

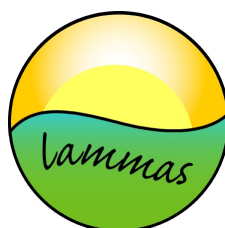
Permaculture Report

Produced by Looby Macnamara,

Designed Visions

(Permaculture Design Consultancy)

For



Lammas Low Impact Initiatives Ltd

Contents

1) Background Information about Permaculture

- a. Designer's biography
- b. Reasons for permaculture
- c. Explanation of permaculture
- d. Permaculture ethics
- e. Permaculture principles
- f. Permaculture design process
- g. Ecofootprinting

2) Lammas Permaculture Design Process

- a. Design meetings
- b. Plot size
- c. SWOC analysis
- d. Positive impact living
- e. Connections with the wider community
- f. One planet model
- g. Dissemination

3) Permaculture Design for the Plots

- a. Summary of people & relevant skills
- b. Benefits Demonstration/education/research/resource production
- c. PASTE sheet (Plants, Animals, Structures, Tools, Events)
- d. Cash crops and added value products

4) References & Notes

1a.

DESIGNER'S BIOGRAPHY

Looby Macnamara is an experienced permaculture designer and teacher and has attained her diploma in applied permaculture design. She is a partner of the Designed Visions permaculture design consultancy and was trustee of the Permaculture Association Britain for 5 years and chairperson for 2 years. This report has been produced in consultation with the Lammas core group and the individual plot applicants over a period of 7 months. Chris Evans (permaculture designer and teacher) and Andy Goldring, Managing Director for the Permaculture Association Britain have also been consulted and have contributed to this report.

1b.

WHY USE PERMACULTURE?

The potential impacts of climate change and peak oil are increasingly catching the attention of the public. Social problems such as unemployment, crime, waste and pollution are combined with environmental issues such as wildlife habitat destruction, water scarcity and soil erosion. The Human race and the planet are heading towards an uncertain future where the problems can seem insurmountable with no clear direction of how to halt, let alone reverse, these trends. The problems are evident around the globe and their effects are often felt across the other side of the world. Governments and councils can provide some solutions and strategies, but changes in individuals' mindsets and behaviours also need to occur for these schemes to have both short and long-term positive effects.

Permaculture brings together elements of tried and tested approaches and technologies to the design and development of sustainable systems. Sustainable/organic agriculture, energy efficient housing, appropriate technology, ethical finance, fair trade, etc. are combined in holistic systems to be low input and high output over time. It addresses underlying causes and motivations and offers practical solutions that can be implemented on any scale. The Lammas project has chosen to use permaculture as a way of designing their project, not only reduce the impact of their living, but also to provide a model for how

to live sustainably in harmony with the resources of the earth. The intention is to inspire many others and help broadcast the ideas of sustainability, low-impact living and permaculture far and wide. The example set by Lammas, in its entirety, will help the local council meet their objectives and demonstrate how other councils can do the same.

The **Objective 1** Local Strategy for Pembrokeshire is founded on the following five Strategic Objectives:

Strategic Objective A: Developing Vibrant Communities

Strategic Objective B: Improving Communication Links to, from and within the County

Strategic Objective C: Delivering Economic Growth Based on Local Need

Strategic Objective D: Encouraging People to Reach their Potential

Strategic Objective E: Promoting a Clean, Healthy and Valued Environment

In line with these objectives, Permaculture works on individual, community, societal and environmental levels.

1c

EXPLANATION OF PERMACULTURE

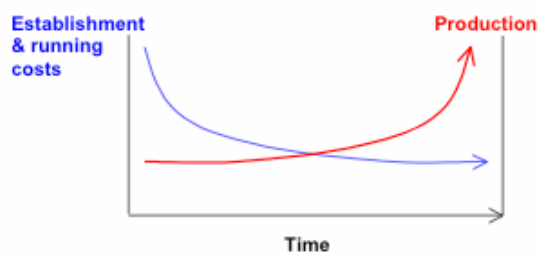
Permaculture originated in Australia in the 1970's and can be now found across the globe. Permaculture's principles can be used in a multitude of situations to improve people's quality of life while reducing the environmental impacts of human settlements. Quite simply, needs are met in an ecologically sustainable way. Permaculture arose out of direct observation of nature and the fact that nature's stability, resilience, productivity and sustainability are governed by ecological principles. Permaculture design aims to use these principles to turn the problems and spirals of degradation outlined above into spirals of abundance.

“Integrated systems are developed to provide for our needs of food, water, shelter, energy and community in ways that are healthy and efficient.”

Permaculture Association

Through application of permaculture design, we can improve the quality and productivity of our individual lives, our society and our environment. Indeed, through creating abundant systems for both humans and wildlife together in this way, we begin to live in harmony with other people, the planet and ourselves.

With a good Permaculture design, systems' planning and start-up costs at the beginning of establishment in terms of time, money and other resources are relatively high. However, resources well spent at this time will enable a system that becomes more self-maintaining later. This means the system will require less time and money in the longer term, while productivity and diversity of systems increases year-by-year. This is the approach proposed within the Lammas project both at the level of the project as a whole and in terms of each individual plot, as illustrated in the figure below. The role of the dwellers on the land will switch from establishment of systems to their maintenance, harvesting, processing, marketing, etc. (eventually satisfying the required 75% of household needs), and managing the site for the benefit of the local and wider community.



1d.

PERMACULTURE ETHICS

At the heart of every permaculture design are the 3 core ethics of Earth Care, People Care and Fair Shares.

Earth Care: rebuilding of nature's capital and enabling all life systems to continue and increase.

People Care: enabling access to the resources people need for a good quality of life.

Fair Shares: limits to consumption and reinvest surplus to the benefit of people and all life systems.

These ethics are used to guide actions and design towards the most harmonious way of life with the lowest impact.

1e.

PERMACULTURE PRINCIPLES

As stated above, Permaculture is derived from an observation of nature and the principles governing ecological systems. The 12 main principles or positive action statements described below are from David Holmgren's book "Permaculture Principles and Pathways Beyond Sustainability".¹ Following this description, for each principle is an explanation of how they have been put into action within the Lammas permaculture design.

i) Observe and interact

With observation we are able to recognise patterns and appreciate details. Observation of nature provides us with first hand experience of how sustainable systems work, and provides the foundation from which to design human settlements with similar qualities of resilience, productivity and sustainability.

At Lammas, the observation phase for the whole project has been extensive. Surveys of the landscape, soil, biodiversity, geology, climate, local markets, transport systems, demand for services etc. have been carried out. Alongside this, the far-reaching knowledge, experience and observation of other communities, low impact developments and permaculture projects by the Lammas core group, residents and specialists has influenced the design. Observation of clients' needs, resources and aspirations similarly allow for sensitive and sensible plot designs that are realistic and achievable.

ii) Catch and store energy

This involves both the catching and storing of seasonal surpluses for household needs and long-term asset building for future generations. Household storages may include preserving home grown produce for winter use, collecting seed and firewood. The main long-term assets that we need to build and preserve for future generations are water, soil and biodiversity (including wildlife and its habitat, trees and seed).

At Lammas, the most obvious application of this principle is the use of passive solar design within the houses. The solar energy is captured during the day and slowly released at night, thereby hugely reducing the resources needed to heat the house. Processing of crops will allow for seasonal surpluses to be stored providing income over the leaner times of the year. The soil and biomass are regarded as important storages of water, nutrients and genetic potential, and plots are designed and managed to most effectively achieve this function. Long-term asset building is a focus of all the designs with tree planting, water conservation, soil fertility building and the saving of seed.

iii) Obtain a yield

This is a reminder that as well as long-term sustainability and productivity, short-term needs must also be met. Work and yields (inputs and outputs) need to be measured realistically (not with farm subsidies) to ensure that we are actually obtaining a yield for our efforts. *Minimum effort maximum effect* - energy needs to be used appropriately to get the optimum output for the least input.

