

13 THE FOOD PRODUCING NEIGHBOURHOOD

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INTRODUCTION

The basic premise of this chapter is simple. It is that it is an essential component of any settlement which is striving for sustainability that it should be able to produce as much of its food needs as it can, and that affordable organic and ethically sourced produce should be available to everyone. Our cities and any new urban development should be green oases, creating abundance and beauty rather than the sterile landscapes of tarmac and low maintenance shrubs which characterize most modern developments.

This chapter will argue the case for a rethink of how urban development is conceived and implemented, focusing on strategies applicable to both new and existing sustainable neighbourhoods. It will firstly explore the case for a reappraisal of how we feed urban communities, looking at the way in which the food system currently fails both human communities and the environment. This is followed by a look at some principles upon which to base an approach for reversing this, as well as a look at permaculture, a design system which offers many useful insights for the actualization of these approaches. It will then go on to look at a range of approaches for providing the inhabitants of the neighbourhood with fresh produce, from people's back gardens up to ethical supermarkets. The chapter closes with an examination of ways in which designers can best promote urban food production through design, and a look at the management issues that arise from this.

WHY GROW FOOD IN TOWNS?

Urban food growing projects are not a luxury but a necessity which arises from the need for solutions to a wide range of problems. Often these problems aren't seen as being linked, but any urban neighbourhood which professes to be sustainable must recognize the need for an approach to providing food for its residents which acknowledges and tackles them all.

'Food Miles'

The environmental impacts of the food system are profound, and are showing very little sign of lessening. Recent studies of the phenomenon which has been dubbed 'food miles' have shown that the impacts of food are not limited solely to its production. A study by Stefanie Böge of the Wuppertal Institute in Germany analysed the distances that each element required to make a pot of strawberry yoghurt had to travel before the final product reached the supermarket. The final figure was 3494km (Douthwaite, 1996). Each phase of production consumes considerable amounts of energy, a system only made possible by subsidized cheap fossil fuels, resulting in a heavy dependence on fossil fuels (making the importing countries very vulnerable to fluctuations in supply) and a major contribution to global warming.

The Globalization of the Food Industry

Since the 1940s, food has become an internationally traded commodity, and the advent of GATT (the General Agreement on Tariffs and Trade) has greatly increased the control of transnational corporations over the way our food is produced and distributed. Transnational corporations control huge areas of the food market – for example, Cargill controls 60 per cent of the world trade in grains (Kneen, 1995). As well as the environmental impacts of the food system, there are also the social and cultural ones. Much of the food consumed in western supermarkets, particularly fresh fruit and vegetables, have been grown as monocultural cash crops in countries with high levels of poverty. The whole issue of debt repayments and the activities of transnational corporations are a very important part of the whole picture. As Tom Athanasiou observes in his recent book *Slow Reckoning*, the 1984–85 Ethiopian famine which claimed over one million lives didn't interrupt the export of green beans to UK supermarkets (Athanasiou, 1996).

Biodiversity Loss

Modern agriculture has had a devastating effect on global biodiversity. This is firstly due to it having modified landscapes and habitats for agriculture, draining wetlands, clearing forests and hedgerows, ploughing up permanent pasture and so on, thereby massively reducing the ecological niches for many species. The second area of concern is the massive loss of diversity in what it grows. Although there are over 6000 apple varieties that can be grown in the UK, the bulk of apple production utilizes just nine varieties. The same is true across the board, variety in all areas of production is rapidly being eroded. It is only in growers' back gardens that certain varieties of fruit and vegetable now exist, through schemes such as the Henry Doubleday Research Association's Seed Savers and others.

Global Warming

That global warming is now underway is a fact disputed now by very few people. Even the most optimistic scenario, the 'Fossil Free Energy Scenario' prepared by the Boston Centre of the Stockholm Environmental Institute which is modelled on the reduction of carbon dioxide emissions to zero by the

year 2100, predicts a global temperature rise of 2.7 degrees Fahrenheit (Athanasiou, 1996). Any urban eco-village must minimize greenhouse gas emissions in all areas of its activities, and reducing the amount of energy required to get food onto its residents' plates is an integral part of this.

Food Poverty

Malnutrition is not just a problem of developing countries. A recent report by the Low Income Project Team for the Department of Health stated that poverty has resulted in malnutrition on a scale unseen since the 1930s (Jones, 1996). Around one-fifth of UK citizens suffer from problems of food poverty and it is a situation made worse by town planning. The cheapest food is to be found in out-of-town supermarkets, yet without a car, these stores remain virtually inaccessible.

