

# Permaculture in practice: Low Impact Development in Britain

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## **Introduction**

The principles of permaculture offer practical guidance on how to live more sustainably. Permaculture is designed to be a holistic integrated practice that can build functioning sustainable alternatives which balance the needs of nature with the needs of humans. In Britain permaculture has been predominantly practiced as an approach to food production and gardening, eschewing many of its wider implications for the built environment, land tenure, planning and economics. However, an emerging movement of Low Impact Developments<sup>1</sup> (LIDs) are broadening the way in which permaculture is practiced by applying it to all aspects of collective eco-living at a village scale.

As permaculture is essentially a design system, not a rigid set of rules, it is important to understand how its principles are actually practiced in order to critically explore its value in different contexts, and its possibilities as a guide for sustainability. As Holmgren notes, “permaculture remains an environmentally friendly method of growing food, rather than the design and philosophical basis of the community itself” (2002, 175). Examining permaculture practice in several LIDs in Britain, this chapter details the shift beyond food production to a more holistic implementation of permaculture principles. However, it also identifies how the lack of a shared interpretation of what permaculture means in practice, the lack of experience of residents in working collectively using permaculture, the tensions of implementing it in practice, and the lack of large scale collective working examples of permaculture in Britain (unlike, for example, Tamera in Portugal or Crystal Waters in Australia [Barton, 1998]), has hindered the possibilities of permaculture in fully shaping sustainable ecological living. Of particular interest here is the collective implementation of permaculture in all aspects of

living including building, land tenure, personal relationships, and resilience to climate change.

Low Impact Development is a radical approach to housing, livelihoods and everyday living that began in Britain in the 1990s as a grassroots response to the overlapping crises of sustainability. LID employs approaches that dramatically reduce humans' impact upon the environment, demonstrating that human settlements and livelihoods, when done appropriately, can enhance, rather than diminish ecological diversity (Fairlie, 1996; Halfcree, 2007). LID is also a direct response to the need for low-cost housing, an anti-capitalist strategy forging alternative economic possibilities, and a holistic approach to living that pays attention to the personal as well as the political. As such LID is "engaged in social transformation through everyday-lived practice" (Woods 2008, 132). This is a subset of the broader eco-village movement. Although it shares many concerns with eco-villages, LID places a particular emphasis upon being low-impact by being visually unobtrusive (integrating nature into its designs), using natural and local building materials (such as straw and wood), being of an appropriate scale (according to what the land can support), being autonomous in terms of water, waste and energy, providing the majority of their food needs from their land, and is often linked to sustainable land-based livelihoods (such as fruit growing, bee keeping, and vegetable box schemes) (Maxey, 2009; Jacobs, 2006).

LID is in essence about localizing all aspects of living to reduce the need for consumption and travel. However this does not involve residents segregating themselves from society. Rather many LIDs invest considerable time and energy in building links with local communities, establishing educational projects, and research (Pickerill and Maxey, 2009a). It is estimated that 10,000 people live in LIDs in Britain, however the size of settlements tend to

be small in scale with few having more than 20 residents (Chapter 7, 2003). Examples include Hockerton Housing Project (Nottinghamshire, England), Lammas (Pembrokeshire, Wales), Landmatters (Devon, England), Green Hill (Scotland), and roundhouses at Brithdir Mawr (Pembrokeshire, Wales) (See Figure 1).

*Figure 1: Map of Low Impact Developments in Britain*

The empirical material on which this chapter is based is drawn from an active engagement with several LIDs since 2006. The level of participation and involvement has varied according to the needs and desires of each community. The author has been extensively involved with the Lammas Low Impact Initiative (Pembrokeshire) which was granted planning permission for nine LID smallholdings and dwellings in August 2009. This included repeated site visits, researching and preparing reports for the planning application, interviews, participation in meetings and events, and most recently (April 2010) volunteering in the construction of the new dwellings. Similarly, repeated visits were made to Green Hill (Scotland) to volunteer, participate in the vegetable box scheme and conduct interviews. Research was also done through volunteering at Tinkers Bubble (Somerset), while day visits incorporating an informal site tour and interviews with participants were conducted at Steward Community Woodland (Devon) and Landmatters (Devon). At more established LIDs such as Hockerton Housing Project (Nottinghamshire) and Hill Holt Wood (Lincolnshire) official tours were attended, interviews conducted, and both places have since become regular sites for teaching fieldtrips run by the author. For more details about each site see Pickerill and Maxey (2009a and 2009b).

