

Multiple Ways to do Design Research: Research Cases that Shape the Design Discipline
Swiss Design Network Symposium, Lugano, Switzerland.
12th – 13th November 2009

Title

MetaboliCity: How can Design Nurture Amateur Cultures of Food Production in the City?

Abstract

This paper introduces a current design research project that explores how designers can intervene sensitively within local urban food growing cultures by providing a design thinking and crafting that may help to sustain these initiatives and catalyse larger positive changes in the surrounding environment. MetaboliCity is the name for a vision of a city that metabolizes its resources and waste to supply its inhabitants with all the nourishment they need and more. This one-year (October 2008 – October 2009) participatory design research project on urban agriculture is based at Central Saint Martins, School of Art and Design and funded by the Audi Design Foundation.

The aim of the project is to design an urban grow-kit accompanied by a set of guidelines to be tested and developed at a selection of sites in London, UK. This is a design-service system that integrates both traditional and hi-tech industrialized agricultural techniques into the fabric of the built environment whilst simultaneously being rooted in permaculture thinking. Permaculture is defined as an 'ecological design system' that empowers city-dwellers to create 'sustainable human habitats by following nature's pattern'. (Robert Hopkins, 2008, p203)

The complex nature of the project calls for a Metadesign approach. Metadesign can be described as 'a shared design endeavour aimed at sustaining emergence, evolution and adaptation'. It creates 'open-ended and infinite interactivity capable of accommodating always-new variables'. (Giaccardi, 2005) MetaboliCity will test and adapt collaborative tools and processes that have been developed as a part of the 'Benchmarking Synergy Levels within Metadesign', AHRC funded research project, at Goldsmiths, University of London (2005-2008).

The project is facilitated by a design and research team, the participants are amateur food producers based at four different sites in London. There are special advisors on hand from the fields of plant science, permaculture, cooking, farming, wildlife and eco-architecture. The participatory nature of the project is informed by the notion of 'Citizen Science' (Irwin, 1995), where amateurs and specialists are engaged in a non-hierarchical process. The project explores how designers can work in multiple ways, taking on different roles within an interdisciplinary context, mediating between experts and amateurs in the field of urban agriculture. The role of the designers is to cultivate shared processes of envisioning, weaving and growing within each of these local contexts.

1. Introduction

It is predicted that by the year 2050, 75% of the world's population will be living in cities. (Ed. Burnett and Sudjic, 2007) The MetaboliCity research project is conducted in London, at a time when the population of the city (including its workforce) is approximately 10 million and arguably we are heading into a serious food crisis. Wartime initiatives in the past, such as the 'Dig for Victory' campaign at the start of World War 2 which produced the Victory Gardens (Viljoen, 2006) have shown that self-initiated and localized urban food production can relieve the pressure on agriculture. At the same time such initiatives educate people about food and nutrition and strengthen and enliven local communities.

In an article for a special edition of Architecture Design magazine, focusing on 'Food on the City', the author Gil Doron asked the question 'Could urban agriculture be the next design revolution?' (Doron, 2005, p52) The article discusses not only the environmental and economical benefits of growing food in the city but also the social benefits.

'Growing food in a communal way, in community gardens and city farms, breaks down barriers between people with regard to differences in age, ethnicity, class and gender, stimulates a sense of 'ownership' of, and pride in, the local environment, and galvanises people to cooperate on other issues of social concern.' (Doron, 2005, p54)

In the 'Dig for Victory' campaign design intervened at many levels of society. From the design of cookbooks and gardening manuals, to the design of the campaign billboards and pamphlets; the design of the spaces (the transformation of local parks) and the strategising and exchange of knowledge in local neighbourhoods between expert growers and amateurs, parents and children. In this case, design adopted a strategic and systemic role in creating large-scale awareness in the general public and facilitating the exchange of knowledge about localized food production.