At Lammas, within the livelihood designs attention is paid to producing yields sufficient to meet 75% of basic household needs. The designs integrate short-term yields with longer term planning.

iv) Apply Self Regulation And Accept Feedback

Dependence on large-scale remote systems has led to not understanding or acknowledging the full consequences of our actions as human beings. By accepting personal responsibility for our own needs and accepting the consequences of our actions there can be a shift from dependent consumers of unsustainable products to responsible producers of appropriate wealth and value. Empowerment of individuals leads to a more balanced and harmonious world.

At Lammas, plot holders are taking responsibility for their own production and responsible waste disposal. Documentation and performance indicators will provide important

evaluation tools, enabling Lammas plot holders to self regulate their systems and designs, and to make the necessary adjustments to ensure that they are getting the optimum yields from their land.

v) Use Renewable Resources And Services

Renewable services are non-consuming uses e.g. a horse pulling a cart and plough. Using renewable resources is using nature's interest instead of the capital or savings.

Sustainable systems emerge through working with nature.

At Lammas, the use of chickens and ducks within the designs is an example of how pest management can be achieved using these renewable services, replacing the need to use expensive pesticides that are produced using non renewable fossil fuels and leave chemical residues in the crops. Use of legume green manure/fallow crops to provide nitrogen instead of artificial fertilizer is another example.

vi) Produce No Waste

Councils across the UK spend a vast amount of time and resources on recycling. While this is valuable to reduce waste going into landfills and incinerators, it is actually dealing more with the symptoms rather than the causes of all of this waste. Recycling is only one of the 6Rs' we need to focus on to drastically decrease waste production. The other 5 are, refuse, reduce, repair, reuse, re-educate.

At Lammas, all 6 of these waste reduction strategies are designed into the system, and plot holders have existing lifestyle commitments in place for waste reduction. The first strategy is to refuse bringing waste into their homes, such as refusing to use plastic bags; reducing e.g. buying produce with minimum packaging; repairing rather than discarding and buying new; and reusing items as many times as possible before then recycling. These policies will extend to their livelihoods where minimum packaging is used for distribution. Recycled materials will also be obtained from local businesses for use in the building of homes. The demonstration of these methods at the Lammas project will help to

re-educate the general public about their own waste production. (For further details see waste reduction policy.)

vii) Design From Patterns To Details

No two sites are the same, and each design is unique. There are, however, patterns and templates that can be used on any site. For example, zonation, sectoring and elevation planning are design tools that can be applied to each particular site. Zones are a concept tool for managing labour resources on a site i.e. the gardener's energy. The more frequently we need to visit an element the closer it needs to be to the home e.g. salad crops that need watering at least once a day need to be near the house, woodland that only needs to be visited a few times a year can be further away.

Sectors are a way of managing incoming energies such as wind and sun so they can either be used more efficiently and productively (such as solar gain and wind energy), or buffered against if harmful to the system (such as windbreaks to shelter crops, livestock and buildings).

Elevation planning ensures that aspects of slope and altitude are used efficiently in the design, such as use of gravity to move water around the landscape, and to ensure that steep land is protected from erosion

At Lammas, the use of zonation is key to the success and productivity of the land. Placing the home in a central place on the plots enables the constant care and attention that is needed. If people had to live off site this attention could not be provided in the same way and would lead to an estimated drop in productivity of up to 50%. Sun and wind sectors have been considered when deciding where to place crops and structures. Another important sector that has influenced design is the visual impact sectors. Elevation planning has been used to map out water-use strategies and planning of access routes, plantations and orchards.

viii) Integrate Rather Than Segregate

Synergy is created when the design is integrated: the whole is greater than the sum of its parts. When beneficial relationships are created between systems and outputs of one system provide inputs for another system, work and pollution are minimised. Unmet needs or inputs = work and unused outputs = pollution.

At Lammas, there are many benefits from having several smallholdings working together on some communal aspects. The sharing of infrastructure, resources such as tools, labour and transport greatly reduces costs and ecological footprints compared with having 9 separate smallholdings. There will be many formal and informal relationships between the residents that will facilitate their livelihoods. There are also many beneficial relationships and connections between the local community and the wider community that is working towards sustainability.

ix) Use Small And Slow Solutions

This principle demonstrates long-term thinking. Small well-managed areas can produce more than large, less intensively managed areas, and can be increased in scale in a more controlled way.

At Lammas, the implementation plans show how plot owners will be working out from small, well-managed areas. A balance is reached within the designs between meeting short-term needs and long-term thinking. For example, use of intelligent and appropriate soil-building strategies will result in continuously increasing diversity and productivity as the land is able to support more life.

x) Use And Value Diversity

The more diverse a system is the more niches are created and filled.

Important functions are supported by many elements - instead of relying on only one crop for our food we would grow many food crops in case one of them failed. The same is true for income, water, heating, etc.

At Lammas, each plot is designed to be resilient with a diversity of crops and income streams. This provides a buffer zone in case of one crop failing in a particular year and also has incalculable benefits for wildlife. The more diverse the system, the more niches are filled and greater yields per unit of land are possible.

xi) Use edges and value the marginal

Edges between two ecosystems have increased productivity, being able to support flora and fauna from both as well as having unique species within the edge.

At Lammas, the edges that are being explored are in the income streams. While conventional small holders may concentrate on the main staples in the vegetable garden the Lammas plot holders are exploring more of the niche and specialised markets. They are pushing the boundaries of profitable produce from the land in order to meet 75% of their basic needs.

xii) Creatively Use And Respond To Change

Succession is an ecological process moving from bare/degraded land to a climax ecological system (such as a mature forest) through the use of specialised "pioneer" plants, each of which prepares the ground for the next stage in succession. It can be accelerated within a permaculture design by the use of specifically chosen species, and can also be applied to non-plant systems where immaturity is replaced by maturity. This principle links in with the first: before we change anything we need to observe first and think hard before changing anything.

At Lammas there will be successional incomes with longer-term crops coming into production sometime after the initial crops. Wildlife habitat creation will also be accelerated with the use of pioneer species. The designs will be able to respond to change in markets and climate.

1f.

PERMACULTURE DESIGN PROCESS

The following SADIMET framework has been used in the design process.

Survey:

This first stage relates to the first principle of observe and interact.

Both the land and the people are involved with this. Surveys conducted on the land include

- Ecology
- Habitat and Species
- Soil
- Water (including Dulas Hydro report)
- Geology
- Economic Activity & Marketing
- Visual Impact Assessment
- SEI Lifestyle Questionnaire

When thinking about the people on the land the following questions have helped determine the direction of both the individual and the overall design.

What do the potential residents want? (both adults & children)

What resources are available? (from residents, locally, on site).

What are the limiting factors? (factors that have the potential to limit productivity: physical ones on site such as soil fertility, slope, aspect, water, climate, pests, etc. and "invisible" ones such as time, money, regulations, etc.)

What is the budget: time, money for implementation & maintenance?

Analysis:

The next step is to determine what this information tells us and what we are trying to achieve with the design, such as reduced eco-footprint, higher food self-reliance, sustainable livelihoods, better water conservation, wildlife conservation, etc.

Design:

We then move on to the design itself and look at what the systems & elements are that will fulfil these functions. We then look at the relationships between these systems/elements and their placement.