## Minimizing Impact through Integration

There is a synergy between LID and permaculture in that they are both design systems which at heart seek to interconnect the processes of life and create more sustainable systems. They are both based upon understanding and creating systems of co-operation that encompass ecology, people and equality.

The word ‘permaculture’ comes from combining *permanent agriculture* and *permanent culture*. The British Permaculture Association defines it as “about living lightly on the planet and making sure that we can sustain human activities for many generations to come, in harmony with nature” (2010). Permaculture is about designing systems whereby the needs of people *and* the environment are met in a way which creates balance and harmony and is inspired by close observation of nature’s own systems of stability, resilience and productivity (Kennedy, 1991). Thus “practitioners should learn from, mimic, and work with – rather than against – nature. This implies that we should design complex, integrated, even multi-stored, systems within which all organisms ... perform not single and competitive, but multiple and mutualistic functions” (Mulligan and Hill, 2001, 205).

These interconnections can be explored by understanding the three ethics that underpin permaculture (earth care, people care, fair share), and how attention to each of these ethics is required to create a holistic, harmonious and balanced way of life. Earth care aims to reduce our impact upon the natural environment and to work in harmony with natural systems. The aim of such an ethic is to enable existing natural systems to flourish and replicate with ease and it is focused on valuing ecological systems and preventing their destruction and pollution. Such an ethic informs how we manage land and design systems which supply our needs in a low-impact way.

People care concerns the needs and wellbeing of people and communities. This involves defining the resources we need and ensuring that we have access to them. This includes access to good food, water and shelter. There is an emphasis within this ethic that people care involves collective approaches to better managing resources for our needs. Thus, for example, collectively organizing better public transport systems or organic food provision. Here good design is used to maximize use of resources for collective benefit. It is about developing environmentally friendly lifestyles that sustain both ourselves and the environment. There is another important element to people care, however, and that is care for self and an understanding that “to be able to contribute to a wider good, one must be healthy and secure” (Holmgren, 2002, 7). Indeed as Whitefield notes “we largely know how we need to change our agriculture and industry in order to make them sustainable. How to deal with human emotions, such as fear and greed, is less simple however, and these are what really prevent us from making progress” (1997, 6). Thus we need to pay attention to personal emotions, human needs, and developing skills such as communication and listening. This involves valuing non-material well-being.

Finally, an ethic of fair share determines that the limited resources we have available to us are shared equally between all beings. These ‘beings’ include all people, animals, plants and, perhaps most importantly, future generations. According to some interpretations this involves setting limits to population growth to create a ‘stable’ population (Holmgren, 2002). While this idea remains controversial, the ethic certainly requires a limit to consumption and a check upon what we perceive as essential for our needs. We thus need to better “match our consumption to need” (Whitefield, 1997, 7).

Permaculture has had a big influence upon green ideas in Britain in recent years, but in the main this has been expressed through changing practices of gardening and food production. In LID many of its key advocates and designers are trained in permaculture design (for example, Ben Law, who built a LID in Prickly Nut Wood, East Sussex, has a Diploma in Applied Permaculture Design) though others describe themselves as ‘accidental’ permaculturists (a point we will return to). As such LID has been described by Tony Wrench, of Brithdr Mawr, “as being a catalyst for letting permaculture happen in the countryside and letting people with no money or very little money, live a balanced lifestyle that will survive economic crises, and will survive peak oil”<sup>ii</sup> (see also Wrench, 2001).