More recently, there is a growing interest and a re-valuing of the importance of localized food production in cities such as London, with local boroughs funding allotment schemes and new enterprises emerging such as the 'Capital Growth' (<http://www.capitalgrowth.org/>) scheme, which aims to support 2,012 food growing spaces for London by 2012. With the UK food industry enjoying a period of reinvention, from television celebrity chefs to the spread of gastro pubs, arguably the general public have never been better primed for home growing. For example, the chef and TV personality Jamie Oliver has moved beyond the role of restaurateur to educate people about the ethical issues facing the food industry.

The aim of this project is to explore how designers can work within a participatory process alongside amateur food producers to offer a range of

design thinking and making skills and approaches to support these new patterns of behaviour. Gil Doron supports the investigative approach to urban agriculture taking place in the field of architecture, stating that

'architectural investigation into a subject that initially seems very remote from design can reframe the subject itself, and open a new field for architectural involvement.' (Doron, 2005, p59)

How can our design investigation into the subject of amateur cultures of food production reframe this emergent, bottom-up example of social innovation to open up a new field of involvement for design? This paper will introduce the context of the Metabolicity project, suggesting why it is important to the field of design research and presenting early findings from the first phase of the project's methodology.

2. Theoretical context

The participatory nature of the project is inspired by phenology, which is the study of plant cycles and variations in climate and citizen science, where networks of volunteers, many who may have no specialised training, perform or manage research-related tasks such as observation, measurement or computation. (Irwin, 1995) The project seeks to equip its participant food growers with the tools and knowledge that they need to plant, tend and document their everyday existence with their plants.

Each participant will be invited to take specific roles within the project. These roles roughly cover co-ordination, documentation and communication. Co-ordinators manage the team of participants, documenters take photographs or log the activities taking place on site and communicators mediate with the project's design team and also use the online archives to upload data and exchange information with other sites. The project celebrates a 'creative democracy' where design becomes a bottom up, co-authored process. (John Chris Jones, 2007)

Designing at an urban scale calls for designers to move beyond specialist boundaries (i.e. product design, interior design etc...) to work across disciplines, often forming unlikely partnerships (i.e. textile designers working with biologists). Metadesign, the design of design, offers a framework to work beyond the constraints of conventional design practice. Some key attributes of Metadesign are that it is in nature 'participatory', 'emergence aware', 'self-creative' and 'flexible' (Wood, 2008). Throughout the process of metadesigning participants move beyond the exchange of knowledge to grow their own 'knowledge ecology' (<http://www.co-i-l.com/coil/knowledge-garden/kd/index.shtml>). The principles of metadesign guide the metabolicity project.

The design researcher Elisa Giaccardi describes how 'Metadesign represents a cultural shift from design as "planning" to design as "seeding."' (Ascott cited in Giaccardi, 2005). To support the ecological nature of the Metabolicity project, an agile, dynamic and robust project structure is needed. The activities taking place at each of the sites are 'seeding' projects aimed at catalysing positive changes in the surrounding environment. It is impossible to follow a linear plan for working with each

of these cultures of growing. There are many variables at each of the sites (e.g. patterns of tending, the use of space, the success of crops) that the design and research team need to be aware of and constantly monitor to update changes in the site profiles. The Metabolicity grow-kit and the guidelines themselves need to be adaptive and allow for emergent behaviours.

Metadesign encourages us to think more deeply about designing for every day life than would be possible in a commercial context. At the broadest scale, we are working towards attuning political, ecological, economical, socio-cultural, sensual and emotional patterns of living, to create less fragmented and more sustainable cities, services, organisations, etc. This is a highly complex and ambitious task.

4. Research considerations

Using qualitative research methods we will be assessing the social, ecological and economic benefits of producing food at the chosen sites, with an emphasis on the participatory and collaborative nature of the project.

This project is guided by four key research questions

1. How can we grow food sustainability in urban spaces with limited resources, and how can design thinking facilitate such a production?
2. What is the role of the designer in agricultural initiatives? How can design be used to generate local participation and engagement with urban spaces?
3. How can a communication platform for experts and non-experts be created to share best practice, disseminate information and network with a wider community engaged with urban agriculture?
4. How do people experience the role of technology and innovation in the context of ecology and agriculture?

