education**, as on economical opportunity on the one hand, and reflecting the desires for alternative urban lifestyles on the other. *Agrarbörse* is not only training gardeners, but attains a considerable amount of recognition and funding through their work with young people, especially through their project *Treibhaus* [greenhouse] a youth centre for youngsters not related to urban agriculture (Agrarbörse *n.d.*).

Once the projects stabilise, the process of growth is often constrained by, first, a lack of sufficient land and, second, a lack of trained urban farmers.

For about a decade, *Growing Communities* had access to three modest, so-called market garden sites for food growing, although, in reality, they were much smaller than traditional market gardens. To address this, post 2010, they established a network of "patchwork farms" consisting of several small private and publicly owned growing sites. At the time of writing, the amount of ground under cultivation, the number of trainee growers and the number of employment opportunities created continues to expand rapidly, including plans to set up a considerably larger 1.6 ha [4 acre] "starter farm" on a vacated council nursery plot in Dagenham, East London. The lack of trained urban farmers has been addressed by adopting a now familiar sequence of actions: first, working with volunteers to establish and, importantly, demonstrate the quality and reliability of urban agriculture produce; then bidding for project-based funding from an array of grant-giving bodies and, at the same time, the effective use of a website and social media. Alongside reliance on volunteers, a formalised *Apprentice Growers Scheme* now trains volunteers, many of whom go on to cultivate plots forming the "patchwork farm" or work on other sites. Funding for the 1.6 ha "starter farm" at Dagenham will enable the employment of a gardener for about two years after which the farm is intended to be self-funding (Growing Communities *n.d.* a).

In the 14 years between 1993 and 2007, *Growing Power* essentially followed the same business model as *Growing Communities*, but at a larger scale and with a more aggressive marketing strategy, helped both by founder Will Allen's background in business and by his drive to align food justice with social justice. Both organisations operate as not-for-profit companies with associated tax benefits. *Agrarbörse* is also a registered society, however, being originally set up with the strategic aim of helping in the transition from GDR to a capitalist food economy, it benefited from funding support and municipal cooperation early on, and its business model – until its refounding in 1996 – was a relatively secure one. Since 1996, however, they pursue a social enterprise business model. All three projects systematically spent time working on developing the financial viability of urban agriculture, incremental growth in production, recruiting volunteers, creating real jobs as turnover increased, developing training programmes, building alliances with local authorities and agencies, and taking on additional

land for growing. Notwithstanding this marked success, Allen notes: 'The honest truth is that with urban agriculture, we are not there yet. We have not yet made it reliably profitable. I think we can, though.' (Allen and Wilson 2012: 226).

Will Allen describes the evolution of his ideas on urban agriculture and the establishment of *Growing Power* in his book *The Good Food Revolution* (Allen and Wilson 2012). Allen believes in the approach of economist Ernst Schumacher, articulated in his book *Small is beautiful: Economics as if people mattered* (Schumacher 1973). Contrary to *Growing Communities*' contention that an entirely new food system needs to be constructed without much engagement with the existing food industry, Allen is prepared to work with partners who are fully embedded in corporate, industrialised modes of production, distribution and marketing. During its early years, *Growing Power* had to deal with serious financial struggles, but in 2011, its continued expansion was clearly evident, as was this "catholic" approach to working with partners who, on the face of it, did not support Will Allen's belief in small-scale, intensive organic production. The late Jerry Kaufman, who many consider the founding father of food planning in the USA, was a leading member of *Growing Power*'s board of directors and described Allen's policy as one of maintaining an "open table" excluding no one from the debate and accepting financial support from unexpected sources provided that no conditions would be placed upon its use (personal communication 2011). In 2011, this was made starkly clear when Allen accepted a grant of one million dollars from the supermarket chain *Wal-Mart* to support 15 regional *Growing Power* training centres. Similarly, *Growing Power* cultivates land using organic principles adjacent to a food processing plant run by *Sysco* who purchase the crops. Sysco produce ready meals for schools in the USA, and certainly do not follow Schumacher's principle of 'small is beautiful'. Critics argue that Allen is complicit in supporting these corporations' programmes of "green wash", while Allen sees his actions in the context of an entrenched system that will take time to change. Jerry Kaufman was instrumental in developing a business plan to move *Growing Power* into financial profitability. By 2007, it turned in a modest profit with income being raised from a mixture of food sales and grants. Will Allen records that, in 2006, about one third of their gross income came from direct sales worth about $375,000, while a further two-thirds was raised from grants. At the point of transition to profitability, the organisation employed 12 staff, but also relied on volunteers and trainees in order to maintain production (Allen and Wilson 2012: 200).

Future plans by *Growing Power* include the construction of a modestly scaled vertical farm, which is perhaps more akin to strictly commercial aims of organisations such as *Lufa Farms* in Vancouver (Lufa Farms *n.d.* a) or *Gotham Greens* in New York (Gotham Greens *n.d.*), both of which have developed lightweight hydroponic rooftop greenhouses on existing buildings. These two new urban farms minimise the environmental impact of their hydroponic systems and use biological rather than chemical insecticides. *Gotham Greens* are reported to produce locally cultivated crops for sale in supermarkets that are no more expensive than more distantly sourced organic produce (Zeveloff 2011), while *Lufa Farms* include their produce in a vegetable box scheme supplemented with organically certified produce from local farmers, following a model very similar to *Growing Communities* (Lufa Farms *n.d.* a).

*Agrarbörse* who, at the time of writing, are running several projects involving urban agriculture in Berlin are planning to tackle the challenge of retail opportunities for urban farmers by setting up a "farm store" – a new building typology in the German capital – that would store, sell, process and exchange food products of even very small individual urban producers who currently face difficulties when marketing their products (Riedel, personal communication Apr 2012).

The economics of building-integrated urban farms is less easy to review at this stage of development, as their history is much shorter, with, to our knowledge, the exception of three entirely commercial rooftop greenhouses established in 1995 above the *Eli Zabar* gourmet market store in New York City (Eli Zabar *n.d.*). In *Eli Zabar's* case, it appears that the building owner runs the market and greenhouse, removing rent for the roof space from the cost equation. For hydroponic greenhouses a well-developed industry already exists and, other than questions raised by gaining access to a rooftop (see *Laboratories for Urban Agriculture: The USA: New York City*, p. 122), the economic models used for running a business are well established. In the early

stages of integrating rooftop farms into cities, farmers will most likely seek out easily accessible flat roofs, strong enough to accommodate the additional load and requiring minimum alteration to a building. In the future, it is likely that existing flat roofs may be selected, even if they require structural reinforcement, or in the case of less suitable profiles, even complete rebuilding as part of a building's refurbishment.