A PASTE sheet (Plants, Animals, Structures, Tools, Events) helps to give an overview of the design, and is included as a summary of the 9 plots (see 3c).

Implementation:

The implementation plan establishes how we are going to realise the design. It looks at the different phases of implementation and includes a timeline of costs and yields (inputs & outputs). The costs are measured in terms of time, resources and money.

Inputs should decrease over time, while outputs should increase. The phasing highlights any dependencies.

Maintenance:

An outline plan of annual maintenance & associated costs of time

Description	Person hours involved		
	Per week	Per month	Per year
Management			
Management decisions			
These will be made by the elected Management Committee. They will meet periodically and will hold executive powers within the office. There will be between 3 and 5 people in the committee, working between 1 and 4 hours a week.	3-20		500(est.) (voluntary)
Major decisions will be made at AGM's and SGM's. Most of the residents will probably attend. They will be held quarterly and will			160 (voluntary)

probably last 2 hours			
Office management			
The office will be manned for general enquiries, transport coordination, low impact promotion, coordinating visitors and educational visits, coordinating land management, IPS secretarial and accounting work, coordinating sales of produce from the settlement, facilitating research and other such affairs.	20		1000
Site management			
The office and meeting room will require fuel for heating. This will be supplied by a Short Rotation Coppice. Management of this coppice including harvesting, seasoning and drying will take approximately 10 days work per year.			80
Community Hub. The Compost toilet will need regular maintenance. The building will need cleaning and periodic works.	2		110
Tracks and Boundaries			
It is estimated that the trackways will need the equivalent of 4 days maintenance work a year			32
It is estimated that the "common" fencing will need the equivalent of 5 days maintenance work a year			40
It is estimated that the "common" hedgerows will need the equivalent of 15 days work a year			120
Renewable Electricity Grid			
It is estimated that the electricity grid will	2		124

need checking everyday, and will only require 4 days annual maintenance.			
Water Networks			
It is estimated that the leat will need checking and adjusting periodically and require 20 days annual maintenance. This is a time consuming affair due to the large distances involved.	4		360
The millpond will need checking and adjusting periodically. This ties in closely with the previous entry.	2		100
The water irrigation networks should require minimum maintenance once established. Estimated at 2 days a year.			16
Tours of project			
In Summer it is estimated that there may be 5 visitor days a week, with tours each lasting about 2 hours. In the Autumn and Spring it is estimated that there will be 2 tours a week. There are no tours planned for the winter months.			312
Educational			
It is estimated that there will be about 12 educational visits a year. They will be for the most part from schools, colleges and universities. It is estimated that they will last 7 hours each and will require 3 hours preparation			120
The woodland management plan will require considerable labour to extract timber and replant. Estimated at 16 days a year for 2 people			416

Transport			
Minibus Shuttle Provision			
There will be a shuttle provision to and from the local towns			442
Total			3932

Thus the project will require approximately 4000 working hours a year to maintain the basic infrastructure. One way of looking at this would be to consider that this equates to each household working 8.5 hours a week toward this end.

Evaluation:

Performance indicators are used to evaluate the success of the project. These indicators include ecological footprint, percentage of needs met from the land, biodiversity, soil health and traffic (as explained in section 13 of the management plan)

Tweak:

The performance indicators provide valuable information to the residents as to the success of their project, this information allows them to tweak their design to maximise their yields.

1g.

ECOFOOTPRINTING

Ecofootprinting is a measurement used to establish our impact on the planet. It is a complicated rigorous calculation that takes into account the amount of energy used for any particular activity. The areas measured are mainly waste, food, transport and water. The figures show how much ecological capacity we occupy. Countries with footprints higher than their capacity are living beyond their means either by living off nature's capital, which will dwindle over time or by importing resources from elsewhere. Currently the UK average is 5.36 gha (global hectares). This value means that we would need 3 planets to live. In order to live within the planet's means i.e. sustainably we need to be able to live on 1 planet hence the term "one planet living".

A recent planning appeal cited the eco-footprinting evidence as valuable evidence to support their case. The appeal was won and planning permission granted. As stated by the planning inspector:

“Encouraging sustainable development is central to current national guidance. The ‘ecological footprinting’ evidence put to the inquiry demonstrates that the impact of individuals living at Keveral Farm is some 38% of the average impact of a UK individual. Their lifestyles reduce their impact on the environment by 62% when compared to the UK average. The majority of the Community work either full time or part time on the farm. Permitting a small affordable dwelling at Keveral Farm would contribute to reducing travel and would support sustainable objectives.”²

In another example of a homestead designed using Permaculture principles, Chris Dixon at his farm Ty Penrhos Isaf in West Wales has calculated his carbon footprint to be between 1.8-2.5 tonnes CO₂ p.a³, the UK average is around 10 tonnes CO₂ p.a

Similarly in the recent appeal decision on the Landmatters Co-operative (Thursday 23rd August 2007), the Inspector’s ruling explicitly endorsed the permaculture aspect of the project. The planning inspector granted planning permission for a permaculture holding, integrating agriculture, forestry, education, ancillary rural enterprises and residential use subject to the 'low-impact' criteria set out in their planning application. It marks a further important benchmark for the recognition of permaculture by the planning system.

2.

LAMMAS PERMACULTURE DESIGN PROCESS

2a.

DESIGN MEETINGS

Design meetings were held in October 2006, November 2006 and March 2007 as well as design workshops at Lammas’ Autumn, Winter and Spring Gatherings. During these meetings the stages of permaculture design were worked through as a group, which mirrored the processes that the individual residents were working on. This was done using

techniques from different sources such as McHarg exclusion method⁴ and Edward De Bono's 6 hat thinking tool.⁵

Autumn: client interview – potential residents

October: plot size and boundaries

October: community hub – functions and citing

Winter: planning for real (looking at the possible connections between plot holders.

March: allocation meeting and feedback on individual designs

Spring: support for individual designs



Landscape model of the site constructed for permaculture design meetings

2b.

PLOT SIZE

When establishing the optimum plot size and number, consideration was paid to the following factors:

- Existing field boundaries
- Existing wildlife corridors
- Visual impact
- Viability of income

- Soil fertility
- Need to produce 75% of basic household needs from the land
- Aspect

The viability of livelihood was obviously one of the most crucial factors and to examine this we looked at existing permaculture projects to consider what lessons can be drawn from them and applied to the Lammas project. We were particularly interested to see how the use of permaculture design can make the best use of available land. Any farmer or smallholder can testify to the reality that working the land is not a 9-5 job but a daily task that can occupy every waking hour at times through the year. This is true of permaculture land projects, although the latter consistently have a higher productivity per unit of land. One of the findings from the review of other projects was that people living on the land were able to give the care and attention needed to their crops and animals. The integrated approach of permaculture projects allowed smallholdings of between 3 and 10 acres to be managed successfully. Low impact living and permaculture dictate a need to avoid large-scale, monoculture and intensive agriculture. Using permaculture concepts, principles and techniques, the approach is to manage human scale systems and increase the yields from the available land, rather than look to increase the land size. The relationship that is developed between the land and the farmer is what makes it unique and distinctive and ultimately increases the productivity. Within permaculture design we look at the *sum of yields*. For example, a conventional approach to keeping chickens would be just to look at the number of eggs produced. When looking at the sum of yields however, we value the eggs, meat, heat, CO₂, pest control and manure outputs of the chicken. When looking at the overall design and *sum of yields* we can see that overall they can produce 75% of basic household needs. When looking at a permaculture system it is not just the number of elements or systems, but the number of connections and the relationships between them that is important. If, however, we were to separate the systems, we would lose the benefits of the integration of the systems within one plot and between plots. This would result in a drop in productivity.