Landscapes of Monotony

It is an indication of our separation from the land and from our agricultural past that we fail to make the connection between food and land. Henry David Thoreau wrote in 1854 that the farmer 'knows Nature, but as a robber' (Thoreau, 1992). The same could be said of our modern-day developments, which replace very little of the habitats and diversity they destroy. We should be aiming to create landscapes which are as varied as the original landscape, indeed more so.

The Challenge

Clearly the above as well as many other problems such as the environmental impacts of intensive agriculture, health impacts of agrochemicals and the lack of education about cooking and healthy eating, combine to form a whole which demands our attention and action. However, as the environmental impact of their choices and decisions are not felt or perceived at the site itself or even in the locality, both the developers and the residents live in the illusion that such impacts do not exist. It is the assertion here that for any urban eco-neighbourhood to be able to be truly sustainable, it should, indeed must, develop strategies for feeding its inhabitants which respond directly to the challenges outlined above.

APPROACHING SUSTAINABLE FOOD STRATEGIES

The growing of food in cities is clearly an appropriate response to a wide range of challenges. I would go so far as to state that sustainable urban food production is a vital component of any sustainable neighbourhood project, indeed of any urban development at all. As Christopher Alexander states in his seminal work *A Pattern Language* (1977):

'Parks, street trees, and manicured lawns do very little to establish the connection between us and the land. They teach us nothing of its productivity, nothing of its capacities. Many

people who are born, raised, and live out their lives in cities simply do not know where the food they eat comes from or what a living garden is like. Their only connection with the productivity of the land comes from packaged tomatoes on the supermarket shelf. But contact with the land and its growing process is not simply a quaint nicety from the past that we can let go of casually. More likely, it is a basic part of the process of organic security. Deep down, there must be some sense of insecurity in city dwellers who depend entirely upon the supermarkets for their produce.'

Eight Principles of Urban Food Production

In order for such urban food growing projects to become truly effective and sustainable, they should observe the range of principles outlined below:

- 1 *Promote local wealth:* benefits must accrue to the local community in terms of cheaper food, paid jobs or the utilization of local skills. Food growing must be seen as being of benefit not only aesthetically or in terms of its wildlife value, but also in terms of financial benefit.
- 2 *Be environmentally sustainable:* although not all community gardens and other urban food growing projects prohibit the use of chemicals, many do. It is essential that just in the same way that intensive broadscale agriculture needs to examine its inputs and outputs in terms of their environmental impact and sustainability, so too should food production on any other scale.
- 3 *Use and build upon existing community networks:* urban areas usually have existing community groups, existing gardening societies and other community groups. To avoid 'reinventing the wheel' it is important that this network be tapped into as much as possible, and other groups are drawn in too.
- 4 *Promote and conserve biodiversity:* it is essential that any food growing project protect and enhance biodiversity – it should make use of 'heirloom' seed varieties, avoid using F1 hybrid seeds and aim to save its own seeds. Biodiversity can also be encouraged by the creation of or the protection of existing green corridors to allow wildlife to move freely between different areas.
- 5 *Be affordable to all:* if the produce grown within a community is not affordable to that community then it becomes elitist and has failed in its principal aim, to provide the local community with fresh, affordable, locally grown produce.
- 6 *Integrate water, waste, employment, recreation, housing, energy generation, wildlife and so on into a whole system:* through the application of intelligent and thoughtful design, an urban food growing project can achieve a number of aims. For example, food growing can be designed into buildings (see below), productive gardens can also purify waste water (through the integration of constructed wetland systems), can be social focus points for communities, can include playgrounds and can be part of a carefully planned network of urban 'wildlife corridors'.

- 7 *Nurture ethnic and cultural diversity*: urban areas generally include a wide mixture of ethnic groups, and as Tara Garnett of the National Food Alliance notes, 'by growing food from their own culture, many people of ethnic origin can begin to reclaim and revalue their cultural identity' (Garnett, 1996).
- 8 *Contribute to an overall move towards sustainable development in the community*: food growing projects should ideally be part of a wider programme of measures dealing with recycling, transport, employment and a range of other issues. One of the simplest places to begin is with a composting programme for the composting of local organic wastes. Local authorities should put together whole packages of such measures designed to achieve this, viewing the separate parts as part of a whole rather than piecemeal projects. The various projects can be linked by an 'umbrella' organization which oversees the sharing of information and funding, and which regularly brings the different groups together to share their experiences.

Permaculture, a Design Approach

Originally conceived in Australia in the 1970s as a 'perennial agriculture for human settlements', permaculture has evolved into a system for the conscious design of sustainable productive systems which integrate housing, people, plants, energy and water with sustainable financial and political structures. It offers an excellent approach to the design of the sustainable urban neighbourhood which is working to actualize the eight principles above. Permaculture (from *permanent agriculture* or *permanent culture*) takes nature as its model, observing that natural systems, typified as climax forest, require no inputs bar sun and rain, create no pollution, have a huge natural biodiversity, are productive on an array of levels or 'niches', are permanent and are massively productive in terms of biomass. It aims to maximize the number of 'cycles', seeing any inputs not provided by another part of the system as unnecessary work created, and any output which do not form the inputs for another part of the system as pollution created.