One of the most interesting proposals for the reuse of an existing (industrial) building is the *Malzfabrik* in Berlin. Originally built in the early 20th century as a malting factory, this heavy-constructed building includes a number of accessible large water tanks and a significant area of roof space suitable, or to be made suitable, for conversion into a greenhouse. The building's developers are currently working with a team to agree on a financially viable aquaponic system as part of a much larger mixed-use commercial development (ECF *n.d.* a).

## Social productivity

Not all urban agriculture projects are motivated by agricultural yield and many measure their productivity in terms of social benefit, not least of which is improved public health. In fact, most practitioners recognise benefits related to behaviour change, often brought about by the awareness-raising capacity of food growing projects. When describing *Growing Power*'s impact, Erich Schlosser comments:

> *…the good that Growing Power is doing in the communities it serves – the heart attacks and strokes and hospital visits it helps people to avoid, and the sense of empowerment that it gives, the families that it brings together – represent a form of social profit that it is impossible to quantify.*
>
> (Schlosser 2012)

These significant health and well-being benefits apply especially to community-based or individual urban agriculture projects and are already being consciously documented (Campbell and Wiesen 2009). However, urban agriculture's full recognition as an important driver for social improvements still has to happen amongst many civic decision makers. "Full recognition" means that the needs of urban farmers and gardeners are treated equally seriously as those of other stakeholders who create benefits for the local community through their work. If this happens it will enable consumers to significantly and sustainably change their behaviour with regard to food.

In the UK, the allotment can be a catalyst for (behaviour) changes related to diet and health. Surveys undertaken by Gillean Denny in Cambridge and Middlesbrough reveal the allotments' continuing influence on food choices across all socio-economic ranges. Most notable are a substantial increase in the quality and quantity of fresh food being consumed by allotment growers during the growing season and a decreased dependency on grocery stores for fresh produce: 70% in growing seasons and 24% during off season. Changes in "food miles" reduce personal carbon emissions by an estimated 950 kg $CO_2$ per year, even while still predominantly utilising grocery stores during off-season months and maintaining an overall dependence on fossil-fuelled transport year round. Allotment tenants also surpass the recommended 30 minutes per day of exercise through time spent on the allotment and through active-commuting related to food procurement. Furthermore, allotment holders who ate less than the recommended daily intake of fruit and vegetables before they had an allotment, increased their fruit and vegetable intake once they started growing food, and this increase was reflected in an increased proportion of fruit and vegetables purchased throughout the year. If this trend is validated in further research, it will indicate the significant behaviour change impact that may be attributed to even relatively modest urban agriculture interventions (Viljoen *et al.* 2009).

Subsequent experience gained when working on student and demonstration projects, such as the *Edible Campus* at the Faculty of Arts, University of Brighton (UoB 2011), suggests that even very modest food growing activity can affect changes in food purchasing habits, resulting in increased consumption of fresh fruit and vegetables and reduced consumption of animal and processed products.

Finding the right tools for achieving large-scale and voluntary behaviour change in favour of environmentally sustainable development has long been a challenge and

so the potential noted here is worth further research. It is the complexity of urban agriculture's benefits that is beginning to be appreciated: New York's deputy food policy coordinator Jordan Brackett, for example, felt that the behaviour change potential of community-based projects had been understood within his food policy team resulting in support for schools and community programmes (personal communication Aug 2011). Such "unmeasurable" benefits are increasingly directing policy makers and politicians who now want the metrics to make the case for the quite radical changes required to embed productive landscapes within cities.

## The usefulness of metrics

New York City provides a good example of how metrics are being used to quantify the impact of community-based food growing. There are several drivers for this: on the one hand, for example, community gardens still do not have permanent legal protection and, therefore, such measurements can be used politically, for example by the *New York City Community Garden Coalition*. On the other hand, active practitioners can use this data to underpin arguments when applying for charitable or commercial funding. In addition, once the data is available it will provide evidence to inform urban policy.

The organisation *Farming Concrete* provides an entrepreneurial example and methodological model for collecting food production data whilst setting up a structure that allows for the continuation of data collection without the need for external funding. The project will be considered a success by its founders, if, after ten years, sufficient data has been collected to make it obsolete. Starting in 2010, three annual reports for New York City have been published online (Farming Concrete 2012). Mara Gittleman and Kelli Jordan, founders of *Farming Concrete*, described how they aimed to use 'citizen scientists' to record the amount of produce cultivated in community and school food gardens (personal communication 2011). They developed a practical approach recognising different levels of interest and motivations found within growers. The most accurate data is gathered by individuals who weigh their entire output using kitchen scales and record the types of crop cultivated. A second approach is to get growers to record the types of crops cultivated, but not measure their weight. These two methods allow for an assessment of the variety and quantity of crops harvested. *Farming Concrete*'s findings were significant: there are some real farmers in the city, and the gardens produce more food than was initially thought. For 2010, they recorded about $200,000 worth – or over 80,000 lbs – of vegetable crops produced, excluding spring crops, from 68 gardens with a net growing area of 1.7 acres (0.7 ha). They explicitly noted that not everything grown on the surveyed sites was measured or recorded (personal communication 2011). Despite this achievement, it is important not to confuse the yields logged by community growers with those that can be achieved by commercial growers.

In *Farming Concrete*'s experience, local academics had concerns at the start about farmers measuring their own output, but now academics are also using this method. Practitioners find it 'infinitely more accurate' than other methods for estimating yield (personal communication 2011). Many community gardens are now being studied by external researchers, who are seen by gardeners as experts but also as demanding intruders. However, *Farming Concrete* enabled practitioners to also see the benefit of gathering data: for some, it is personal interest, for others, a means to assist with funding applications and membership recruitment or to establish which crops are the most successful in different locations.