LID reflects the ethics of permaculture in two keys ways: in its holistic approach and in its emphasis upon the importance of people and the personal. LID takes holism - the idea that we need to understand the whole of a system (physical, social, economic, and psychological) and that the properties of a system cannot be understood by its component parts alone - as its approach to understanding how humans should interact with the environment (Pickerill and Maxey, 2009). For Will (Green Hill) this holism is central to permaculture;

one of the things that defines permaculture is to try and – for an individual or a group –do the whole process, be both implementer and designer and observer, and evaluator as well, to learn lessons ... because it’s incorporating people and the earth and trying to get that fair share ... that defines it as being holistic.<sup>iii</sup>

Thus LID and permaculture advocates that in addition to physical changes we must attend to the personal and emotional too (Brown and Pickerill, 2009). This very much reflects a permaculture ethic of seeking to work in harmony with nature’s systems and of people care,

and an acknowledgement that the personal politics of change are as important as protecting the natural environment.

## **Principles in Practice**

Given the breadth of this ethical framework it is important to explore what this has meant in practice in LIDs. This can be assessed by how the twelve permaculture principles developed by Holmgren (2002) have been put into practice. These principles are intended to ensure energy-efficient design (Laughton, 2008). In other words, permaculture “can only be achieved by means of careful design. Useful connections can only be made between things if they are put in the right place relative to each other” (Whitefield, 1997, p.3). This is part of permaculture’s appeal for LIDs; “what I particularly like about permaculture is that it offers a set of design principles, but does not necessarily tell you how to do something ... This gives you flexibility in responding to location and situation”<sup>iv</sup>.

Permaculture is a deliberate and assertive approach to sustainability and its practice in British LIDs will be explored through the examination of the interpretation and implementation of four of the twelve principles: Catch and store energy (number 2); Integrate rather than segregate (8); Design from patterns to details (7); and Creatively use and respond to change (12).

### **Catch and store energy**

The principle of ‘Catch and store energy’ is often applied to arranging plant growth to best store energy in the landscape, such as creating areas of biomass like trees or through the protection and nurturing of healthy soils. However, it can equally be applied to constructing highly energy-efficient buildings which naturally store solar energy. If orientated to the south

buildings can benefit from passive solar gain which both heats and lights a space for free. Often this solar gain can be stored in walls with high thermal mass to heat the space overnight or during dull days. Moreover, photovoltaic panels and solar thermal water heating catch solar energy and store it for use in the home. The use of natural materials often facilitates the process of storing energy too, for example straw bale or adobe creates thick walls that help to store solar energy.

An example of the use of this principle is the design of the dwellings at Hockerton Housing Project, Nottinghamshire. Built in the mid-1990s the five-house terrace has thick concrete walls and is earth sheltered to the north. All the windows face south with a large conservatory designed to capture the sun's energy but also to prevent over-heating and thus stabilize the internal temperature of the homes. The homes rarely need heating (using wood stoves) and electricity is generated by photovoltaic panels and two wind turbines.

There is a tension in the application of this principle, however. In order to create such a dense thermal mass a large amount of concrete was used in construction. This potentially works against some of the other principles such as *Use and Value Renewable Resources and Services* (number 5) and *Produce No waste* (6). Thus permaculture in practice often has to be pragmatic. At LIDs such as Tinkers Bubble (Somerset) and Landmatters (Devon) their eco-buildings are made predominantly from more natural materials (largely wood) often not perfectly positioned for solar gain - which consequently do not catch and store energy with the same efficiency as those at Hockerton. They also lack air-tightness and are not well insulated. LIDs in Britain have not yet resolved the tension as to whether it is better to use non-natural materials to increase energy-efficiency in building, or to compromise efficiency and avoid the use of polluting building materials. This example illustrates that although

permaculture design principles are being incorporated into house building in LIDs, compromise is often needed to make such principles work in British contexts. This is despite the growing evidence that natural materials like straw-bale construction or earth berming (using earth to increase the thickness of walls by piling it up against the sides and part burying the walls) can be both non-polluting and energy-efficient.