Permaculture is founded on three ethics. The first, 'Earthcare', advocates strategies which repair and regenerate both the planet and all its living species. The second, 'peoplecare', states that the objectives of Earthcare cannot be separated from the repair of human communities and societies, and that not only is the simultaneous tackling of the human and the natural crises currently facing us desirable, the two are actually inseparable. The third ethic is that of 'fair shares', which means that any permaculture project must also play its part in making the world a more equitable place. This principle is often also described as meaning the giving away free of any surplus produce.

In relation to the planning of an urban neighbourhood, permaculture is often seen as being solely concerned with gardening. One often sees a small area of a larger piece of land being designated for permaculture, meaning a food garden, while the rest of the site is excluded from the design. However, permaculture offers an excellent tool for the integrated design of the whole urban eco-neighbourhood, founding the whole development on good ecological design and a sense of ethics.

Food production would not be seen in isolation from the other aspects of the development. Creating cycles of waste and water, maximizing the number of functions they perform creates many niches for food growing.

FEEDING THE NEIGHBOURHOOD

Any strategy for the sustainable provision of food should be inclusive of all the members of the community and should aim to cater for their wide range of needs. I have therefore identified a range of strategies, which, when put together, would provide all of the members of the eco-neighbourhood (and beyond) with clean, fresh and affordable food.

'Grow your Own'

Clearly the best way of providing food in the urban eco-village would be for people to grow a large proportion of their own food needs. In countries where food is in short supply or where there is much poverty there is a clear motivation for the urban food grower. The United Nations Development Programme estimates that world-wide 800 million people are involved in urban agriculture (Smit, 1996). While this figure is very encouraging, it must be remembered that much of this is in poorer countries, and the challenge to be addressed in the planning of a European urban sustainable neighbourhood remains how one is to inspire in modern day western urban dwellers an interest in food growing. There are no figures for the amount of people actively growing food in the back gardens of the UK. How does one define food growing anyway? Is a window box of herbs food growing, or do we mean a certain amount of vegetables? To my knowledge, no-one has yet attempted to put a figure on this, the closest figure is probably that one in every 45 households has an allotment (Crouch, 1996).

Productive Gardens

Back gardens can be highly productive and not necessarily involve a lot of work. A good example of this is the small intensively used urban garden of Michael and Julie Guerra in Hatfield in Hertfordshire. The garden, like many urban gardens, originally had very little topsoil and consisted almost entirely of concrete slabs and lawn. They prepared a permaculture design for the site and then 'created' the back garden over a weekend; all the raised beds were made and the paths were laid. A huge diversity of species was planted (with a high proportion of perennial species) and every available growing space utilized. The Guerras state that during the summer months their weekly food bill averaged £3 a head and required only about two hours work a week. The total annual productivity of their garden has been estimated as producing the annual equivalent of 15 tons of food per acre (Garnett, 1996). They are aiming, through the use of more cold frames to extend their growing season and wish to install a 'grey-water' system, which they feel would double the garden's productivity. It is an excellent example of just how productive a back garden can be.

BOX 13.1 TEN PRINCIPLES OF PERMACULTURE DESIGN

There are ten design principles which Mollison (1988) defines as being central to permaculture design. The first, '*relative location*', states that it is how elements of the design are sited in relation to other elements that is important, along with how many beneficial connections are established between them.

The second, '*multiple function*', states that each element of the design should be sited/designed/selected to perform at least three functions. Tree planting can provide a windbreak, a harvest of fruit, nuts or coppice timber, animal fodder, soil stabilization, reduced heat loss from houses and a wildlife habitat.

The concept of '*multiple sources*' is that it is sensible and prudent to not rely on just one source of anything, for example relying solely on tap water for irrigation is a risky strategy, a combination of rainwater harvesting, ponds, diversion ditches, moisture-retaining mulches and grey water reuse is much more sensible.

Mollison's fourth principle is '*zone, sector, slope*'. Zone refers to placing elements of the design according to frequency of use, for example a herb bed needs to be nearer the house than a walnut tree. Sector refers to the analysis of the site so as to enable the control and utilization of the energies entering/passing through the site – cold winds, summer/winter sun etc. The utilization of slope is also important, it enables the designer to allow gravity to do much of the work which bad design requires the use of external energy to do.

'*Energy cycling*' aims to harvest nutrients and energy which would otherwise be lost from the design by building in as many cycles as possible.