The project context, structure, outcomes and methods and process have been holistically mapped using a tetrahedral structure. This is a non-hierarchical and relational model developed by Professor John Wood at Goldsmiths, University of London to help designers to structure written proposals. Wood describes how 'The tetrahedron affords parallel, self-reflexive, relational representations. It provides an almost ideal basic format for representing a manageable set of relations.' (Wood, 2005)

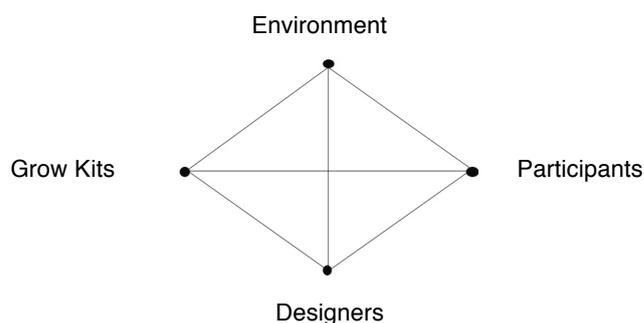


Figure 1. A tetrahedron inter-relating the project's structure

The methodology – A grow framework

The methodology includes holding a series of three informal situated interviews with participants at each of the sites. The purpose of the stage one interviews is to encourage the participants to wildly imagine how they would like their site to be through a process of envisioning and prospecting. The interview also captures previous growing experiences and the reasons why the participants wanted to become involved in the project. The design team are also given the opportunity to identify key opportunities and challenges facing the site. The key themes of the project (i.e. design, environment, collaboration and technology) are also explored with the participants to gauge different attitudes towards these different aspects of the project. Story-telling has been identified early on in the project as an important aspect of working with participants to obtain a rich picture of each site and get to know the participants involved. The second stage of interviews will also take place at each of the sites and are intended to evaluate the work in progress. Here the participants feedback early experiences of living with the plants and grow-kits in their environment. The participants and design team also reflect on the grow-kit workshops that each of the sites have undertaken. At this point subtle changes to the grow-kits may be made. The final stage of interviews will take place after the project's main workshop, which will bring all of the participants together. These interviews will gather feedback on the whole process, whilst sharing the findings and future opportunities with the participants.

At each of the grow-kit workshops, participants worked alongside the design team to construct the grow-kits for their site. The grow-kits were subsequently installed at each of the sites.

A 'knowledge ecology' one-day workshop is scheduled as a part of the London Design Festival in September 2009 that will bring together all of the participants and bring in special advisers. The workshop will be facilitated with metadesign tools and processes that are designed to encourage creative synergies within teams. This event will be a 'harvest' celebration where participants will exchange experiences and feedback on the successes and failures of the kits and their social networking website. The workshop will also provide an opportunity to evaluate the grow-kit and guidelines with the participants. The feedback from the workshop will inform the final stages of defining the metabolicity grow-kit and guidelines as a design service system.

3. Design Interventions in the City

When we asked our participants to define design and locate examples in their environment they came up with ergonomically challenging computers, bad office refits, cars and car parks. Not all but many of the negative aspects of each of these sites can be traced back to a lack of joined-up thinking in the design process. The design critic John Thackara notes how 'Too much of the world is just too designed. Too much control over

networks is detrimental to the social innovation upon which our future fortunes depend.' (Thackara, 2005, p94) In each of our cases, the amateur cultures of food production are self-initiated, emerging in between that which is designed and functional. Thackara discusses the importance of protecting design-free zones in the city where these bottom-up initiatives may flourish.

'design-free situations, or free zones, in which planning and other top-down, outside-in improvements will be kept at bay to make space for the kinds of experimentation that can emerge, unplanned and unexpected, from wild, design-free ground.' (Thackara, 2005, p94)

The role of the designer is to become a guardian of sorts within an urban context and to nurture spaces that are relatively design-free. Design as a final product is replaced by design as an ongoing forming process with emergent and partially unpredictable outcomes.

These design-free spaces in turn welcome 'informal teams, self-managed organizations, small institutions, alternative spaces and individuals themselves' to take part in new creative practices. (Petrescu, 2005, p.88) How can designers and developers become more supportive of these attempts?