### **Integrate Rather than Segregate**

Permaculture principle eight, *integrate rather than segregate*, identifies that the relationships between things are vital to the successful operation of a system as a whole. Moreover, by working together synergies are created which means that “the whole is greater than the sum of its parts” (Macnamara, 2009, 10). Thus it is important to generate connections and intersections. This principle overlaps with another - *Produce no waste* – as ideally a system is created whereby the needs of one are supplied by another.

Although often applied to food production, for example by ensuring that food is supplied by a broad variety of sources (main crops, wild food, orchards, and exchange with others), integrate rather than segregate can also be conceived as a principle to be applied to designing how we live together and with others. In theory this suggests, for example, that we locate chickens near parts of the garden that require pest control, and then use chickens for meat, feathers, and eggs (Whitefield, 1997). If we apply this more broadly to eco-living it requires us to structure our dwellings, infrastructure, and livelihoods in ways which maximize sharing and communal use. Thus we locate according to needs which could also increase the ability to share and to generate multiple uses from one resource. This principle then speaks to the need for collective approaches to sustainability.

Lammas is a new LID, construction began autumn 2009 of nine eco-smallholdings and a community hub on 76 acres of mixed pasture and woodland near Glandwr, Pembrokeshire, Wales. Lammas deliberately structured its design around principle eight, employing permaculture design specialist Looby Macnamara to aid plot plans. She argued that “the sharing of infrastructure, resources such as tools, labour and transport greatly reduces costs and ecological footprints compared with having nine separate smallholdings” (Macnamara, 2009, 10). Lammas is not an intentional community<sup>v</sup> however, and they wished to create a supportive village environment whereby residents shared resources but also maintained maximum personal freedom. Thus they used permaculture to design a way to work collectively when necessary but ultimately each have their own space, freedom and choices in how they use their plot and make their livelihood; experimenting with permaculture to create new ways to live together. The result is a village with a strong sense of mutual solidarity, sharing and kindness. People care becomes as important as earth care as there is recognition of the importance of personal autonomy and space for individual emotions. This personal need for some separation, however, naturally limits the amount of integration possible and although tools and labour are often shared at Lammas most residents have their own vehicle and are building their own homes predominantly by themselves. Holmgren, as an advocate of intentional communities, argues that ideally we should cooperate even more than this; “the belief that human nature demands that we live segregated and uncooperative lives is arguably a greater impediment to a sustainable future than the belief that technology and human brilliance can solve environmental problems” (2002, 176).

At other LIDs the attempt to integrate rather than segregate has been hampered by a lack of shared interpretation of what permaculture means in practice. Laughton notes that many “projects had naturally arrived at permaculture style solutions without labeling them as such”

(2008, 81). Landmatters (Devon) struggled with agreeing on a collective definition of permaculture despite many residents having attended permaculture training. As a result:

We've found it pretty challenging creating a Permaculture Design for such a large and multi-faceted project, working as a group of 10 to 15, reaching agreements by consensus. Even if everyone agrees on the Principles that underlie Permaculture Design, people have differing ways of approaching it, and it's not always simple or easy to bring these together. I think the most challenging aspect has been creating a Design for the site as a whole, or for the whole of the area designated for residential and educational structures. There are just so many overlapping sets of inter-relating factors to be considered in working on each part of the design, and it can be especially hard to look at this in a large-ish group, when you have the added complexity of many different ways of working and differing opinions and desires. It's been really helpful bringing in experienced Permaculture Designers from outside our group to act as facilitators at key points in this process. We've been able to move the Design forward significantly in quite a short time when we've done that.