Some of the projects studied and/or contacted for their experience in low-impact settlements are listed below. It is noteworthy that all of these have received planning permission to live on the land where their livelihoods are based.

Place	Area (Acres)	No: Residents (Households)	Landuse
Keveral Farm, Cornwall	30	15 adults, 9 children (8)	Mixed vegetable, polytunnels, forest garden, orchards, woodland. No livestock
Ourganics, Dorset	5	1 adult	Mixed vegetable, fruit trees, forest garden, polytunnels, poultry
Fivepenny Farm, Dorset	80	4 adults 6 children (2)	Mixed vegetable, polytunnels, orchards, woodland (under establishment), cows, pigs, sheep, poultry.
Ty Penrhos Isaf, Gwynedd	7	2 adults (1)	Mixed vegetable, polytunnels, forest garden, orchard, woodland, poultry, horses
Stewards Wood, Devon	32	10 adults, 3 children (6)	Woodlands, forest garden
Tinkers Bubble, Somerset	40	11 adults, 4 children (6)	Woodland, orchards, pasture, vegetables, polytunnels, working horse, cows
Prickly Nut Wood, W. Sussex	8	2 adults, 1 child (1)	Woodland, vegetables, forest garden, polytunnel

There are 76 acres of land in the Lammas project which will be managed by 9 households. Therefore each household will effectively be managing approximately 8 acres each.

When looking at the soil fertility and aspect of the Lammas site we concluded that one of the fields was extremely rich in fertility and depth (300mm to 450mm) and two of the lower fields have poor fertility and depth (50mm to 120mm) and are steep. These facts have resulted in the decision to use the steep fields for grazing and coppice with the design of plots 1-4 as a terrace being sited on the fertile ground, thus enabling four families to

capitalise on these findings. The other plots enjoy a range of soil depth averaging at about 230mm.

It is important that all the plots do not disturb existing wildlife corridors and have areas of visual screening for house placement.

These factors have led us to the plot boundaries as shown on the site plan.

2c.

SWOC analysis

The following SWOC analysis was completed by the residents in March.

Strengths	Site – land owner, Dedication, Co-operation, Current political climate, Momentum Public goodwill, Community, Affordable housing prices, Media & public interest Range of knowledge, Exemplar, Quality of personnel, Inspiration, Biodiversity Positive impact, Improving local economy, Uniqueness, Using local services, Educational process
Weaknesses	1 st time, height above sea level, harsh living, lack of city resources, marketing plan establishment costs, waiting period, perception of neighbours, soil health, public opinion, exposure
Opportunities	Attract funding, Media, Local contact, Trail blazing/pioneering, Personal growth and empowerment, Friendship, Influencing council policy, Keeping local services, Rural regeneration, Opportunity for designers, One planet living measurement, Social enterprise, Survival strategy, Working partnerships, Community, Healthy eating Eco foot print – living laboratory, Eco tourism, Cross fertilization, Networking Experimentation
Constraints	Global economy, Local climate, Unpredictable climate change

	Road sizes -> transport of building materials, Temporary accommodation Visual impact, Time and energy
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2d.

POSITIVE IMPACT LIVING

Using permaculture design we attempt to not only have a low impact but to actually have a positive impact on our own lives, our communities and the environment. The positive impacts that would be expected and are designed for are

Environmental benefits

- Increased biodiversity
- Increased soil health and fertility
- Wildlife habitat creation

Social benefits

- Quality of life
- Healthy living
- Public access to the countryside
- Education

Economic benefits

- Providing rural employment including local contractors and seasonal employment on site
- Boost to the local economy
- Local shop
- Resource production

These benefits would start to accrue within the first few years and would further increase over time.

"The diversity and richness of local food around the planet is surely one of our greatest biological and cultural treasures. Preserving it for generations to come will require changes at the policy level as well as at the grassroots. The benefits will be immense: simultaneously improving the environment, reinvigorating our economies, revitalising our sense of community, and even reducing poverty, hunger and violent conflict."⁴

Helena Norberg-Hodge

2e.

CONNECTIONS WITH THE WIDER COMMUNITY

The most immediate connection will be with the many customers of the Lammas produce. This will predominately be with local people at farmer's markets and whole food shops, which will help to boost the local economy. The website and markets further a field will help to establish the quality of Lammas produce more nationally.

Further connections with the local community will be made via the part-time café and shop, contractual work and employment for local people and the many other skills that are present with the Lammas residents. Local schools will have opportunities to visit and learn at the project. Other visitors to the site including those on courses will be able to take away significant information as well as inspiration. These visitors will include university students, vocational trainees, volunteers and guests.

On a wider scale the Lammas initiative aims to, and has already begun, to broaden awareness of low impact living and to provide the valuable inspiration for people to redesign their own lifestyles.

The work that is done both socially and on the land links in with many existing networks that have similar aims including the Permaculture Association, Garden Organic, Soil Association, Centre for Alternative Technology (CAT). There will be many opportunities for inter and intra-organisational exchange and cooperation by developing and using the Lammas project as a noteworthy case study and research model.

2f.

ONE PLANET MODEL

The Lammas project is going to be a model for sustainable 'one planet eco-footprint' living. As a model there are 4 main functions that Lammas will perform in which the work done on site can be disseminated to the wider public reaping benefits beyond just the people living on site.

These 4 functions are

Demonstration

Education

Resource production

Research

With *demonstration* people can see how techniques and systems are being used and see their productivity. They are then able to be *educated* on how to build, implement and manage the techniques/systems for themselves. *Resources* such as seed, seedlings and educational matter (books etc.) can be made available for them to take away and implement the techniques in their own lives, and information can be given on where to obtain the resources if they are not directly available from Lammas. The fourth function is for the project to carry out *research* in how to improve the techniques to achieve the best results.

Below are some examples of the different functions:

Specific ways of how each plot will be fulfilling these functions is given in section 3b below.

Demonstration: the diversity of plots here is crucial to demonstrating the widest possible range of techniques. Techniques and/or systems that will be demonstrated include

- low impact building (passive solar design, cob, straw bales, timber etc)
- organic gardening (fruit and vegetable production, propagation, seed saving, green manures, living mulches)
- animal husbandry
- waste management (use of recycled materials in building, grey water treatment, compost toilets, compost, wormeries, minimum waste brought on site i.e. products with packaging)

- woodland management (coppicing)
- renewable energy (hydro, solar)
- water management
- wildlife conservation
- soil conservation and improvement

Education:

- courses
- skills development
- tours
- media coverage
- briefing sheets

Resources:

- publications
- seeds
- plants
- worms
- compost

Research:

- into cutting edge technologies and approaches
- specific cultivation for the West Wales climate
- documentation
- dissemination

A diversity of households on the land is needed to fulfil these functions and enable households to meet their own needs as well as contribute to these wider aims

2g.

DISSEMINATION

Lammas has already attracted quite a lot of media attention that is set to increase once the project is established on the land. Campaigning and raising awareness of the issues and the possibilities of low impact living is a key focus of Lammas. Publications that will be

targeted include Permaculture Magazine, The Land, Resurgence Magazine, The Ecologist magazine... as well as the local and national newspapers, radio and television.