'*Using biological resources*' means using the natural qualities of things, for example chickens like to scratch so put them onto vegetable beds in winter to turn them over, eat weed seeds and slugs.

'*Stacking*' is based on observations of natural systems as three-dimensional systems (eg forests) rather than one dimensional (a field of wheat, a lawn), and trying to replicate this where possible.

The eighth principle is that of '*diversity*'. Permaculture landscapes contain a very high diversity of plants, and protection of biodiversity is seen as being a high priority. Diversity is also important socially and economically – a wide range of small businesses being far preferable to one big employer.

'*Edge*' notes that in natural environments productivity increases at the edges between different ecosystems. In permaculture garden design, edges of ponds and beds tend to be curved and crenellated so as to maximize this effect.

Finally '*small scale*'. This means, in terms of gardening, starting at your back door and keeping a garden intensive and small. The application of permaculture design can result in highly productive intensive small gardens, keeping them small makes them easier to manage, easier to water and more pleasurable to work in.

Allotments

In a very high density urban settlement, particularly one which makes use of a high level of flats or maisonettes, provision must be made for those with no access to a garden. This could be done through the provision of allotment spaces nearby, preferably within 200 metres of the house. This model has been used in many places, including Odense in Denmark, where allotments provide an attractive area around the flats and provide an important outdoor social

focus for residents. Vancouver in British Columbia has built many high density housing developments as housing cooperatives and surrounded them with extensive gardens and other horticultural activities to great effect. Any new allotment space created as part of the neighbourhood should prohibit the use of biocides from the outset.

Rooftop Gardening

Lack of garden space need not be an obstacle to the urban gardener. Garden spaces in such situations could also be created through imaginative building design. The use of rooftops for food production offers many benefits, it reduces rainfall runoff, 'greens' urban environments, increases wildlife interest, improves air quality and adds to the insulation of a house. It doesn't necessarily require strengthening of roofs, regular soils and composts can be used, and perlite and vermiculite can be added where lighter soils are required. St Petersburg in Russia now has 15 rooftop gardens growing a range of fruit and vegetables. The produce has been found to have lower levels of heavy metals than vegetables bought at the city market (Gavrilov, 1996). Switzerland is the first country to legislate in favour of rooftop gardens, a recent bylaw states that new buildings must be designed to relocate the greenspace covered by the building's footprint to their roofs, and existing buildings must green 20 per cent of their roofs. Rooftop gardening is now becoming an accepted element of urban ecological projects, for example the Halifax EcoCity Project in Adelaide is designed to include rooftop gardens to 'provide places to relax, grow food and nourish neighbourliness'. (Urban Ecology Australia, 1995)

The Question of Yields

The issue of how much food a city could actually produce is still one in need of much research. At present the most productive system seems to be bio-intensive gardening, being developed in the US with considerable success. Yields have been recorded in a range of 2–16 times the US commercial mechanized levels, and in terms of home gardens, bio-intensive gardens have been highly successful too. It has been estimated that on an area of 100 square feet, with just 20 minutes input per day can produce up to 322lbs of vegetables and soft fruit during a four to six month growing season (Todd and Todd, 1994). This system uses only a quarter of the land used to grow vegetables conventionally.

Local Food Growing Initiatives

Community Gardens

Some residents of the eco-village may want to grow some of their food but they may not have a garden, they may be too busy to commit themselves to an intensively productive garden, or they may feel that, as yet, they don't have sufficient skills or knowledge to undertake vegetable growing on their own. One way of addressing this is by including a community garden. Community gardens are more established in the US but there are also some working models in the UK. Growing food together with others is increasingly becoming seen as a valuable tool for community development, as Georgia Ashby of Philadelphia Green, one of the US's largest community gardening programmes says 'gardening is the catalyst that brings residents from behind locked doors

BOX 13.2 DAVIS HOMES, CALIFORNIA. CASE STUDY OF A FOOD PRODUCING NEIGHBOURHOOD

Davis Homes is a small housing subdivision of 240 homes on 63 acres near Sacramento, California. It was designed by Paul Calthorpe and Michael and Judy Corbett with the aim of being as self-sufficient as possible in food and energy. It was a highly innovative development in many ways, not least for its approach to food production.

The suburb is surrounded by a greenbelt of fruit trees; almonds, pineapple guavas, figs and plums (Kourik 1986). Each neighbourhood within the development has its own orchards. The fruit trees were all part of the original design and were paid for by the developers. They are maintained by a crew which works for the homeowners association and are paid partly by income from selling the trees' produce, which fetches a high price at the local markets. Many of the orchards are underplanted with clover instead of grass which needs less maintenance and which fixes nitrogen to the trees. The landscaping of the area as a whole features a wide range of edible and otherwise useful plants, leading to levels of plant and animal diversity approaching those of natural ecosystems (Kourik, 1986).