We have worked best doing broad-brush design as a whole group, and then the detailed design being worked on by smaller groups. Sometimes when something is really key or is controversial within the group, we feel the need to include everyone in the detail of the design. Personally, I have mostly found this really unsatisfying. I feel we have usually ended up focusing on finding compromises between

opposing desires, and this has not felt to me like a genuinely holistic, Permacultural approach. It tends to be focused on what people feel is needed right now, and not to be looking ahead to what the site and the project might be like in the future. I'm pretty sure that some people here would disagree with me about this. In any case, we continue to observe, evaluate and review both the results and the process of our Designing. Permaculture Design is not a process with a fixed end point – it's ongoing. I would have liked to have had a fairly detailed design of all the major elements, all integrated together, before starting to implement any significant, long-lasting aspects of the design, but maybe that's just not realistic in a group project like this, with so much complexity. Whereas, once you start actually *doing* something, then you have something to review, to evaluate: you have more concrete information on which to design further.<sup>vi</sup>

Thus while individually residents in LIDs may be practicing permaculture - or some permaculture principles - and certainly applying it to more than simply food production, there remains a lack of experience of residents in working collectively using permaculture as a encompassing design approach.

### **Design from Patterns to Details**

Permaculture seeks to use patterns evident in nature to aid efficient design (Principle 7).

Thinking about patterns aids the development of large scale permaculture plans for a project.

Patterns design can include zoning (dividing a site according to which sections need more attention), sector analysis (considering how sun and wind flows through a site) and elevation

planning (ensuring appropriate use of slopes and altitude). This approach facilitates planning use of a site before thinking about the detail.

At Green Hill LID (Scotland) principle seven has been used to design the entire site, including location of homes, and zoning was used to consider human energy use for daily tasks. Since 2001 this community has been living without planning permission in a woodland. They have recently completed a timber-framed straw-bale house. Rainwater is used for everything except drinking, power is generated by wind and solar, and houses are heated by wood-fired stoves. The pattern design process is also used when changes are required like;

The movement of the hen house recently ... we observed the two main places we thought it feasible to take it to ... and thought about the pros and cons of each of those sites and how that would work and opted for putting it next to the sheep enclosure because of that design process we went through - how that would be easy in terms of the day to day flow of our pattern, going to feed the hens, check on the sheep – they're both in the same place ... we can feed at the same time, and the collectivisation of our resources, so the water can come off the roofs of both of the buildings, that can be collected together and that then becomes a shared resource for hens and sheep. <sup>vii</sup>

At each stage of design residents chose to use the OBREDIM (Observation, Boundaries, Resources, Evaluation, Design, Implement and Maintain) approach. For Green Hill this enabled a broad variety of influences – aspects from the three ethics and all principles – to be incorporated and considered at each stage. Thus the role of climatic conditions was

considered alongside human energy levels and security from possible thieves. When considering the expansion of their food production area, “we didn’t know whether we wanted to go east or west .... So one side in terms of observations is quite exposed, quite windy, but more secure, less interaction with the public. On the other side, more sheltered, got a good windbreak around it, but potentially less secure, next to a public footpath, so potential nicking of vegetables”<sup>viii</sup>. The main disadvantage with this process is the time that it takes to do it thoroughly which Will argued would take at least a year. This was problematic because of the heavy demands on the residents time (looking after young children and generating their income from land-based livelihoods) and because some members of the community preferred to make decisions more quickly than such a process enabled.

### **Creatively Use and Respond to Change**

Permaculture encourages a creative and positive response to change, both in planning to encourage ecological succession (for example from bare land to mature forest) and in reacting to larger scale shifts such as climate change. Thus, while known changes can be planned for (such as changing seasons), there is also a need to be able to respond to changes which might have less well understood consequences. For Holmgren, “one of the great challenges in energy descent is to replace mass solutions and systems with a great diversity of systems and solutions to suit the particular needs of sites, situations and cultural contexts” (2002, 242). This response to change is as much about social change and knowing how to work together and collectively as it is about ecological response. As the Permaculture Association notes, “working with people is just as important in permaculture as working with plants (which are much easier!)” (2010).

