Small is Successful

Creating sustainable livelihoods on ten acres or less

The Ecological Land Co-operative

The Ecological Land Co-operative's (ELC) main purpose is to support the creation of truly affordable and highly sustainable land-based livelihoods. Such livelihoods re-invigorate rural economies, increase local resilience and address key challenges of sustainability, peak energy and climate change. In addition to this, ELC also acts as a consultee on national and local policy in this field.

We are pleased to be supporting research into the viability of low acreage livelihoods in the UK.

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Front cover: Patsy Chapman (pictured) runs Longmeadow Farm with husband Hugh Chapman.
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Foreward

Small is Successful is an enlightening, captivating and timely read.

The authors pay true testimony to the enterprise and resilience of those at the forefront of sustainable living and one cannot help but feel inspired. Through eight case studies, you will be given an insight into the aptitude, passion and enterprise required to make a small farm succeed.

Small is Successful dispels some of the prevailing myths about the viability of working 10 acres or less. It draws acute observations on the strengths, weaknesses, opportunities and threats faced by each case study, culminating in key findings and some thought provoking recommendations.

It is evident that whilst promoting sustainable living, many of our well intentioned regulatory systems struggle to differentiate between genuine and disingenuous lifestyle choices. Aptitude, passion and enterprise are attributed to individuals. However, they are not facets of land itself or any associated development. The result is often a precautionary approach, which can sometimes be perceived as imposing bureaucratic "red tape". *Small is Successful* responds with reassurance on what is possible, presenting examples of small farms where economic, social and environmental needs have all been nurtured.

Such challenges will increasingly lie in the hands of local communities themselves and as such it is important to foster confidence in what can be achieved. The authors clearly recognise this and make some very astute recommendations.

The Government's Localism and Decentralisation Bill will encourage local communities to identify the type of development that they would like to see and to set out a positive vision for their neighbourhood. There is renewed interest in the growing, provenance, production and distribution of food in the UK. With proper forethought, Neighbourhood Plans could present an opportunity to reinvigorate urban and rural areas to support small farms and the creation of sustainable livelihoods. *Small is Successful* has not only enhanced my own understanding of how this might be achieved, but has also fed my enthusiasm toward resilient local communities that respond to the twin challenges of climate change and peak oil. I hope that it will do the same for you.

Brett Spiller
Chair, Royal Town Planning Institute (SW) 2010

Contents

Executive Summary

1. This report looks at the economics of growing food on ten acres or less. The case studies profiled in this report include, four different styles of fruit and vegetable producer; one shiitake mushroom grower; a hatchery providing ducklings to poultry producers; a mail order seed company targeting the home gardener, and a mixed smallholding which produces cider, apple juice and honey, as well as eggs, lamb and cordials. They represent a typical selection of the balance of enterprise types which is possible at this scale[1].

2. The eight smallholdings demonstrate that economically viable and highly sustainable land based enterprises can be created on holdings of ten acres or less. Indeed, with the right approach such livelihoods can be created on two acres or less, although the incomes generated would be described as modest.

3. Low acreage livelihoods can be created on marginal sites, as illustrated by several case studies featured in this report. The Real Seed Collection, for example, provides livelihoods for three full-time and two part-time workers based on half an acre of semi-improved pasture at 100 metre elevation.

4. The range of enterprises suited to low acreage livelihoods is expanding and evolving.

5. These livelihoods often follow a low and slow development trajectory, allowing growers to avoid commercial loans and build up skills and knowledge on the job. This often includes practical skills such as carpentry to further reduce costs. A slow development trajectory also allows livelihoods to develop in harmony with the eco-system, a process which takes time. Those concerned with the way in which land is farmed need to allow a relatively long period before they judge either the ecological or economic success of these smallholdings. This is particularly true for smallholdings dependant on new tree growth, e.g. orchards, forest gardens, woodlands or windbreaks.

6. The most significant factor in creating viable low acreage livelihoods is the mental attitude and approach of those involved. This is a stronger determinant of success than acreage, aspect, soil conditions or expertise. This approach includes commitment, willingness to work long hours, patience, long-term perspective and creative, solution-focused thinking.

7. Adding value is a key to low acreage livelihoods. All eight case studies achieve high yields per unit area by intensive and/or diverse cropping and then increase the value of the raw products through some form of processing and/or direct marketing.