In terms of individual food gardens, at its outset the creation of an atmosphere of abundance and the encouragement of individuals to grow food, resulted in over 80 per cent of the homes having food gardens, averaging 55 feet by 85 feet in size (Kourik, 1986). In recent years however, much of this has declined as new people move in and as peoples' lifestyles change, and where once there were abundant gardens there are now lawns. Davis Homes is a good example of one of the main problems with urban food growing initiatives – how does one keep them going once they've started? The rapid turnover in allotments in urban areas is testimony to this. People may start a garden but then may have children, may get a new job, may simply get bored of gardening.

It is the broader landscaping concept that has been most successful in the long term though Davis has the feel more of a food forest than a housing project, and has proved very popular to home-buyers. Indeed, the problem if anything has been that it has proved so popular that house prices have risen to far in excess of the original prices, resulting in many of the original residents leaving. However, the project does prove that there is great demand for such development and indeed it is extraordinary that it is still the only development of its type in the US.

As a model for integrating productive landscaping, energy efficient housing (all the houses are designed to maximize passive solar for space and water heating), waste reduction (70 per cent of the population sort their rubbish for recycling; Girardet, 1992) and water conservation, Davis Homes is highly innovative and illustrates that food production can be a highly successful component of well-designed ecological housing projects. It also illustrates however the potential pitfalls of sustaining urban food production over periods of time (see Appendix 2, Davis).

to work together' (Hamilton, 1996). Community gardens can be any size and can be run in a variety of ways. A community centre may involve local residents in growing food, some of which may then be distributed among local people, either free or at reduced cost, or vacant land or the land of a community centre or church may be divided into plots.

At Springfield Community Gardens, a permaculture project in inner-city Bradford funded by City Challenge, volunteers grow food which is then given to a local social club for the elderly or is sold in local shops. At Calthorpe Community Gardens in central London, local people use plots to grow produce and are provided with seeds, tools and compost. The 'Green Thumb Community Gardening Programme' in New York is the largest municipally run community gardening project in the US, leasing, free of charge, over 1000 plots totalling over 125 acres (Garnett, 1996). It leases city owned land to local groups to turn them into flower and vegetables gardens, being provided with materials by the project. They also run a number of other successful projects, including the 'Urban Orchards' programme, which has planted nearly 2000 fruit trees since 1984, and 'Education in the Garden' which aims to involve local children and their schools in gardening.

Community gardens bring many benefits. According to Australian community gardening activists and permaculture designers Neal Bodell and Martin Anda:

'...the values of community gardens are manifold. They provide opportunities for the public to garden, grow food, and work with nature, while at the same time living in a medium density urban environment. They provide a space for learning, social activity, cultural exchange, community art and "community science". They can provide a place of beauty for contemplation, or a pleasant stroll. In short, they are productive, empowering and regenerative of the human spirit.'

An urban sustainable neighbourhood could include one or more community gardens. They could either be operated as allotments or by a system in which one received produce in relation to how many hours work one had put in. The exact model adopted would be unique to each project.

The Urban Market Garden

Most of our towns and cities used to be ringed with market gardens which supplied the local population with a percentage of their fresh fruit and vegetables. In some places this is still the case, for instance in China, 14 of the 15 largest cities are surrounded by belts of farmland leading to their being largely self-sufficient in food. The cities are designed to be as compact as possible, leaving the maximum amount of farmland possible (Girardet, 1992). However, the process of development usually results in such land being viewed as a 'soft touch' for developers. This happens world-wide, from the pressure from supermarkets on urban greenspace in the UK to the pressures on land caused by the massive urban expansion projects currently underway in China.

The revival of the urban market garden is an important aspect of the urban eco-neighbourhood. These days, with a heightened demand for fresh organic produce and the dire need for employment opportunities in urban areas, the recreation of some urban market gardens seems more promising. It is unlikely, however, that they would be able to meet all of the fruit and vegetable needs of the neighbourhood. How then could the land be most productively used?

The most logical approach to focus on crops which don't travel or store well. Staple crops like carrots, parsnips, onions and leeks take up a lot of space, are easy to store and can be produced very efficiently by nearby organic farmers. More worthy of attention is a wide range of salad crops, tomatoes, sweetcorn, soft fruits, green leafy vegetables and herbs. These are more productive on less ground and bring in good financial returns.