As a replicable model, *Farming Concrete*'s success has been based on a formal and funded public portal, represented by its website and annual reports, combined with a very active informal, but skilled and focused community of practice 'communicating over coffee and online'. Funding came from a variety of sources including New York's publicly funded *Green Thumb* community gardening project, a student internship at *The New School* and other funding from a variety of organisations promoting an improved public realm. A measure of *Farming Concrete*'s impact is that – according to *Sustain*'s Sarah Williams – the longer-established London-based food charity *Sustain* is planning to adopt the citizen scientist approach to quantify yields and encourage more intensive production from London's community food growers (personal communication 2012).

Reflecting on the project's strengths and weaknesses, Mara and Kelli thought its decentralised nature was

its strength because the community is 'doing it', which needs a flexibility and willingness to find out what works. A reality, but also a frustration, is the attrition rate for participants despite the effort put into running the project. *Farming Concrete* recommends recruiting twice as many participants as required. A notable success was recorded during the project's second year, when gardeners came forward to join the project, rather than having to be recruited.

Other increasingly important metrics include recording the environmental benefits of urban agriculture, for example those relating to its potential to minimise rain and storm water runoff, especially from impervious areas of paving and rooftops. Concurrent with the foundation of *Farming Concrete*, Tyler Caruso and Erik Facteau established the organisation *Seeing Green* in New York to document the water retention potential of rooftop farms, as well as to advise more generally on their design (Seeing Green *n.d.*). Set up using crowdsourced funding and on a more commercial basis than *Farming Concrete*, their findings will help to make the case for urban agriculture's contribution to sustainable urban drainage systems.

In the future, metrics associated with the use of compostable waste and water storage can be added to those emerging for yields and reduced stormwater runoff. Recording quantifiables, such as measures of food production or water retention, are relatively straightforward tasks and may be considered a "stage one activity", not only when it comes to assessing a city's environmental performance, but also when generating the reasons for implementing productive urban landscapes.

## Food policies for everyday life

Benefits and metrics need evaluation and coordination if the different parties involved in reforming urban food systems are to work together. Joint top-down and bottom-up processes can move initiatives 'from alternatives to alliances', as Kevin Morgan puts it in his chapter (p. 23). Looking once more at New York the work of the mayor's food policy coordinator and team illustrates this process very well: first, the formal establishment of such a position or body helps to facilitate coordinated food planning by providing a single point of contact; second, food policy has been included in the city's planning documents. Both of these actions are extremely significant and they are still extremely rare.

Food policy in New York operates in a context of extreme discrepancy in wealth with near to 400,000 millionaire residents and about 1.8 million people on incomes below the official federal poverty threshold. The latter are eligible to receive benefits from federal, not city budgets, in the form of food stamps which operate like a credit card. Furthermore, 6 million of New York City's 8.5 million residents live in food deserts (Brackett, personal communication Aug 2011). Far from being a singular case, this condition is increasingly prevalent in nations that follow a neoliberal economic agenda, and to address it requires top-down commitments.

Whilst food sovereignty and food security might be the most important global political concerns for the feeding of our cities, food poverty and food deserts are the most critical socio-political contexts for local action. Access to food becomes an important factor for urban planners from a multitude of angles, and a number of widely applicable points can be noted:

- Budget: Given limited resources, an interesting **budgeting tension** was identified in food deserts between funding urban agriculture and recognising its "great" educational impact or funding new supermarkets. The idea of supermarkets in food deserts deserves further scrutiny to identify to what extent they contribute in the first place to the problems created by narrowly defined, profit-driven models.
- Food schemes: New York has developed **innovative food schemes** targeting people on low incomes. These include about 500 mobile fruit and vegetable carts generating modest incomes for vendors. The city believes that for every one dollar spent using food stamps, one-and-three-quarter dollars is spent in the local economy, further aided by a so-called *Health Bucks Initiative* offering a 40% bonus when food stamps are used to purchase fruit and vegetables (Brackett, personal communication Aug 2011).
- Nutrition standards: Direct procurement of about 250 million meals per year (school dinners, etc.) in New York City provides another avenue for **improving nutrition standards**, and initiatives

have included the banning of trans fats in procured food. Improved nutrition standards, in return, will facilitate healthier food shopping choices (Brackett, personal communication Aug 2011).

- Interdependencies: New York's innovation during Mayor Bloomberg's tenure was to recognise food and agriculture as a cross-cutting planning issue and, most significantly, its **spatial and systemic interdependencies**. The decision to revise the city's long-term sustainability strategy *PlaNYC* to include food planning in 2011, just four years after its initial publication, can be seen as part of the zeitgeist (NYC *n.d.*). From the perspective of creating a *CPUL City, PlaNYC* acknowledges some key features by committing to provide access to green space (that can include urban agriculture) within any ten-minute walk and by recognising the potential to create closed-loop waste systems utilising, for example, restaurant waste.
- Spatial access: Although *PlaNYC* recognises the spatial requirements of urban agriculture with respect to the need for sites, it cannot be said to be linked to a **wider productive urban space strategy** as, for example, envisaged by the *CPUL City* concept. Such a strategy, however, would not only facilitate the access to sites across a city, but also to food products by encouraging their direct distribution and exchange.
- Regional produce: When asked why New York City did not just **advocate increasing the amount of and access to regional produce**, the city's deputy food policy coordinator's answer was that they were not sure about the environmental impact of imported food compared to local produce, for example one long-distance transportation versus a number of smaller, perhaps inefficient local trucks. Furthermore, they did not know if there were local 'choke points' within food distribution pathways in the city (Brackett, personal communication Aug 2011). Such questions are now being addressed by a number of studies underway. One of the most systematic studies is being undertaken by the Urban Design Lab at New York's Columbia University as part of a *National Integrated Regional Foodshed Project* which aims to research the reintegration of regional food production into local supply chains (Urban Design Lab 2011a).
- Land ownership: Challenges to realising this integrated vision are common to many cities and include **public and private land ownership** discrepancies, the silo mentality that prevents different municipal departments from communicating with one another, and the delivery of policies that are reliant on different agencies and agents to work together.

## Conclusion: change!

There are several departure points for bringing together the food-productive life in our cities, such as environmental concerns; community cohesion and identity; encouraging small-scale enterprise; environmental education; improving health and individual lifestyles; creating one's own city of short ways; and encouraging local exchange, monetary and otherwise. All aim to finally agree on a coherent policy for coordinating the multiple players involved with productive urban landscapes.