In the book 'Architecture and Participation', the architect and critic Doina Petrescu observes how

'Formalised regeneration commonly initiates systematic interventions without considering the dynamics that precede them. Allowing (both in terms of funding and politics) spaces to function with their own dynamics, encouraging different temporary and self managing agencies to emerge in time would be a solution to stir public participation and make it a sustainable and transformative process.' (Petrescu, 2005, p89)

Each of the project sites act as an urban catalyst, stirring up interest within the local area that in turn creates a positive ripple effect in environment beyond the site. For example, the allotment scheme that is taking place at St.Luke's community centre, one of our participating sites, has attracted amateur growers from housing estates in the nearby area as well as companies who send their employees for a voluntary day growing food and tidying the space.

4. Our approach to design

We have developed a tentative set of design principles that have been inspired by permaculture and the Transition Movement (Hopkins, 2008) to inform the creation of the grow-kits and the selection of the case study sites.

MetaboliCity Project Criteria

1. ENVIRONMENT

- Appropriate use of space and least intervention at each site (appropriate technology)

- Local solutions wherever possible (seeds, skills and resources)
- Design for diversity and cross-pollination in all aspects of the intervention.

2. GROW-KIT

- Modular & Lightweight - to allow for flexible configurable space that's easily disassembled.
- Grow-Kit Resources:
 - a) No waste - cyclical systems (energy, water & materials - reuse, recycle or degrade safely)
 - b) De-Materialise - Less and fewer combinations of materials sourced ethically and environmentally.
 - c) Low energy or renewable energy
 - d) Low toxicity and pollutants
 - e) Understanding of Life Cycle Thinking for all aspects of design, manufacture, distribution, use and take back.
- Transparency - in practice, method and dissemination. Allow for an inclusive open platform. (Open Source, Creative Commons)

3. DESIGN TEAM

- Relational Systems Thinking: Look for on-site and cross-site connections and synergies (recognising patterns of tending, resources)
- Regularly reflect and evaluate the system to allow for adaptability and resilience that nurtures an ability to respond and change.
- Optimised design through an understanding of structure and geometry on every scale. (from material composition to social structures)

4. PARTICIPANTS

- Participants actively engaged in the design, assembly and monitoring of the grow-kits.
- Playful experimentation to cultivate spaces of wilderness and delight.
- Storytelling at each phase of the project to create a unique urban mythology around each intervention

Integrating technologies old and new

The project provides an ongoing experimental space to test and adapt the Metabolicity grow-kits and the guidelines for use. This is an inclusive process where the participants become 'co-researchers' in the development of the kits and the guidelines through regular feedback sessions. The grow-kit provides 'agri-tecture solutions' that embed living organic matter into the materials of our built environment (Diller Scofidio + Renfro, 2004) to address some of the most challenging urban spatial conditions. The grow-kits are serviced through a series of site visits and workshops facilitated by designers. Each kit is compiled from a set of growing components in response to the greatest needs and opportunities the site offers and the participants highlight.

The product design includes the grow-kit components and monitoring equipment as well as the application of the kits to the various sites. The

components consist of a lightweight architectural trellis system (developed with design studio Loop.pH), irrigation system, rainwater collection, nutrients, water pumps, various growing mediums and local seeds.

The service builds on the guidelines and is managed through an online platform, envision, weaving and growing workshops and a final knowledge ecology workshop. Both the kit and guidelines will be developed and adapted throughout the project with the participant feedback. The kits will have a multi-potential for use designed into them, a correlation of parts that can be constructed differently for the needs of each site.

The project focuses on four different case study sites in London. The sites are a city office, a restaurant, a community centre, a housing estate and an art college. Each site offers a different set of opportunities and challenges (e.g. social, spatial, architectural, horticultural). On each of these sites the participants already have a history of growing food in the city, whether this is on site or in their personal lives. Therefore, the project is not initiating urban growing but providing support to each context in the way of

1. Using 'designerly ways' of thinking, crafting and intervening within challenging urban spaces to support these cultures of growing – through assessing the sites, customizing the kits, providing on-site workshops and a collective workshop, monitoring and documenting the process with a social networking website.