Problems could arise in terms of whether the gardens would need a heated greenhouse to enable all-year round production, and if so, how that heat is to be produced sustainably? I once visited a Combined Heat and Power (CHP) plant in Denmark, the interior of which was extremely warm all year round, and wondered why no-one had thought of this as a food-growing space...it was warm enough to produce a wide range of produce all year round. The application of sensible design could easily result in an 'edible CHP', and as many ecological planners now look to CHP as the most efficient way to heat new neighbourhoods and settlements this is a potential area for a further research.

Market gardens can be operated as a private business concern, as a cooperative, or by other groups, such as part of rehabilitation schemes for prisoners or as part of occupational therapy for the handicapped or those with psychiatric problems. Ruskin Mill in Nailsworth, Gloucestershire, for example, runs courses for young people with behavioural problems and learning difficulties which give training and experience of a wide range of crafts and skills, an integral part of which is food growing. Students work in the organic market garden, tend the sheep and cows, work in all aspects of the vegetable shop and also in the Mill's café, preparing and serving the food. In this way, the organizers state, 'disaffected young people can take part and take pride, in every aspect of food production from growing and rearing to harvesting and marketing, from preparing and presenting to eating and celebrating the end result' (Garnett, 1996).

Involving the Next Generation

If the neighbourhood includes or is near to a school, involving the children in food production is very important. Michael Littlewood, an international environmental design consultant, has proposed that schools embrace the challenges of sustainable development and 'start not only teaching "designing in harmony with nature" but practising it too' (Littlewood, 1996). The creation of productive landscapes combining 'green' buildings, intensive food gardens, productive ponds, coppice woods, orchards, small livestock and so on would be an invaluable tool in terms of environmental education, as well as promoting healthy eating, providing life skills and what Neil D Hamilton calls 'agricultural literacy' (Hamilton, 1996). It could involve all areas of schools activity and produce could then be sold to local residents or parents. There are some schools experimenting with food growing projects, but as yet there are none who have taken this approach to the whole landscaping. Tara Garnett also suggests that schools, when awarding catering contracts, specify that food must be sourced locally where possible (Garnett, 1996).

The City Farm

As the focal point for the development, a city farm can combine a number of uses. It can provide environmental education, a venue for courses and

BOX 13.3 THE SUSTAINABLE FOOD CENTRE, AUSTIN, TEXAS

The Sustainable Food Centre has been developing innovative ways of supplying inner city urban dwellers with fresh organic produce as well as supporting local farms. The Centre encourages local stores to support local farms and to stock local produce. As a part of this they run a 'Buy Texas' campaign which now includes over 750 companies in promoting local produce (Colloff, 1996, p1).

They also set up the Eastside Community Farmers' Market where, during the summer months, farmers sell fresh produce to the residents of the poor East Side community. This led to a two acre site next to the Farmers' Market being developed as the Eastside Community Garden, making allotments available for individuals, families and organizations. Any surplus fruit and vegetables grown in the garden can be sold at the Farmers' Market.

The Centre has also pioneered a number of innovative food related projects. Their Cocina Alegre Food School teaches people healthy cooking on a low income and they are also considering an agricultural apprentice scheme for local teenagers. The Food Centre illustrates a combination of local food growing, involvement of local farmers and the involvement of and education of the local population.

meetings, a café as well as selling its produce. It could also be a community composting centre, it could include a reed bed/aquaculture system to purify and then utilize local waste water and it could provide workshop spaces for local small businesses. Through a careful examination of the surrounding community's needs and skills, a city farm could be designed to perform a large number of tasks.

Beyond the Neighbourhood – Bringing the Food to the People

Community Supported Agriculture

It is highly unlikely that a combination of all of the above would be able to produce all of a town or city's inhabitants' food needs. It is also important to consider the eco-village in terms of its effect on the surrounding rural community as well as the urban one. Therefore, support of local organic farmers is essential. One of the best ways of doing this is community supported agriculture, the most successful recent manifestation of which is generally known as 'vegetable box schemes', also known as 'standard ordering systems'. Here, weekly deliveries of boxes or bags of fresh, seasonal, locally grown vegetables are delivered to a number of drop-off points across the city. Buyers have no control over what produce they receive, but for many people this is one of the attractions of the scheme. There is also a more complicated version, the 'combined ordering system', which gives people more choice over what they receive and includes other organic produce as well as vegetables (Pullen, 1992).

It would also be possible to link the eco-village with an organic farm on the outskirts of the city. The farmer would have the benefit of a regular buyer of his produce and would be able to plan what to grow and when through discussion with the residents. The residents for their part would have a regular supply of fresh produce from a grower they know. This relationship has proved

very successful in many places for individuals and smaller groups of people via veggie box schemes, and an urban eco-village seems the ideal opportunity to establish this twinning on a larger scale.