3. PERMACULTURE DESIGN FOR THE PLOTS

The potential residents of Lammas are a highly skilled, dedicated group of people. They have between them wide ranging experience that will enable them to carry out the work needed to provide their own livelihoods. Permaculture designers recommend that time, money and other resources are spent and invested in the planning and establishment phases so that mistakes are made on paper rather than on the land. The residents of Lammas have all spent many hours and days researching and thinking about their designs including species choice, placement and building materials, to facilitate their implementation when they come onto the land.

Permaculture 3a

Summary of people and relevant skills

Plot number	Names	Skills
1	Andy, Jane and Jake Wells	We are a family of three. We are committed to living a low-impact, sustainable life style. We have many years experience of small scale organic horticulture and free range poultry rearing. Additionally Andy has many years experience of environmental engineering and is used to developing and implementing appropriate solutions for waste, water and energy problems. Jane is a teacher with particular interest in environmental education and forest schools. Jake is 15 and is currently studying for GCSEs.
2	Katy Taggart & Leander Wolstenholme	We are a family of five. We want to help demonstrate that it is possible to support ourselves sustainably from the land. We bring with us a wealth of professional experience in ecology, botany, horticulture and experience of running a successful small business for the past 9 years.
3	Katherine and Steve Moseley	We are a family of three who wish to become self sufficient and lower our carbon footprint. We are organic gardeners with experience of growing fruit and vegetables. Katherine has experience of making baskets from local resources such as willow and brambles. Steve uses driftwood and other materials found on our local beach to make everyday objects such as frames and mirrors. We want to take this a step further and show how it is possible to live a sustainable life off our land. Katherine has a degree in Design and Media Management, an HND in Business and Finance and a PGCE in primary education. She has been working as a teacher for 8 years. Katherine is a qualified Holistic Therapist and a qualified lecturer in this field. Steve is a qualified glazier and is also active in creating objects from locally sourced materials. Katherine and Steve also have first aid training and are Marine Mammal Medics for BDMLR. We hope our experience and education will further enrich the local community.
4	Ayres, Marianne, Mirelle, & Ellion Gipson	We are a family of four who have always lived a low-impact lifestyle. Within Marianne's experience as a commercial gardener, business manager, office manager, administrator, editor, sustainability educator, and devoted mother of two, Ayres' experience as a farmer, farm and garden manager, business owner, manager, and administrator, US Marine Corps and Army sergeant, team

		supervisor, Japanese translator, bodyworker, teacher, group facilitator, and counsellor, Mirelle and Ellison's abundant charm and stunning good looks lie the abilities to lead, follow and follow through, organise, educate, and achieve.
5	Dawn and Ant	We are a married couple who bring our depth of experience in organic horticulture, permaculture, agriculture and community living to the settlement. Ant has many communication and administrative skills, is a good team worker and is passionate about preserving and enhancing our natural environment. Dawn is an intuitive permaculture student and teacher, working with earth energies to bring beauty and abundance. We have been living a low-impact lifestyle for over a year now and working towards a sustainable future for several years. Our land management plan show how we aim to achieve a realistic sustainable future from our smallholding, and how our enterprises flow in harmony within the whole settlement.
6	Paul & Hoppi Wimbush	We are a family of five with a wealth of architectural, agricultural and community experience. We are passionate about sustainable living solutions. In addition we bring education, communication and therapeutic skills with us. We have experience of low-impact building and living.
7	Simon Allard & Jasmine Saville	We are a family of four who have built and lived in two low impact houses and have been involved in sustainable land use, woodland management and permaculture food production for the last five years. Our Lammas proposal combines this with our extensive experience of teaching, working with groups and self employed project management to offer a practical and accessible resource to find real solutions to the challenges of contemporary environmental issues. Through our land management we will attain a realistic level of sustainability in a rural context that demands diversification both for domestic subsistence and business; as a teaching resource and crucially a net gain in biodiversity.
8	Cassandra & Nigel	We are a couple with 3 children, one with a disability. We are passionate about living lightly on the earth. We are also totally committed to providing meaningful opportunities for disadvantaged people, and finding new ways to make our society more socially inclusive, as well as sustainable. With 8 years business management experience and an environmental science degree, Cassandra is highly qualified as well as being a talented craftswoman. Nigel has 10 years experience working in national learning disability organizations and has an international social business qualification. We both have years of

		gardening and land based livelihood experience. We want to further develop our skills and use them to teach schools, visitors & other groups about sustainable living and social integration.
9	Kit & Saara	We are a couple currently living in a small cabin in woodland on the Gower. Kit is a furniture maker, running a small workshop. Saara is currently a student, but also a fully qualified nurse. We have experience of growing our own fruit and vegetables. We are keen gatherers from nature. We are interested in all aspects of traditional crafts, from preserving techniques to making soap and basketry.

Permaculture 3b

Benefits

	Demonstration	Education	Research	Resource production
1	<p>We want to demonstrate that living a low impact lifestyle in harmony with nature and the seasons is not only a practical and comfortable experience but is also good for emotional and physical well being. We look forward to the challenge of supporting the land as it supports us.</p>	<p>Andy is keen to share his knowledge and experience of appropriate solutions to waste, water and energy problems. Jane is an inspirational and dedicated teacher. After learning Welsh, she will offer school visits to smallholding, composting advice, habitat studies and outdoor craft workshops.</p>	<p>We will research companion planting as a method of pest control. We have already discovered that inter planting carrot with coriander is effective against carrot fly.</p> <p>Growing strawberries in a polytunnel using hydroponic methods to increase yields.</p> <p>We will be researching the cultivation of grain crops such as Quinoa and the growth of tropical fruits.</p>	<p>We will be producing a range of seasonal vegetables as well as soft and top fruits.</p> <p>In addition we will provide livestock as a resource.</p>
2	<p>The cultivation of native wild plants.</p>	<p>We will be leading nature walks and talks in the local area with an emphasis on native plants.</p>	<p>We will be researching the cultivation of wild native plants.</p>	<p>We will produce willow for craftwork. We will supply wild foods.</p>
3	<p>We aim to show that plants can be grown in our climate that can replace the mass import of cotton from around the world. This would demonstrate the viability of a cloth industry for modern times.</p>	<p>We will forge links with local schools and use curriculum based projects on our land to enrich school based teaching.</p>	<p>We will be researching the different methods of growing flax, harvesting flax and the processes available to make the flax in to cloth. We hope to find a</p>	<p>We will produce flax cloth to create our own products to supply the local and wider community.</p> <p>We will supply food from</p>

	<p>Our aim is to show how a low impact, sustainable life style can be accessible to all, in one way shape or form. We wish to demonstrate the advantages of using permaculture techniques over traditional agriculture and horticultural methods.</p>	<p>We intend to show how flax can be effectively cultivated and used as a viable alternative to cotton imported from all over the world.</p>	<p>method for a viable flax cloth industry in the Welsh and U.K. climate.</p>	<p>our land to the local and wider community.</p> <p>We will provide information about our plot and research carried out through talks and guided walks of our land. We will also make information available on our personal and the Lamma website.</p>
4	<p>We are now eager to move on to a new role in our relationship to the land and our global community, to transition from low-impact dwellers to land-stewards. The former, while a necessary stage of environmental awareness, simply forestalls or mitigates destruction, sees humans as separate from and perhaps even bad for the planet, and stands in opposition to consumption. The latter brings forth life, food, and sustenance, sees humans as an integral, beneficial and benevolent function of the 'ecosystem' and affirms the abundance that comes from direct relationship to the planet that is both home and provider for us all.</p>	<p>We intend to support and educate the wider community about the proper re-use of 'organic waste' materials through a Community Compost Scheme and our vermiculture compost system. Our electric collection vehicle will take kitchen scraps, garden waste, cardboard, paper, etc. from, for example, local restaurants, shops, schools, and neighbours. We will offer tips, services, and samples of worms and finished worm castings that would help people improve their own home compost production. Organisations and</p>	<p>The art and science of vermiculture & vermicomposting – worm husbandry and the use of composting worms to turn 'organic waste' into nutrient-rich, plant-ready fertiliser – will be our primary areas of research.</p>	<p>We plan to write informational leaflets and articles concerning the art and science of vermiculture & vermicomposting. We project that after one year from start-up we will easily have the capacity to efficiently turn .5 to 1.5 tonnes of 'organic waste' into 100 to 400 kilos of fertile topsoil, weekly. We plan to also produce 'garden variety' compost, compost tea, and composting worms.</p>