The metrics for recording social, economic and environmental models of such viable urban agriculture – with all its benefits and challenges – are being developed now, and it is likely that the financial challenges for breaking even, socially and economically, will be eased as the real cost of food becomes even more evident in the future.

Having started this, developing equitable urban life requires a public platform. Public platforms for urban agriculture may take different forms, but all operate under the broad umbrella of environmentally sustainable development. Models for this do now exist, ranging from the discussed advisory strategies emerging in cities like New York to the precisely focused practice-based programmes of *Edible Rotterdam* (Graaf 2012) or the Swiss research programme *Food Urbanism Initiative* (FUI 2011) to every food growing project's own stakeholder engagement. Platforms like these can provide the framework for jointly building a new urban agriculture infrastructure, embedded in the city and recognising the multiple benefits arising from its integration.

So, the spaces envisaged in *CPUL City* are not only food-yield-productive, but their everyday use is also guided to be healthy, fair, economically stable and convivial. These spaces are green and open, and they flow out and into the countryside… and back from there… as does wildlife… and air… and people, above all… and food…

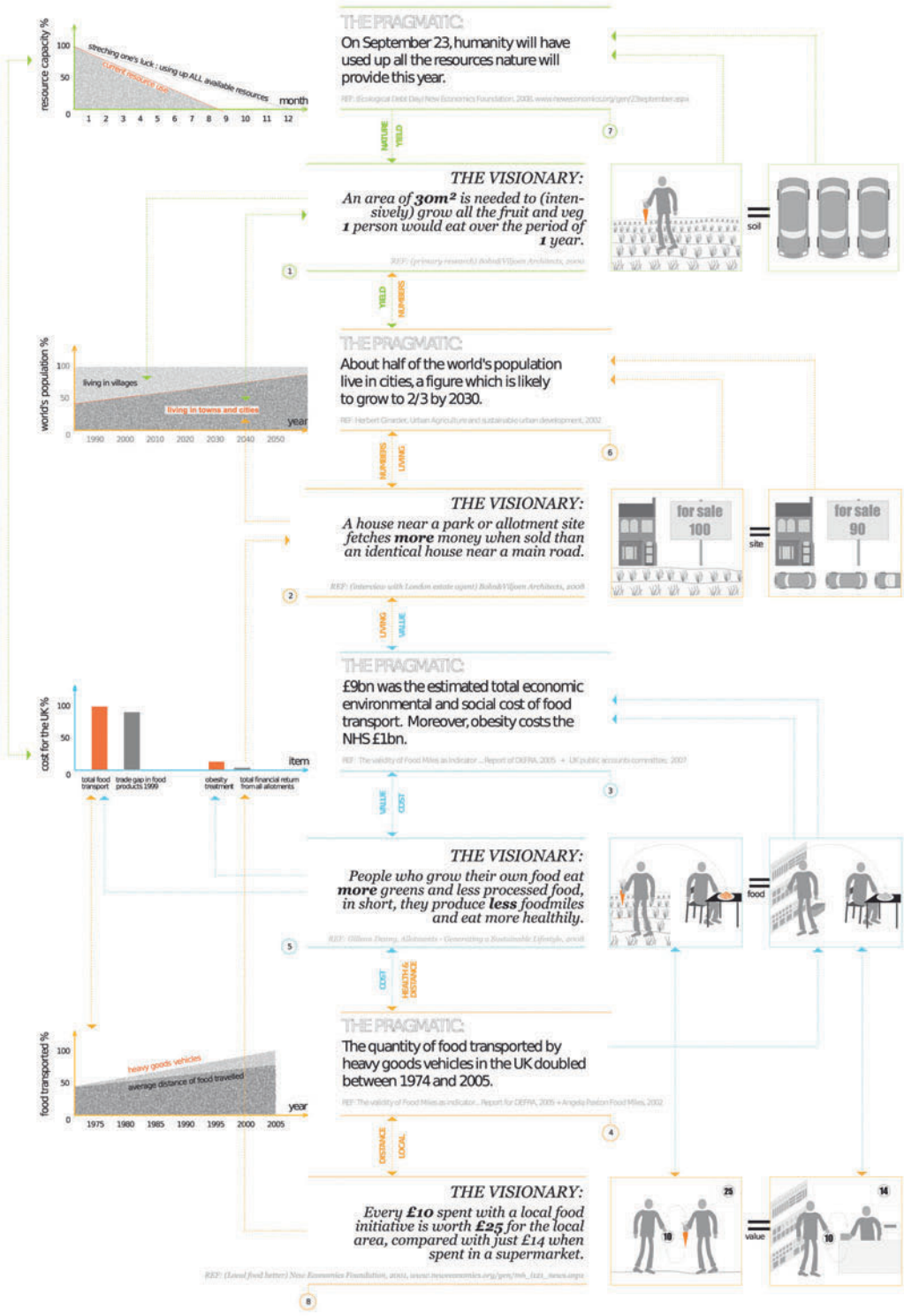


**Fig 1: The pragmatic and the visionary.** A UK-centred dialogue on our society's relation to food, space and everyday life within the city.

# The city in the fabric of eco-social interdependence

Yrjö Haila



The material success of humanity presents us with a range of perplexing questions, but the most perplexing question of all is the enormity of the success itself. Plenty of indicators are on offer; for instance population growth, the spread of the human population across the Earth, appropriation of biological productivity for human purposes (estimated at 25–40%, Smil 2002) and the diversification of economic life. The last offers what is perhaps the most dramatic single indicator; Beinhocker notes that the number of 'stock-keeping units', a measure retailers use to count types of units they sell in the economy, for the Yanomamö tribe in the Amazon numbers a few thousand at most while the corresponding number in the economy of New York City is in the order of tens of billions (Beinhocker 2006).

It is well understood, of course, that the material success has to be due to efficient utilization of what nature offers. As with all organisms, humans are dependent on metabolic exchange with the environment, that is the acquisition of necessities such as food and water and the expulsion of waste. Metabolism necessarily modifies environmental conditions at close range. Human metabolism is social in nature, embedded as it is in the division of labour among members of communities to which human individuals belong. The outline of the history of human material sustenance is known quite well. Early forms of social sustenance date back several million years, but a major transition occurred with the origin of agriculture and permanent settlements just over 10,000 years ago, and with the origin of written language some 6,000 years ago. After these transitions, human population size started to soar. Against the temporal scale of biological evolution, these transitions were very recent indeed.