Farmers' Markets

One problem some people find with the veggie boxes however, is that they have little say over what comes in the boxes, for a three week period every year they may have rather a lot of a vegetable that they don't like. One way around this is through the establishment of farmers' markets. In the US, farmers' markets are very successful and are growing rapidly. By the end of 1993 there were 1755 local farmers' markets in the US, enabling over 3.5 million consumers to obtain at least a portion of their food from them (Hamilton, 1996). Farmers' markets are now beginning to appear in the UK, the first started in September 1997 in Bath. It was organized by a collection of local community groups and the local council's Agenda 21 unit. The first market was attended by over 4000 people and was widely reported by the media. One stallholder was reported as saying 'Its such a lovely atmosphere. Its fun to be here, much busier than I had expected. Its like being on holiday, with people laughing and talking to each other. It feels so open and cheerful' (Tutt and Morris, 1998).

Farmer-Consumer Cooperatives

An approach which has proved very successful in Japan and elsewhere is that of farmer-consumer cooperatives. In Japan the concept is now firmly established, with over 660 producers providing over 11 million people with food (Clunies-Ross and Hildyard, 1992). The system is quite simple. Groups of six to 13 families make a bulk order once a month of a range of produce, which is then delivered at different times depending on its perishability. One of the principles of the system is that only one variety of each product is available, this gives the cooperative more leverage in terms of bulk buying as well as in asking producers to ensure the produce is chemical-free.

Ethical Shopping

Conventional shops too have a role to play. If the neighbourhood is to have its own food shop, it can be encouraged to source local produce and seek to sell as high a percentage of ethically and sustainably produced foodstuffs as possible. The model developed by the Out of this World, the 'ethical grocers chain', is a good model for how large stores can put ethical concerns as their priority. Out of this World is a consumer cooperative which is owned by its 15,000 members who are both shoppers and shareholders. Out of this World selects its produce in accordance with five main criteria which are 'that products make a positive contribution to healthy eating, animal welfare, fair trade, environmental sustainability and the local community' (Out of this World, 1997). Their shops, of which there are now a number throughout the UK, also seek to stock locally grown produce where possible.

CONSIDERATIONS FOR DESIGNERS

What can be learned from the above, and what can the principles of permaculture add to our approach to designing food strategies for the eco-neighbourhood? What follows are some strategies for designers and developers to consider at the planning stages.

Designers should strive to integrate approaches to food, housing, water, energy and waste, considering how all the elements can be interconnected to create the maximum amount of cycles and the highest level of productivity. If density is to be high, consideration should be given to ways of compensating for this, for example in terms of productive parks, rooftop gardening and so on. When designing the layout of the whole development, designers should maximize the number of housing plots with south facing gardens, and preferably plant trees to the north side to create sun traps.

Tree planting should be made up of fruiting or otherwise useful species, with species needing more attention placed nearer to housing. Trees should also be sited to perform a variety of functions, windbreaks, privacy, soil stabilization and so on.

If food growing is made the focal point (physically) of the development, surrounding housing can be designed so that the area is always overlooked, thus reducing vandalism and creating a feeling of connection to nature for the residents. Another way to deter vandalism and theft is to remove the labels from fruit and other high value trees; if people don't know what a tree is, it is harder for them to sell on to other people.

The concept of 'multiple function' outlined above can also be applied to ponds and lakes. If the site has an area which is susceptible to flooding, this could be made into a lake, which could be designed to produce food and other useful crops, as well as being part of a sewage purification system. This lake could also be sited to reflect winter sun into buildings, provide a leisure facility and irrigation for other food gardens. An aquaculture city farm, for instance, could serve many different functions. If the development is along the edge of a river, lake or docks, John and Nancy Jack Todd propose that food could be grown on floating barges which could 'line the harbours and sell their produce of fish, flowers, vegetables and herbs' (Todd and Todd, 1994).

A system of composting and recycling would vastly reduce the amount of waste generated by the residents and provide compost and other materials to enrich the soil. Designers can allocate a recycling area as well as an area for composting, in an area accessible to all but shielded by trees so as to contain any possible smells and visual intrusion. The design of the development cannot make people separate their waste for recycling but house design can include adequate kitchen space for a number of different bins. Community recycling schemes can much reduce the amount of waste households produce. The WyeCycle scheme in the village of Wye in Kent estimates that households making full use of the scheme can reduce their waste by 90 per cent (Hoyland, 1996). Community Compost, a community composting project in the Forest of Dean, collects waste from two villages, kitchen waste once a week and garden waste once a month. The resultant compost is sold to local people, and the scheme also sells biodynamic vegetables grown at Oaklands Park, a nearby

Camphill Community through a box scheme that runs alongside the waste collection. The scheme has created part-time employment for two people (Hoyland, 1996).