2. Harnessing relevant expertise – identifying specialists to contribute knowledge, providing a web-platform for the sites to exchange ideas with each other as well as a much wider community.

The workshops are to cultivate and transform small-scale urban environments and aim to catalyse positive changes within these local environments and the surrounding contexts. They should evoke a sense of local pride, be engaging, fun and provide creative ways to re-imagine the city. Whereas the more traditional perception of the designer celebrates this figure as a guru who imparts unique, wholly important ideas to the masses, the role of the designer in this project is that of a facilitator, mediator and co-researcher alongside the participants, offering designerly ways of thinking, documenting and crafting within each case.

The project also catalyses an online social network (www.metabolicity.com), linking up the four sites that are taking part and providing a dynamic space to document the activities taking place at each site. The website provides a library of resources for participants and is a place to store information on the grow-kits and guidelines and support discussions between the four sites. This is intended to encourage a 'knowledge ecology' to evolve between the sites.

The case study is to test the feasibility of urban agriculture at a variety of locations and covers four main city activities for small-scale amateur growing:

- * Restaurants

- * Community/ public spaces
- * Workplaces/ Offices
- * Education/ Colleges/ Schools

There are two indoor growing sites and two outdoor growing sites. The indoor growing sites are both using hydroponic growing solutions and the outdoor sites are both using vertical structures and growing in earth.

5. The four site profiles – Early findings from the interviews and grow-kit workshops

A brief overview of each site is presented here, based upon the data collected from the stage one interviews. These interviews were conducted in March-April 2009 by the project researcher and the Principle Investigator and held with participants on each of the sites. The following site profiles identify the opportunities and challenges for growing, defined key aims for each of the sites, the dream outcomes and key insights for the design team. They also include a piece of story-telling from each of the participants reflecting on their own growing experience.

1. NFP Synergy – the research office



Figure 2. NFP Synergy grow-kit workshop, weaving a vertical structure

Site Description:

NFP Synergy are a research office based in Spitalfields, East London. They have recently moved into the office, which was previously a guitar shop. They have experimented with growing herbs in their kitchen and tomatoes in their front window.

Storytelling:

'It was someone who works with Michelle's idea to have some tomatoes and chilli plants, because we've got a big window with a lot of sunlight out there, so we thought it'd be nice to have some, and they kind of worked well for a while but then there were quite a few problems. People didn't water them, they were drying out and getting a bit thin, and attracting – well, we don't know if they were attracting flies, we think that was coincidental – and also, because they were on the windowsill, stuff was dropping down onto our manager, Brian.' (Participant A, March 2009)

Opportunities:

At this site the participants are willing and engaged. There are good communications in place in the office with timetabled opportunities for social gatherings etc... The office is web friendly, with some of the participants comfortable with using social networking websites similar to our project. There is a window space for growing tomatoes with good sunlight. The participants are interested in tending to the plants, and enjoy the performative aspect offered by the window space - connecting to the outside world.

Challenges:

The contained space, not having natural ventilation, they need a project leader, getting people to water plants.

The Aims:

To introduce a free-standing vertical growing system in the front window space.

Intervention:

Indoor window space vertical growing

Background Research & Expertise:

'We might need a bit of professional advice on what to do if there are pests.' (Participant B)

'We had an office knitting circle for a while...' (Participant B)

Dream scenario:

'if the whole front window was covered in amazing, colourful blooms.' (participant A)

Key insights/ inspirational triggers for design:

'because its quite a rationalized, intellectual business, I think having sensory things would be a really good counter-effect.' (participant B)

2. Fifteen – the resturant

Figure 3. Fifteen grow-kit workshop, hydroponic teapots

Site Description:

Fifteen is Jamie Oliver's restaurant off Old Street in London. It is coupled with the Fifteen Foundation, which takes care of Jamie Oliver's various projects such as the young chef apprentice scheme. The restaurant has fine dining downstairs and an Italian restaurant upstairs. There are also two floors of offices above the restaurant.