It becomes easier to understand the human material success when we take account of the fact that most of the skills humans have adopted have incipient models in what other animals are able to do. It is against this insight that the exclusively human skills rise into focus. What is specific to humans is grounded in our ability to construct symbolic worlds in which we reside: Terrence Deacon used the term 'symbolic species' to describe this speciality (Deacon 1997). Deacon talks about the ability to use symbolic language in particular, but also material environments decorated with everyday utensils, built structures, cultivated environments and social paraphernalia exert symbolic force. Historian of architecture Joseph Rykwert offers a classic description of the city as a formation laden with symbols (Rykwert 1988).

Symbols create temporal realities over and above what is immediately experienced here and now. Symbolic meanings that are projected toward the future make the future, in a sense, present in the present: such projections become a part of the reality that directs our actions. This is what normative rules, conventions and institutions do as 'second nature' (Dyke 1988). A political declaration such as, for instance, the goal set by the European Union to halt the deterioration of biodiversity first by 2010 and then, after this had failed, by 2020, is basically symbolic: the chances of reaching the goal are very small, but it has an effect on decisions made today.

Material artefacts are future-oriented as well. This is certainly true of houses that are meant to be lived in by an innumerable number of generations in the future. Similarly with material practices: tilling the land makes sense, provided labour conducted today bears fruit after a certain period of time. But whether the fruit of the labour will actually be harvestable depends on human success in persuading nature to comply and produce those fruits. In addition, success depends on coordinated action of the members of the society.

All this means that human material success is backed by an increasing dependence of humans upon ecological conditions in the surroundings; not independence as might be thought. More accurately, we are in a relation of

interdependence with the surrounding ecological conditions, increasingly with the biosphere as a whole; humanity depends on environments modified by previous human labour (second nature), and such environments depend on continuous human modification and care.

Symbolically laden human imaginations quite obviously have their downside, too. We are able to construct projections that are pure myth and fantasy. This ability is particularly pronounced if we extrapolate recent experience toward the future in a straightforward linear continuum. This dilemma is at the heart of the current eco-social predicament of humanity.

## The dynamics of social metabolism

The machinery of human social sustenance is analogous to the machinery maintaining the metabolism of individual organisms; what is needed is transported in and waste is expelled back out. The continuous flux of materials is driven by an external source of energy. The system is very far from thermodynamic equilibrium. The energy that maintains life on Earth is ultimately derived from the sun in the form of intensive radiation that plants and other photosynthesizing organisms can use to synthesize organic materials. Other organisms derive the energy they need from organic matter they acquire from their surroundings.

Organismal metabolism is coupled with usable sources of energy in the surroundings, as the dependence of life on solar radiation clearly shows. In addition, a broad range of different organisms is able to exploit energy flows of other types in their surroundings; Turner dubbed this phenomenon 'the extended organism' (Turner 2000). The elaborate nest structures of termites and ants are examples. A similar distinction can be applied to the social metabolism of human communities. In the terminology of economist Nicholas Georgescu-Roegen, 'endosomatic' metabolism refers to what happens inside human bodies and 'exosomatic' metabolism to the functioning of the human economic system that is driven by various external sources of energy. This distinction is pretty straightforward and has been made in variable terminology by several authors, but Georgescu-Roegen drew particularly consistent conclusions concerning both human economic history and our present ecological predicament (Georgescu-Roegen 1971).[1]

Built structures as well as tools and other utensils are part of our exosomatic metabolic machinery. It is thus well understandable that permanent settlements and, eventually, the city opened the way for a great intensification of exosomatic metabolism. But cities are still metabolic systems, analogous with organisms, maintained far from thermodynamic equilibrium by material throughput driven by a flow of energy acquired from the outside. Cities and organisms are also vastly different, but the analogy offers valuable comparative perspectives on dynamics of change in short versus long temporal horizons (Dyke 1988; Polimeni *et al.* 2008).

In the short term, efficiency of the metabolic process is critical, indicated by what is achieved when a certain amount of material is harnessed into use with a certain amount of "work". Well-established laboratory procedures are used for measuring the efficiency of organismic metabolism. The efficiency of social metabolism is described using, for instance, Gross Domestic Product (GDP), the market value of goods and services produced within a country in a given period of time, as an indicator of efficiency of a national economy in monetary terms. GDP serves reasonably well the purposes of governmental book-keeping when the economy is running smoothly. However, indicators of current efficiency, whether of organismal or social metabolism, turn out to be deficient whenever environmental conditions change. GDP is a totally unrealistic indicator of the health of an economy on a longer temporal perspective, as it neglects the consequences of environmental deterioration.

In changing conditions, a critical feature of a metabolic machinery is its adaptability: Is the system – either an organism or an economic unit, such as a city – able to cope with the new environmental conditions in the long term? In biology, the long term is covered by evolutionary adaptability. Slobodkin and Rapoport give a phenomenological account of the dilemma using a metaphor of 'existential game' (Slobodkin and Rapoport 1974). In an existential game, there are no permanent winners. The reward consists of staying in the game. Current understanding of gene expression and of the evolutionary dynamics of individual development

("Evo-Devo") offers detailed knowledge on the mechanism, but the story is too long to take up here.

The adaptability of economic metabolic machinery is a more contentious issue. In modern societies, this is a question about the evolution of human exosomatic metabolism. A key issue is economic growth, both in a historical perspective and at present. It is quite obvious that economic growth had its origin in permanent groups and, later, settlements in which some of the members could secure their sustenance without participating in actual work. Incipient division of labour has ancient roots. The basic factors driving economic growth have remained similar all along: trade, increasing productivity of labour in agriculture and, later on, in manufacture, refinement of the division of labour, improving skills and motivations of labourers, stability of laws and institutions that provide favourable conditions for economic transactions and accumulation of property, and so on (Mokyr 1990).