The emphasis on diversity as a form of ecological and social resilience is evident in several LIDs in Britain. Landmatters is a 42 acre eco-community in Devon (England) which currently only has temporary planning permission and is thus restricted to temporary dwellings. There are currently 12 adults on site and seven houses established in 2004 and all land is collectively owned. Permaculture was core to the creation of the community: “we had all done a permaculture course, so had that philosophy as a common commitment” (Rodker, 2009, 64), even if in practice they struggled to agree on its finer details. Diversity was evident in their food growing to an extent: “we can create resilience via diversity. We are not sure yet whether it is going to become wetter or dryer and we could start growing for both knowing that we might waste some, but also that some will survive. Really it is about diversity, which we do anyway, and growing a huge range of crops, such as the variety of salads that I have”<sup>ix</sup>. However, in other ways Landmatters is not very diverse and this has led to both personal tensions and a narrow skill base because “although shared beliefs and co-operative behavior are fundamental to the success of intentional communities, too much similarity in skills, ages and needs and personalities encourages competitive rather than co-operative relationships” (Holmgren, 2002, 176). This similarity of types of people attracted to LIDs is something most residents are very aware of and continue to seek to diversify.

LIDs actually have quite a flexible approach to change rather than simply being resilient; in other words they have incorporated permaculture less in planning resilience and more in their spontaneous flexibility to change as it happens. LID is an ongoing experiment, and Landmatters continue to invent and create as they evolve. Their design provides flexibility in response to change in part because their dwellings are temporary, self-built and modular (and thus can be easily modified), their needs change and are adapted to (for example, many couples now have young children and have had to change their lifestyles), and their land

management evolves (with the intention of generating more land-based income but with an approach that is open to new opportunities). They have also reflected upon their personal needs for more comfort.

## **Transitions to a Sustainable Future**

The greater incorporation of permaculture into LIDs in Britain has occurred alongside the emergence of the Transitions Towns Movement. Transition Towns, also known as the Transition Movement, is a social movement where communities collectively decide to prepare for the consequences of peak oil and to mitigate the impact of climate change. This tends to involve groups of campaigners raising awareness of environmental issues within their local town, practical efforts to reduce energy use and attempting to build resilience to climate change by, for example, establishing communal allotments and designing an energy descent plan (North, *forthcoming*). The aim is to engage the whole community in planning for a more resilient way of life in a hopeful and productive way with the slogan ‘Peak oil makes it inevitable. Transition initiatives make it feasible, viable and attractive’ (Transitions Town, 2010). Transitions Towns have been greatly inspired by permaculture; the movement’s founder Rob Hopkins is an active permaculture teacher and much of its approach mirrors a permaculture understanding of natural systems and resilience. Indeed Transition Towns are in effect a re-imagination of permaculture:

Transition Towns are a remarketing of permaculture. It’s a reflection that permaculture has grown to such an extent that it’s able to think about stuff at a town/city level, rather than in the 80s or the 90s at a garden level or allotment level. One of the reasons why the transition

town movement exists is because it's stopped saying permaculture is just about gardening ... Permaculture has always wanted to be a whole society thing ... we've got to join everything up, we've got to find some way of involving the community a lot more ... The resilience that the transition town movement talks about is the same resilience that is talked about in early permaculture teachings ... it's like nature's really resilient, how do we match that? <sup>x</sup>

This re-imagination illustrates, in much the same way as LIDs, that permaculture is a flexible and useful tool for outlining the possibilities of sustainable living. In both Transition Towns and LIDs there is a strong element of the need to survive the evolving climate change and that to do this requires a process of experimentation and closer observation of nature's systems. Both begin to put into practice the original intention of Mollison and Holmgren (1978) of a new way of living which involves radical changes far beyond simply producing our food differently.

## **Conclusions**

Low Impact Developments seek to operate with the least energy input and the least negative impact. This is very similar to the permaculture principle of minimum input for maximum output. Overall the aim is to make a positive contribution to the natural world, locally and globally. In other words, have a positive relationship with nature which is beneficial for all<sup>xi</sup>

Many LIDs in Britain have used permaculture as a way to structure their communities, food production, house building and livelihoods. Increasingly they have been able to shift beyond food production to a more holistic implementation of permaculture principles, just as it was originally intended, and as a result be part of “the permaculture movement [which] acts as a sort of a natural laboratory wherein potentially sustainable solutions are experimented with” (Veteto and Lockyer, 2008, 53).