		<p>businesses may, from time to time, need to consult about their own organic waste disposal. We will offer a consultation and system design service. We plan to conduct tours and volunteer workdays in the wormery where people can see first-hand the everyday magic performed by composting worms.</p>		
5	<p>We wish to demonstrate the advantages of using permaculture techniques over traditional agriculture and horticultural methods.</p> <p>There will be a wilderness area on the south-east side that will be unmanaged and allowed to develop naturally into woodland. Schools and education centres will be invited to watch and monitor the various stages for educational purposes.</p> <p>We will be experimenting with four types of soil improvement methods which will show differing results in soil health, ph level improvement and crop yields/health.</p> <p>Seer Rock dust</p>	<p>We will run workshops on our holding and on communal land to show people how easy it is to live with nature rather than continuously working against natural forces. The aims are to show people how they can build shelters they can actually live comfortably in, how to forage the land for food and comfort and how to live a low-impact lifestyle, at the same time building self-esteem and self-awareness through fun activities.</p> <p>We will hold courses in</p>	<p>Plot 5 has acid soil and we will experiment with the alternatives to the traditional lime used in these circumstances.</p> <p>Forest gardening is an ongoing research project. We will be experimenting with various food production techniques.</p>	<p>Information on how Plot 5 is run and maintained will be available on boards, leaflets and both the Lammas web site and our own web site; www.permorganics.org.uk</p> <p>In a similar manner, information on the principles of sustainable living used on Plot 5 and why it is designed how it is will be available.</p> <p>We will produce medicinal herbs as pot plants, fresh cut and dried for the Natural Remedy market. Our herb gardens will be entered into organic conversion with our vegetable gardens and</p>

	<p>Agricultural Lime Green Manures Sheet mulches</p>	<p>herb cultivation and usage, dye plants and making natural pigments, and permaculture gardening.</p> <p>Informal information sharing will also be available on an ad hoc basis to visitors when useful.</p>		<p>poultry.</p>
6	<p>We aim to demonstrate an integrated permacultural approach to farming.</p>	<p>We will run courses in a range of topics including “low impact architecture”, “sustaining healthy communities” and “honouring the sacred within.” Hoppi is very passionate about bringing emotional intelligence into the education system.</p>	<p>We are particularly keen to research the viability of various fruit and nut growing possibilities in North Pembrokeshire.</p>	<p>We will provide livestock as a resource, as well as literature on the project as a whole. In addition there will be blueberry plants, raspberry canes and hazel trees.</p>
7	<p>Specifically 1 acre will be planted as a forest garden, a complex form of agroforestry (fruits, nuts, climbers and herbaceous plants densely planted to emulate the structure and relationships of natural woodland, Wales' climax ecosystem). This area will be cultivated for home consumption but is intended explicitly as a teaching resource</p>	<p>Jasmine's micro business, Mini Edible Gardens, will after the set up phase also be extended as a education resource as she takes this concept into schools on a non profit basis working in conjunction with existing projects where appropriate, e.g</p>	<p>The forest garden is an ongoing research project in addition to being an education resource and food growing area for ourselves. Experimenting with unusual edibles (eg fuschia trees provide raisin like fruits in late summer whilst being</p>	<p>Seed saving of plants and trees will provide material for a nursery for home planting and surplus plants and saplings will be made available for visitors in keeping with the aims of facilitating other people to make a start in growing food and trees. E.g. we will establish a small tree nursery from seed mast at</p>

<p>to demonstrate planting techniques, principles and unusual edible crops as a strategy to mitigate the vicissitudes of climate change, erratic weather and the challenge this poses to food security. The forest garden model is adaptable to backyard up to broadscale and will be presented on site with information boards for the benefit of visitors and the community. Specifically Jasmine Saville has begun teaching a forest gardening course and will be using the site for this.</p> <p>The dwellings are designed to be fully self sufficient with complete passive solar heating. In combination with the use of natural materials, this will be a nationally unique example.</p>	<p>Naturewise in Cardigan.</p>	<p>tolerent of extreme weather conditions) and planting styles (eg layering of crops to maximise space and seasonal conditions and soil cover to increase yields and minimise inputs) is new territory and as such is research into what is possible in west Wales to diversify food crops and improve soil and biodiversity. This will be closely monitored and documented from the start and liason with the Agroforestry Research trust in Totnes and Naturewise in Cardigan will provide information sharing and plant resources to maximise success.</p>	<p>Pont-y-Gafel of alder, elder and ash to plant in our wildlife corridor and in the thinned conifer plantation on our site. Surplus saplings will be available at a small price to cover costs to any interested party. Similar example, surplus soft fruit cuttings will be grown to facilitate mini fruit gardens in local schools. A key part of Jasmine's Mini Edible Garden packs and strategy to replenish the soil is comfrey production for bulk organic matter, as a liquid manure and as root cuttings for propogation. These products would be available on site and a key element of her market produce. This is specifically intended as a resource to facilitate real sustainability (to get people growing, alternative to synthetic and fossil fuel fertilisers etc) and as such comes with full instructions for use and information explaining the point of the resource.</p> <p>By participating in the woodland management of</p>
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				the site, Simon will help to make sustainable local timber available to project members and outside parties in the case of surplus (subject to development of woodland management plan).
8	<p>We will be building a demonstration vernacular cob walled garden with 4 small cob/recycled glass greenhouses. The garden will be made accessible to people with a partial physical disability, and will be made with people of all ages & abilities.</p>	<p>We will be offering sustainable crafts work experience to local people with a learning disability. Through this work we hope to develop a small social business run by and for the clients.</p> <p>We will offer low impact yurt holidays to disadvantaged families with a child with a learning disability.</p> <p>We will be offering hands on workshops for schools and other groups in willow crafts and felting.</p> <p>We will run cob building courses on our workshop, house and walled garden.</p> <p>We will grow many different willows for coppice and crafts</p> <p>We will plant a wide variety of broadleaf trees for food, fuel, &</p>	<p>We will be documenting the therapeutic value of 'Permacultural Therapy' for disadvantaged people through user led video diaries.</p> <p>We will be experimenting with own root coppice orchard intercropped with perennial vegetables, as well as Green manures for soil fertility and in rotation mulches.</p>	<p>Our learning disabled clients and all yurt rental guests will feedback to Local Authorities regarding our method of social inclusion & 'permacultural therapy', for the benefit of future projects in other localities</p> <p>We will produce an annual report on how this work is going, written using feedback and input from our clients & yurt guests</p> <p>We will make available a leaflet on how our plot is run & why</p> <p>We will sell any excess soft fruit plants & dye herbs & shrubs, as well as seeds</p> <p>We will produce a brief report on the results of our experiments with bi-cropping, green manures,</p>