A couple of further specifications are necessary. First, extensive and intensive growth need to be distinguished. The former refers to expansion into new regions without structural change, and the latter to novel structural adjustments within the economic machinery. Modern economy equals capitalism and is characterized by intensive growth. Joseph Schumpeter emphasized that capitalism is an evolutionary system and characterized the factors promoting intensive growth as follows: 'The fundamental impulse that sets and keeps the capitalist engine in motion comes from the new consumer goods, the new methods of production or transportation, the new markets, the new forms of industrial organization that capitalist enterprise creates' (Schumpeter 2005: 83).

In the course of growth of the capitalist machinery, exosomatic metabolism has increased in relative significance far over anything known before in human history. An essential part of this transformation has been a revolution in the techno-economic base of industrial production; namely, a transition from organic to mineral-based economy (Wrigley 1988). Mineral-based energy economy – dependence on fossil fuels – is basically parasitic exploitation of carbon storages produced by the biosphere in the course of several hundred million years in the geological past.

A second necessary specification is that nature is an integral element in economic productivity. This is one of the central tenets that Georgescu-Roegen held against mainstream economists. The economy does not create anything new; instead the economy brings about novel combinations of forces of nature, human labour and capital stock built up by previous economic activity. All these factors are equally necessary for economic development albeit in different forms. The modern mineral-based industrial economy marks a transition in the relative significance of exosomatic versus endosomatic metabolism, and it is deceptively easy to forget the role of nature's dynamics. However, the transition owes its success to ancient ecology that has produced fossil fuels and ancient geology that has produced exploitable mineral deposits. The natural processes humanity has to thank for these resources are way beyond the sphere of our influence. Economists have, of course, known for quite some time that particular mineral resources as well as sources of energy are exhaustible, but the standard response has been: whenever a resource is exhausted, find a substitute.

Third, a short-term increase in efficiency of resource use does not mean the amount of resources used will decrease. This phenomenon is known as the Jevons paradox, named after the analysis by 19$^{th}$-century economist William Stanley Jevons of what he called 'the coal question'. Jevons noticed that an increase in the efficiency of the use of coal in steam engines leads ultimately to an increase in the quantity of coal used, not to a decrease as might be expected. This is because the original drop in demand leads to a drop in price and increasing consumption will eat up the original decline in the quantity used, usually very quickly. This phenomenological rule, also called 'rebound effect', has been vindicated over and over again (Polimeni *et al.* 2008).

The economic dynamics of human societies are deeply enmeshed in nature. Understanding this fact should become part of our cultural consciousness. This is a concrete challenge, not an abstract one. Hence, novel initiatives are needed, such that capture the imagination and creative action of people. It is within this framework that urban agriculture has to be viewed, but before getting there, we have to take note of another aspect of the historical legacy we have inherited.

## Modernity: the tragedy of human material success

There is another story to be told about the stabilization of modern societies, parallel, but also alternative, to human material success, namely, the fading away of human eco-social dependence from the cultural understanding of modern societies.

The roots of capitalism extend back in time at least to medieval cities and trading centres in the Mediterranean world, if not to Antiquity, but digging out the roots is not necessary for our purposes. Another part of the historical dynamics of capitalism is important, however: credit. Institutions of credit have facilitated economic transactions directed toward the future on an increasing scale. Joseph Schumpeter regarded credit as 'differentia specifica' of capitalism. Credit is obviously necessary for long-term investments, but is also laden with a conceptual quandary: credit brings about 'systematic undervaluation of the future', but '[t]his problem is being obscured by the practice of postulating that the economic engine is being maintained, or maintaining itself, as a matter of course' (Schumpeter 1944: 929).

Undervaluation of the future is a consequence of economic growth: if prosperity increases toward the future, then the monetary value of any particular ingredient of material wealth will be, relatively speaking, cheaper in the future than it is today. This explains the pervasive claim of growth optimists that it is (always) wise to accumulate riches today to get more resources for solving problems tomorrow. But this, of course, is strongly constrained by what the problems are like those that accumulate towards the future. Georgescu-Roegen had a terse aphorism to the contrary: 'Given the historical uncertainty … instead of maximising the present value of future wellfare, we should seek to minimize future regrets' (Mesner and Gowdy 1999: 63).

As recent experience has taught all too convincingly, the accumulation of credit can create huge economic problems when finances and what is called the "real economy" deviate from one another. The economic system may be transformed into a huge Ponzi scheme – as, in fact, has happened during the last few decades (Feierstein 2012).

When undervaluation of the future becomes the normal routine, another consequence follows: the real material dependencies of humanity on the conditions of nature vanish from sight. An older ideological layer, religious belief in Divine Providence, had already prepared the soil for such a misperception. From mixing together with providentialism, momentarily uplifting economic experience grew another transcendental conviction: blind trust in inevitable human progress through reason and economic growth. This received strong boost by a general increase in 'exosomatic comfort', as Georgescu-Roegen put it. In the realm of material economy, trust in progress equals to a belief in the substitutability of (almost) anything for (almost) anything else.

This ideological trajectory is a manifestation of the tragedy of material success; the prevailing inability to understand that economic growth cannot solve the problems it has created. The dominant position of industrial agriculture is as good a specific demonstration of the tragedy as anybody can wish (Giampietro and Mayumi 2009).

There is no doubt that there has been a gradually emerging consciousness about the human biospheric dependence. The seeds were sown during the 19th century, basically as a reaction to wanton destruction and overuse of nature (Haila 2012). But we have to move further. The task is to unpack the elements of human biospheric interdependence. At issue is what mutual interdependence means: humans should be able to construct a benign second nature under the conditions given by first nature, the biosphere (Haila and Dyke 2006).

Drawing qualitative distinctions between types of problems is a first necessity. A primary distinction to draw is between source scarcity, which refers to scarcity of resources, and sink scarcity, which refers to the filling up of places to dump waste. Mineral-based industrialization has provided means to overcome source scarcities over and over again in the course of history. Mainstream economists have acquired great skills in promoting the view that such substitutability can be achieved far into the future as well. There is an underlying problem in this scheme, however, as pointed out by Georgescu-Roegen: the need for substitution arises when the most easily accessible mineral deposits are used up and exploitation

moves elsewhere. This always implies increasing need of energy, as well as more extensive strain and disruption to the environment.