Storytelling:

'Interviewer 2: What do you think about the idea of growing food in a restaurant?

(Participant B): I think it's a brilliant idea, I really do. I think it should be everywhere... people come here because of what they see Jamie do on television. Get it upstairs, downstairs, in the toilets, everywhere. People will still look at it, they'll find it funny or they'll ask you about it, they're not going to be offended or insulted, they're probably going to think it's a good idea. I mean, if you look at the River Café, one of the things it's famous for is growing it's own herbs and certain vegetables...' (March, 2009)

Opportunities:

A curious chef and engaged staff involved in the participating team.

Challenges:

The most commercial of the four sites, the space at fifteen is more aesthetically demanding than the other sites and the grow structures need to fit in with the restaurants branded image. The grow kit also needs to sit within a very busy dining room full of customers. The space is highly functional, design and programmed. The staff rotas mean that tending time must be carefully planned. 'Kids on a Saturday morning' (participant B) create havoc in the space. The participant interviewed was not comfortable using social networking website.

The Aims:

The aim here is to develop imaginative ways of integrating planting into decorative spaces in a busy restaurant environment. Also, another aim is to be able to use the produce in the restaurant kitchen.

Intervention:

Replace decorative spaces in the upstairs dining room with planters growing herbs and chard.

Background Research & Expertise:

'I think it'd be nice to take some pictures, because the Romanesque that I'm growing at home, the seeds are only about that big at the moment, but they're the same colour as the florets of Romanesque, which I wasn't expecting. And chard, is meant to be really good, when it gets to about that big, you get like red, orange, yellow, green sprouts.' (Participant B)

Dream scenario:

'capture people's imagination and be a talking point.' (Participant C)

Key insights/ inspirational triggers for design:

'why pay for it when you can take the seeds that you put in the bin.'
(Participant B)

3. Byam Shaw



Figure 4. Byam Shaw grow-kit workshop, students weaving a vertical structure

Site Description:

Byam Shaw is an art college in North London. They have been developing an outdoor growing space in what used to be the car park. They are driven by permaculture ideas and inspired by roof gardens.

Storytelling:

'I mean we've got a low maintenance ethic, which would need to continue really... we've got a system running here... which means that we can just apply whatever waste we have to the soil and increase the soil year on year, it's very easy, non-maintenance, potentially quite a high yield system. Whatever else we're going to include, would have to have those same attributes.' (Participant A)

Opportunities:

This site already has quite an established growing culture. The participants have a good knowledge about permaculture. The students at Byam Shaw are also engaged in the growing and the canteen uses some of the food grow.

Challenges:

Space constraints, other growing initiatives taking place on site and an unclear relationship how this bears on this project.

The Aims:

To develop a kit that can either contain soil, or it can contain a nutrient solution, and not really distinguishing between different ways of growing.

Intervention:

An outdoor vertical growing system.

Background Research & Expertise:

Soil and nutrients, vertical growing

Dream scenario:

'Our original thing is that we wanted to use the roof, but it's very – there are sort of ideas about building on it – so at the moment we've had to put that to one side. But that was the original impetus, doing a bit of a forest garden up there.' (Participant A)

Key insights/ inspirational triggers for design:

'I mean I suppose, because we were interested in growing things vertically, and we've got various schemes that we're trying to develop, I mean I suppose that would be where there might be a kind of crossover... But because we were really going with the permaculture idea, and using whatever's local, using whatever's near at hand.' (Participant A)

'I'm interested in the emotional influence in it, and that thing of tending.'

(Participant A)

'I mean, it is very out of date, but in theory, our wormery quite soon should be producing liquids, which you then dilute with water, which is then really excellent nutrient, and there are very basic quick ways using animal dung – which we can actually get from down the road. (Participant A)

4. St.Luke's Community Centre

Figure 5. St.Luke's grow-kit workshop, installing a vertical structure in the allotment site

Site Description:

St.Luke's community centre has a collection of small allotments and some leftover space behind the building for growing.