MANAGEMENT ISSUES ARISING

To create a sustainably fed neighbourhood or to retrofit an existing one based on the above is clearly feasible, as well as desirable. The first question that arises however is whether there is a market for such neighbourhoods. It is my belief that there would be a very strong interest in them, that their time has arrived. In terms of new social housing projects which not only tackle homelessness but also address many of the other chronic problems affecting urban areas such as malnutrition, unemployment, poor water quality, lack of greenspace and so on, the 'business-as-usual' approach is clearly inappropriate. Intelligently designed urban agriculture can tackle many of these problems. A number of other considerations then arise which can be looked at in three stages. The first is those which relate to the initial stages of the development, the second is those of relevance to the establishment phase and the third is those which relate to the project once it is up and running.

Initial Stages of Development

In some developments the issue may arise of who the neighbourhood's residents are to be. Either an approach can be taken such as at the Lebensgarten urban ecological community in Germany and in some co-housing projects, where people are chosen who are already sympathetic to the project's aims. The alternative, which would be the case on larger developments, particularly those with a social housing element, would be trying to involve and educate incoming residents. If the developers knew who the residents were to be, they could involve them in the design process. There could also be a course and a 'user's manual' given to people on arrival, to teach them about the site design and how they might live and operate in a way most in harmony with the aims of the development. This is an approach which is now used with great success in rural eco-villages in Australia such as Crystal Waters and Kookaburra Park.

Setting goals for the amount of food you intend to grow and obtain from other sources as well as setting out how, practically, this will grow with time is a very useful practice. This will keep the project realistic and also keep it moving towards a goal. The Los Angeles Eco-Village project for example, have set themselves the initial goal of increasing neighbourhood organic food production to provide 10 per cent of the diet for 20 people (the eco-village group), and to obtain another 10 per cent of their diet via neighbourhood food buying cooperatives.

Establishment

When the village's food gardens are being created, employ as many future residents as possible to do the work. This is only really possible in a centrally planned development though, a private sector development could involve

local community/volunteer groups. One approach used by Catherine Sneed in her urban gardening work with ex and current prison inmates in San Francisco is to get prison inmates from particular neighbourhoods to plant trees in those neighbourhoods. 'No-one messes with our trees!' she says.

Each site will be different in terms of whether gardens will need to be fenced. Where it is necessary, aim through design to fence as sensitively as possible. Screen fences with fruiting hedges and try to use wood instead of metal.

Other approaches which may prove useful at this stage in the development are giving free trees to residents from an on-site tree nursery and involving local schools in tree planting. It is important too during the construction phase of the development that care is taken not to damage any existing trees, hedges or natural features and that great care is taken to compact only the minimum of soil.

There may be concern also about contamination of soil and the health risks associated with growing vegetables in an urban environment. Care should be taken to screen roads so as to form a barrier for pollutants. Lead, one of the most harmful pollutants in terms of human health, does not travel very far from roads and is quite easily screened out.

Up and Running

If the development contains low-cost housing, developers may like to consider ways to retain it as low cost, a development of this kind will be very popular and house prices will rapidly rise. The project may therefore start out with some affordable low cost housing but end up ten years later with exclusive expensive homes. It is also important to make every effort to involve residents in the management of the project.

CONCLUSION

I have argued here that for the designers and developers of an urban sustainable neighbourhood to take clear and effective strategies to the sustainable provision of its residents' food is both essential and practical. If the development is to truly become a part of the solution to our current ecological decline then it must address the whole area of food and land use. People like greenery, they like contact with nature. It is a simple point but one which much modern development seems to forget. There is a strong argument that almost the entire population has a strong desire or even psychological need for contact with nature (Johnston, 1990) and there is an equally strong argument that separation from nature is a major factor in anti-social behaviour.

Although much can be done at the design stage, the main challenge is residents' lifestyle choices and patterns of behaviour remaining true to the ecological aims of the development. If the developers, be they private or public sector, are truly committed to the project being an 'ecological/sustainable neighbourhood', it is important that they offer some sort of education or awareness raising programme to incoming residents. As has been mentioned earlier, the running of a permaculture design course would fulfil this role excellently.

The time is right for developments which take an innovative approach to how it feeds its residents. The aim of many new developments seems to be to site them within easy reach of existing jobs, rather than creating new jobs as part of the development. To adopt the integrated approach outlined in this chapter creates a wide range of niches for employment creation, both in the production of produce and then secondary 'spin off' jobs processing that produce into higher value items.

The range of approaches and possibilities which I have set out here are practical and tried and tested. The more they are implemented and proliferated, the more commonplace they become, until, we can hope, we reach a point where, to quote Christopher Alexander, 'it becomes as natural for families to have their own vegetables as their own air' (Alexander, 1977).