Sink scarcity is a different kind of problem altogether. The changing composition of the atmosphere and the concomitant warming of the climate bring this fact into focus at the moment. The capacity of the atmosphere and the biosphere to assimilate the accumulation of greenhouse gases is limited, basically due to everything we do.

The global erosion of biodiversity is essentially a manifestation of sink scarcity, too. As human material activity increases in scope and extent, this tends to produce a general deterioration of the conditions of the Earth's ecosystems. Indications are as numerous as one can wish: suburban sprawl and the concomitant expansion of traffic networks, homogenization of agricultural and silvicultural landscapes, eutrophication of waterways, open-cast mining, and so on.

A credible alternative to the dream of progress cannot build upon a total rejection of the current economy. It is unclear what a total rejection could mean in the first place. Differentiation is necessary as regards specification of the problems and finding credible responses. A promising perspective is to get back to the basics: how can a secure food economy be built up for current cities?

First of all, most cities throughout human history have actually depended on their own cultivations. The ancient city states, including the Greek *polis*, were agricultural cities as Max Weber already pointed out. Classical sources give ample support for such a view: Hesiod's *Works and Days*, Vergil's *Georgica*, and so on. Cities developing agricultural systems in their surroundings become dependent on environments that remain favourable only under the condition of constant human intervention. In well-bounded situations, the mutual coupling can be described as co-evolutionary symbiosis. Venice is an example, beginning from the interdependence of the city with the lagoon where it was established on a group of inhospitable mudflats.

Conquest and colonization offers another model probed already by the Greeks and their precursors. Conquest is hardly a sustainable option on a longer term, however: an imperium built upon conquest runs short of regions to conquer. Soon it becomes necessary to actually form permanent economic connections with the areas conquered, but imperia aiming for stabilization face problems of diminishing returns (Tainter 1988). The fall of Rome is a good and sobering example: Western Rome collapsed after having lost its granaries in northern Africa to barbarian hordes that reached the region via the Iberian Peninsula. Eastern Rome hung around for another couple of centuries supported by its granaries closer at hand in the eastern Mediterranean.

Modern cities show huge variation in how different elements of food procurement are combined together, as analyses in different chapters in this volume demonstrate. A major point, and a major necessity is, however, to adopt a bottom-up perspective and get people involved. Urban agriculture is an important initiative in this regard. It can pave the way for a new understanding of cities, founded on material practices which may gain symbolic weight, comparable to what happened in classical cities (Rykwert 1988).

## Critical capacity and informed action

To come to grips with the current eco-social predicament, global book-keeping of both waste of resources and state of sink problems is certainly necessary, but there are no straight roads from there to what can be done locally – simply because human actions do not add up in a linear way. Aggregation produces figures such as the global ecological footprint, but interpreting them is difficult. This is analogous to what is known as the fallacy of misplaced concreteness in economics: figures may be precise, but their meaning is obscure.

I'll conclude with a normative perspective. The first necessity is to open up new options for people to take up. Every new type of solution is tiny to begin with and, hence, does not play any role or obtain any visibility in macro-economic calculations. In particular, we have to focus on processes that are opened up by new initiatives and developments. Urban agriculture is clearly one such field: activity that cannot be evaluated solely by its formal weight in global food statistics.

Philosopher and social critic Cornelius Castoriadis was particularly interested in the growth of human capacity to assess critically one's conditions and prospects of life (Castoriadis 1991). Critical capacity grows out of an understanding and concern for the existing conditions and of the imagination that goes beyond them. Thus, it prepares a scheme for an alternative future. Imaginary is the other key term in Castoriadis: Imaginaries are plausible futures that grow out of the conditions at present.

According to Castoriadis, there have been two stages in the prehistory of modern society that have supported the growth of critical capacity: the *polis* of the classical world, and the medieval city state. Humanity is dependent on cities and cities are also at the apex of the current environmental predicament.

There is one more element in the historical legacy of the city that has to be taken up: cities as breeding grounds for cooperation, communality; the common good. The focus of economic concerns has to move away from obsession with material comfort. After all, as Geogescu-Roegen put it, the aim of the economic enterprise is not material flow, 'the real product of the entire activity is the mysterious immaterial flux of life enjoyment' (Bonaiuti 2011: 100). Such a move brings about a novel question: how can we support the origin and growth of a new kind of collective consciousness in existing cities? We should build up capacity for reorganizing collective activities as such that local efficiency is increased, but that the activities do not fall prey to the ghost of the Jevon's paradox – i.e., that the fruits of increasing efficiency in terms of diminishing load to the environment will not be wasted.

I believe an ecological perspective on cities offers elements for a new and more concrete perception of human eco-social interdependence. First of all, cities are ecological formations in a metabolic or physiological sense; the task is to make transparent the mutualistic versus parasitic relationships of city economies with the environment. This can be achieved with a metabolic perspective. Single numerical indicators such as 'ecological footprint' or 'carbon footprint' may help, but they provide vision only toward one narrow focus at a time.

Also, cities are ecological formations in that they create novel types of ecological communities; what humans do is an integral element in the dynamics of such communities. Differentiation between scales is an important characteristic of ecological communities, including urban areas. Cities as ecological entities can be approached starting from three spatial and temporal perspectives, namely region, landscape and site. Region refers to the (bio)geographical context; landscape refers to the mingling together of human work and activity with the environment into symbolically significant milieus; and site refers to specific locations that are meaningful for individuals through experience and affect.

Most importantly, the future of cities depends on what people do, and are empowered and entitled to do. Urban agriculture and other ecologically sound activities gather their momentum against this background. Fruitful partnering between city officials and civil society actors, a dynamic interplay of bottom-up and top-down initiatives, would provide energy for a supportive process, as Kevin Morgan points out in his essay. The team around Tjitske Akkerman evaluate this possibility from a policy research perspective (Akkerman *et al.* 2004). Let's not forget, either, that urban agriculture gives support to new thinking concerning the whole system of food production. Critical capacity is germinating in urban garden lots, together with carrots, parsnips, tomatoes, beans and whatever else people grow there. Not every urbanite needs to become a gardener, but every urbanite needs food. A new combination of needs and pleasurable activities is at issue.

Note

1. Georgescu-Roegen's main conclusions are presented in the essays in Bonaiuti 2011; for a primer on quantifying social metabolism, see Giampietro and Mayumi 2009.