		<p>animal forage</p> <p>We will be growing dye herbs, shrubs & trees, sharing the seeds, & selling the plants and plant dyed wool.</p>		<p>inter cropping, and our coppice orchard</p>
9	<p>We plan to demonstrate efficiency in our holding and excellence in our craftwork.</p>	<p>We will run courses on furniture making.</p>	<p>Forest gardening is an ongoing research project. We will be experimenting with various food production techniques.</p>	<p>We will be producing a range of meat and dairy products, ciders, furniture, artwork and craftwork.</p>

Permaculture 3c
 PASTE Analysis

plots	PLANTS	ANIMALS	STRUCTURES	TOOLS	EVENTS
1	<p>Native apple Trees, Soft Fruit and asparagus for income.</p> <p>Hybrid willow, Chestnut, Ash and Hazel coppice for basket and besom making.</p> <p>Fruit and vegetables, for household.</p> <p>Traditional wildlife hedges will be planted.</p>	<p>We are planning to keep around 30 chickens for egg production. Oxford Sandy and Black pigs to provide meat for our own use.</p>	<p>Terrace. <i>This will be built using roundwood and sawn wood to form the frame. It will be infilled with straw bales and cob. The roof will be turf.</i></p> <p><i>Relevant to plots 1-4</i></p> <p>Two polytunnel (20m x 5m) One roundhouse 2 Mobile chicken arks Pig ark. Barn Timber framed, turf roof Greenhouse Timber framed</p>	<p>We will use mainly traditional hand held gardening and woodwork tools for all work around the holding.</p> <p>We may use tractor from plot 9 in year 2.</p>	<p>Harvest gathering and celebrations involving volunteers and community.</p> <p>Autumn coppicing for basket work and besoms.</p> <p>Christmas crafts for local children. Wildlife walks and bird watching.</p>
2	<p>A wide variety of basket willow to use for basket making and also to sell.</p> <p>A variety of native, edible food plants to sell.</p>	<p>We plan to be a part of the cow club</p>	<p>Terrace. <i>This will be built using roundwood and sawn wood to form the frame. It will be infilled with straw bales</i></p>	<p>Mainly use traditional hand held gardening tools and hand held basketry tools.</p>	<p>Harvesting basket willow is an activity that takes place in winter or early spring.</p>

	<p>Native plants for fabric dye kits</p> <p>Fruit trees and bushes for jams and pickles</p> <p>Vegetable garden</p> <p>Orchard</p>		<p><i>and cob. The roof will be turf.</i></p> <p><i>Relevant to plots 1-4</i></p> <p>One polytunnel (5.2m x 2.5m)</p> <p>One roundhouse (6m dia) (Toolshed/ workshop/ woodshed)</p>	<p>Will use tractor from plot 9</p>	<p>Pruning will take place in the orchard on a cold dry day in winter.</p>
3	<p>Flax for linen.</p> <p>A variety of basket willow, dogwood, brambles etc. to use for basket making.</p> <p>A variety of edible food plants to sell.</p> <p>Native plants for fabric dye .</p> <p>Fruit trees and bushes and strawberries for jams and pickles.</p> <p>Vegetable, soft fruit and herb garden.</p> <p>Orchard.</p>	<p>We will keep 30 Rhode Island Reds for egg production and 6 Khaki Campbells for personal egg consumption.</p> <p>These will also help with pest control.</p>	<p><i>Terrace.</i> <i>This will be built using roundwood and sawn wood to form the frame. It will be infilled with straw bales and cob. The roof will be turf.</i></p> <p><i>Relevant to plots 1-4</i></p> <p>Barn/workshop – 18m by 5m; timber frame with turf roof.</p> <p>Three moveable poultry arcs, 3mx1.3m</p> <p>Three polytunnels , 1 - 9m x 4m (height 7ft) and 2- 18mx5m (height 8ft 6in)</p> <p><i>Garden arbour – 5m diameter.</i></p> <p><i>Compost toilet. 3m by</i></p>	<p><i>We will mainly use traditional hand held gardening tools and hand tools for transporting and turning compost.</i></p> <p><i>Will use the tractor from plot 9 and or community horse and plough.</i></p> <p><i>Loom – contained in the barn/workshop for weaving flax linen.</i></p> <p><i>Spinning wheel for turning flax in to yarn.</i></p>	<p>Sowing flax crop from Mid-March.</p> <p>Harvesting crop in July.</p> <p>Flax harvest.</p> <p>Cloth production over the winter months.</p> <p>Harvesting basket willow takes place in winter or early spring.</p> <p>Christmas Garlands will be made in December and other festival wreaths throughout the year.</p>

			3m	<p><i>Fibre processing machines-rollers and combers.</i></p> <p><i>Dye vats ~ to dye the flax fabric.</i></p>	<p>Pruning will take place in the orchard during the winter months.</p> <p>Herb cultivation, propagation and preparation - April - September</p> <p>Jam and chutney making June - November</p>
4	<p>We will grow herbs, such as basil parsley, and coriander, and several varieties of garlic for sale. For home consumption and trade within the community , we will grow fruit trees and soft-fruit bushes. Annual vegetable beds will be used to cultivate brassicas, legumes, and root crops, and exotic and delicate edibles will be grown in our kitchen garden, glass conservatory, and polytunnel.</p>	<p>We are mostly committed vegetarians, with one occasional fish-eater. We will keep two Khaki Campbell ducks for pest-control, eggs, and as pets. We have expressed an interest in helping with chickens in exchange for eggs.</p>	<p><i>Terrace.</i></p> <p><i>This will be built using roundwood and sawn wood to form the frame. It will be infilled with straw bales and cob. The roof will be turf.</i></p> <p><i>Relevant to plots 1-4</i> One polytunnel (20m x 6m)</p>	<p>We will mainly use traditional hand held gardening tools and hand tools for transporting and turning compost.</p> <p>Will use tractor from plot 9</p>	<p>We plan to conduct tours and volunteer workdays in the wormery where people can see first-hand the everyday magic performed by composting worms.</p>
5	A new-plant mixed	2 Goats	House: Straw bale,	We will use	Coppicing -

	<p>deciduous woodland area. A forest garden. Extensive Vegetable gardens. SRC (willow) & LRC (hazel, ash, sweet chestnut) Herb gardens Soft fruit garden Wildlife corridors</p>	<p>20 Chickens 4 Ducks 6 Geese for milk, eggs, meat, and pest/grass control.</p>	<p>turf roof. 11 m dia. Barn/workshop timber frame with turf roof. 13m dia. 2 Poly tunnels, 5m by 14m Mobile goat shelter Mobile Hen house Mobile Duck house Mobile Goose house</p>	<p>mainly traditional hand held gardening and woodwork tools for all work around the holding. We may use tractor from plot 9 in year 2.</p>	<p>November to February. Vegetable sowing, planting, harvesting and storing – all year. Wood working – most months. Herb cultivation, propagation and preparation – April – September. Forest Garden design – winter months.</p>
6	<p>Hazelnut trees, Apple Trees, Plum Trees, Soft Fruit for income. Hybrid willow, Chestnut, Ash and Hazel coppice. Fruit and vegetables, for household.</p>	<p>2 Dexter Cows, 4 Brecon Buff Geese, Khaki Campbell Ducks, Ixworth rare-breed chickens</p>	<p>House: (168m²) Timber frame, turf roof, straw bale and outbuildings Barn: (136 m²) Timber framed, turf roof Greenhouse: (110 m²) Timber framed Root Cellar: (40 m²) Earth sheltered</p>	<p>Shelling Machine (Nuts) Will use tractor and workshop from plot 9</p>	<p>Hazelnut Harvest (September) Fruit Harvest (late summer/ autumn) A range of courses in smallholdings and personal development throughout summer</p>