In examining LIDs we are able to critically examine the successes and tensions of permaculture in practice in the particular national context of Britain. Permaculture has been used to shape site plan decisions, to make best use of resources and energy, to support the processes of integration rather than segregation and to assert the importance of being flexible in the face of change. However, the partial implementation of permaculture principles and ethics highlights the struggle many LIDs have had with implementing permaculture collectively and in building integrated and communal ways of living. Whether this is an assertive rejection of the full implications of collectivity and thus a critique of permaculture, or more a reflection of the stage at which LIDs find themselves is unclear. Few LIDs have been able to put permaculture fully into practice because of a difficulty of collectively agreeing the finer details of what permaculture is, and for the lack of large-scale collective working examples of permaculture in Britain.

Moreover, there are many ‘accidental’ permaculturalists who have come upon it and practice what they call ‘common sense’ approaches to eco-living which could be conceived by others as permaculture practice. Permaculture has openly and deliberately built upon a myriad of understandings of nature’s systems, both indigenous and western scientific, and as a result is conceived by many as being about “looking at some of those traditional ways of farming and

working the land and traditional communities and saying what works and what doesn't work?"<sup>xii</sup>. Other permaculture advocates have argued that in practice it is "only by reconnecting ourselves with our local resources can we move towards a sustainable society" (Whitefield, 1997, 8). This, however, confuses the wider lessons of permaculture in that it is a hybrid of principles, some about localism, but others about connection, integration and the balancing of needs of the earth and people. There are also tensions about the time needed to closely observe a site before any plans are made (advised to take 12 months) amid the acknowledgement of the need to evolve systems quickly to cope with climate change.

My analysis of only partial success in the implementation of permaculture in LIDs is not meant as an assertion of its failure, rather a celebration of its successes thus far. Britain is in a transitional period of making permaculture work at a large scale in collective spaces. However, it is the broader lessons that permaculture teaches which have been embraced by LIDs where hope really lies. In balancing the needs of the earth with those of people, of asserting the importance of equality, and crucially in tying these together with a focus on holism sustainable ecological living has begun to become a reality.

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## Notes

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<sup>i</sup> I use the term Low Impact Development after Fairlie (1996) to refer to a radical approach to living, as opposed to use of the term in the USA for a storm water management system which seeks to disperse storm water using biologically inspired design. Such an approach in Britain is referred to as sustainable urban design systems and is very different to what is explored in this article. However, recent work in North Carolina has used permaculture design in improving these storm water management systems, see Ormond *et al.* 2010.

<sup>ii</sup> Interview with Tony Wrench, Brithdr Mawr, 15<sup>th</sup> August 2006

<sup>iii</sup> Interview with Will, Green Hill, 15<sup>th</sup> May 2006

<sup>iv</sup> Interview with Josh, Landmatters, 18<sup>th</sup> May 2010. These are the personal views of Josh and are not necessarily shared by all residents at Landmatters.

<sup>v</sup> An intentional community seeks to operate according to an agreed set of principles to which all residents comply – hence they act with intention be it around spiritual beliefs, dietary constraints or minimising environmental impact. Lammas decided to have as few rules as possible and seeks to encourage individual freedom in decisions about spirituality, eating meat and the ownership of individual motorised vehicles.

<sup>vi</sup> Interview with Josh, Landmatters, 18<sup>th</sup> May 2010

<sup>vii</sup> Interview with Will, Green Hill, 15<sup>th</sup> May 2006

<sup>viii</sup> Interview with Will, Green Hill, 15<sup>th</sup> May 2006

<sup>ix</sup> Interview with Josh, Landmatters, 18<sup>th</sup> May 2010

<sup>x</sup> Interview with Will, Green Hill, 15<sup>th</sup> May 2006

<sup>xi</sup> Interview with Will, Green Hill, 15<sup>th</sup> May 2006

<sup>xii</sup> Interview with Will, Green Hill, 15<sup>th</sup> May 2006