# Sueños Utilitarios: La Habana

Yuneikys Villalonga



*Utilitarian Dreams* was a multidisciplinary project examining past, present and future cityscapes. Focusing mainly on Havana and Brighton, it continued an earlier dialogue and project, commissioned for *Cinecity: The Brighton Film Festival, 2005*. The 2006 exhibition in Havana, Cuba, followed a month-long collaboration/workshop between architects, artists, art critics, and students from the Universities of Brighton and CUJAE Havana. The collaboration provided time to formulate a number of questions: How do landscape and the city update in response to new realities and necessities of society? How are the private and public landscapes of the city shaped by historical, economic, social and political circumstances? How and to what extent do citizens affect and become affected by their surroundings from psychological, aesthetic and spatial points of view? How do individual and social projects converge, and which are the visions, memories and desires people project into the future?

The exhibition space was an abandoned pedestrian crossing that passes underneath one of the most popular avenues in Havana: Carlos III. It was lent by the Vivarta Studio Theatre, for whom it serves as headquarters. Referring to the urban landscape while being placed underneath the city provided an interesting curatorial perspective. Some of the projects realized for the show observed the social meaning of individual, natural and architectural borders. Others looked at the aesthetics, the memory and the traces of the cityscape. There were questions related to freedom of choice and contrasts in the "desire lines" found in different parts of Brighton and Havana.

The *CPUL City* concept developed by Katrin Bohn and André Viljoen was employed to speculate on the possible future growth of Dublin, London and Havana. The same concept was applied to realize *Carlos III Micro-Organopónico*, a structure of organoponicos (urban market gardens) that inserted the project into the city of Havana, as it ran upstairs from the exhibition spaces below ground to their entrance at street level. The project *T.error* by T10 (Fidel García) interfered with less visible boundaries. Using a system of antennas, a laptop and sensors, it prevented citizens who live in the area from listening to official radio stations. These became interfered with whenever a person approached the work, creating around the show, as García describes it, 'a territory free from the ideological contamination of the news'.

Historical photographs from London's Imperial War Museum showed green alternative projects in the devastated post-war city. They were in dialogue with Tom Phillips' piece titled *A Century of Continuity Within Change*, which presented a chronological collection of one hundred postcards depicting the ongoing continuity of ornamental planting between 1900 and 2000 at the Eastbourne Carpet Gardens in England. Alejandro González and Pavel Acosta's photographs examined the current conditions of venues in the city that had a different significance in the past.

Altogether, *Utilitarian Dreams* was full of hybrids going beyond traditional architectural and artistic forms of expression into what could be better described as "Cultural Manifestations": probably the only way to bring into dialogue so many different aspects of the past, present and future spaces of the cities that we live in.

**Utilitarian Dreams** was possible due to the joint efforts of the architecture programs of the University of Brighton, UK and CUJAE Havana, The British Council in Cuba, and the Batiscafo Residency, Gasworks/Triangle Arts Trust, England, UK.


**Fig 1: "Drumflowers"/*We can make tomorrow better*.**
Inkjet and silkscreen on paper, 50x85cm. Tom Phillips, 2006.

The title I devised for our project, Utilitarian Dreams, was well endorsed by my eventual visit to Cuba itself. As a child born into a wartime Britain bombed into austerity, I knew of the pride of struggle, and saw its peaceful side in Cuba and its people. Our study of organoponicos was a lesson not only in urban regeneration, but in the poetics of small-scale agriculture reinvading the urban construct (as I had seen in the wartime *Dig For Victory* allotments of my childhood in London). Here and there, travelling through Cuba, I saw written up the inspiring slogan from Che Guevara, 'Today we can start to make tomorrow better'. This has an ever more universal value as we begin to fight climate change, uniting to save the environment from degradation; we will find ourselves in the first global continuous revolution as each nation recognises the imperative.

TOM PHILLIPS
*London, 2006*

In my childhood, I often heard people speak about the "Man of the Future". This would have been at the age of five or six. I belonged to the generation who enjoyed staying at the students' summer camp *Tarará* and going for visits to Parque Lenin. These places were emblematic at those times when the future of my generation was being set. We were called "The 2000 Generation"; the date sounded really far and promissory to me. *Havana City; Future* is a return to these places today (20–25 years later) to discover their new condition, in a journey to the promised future. My generation, the one before, and the present one meet in a "reflexive picnic" to repeat to ourselves over and over again, that our future is every moment. Anyhow, the future of 20–25 years ago is today, right?

ALEJANDRO GONZÁLEZ
*Havana, 2006*

I have been very interested lately in the way people fulfil and materialise their needs, wishes and utopias, especially when this implies a reformulation of spaces that people share in the city. In the Series *Out*, I photograph street versions of popular sports that take place in spaces full of "architectural barriers", but where the determination of participants (poses, style, outfit) paradoxically make them closer to the ideal of the professional player. The game actually happens in people's heads: only there, the structure of a football field is superposed on a terrace roof, a garage entrance or a garden.

PAVEL ACOSTA
*Havana, 2006*

The word *organopónico* is familiar to all Cubans and refers to market gardens located in the city centre which supply urban residents with locally produced fruit and vegetables. Although initially introduced as an emergency measure during the "special period", they provide a model for how cities can reduce their environmental impact, while adding a new dimension to their experience. For Utilitarian Dreams, we constructed a working *Micro-Organoponico* within the exhibition space's entrance area, utilizing materials supplied by the adjacent Calle Retiro Organoponico. The installation allowed one-to-one contact with some of the basic elements of an *organopónico* – plants, soil, raised beds, water flow – and introduced Bohn&Viljoen's propositions for a *Continuous Productive Urban Landscape* in Havana (Havana CPUL).

BOHN & VILJOEN
*Havana, 2006*

**Fig 2: Alrededores de la Ciudad Escolar "Tarará".**
12 de junio de 2005, La Habana, Cuba. Alejandro González, 2006.

**Fig 3: Football (from the Series "Stolen Spaces").**
4 photographs, light jet print, 100x66cm. Pavel Acosta, 2006.

**Fig 4: Carlos III Micro-Organopónico.** Installation (assisted by L. Frómenta and R. Martínez). André Viljoen and Katrin Bohn, 2006.