Storytelling:

'I don't exactly think Tesco's are going to be quaking in their boots, that we're all going to be living the good life anytime soon, but it's more about the process, it's about supplementing what you're eating, it's about the calming nature of it, soothing. Its about the investment, rather than just

nipping down the shops every night after work to buy a bag of lettuce, you just nip out the back of your house and pick something up that you've seen grow and fought the slugs off of for weeks, and you really feel like you've earned it. So there's lots of reasons for doing it, and obviously the education and people knowing where it comes from and the fascinating processes that get it there can't hurt. So I don't think it's a case of living off a window box, but there's so many other benefits, especially in difficult economic times, I would imagine.' (Participant C)

Opportunities:

Willing and engaged individuals, a large outdoor space, and an excellent site manager and initiative, St.Luke's also has good links to IT centre for workshops.

Challenges:

To divide the small space vertically, to enhance a community spirit, introduce more basic growing skills, to encourage younger people to use the centre.

The Aims:

To develop a scheme with a larger group of people to add to the allotment site, introducing vertical growing frames and environmental monitoring.

Intervention:

Large scale outdoor vertical growing

Background Research & Expertise:

Vertical growing

Dream scenario:

'to keep this as a centre where we can offer training and support for people, and I suppose, develop a bit of a nursery bed, but also try to get people doing it a bit nearer to where they live.'

 (Participant 0)

Key insights/ inspirational triggers for design:

'because a lot of the people that I work with in this area don't have any outside space, or very little outside space, and there is actually very little opportunity for planting in the ground, I suppose I'm always trying to learn ways of making the use of small terraces, balconies.'

 (Participant 0)

Summary of findings from stage one interviews and grow kit workshop

Since each of the grow-kit workshops has taken place, there has been a mid-phase realisation that the 'making' process is more complex for amateurs to grasp than anticipated by the project team. One explanation for this is that previously, when the design team have collaboratively woven the grow structures it has been with other designers who have had some training or have some sensitivity to the process. There is embedded information in the system that participants do not have access to. This was perhaps least problematic with the NFP Synergy site, where the participants had previously been members of an office knitting circle. This equipped them with some confidence, knowledge and skills in making.

One idea was that there could be more specialised workshops facilitated by the design team for participants on weaving and making, spatial design, observing and documenting and planting and tending. This realisation will help us in the design of the final workshop with all of the participants.

The design team have admitted to a desire to control certain aspects of the process. There is a resistance to hand over parts of the process that are enjoyable or rewarding. It was felt that it would be helpful to become clearer about what roles the designers in the team take at different stages of the process. This needs to be more clearly defined (i.e. when and how involved a designer is in making, facilitating and organising each of the groups of participants). On different sites there are different levels of control and different knowledge needed.

An early observation is that NFP Synergy research office was the most successful of the grow kit workshops. Some of the factors that might have effected this are: they already have a social gathering designed into their working schedule, there have a knitting circle and are familiar with craft resurgence, they are a research office and are comfortable with the research aspect of the project, they are all women. Byam Shaw has been identified as the most challenging of the sites so far. Some of the factors that seem to have led to this are the space restrictions and how this growing initiative sits alongside other similar initiatives on site. The participants don't seem to know what they want to get out of the process and it is unclear whether they are collaborators or competition on site.

The Bio-wall vertical growing structure itself has become a benchmark for the success of each of the grow-kit workshops utilising this component of the grow-kit.

6. Conclusions

'As a biologist, the question for me is not whether our technology is natural, but how well adapted it is to life on earth over the long term. And as designers, I think we are realising that perhaps our designs are not that well adapted yet.' (Benyus, J, 2002)

Metabolicity is a metadesign seeding project aimed to nurture amateur cultures of food production in the city. To achieve this aim, the project has set out to create an adaptive, flexible and non-hierarchical project structure. The challenge facing the design and research team is to sustain a framework for the project that can deal with the variations and unpredictable happenings that occur at each of the sites at both social and environmental levels. The project seeks to encourage a shared learning experience to take place across each of the sites, between the participants, designers, and special advisors, resulting in a 'knowledge ecology' that can work to sustain the project and onsite growing activities in the future.