7	<p>Trees: fuel, windbreak, wildlife habitat, soil regeneration, conifer area replanting including native regeneration: 'biomass' willows, alder, sea buckthorn, silver birch, false acacia, oak, ash, blackthorn, holly, elder and gorse.</p> <p>Herbaceous: comfrey, soft fruit from prunings, forest garden understorey eg perennial edibles and beneficial insect plants, yarrow, mallow, bellflower, 9 star broccoli, calendula, golden rod.</p> <p>Vegetables: for sale in Mini Edible Gardens: tomatoes, cucumbers, lettuce, melons, strawberries, french beans</p>	<p>3 Indian runner ducks for eggs and pest management.</p> <p>3 British milk sheep and their lambs for home consumption of dairy produce and meat.</p>	<p>Main house: 225m²; timber pole frame, straw bale and cob walls, earth floor, turf roof, passive solar heating, large greenhouse (90 of the 225m²), low visibility earth sheltered design.</p> <p>Chalet: 50m² otherwise as above with small greenhouse.</p> <p>Workshop: Straw bale, reclaimed perspex roof, low visibility by planting and naturally coloured render.</p> <p>Polytunnel: 25m by 6m reclaimed hoops, polythene cover</p> <p>Barn: Pole frame, board and hurdle walls, turf roof.</p>	<p>Green woodworking area including pole lathe, steam box, shavehorse etc.</p> <p>Other woodworking tools including bench tools in own or shared workshop</p> <p>Simple forge</p> <p>Grassland management: austrian scythes.</p> <p>Will use workshop (9)</p>	<p>Forest Gardening: towards an edible landscape: weekend course running in April and September. £120 includes food and camping. 10 participants to arrive mainly by public transport. From year 2 School group visits with focus on food growing for kids and nature based forest school style activities.</p>
8	<p>Dye plants e.g. woad & trees e.g. silver birch for plant dyed wool wholesale & felting packs</p> <p>Variety of Willow species for wholesale (& craft workshops on site)</p>	<p>Rare-breed Leicester Longwool sheep, for making organic plant dyed wool for sale, their lambs for meat, & to use as</p>	<p>Sedum roofed timber framed cob house and annex.</p> <p>Turf roofed timber frame barn</p> <p>2 Cob/recycled glass greenhouses, 16 sq m</p>	<p>Austrian Scythes for hay harvest,</p> <p>Secateurs & long handled loppers for willow harvest</p>	<p>Craft willow harvest, October & January</p> <p>Lambing</p> <p>Plant dying wool (summer)</p>

	<p>Forest garden trees for dying, bee forage, chicken forage & crafts</p> <p>Own root fruit trees for coppice orchard</p> <p>Walnut & hazelnut trees</p> <p>Green manures for soil fertility and in rotation mulches</p> <p>Raspberries, tayberries, black and whitecurrants, blueberries & strawberries as jams</p> <p>Heritage tomatoes for chutney</p> <p>Willow & ash coppice for fuel</p> <p>Bi-crops including winter wheat & clover</p>	<p>pest control in orchard & in field crops</p> <p>Khaki Campbell & Miniature Appleyard Ducks for meat eggs & pest control</p> <p>Black Rosecomb Bantams & Silver Grey Dorking Chickens for meat & eggs</p>	<p>& 25 sq m</p> <p>Turf roofed timber framed cob workshop</p> <p>Windmill (6m high)</p>	<p>Long handled bill hook for bramble clearance as needed</p> <p>'Chicken tractor' for ground clearance & pest control,</p> <p>Variety of other hand tools,</p> <p>Block & tackle for removing trees from woodland</p>	<p>May Day, Solstice & and Harvest celebrations on our land</p> <p>Hay harvest, June & August</p> <p>Felting workshops & willow weaving workshops in hub</p> <p>School workshops in partnership with plot 7</p>
9	<p>Orchard of various trees for ciders, juices and fruit for our own use.</p> <p>Vegetable and fruit production our own use.</p> <p>Forest Garden.</p> <p>Mushrooms for our own use.</p> <p>Willow coppice for our</p>	<p>Oxford Sandy and Black pigs to provide meat for our own use and a range of products.</p> <p>Goats to provide milk for our own use and a range of dairy products</p>	<p>House 144 m² Timber frame. Sedum roof.</p> <p>Work building 144 m² Timber frame. Sedum roof.</p> <p>Polytunnel 80 m²</p> <p>Barn 80 m² Timber frame. Sedum</p>	<p>A 2-wheeled tractor with various attachments available for hire to residents.</p> <p>A woodworking workshop with saws, planes</p>	<p>Cider tasting</p> <p>Gallery space</p> <p>Furniture courses</p>

	own fuel	and meat. Chickens for our own use. Ducks for our own use. Geese for our own use.	roof. Animal shelter 60 m ² Timber frame. Sedum roof.	and a wide range of tools available. A certified meat-processing facility	
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Permaculture 3d

CASH CROPS AND ADDED VALUE PRODUCTS

	Cash Crops	Added-Value
1	Strawberries, salads, eggs and asparagus. Fruit trees and bushes.	Baskets and besoms
2	Wild food harvest Willow cuttings	Baskets and willow sculpture kits Christmas decorations
3	Soft fruit and top fruit Salad and herbs Eggs	Flax linen sold as tablecloths, napkins, scarves etc. Baskets and other willow objects Christmas and seasonal garlands Jams and chutney
4	Basil, Parsley, and Coriander, and several varieties of Garlic	Composting worms Composting Tea Compost Chilli, Garlic, and Herb products
5	Seasonal vegetables, soft fruit, heritage and unusual varieties, medicinal & culinary herbs. Eggs. Geese.	Small wood crafts, potted herb collections, fresh cut and dried herbs.
6	Hazelnuts, Soft fruit, Top fruit, Poultry/ livestock	Gypsy Caravans, Pasties and Quiches
7	Comfrey liquid feed, Comfrey root cuttings, Fruit bushes	Mini Edible Gardens, Woodwork craft: Furniture, boxes, candlesticks, hurdles etc.
8	Wholesale craft willow Wool wholesale	Organic plant dyed wool Felting kits

	Flowers	Honey Jams Chutney
9	Piglets	One-off furniture pieces and artworks, Smoked Hams/ Pork products, (Soap, Candles)

4. REFERENCES & NOTES

- 1 Holmgren, David (2002), Permaculture: Principles and Pathways Beyond Sustainability. Holmgren Design Services, Victoria, Australia.
 - 2 Appeal notice for Keveral Farm, Cornwall by Jim Griffiths an Inspector appointed by the Secretary of State for Communities and Local Government Date (page 5)
 - 3 <http://www.konsk.co.uk/design/energy2.html>
- Different quotes for the UK average carbon footprint varying between 9 – 11 tonnes CO₂ p.a
- 4 Helena Norberg-Hodge, International Society for Ecology and Culture, www.isec.org.uk cited in Clean Slate Sept 2006
 - 5 Mc Harg's exclusion method – Ian McHarg was a professor of landscape design who developed this method for placement. The basis of his method is to ask not where something should go, but where shouldn't it go. Overlays are produced showing constraints in different areas, from these it is established which area has the least constraints and should be used. This method was used to establish the most suitable site for the community hub building at the Lammas site.
 - 6 De Bono, Edward (2004) How To Have A Beautiful Mind, Vermilion, London, UK
- 6 Hat thinking is a thinking tool that enables all members of a discussion to view any issue in the same way at the same time. For example the black hat is for critical thinking that enables people to express doubts and concerns, which can lead to contingency planning.