As the growing season is now under way, we will soon discover how our participants live with their plants and harvest their produce. We will find

out if the design interventions at each of the sites have succeeded in enabling growth and collaboration. The final workshop for the project is therefore a start of something rather than a summing up, indicating the next stage in the life-cycle of metabolicity.

References

Benyus, J, 2002. *Innovations Inspired by Nature*.

http://flow.doorsofperception.com/content/benyus_trans.html (last accessed 13th July 2009)

Editors Burnett, R., and Sudjic, D., 2007. *The Endless City: The Urban Age Project* by the London School of Economics and the Deutsche Bank's Alfred Herrhausen Society. London, Phaidon Press Limited.

Doron, G., 2005. AD Magazine. Food and the City. 'Urban Agriculture: Small, Medium, Large.' Great Britain, John Wiley and Sons guest edited by Karen A. Franck

Giaccardi, E. 2005. Metadesign as an Emergent Design Culture. *Leonardo* **38**(4): 342-349.

Hopkins, Robert *The Transition Handbook, from oil dependency to local resilience*, 2008, Green Books Ltd.

Irwin, A., 1995. *Citizen Science: A Study of People, Expertise and Sustainable Development*, London, Routledge.

Koestler, A. c1964, 1969. *The Act of Creation*. London: Pan Piper.

Luc J.A. Mougeot, in *_focus: GROWING BETTER CITIES Urban Agriculture for Sustainable Development*, IDRC 2006, p2

Low, N, Gleeson, B, Green, R, Radovic, D, 2005. 'The Green City: Sustainable Homes, Sustainable Suburbs' UNSW Press Book

Mollison, Bill. *Permaculture: A Designer's Manual*. Tagari Press (Australia).

Mollison, Bill *Permaculture Two*. Tagari Press (Australia) 1979

Editor Petrescu, D, 2002. '*Working with uncertainty towards a real public space*'. Architecture and participation. London, Routledge.

Thackara, J, 2005. *In the Bubble: Designing in a complex world*. Cambridge, MA: MIT Press.

Tham, M., Jones, H., (2008), 'Metadesign Tools: Designing the seeds for shared processes of change' Paper presented at 'Changing the Change'. An international conference on the role and potential of design research in the transition towards sustainability. Turin, 9th, 10th and 11th July 2008. www.attainable-utopias.com/tiki/m21

Thorpe, A., 2009. Core 77.
http://www.core77.com/blog/news/the_context_of_low_product_how_designers_can_help_articulate_a_new_social_language_by_ann_thorpe_13623.asp (last accessed 13/07/09)

Viljoen, A., 2006. CPULs - Continuous Productive Urban Landscapes: Designing Urban Agriculture for Sustainable Cities. London, Architectural Press.

Wood, J., (2005) 'The Tetrahedron Can Encourage Designers To Formalise More Responsible Strategies', for the 'Journal of Art, Design & Communication', Volume 3 Issue 3, Editor, Linda Drew, UK, ISSN: 1474-273X, pp. 175-192

Wood, J., (2007), Guest article 'Synergy City; Planning for a High Density, Super-Symbiotic Society', (Editors P., Jones & H., Jones), Landscape and Urban Planning An International Journal of Landscape Ecology, Planning and Design Editor-in-Chief: J.E. Rodiek ISSN: 0169-2046

'Benchmarking Synergy Levels within Metadesign', AHRC funded research project, at Goldsmiths, University of London (2005-2008)
www.attainable-utopias.com/tiki/m21 (last accessed on 13th July 2009)

<http://www.co-i-l.com/coil/knowledge-garden/kd/index.shtml>

<http://www.transitiontowns.org/>

http://en.wikipedia.org/wiki/Citizen_science

http://www.softopia.demon.co.uk/2.2/creative_democracy.html

Architectural growing trellis by Loop.pH
<http://loop.ph/bin/view/Loop/BioWall>

<http://www.un.org/sg/articleFull.asp?TID=90&Type=Op-Ed>

Agri-tecture reference: <http://www.psfk.com/2004/08/agritecture.html>

Dig for Victory
Running time 65minutes
DVD, 2006
Documentary
Acorn Media