8. Enterprise diversity is a common feature of successful case studies. This spreads risk and enables more efficient use of land and other resources.

9. Attention to detail is a valuable characteristic. The most profitable small-scale land based enterprises are labour intensive. For example, growing, harvesting and processing salad leaves, soft fruit, seeds and mushrooms all require careful attention to detail. A small acreage brings the benefit of being able to focus more attention per unit area of land, to maximise its productivity and profitability.

10. Horticulture is better suited to low acreage livelihoods than livestock. Livestock generally requires more space to provide nutrients and pest management than horticulture, which is capable of generating highly profitable yields from very small areas of land. However, the emergence of micro-dairies suggest that a dairy serving a local village or community might be viable on ten acres or less.

[1] We set the threshold at 10 acres because this is below the level at which most farms are typically considered viable (in the UK, 12 acres are required for a farm to qualify for permitted development rights, for example). Any figure, however, will be somewhat arbitrary. All data is correct as of the completion of the research (Oct 2010). Two of the case studies' names have been changed to preserve their anonymity.

Further research into the role of livestock within low acreage livelihoods is needed. Livestock have historically been of great value within the small farm setting, particularly in their contribution to soil fertility, and in increasing the farm's economic and biological diversity.

11. Most of the eight case studies began with the purchase of marginal sites, with high elevations, north facing aspects and/or exposed, denuded and compacted soils. Only one case study, Honey Pot Farm, is located on Grade I agricultural land. The case studies have demonstrated an ability to work sensitively with each site to develop livelihoods appropriate to each location and capable of improving the fertility and productivity of the land available.

12. Where growers and farmers can purchase land at or near agricultural land prices, low acreage livelihoods offer affordable opportunities to enter farming. High property prices remain the single greatest barrier to new entrants to small-scale farming.

13. The National Policy and Planning Framework (NPPF) for low acreage livelihoods is already largely in place. However, at the local level significant obstacles remain, with smallholders describing "Red Tape" as one of the greatest problems they face. Small changes to planning policy nationally and locally could thus unleash the significant beneficial potential of low acreage livelihoods. The review of the NPPF being undertaken in 2011 represents a unique opportunity in this respect.

Introduction

This report has been produced in response to demand from planners, prospective smallholders and organisations interested in land based livelihoods. There is a common view, particularly amongst planners, agricultural assessors and farmers, that for a holding to be viable it must be large. This is perfectly understandable given farming's productivist direction of travel since 1945 which has seen increasing mechanisation and standardisation within agriculture, and with it the expansion of field and farm sizes.

The assertion that farms need to be large can be challenged on a numbers of grounds. Firstly, whilst the average English farm is 145 hectares[2] (368 acres), farm business income from agriculture[3] has averaged £5,590 per farm per year over the last 5 years (Table 1). Once unpaid manual labour is factored in, this drops to *a loss* of £16,525 per farm per year. Cereal farms are on average the largest type of farm, with each farm cultivating around 210 hectares[4] (519 acres). As a sector they made a loss in agriculture in three out of the last five years - an average loss of £5,297 per farm per year- even before unpaid manual labour was accounted for[5]. The economic viability of cereal farms, as well as other types of farms, is reliant on public funding. In 2008/09, across all farm types, income from the Single Payment Scheme accounted for 45% of farm business income, whilst all public funding accounted for 56% (Figure 1). It is worth noting that smaller scale farms of the type covered in this report typically receive no subsidies. None of the eight case studies featured in this report receives agricultural subsidies.

Table 1: English Farm Business and Corporate Income From Agriculture

	2005/06	2006/07	2007/08	2008/09	2009/10	Average
Farm Business Income from Agriculture	-3,871	-1,673	11,371	17,701	4,420	5,590
Adjustment for unpaid manual labour of farmer, spouse (if unpaid) and unpaid business partners	*20,626*	*21,441*	*22,279*	*22,738*	*23,487*	
Farm Corporate Income from Agriculture	-24,497	-23,114	-10,908	-5,037	-19,067	-16,525

Source: DEFRA (2010) *Farm Accounts in England* Table 5.19 and FBS Government Office Region Reports. http://www.farmbusinesssurvey.co.uk/regional/GOR.asp. Accessed 02/02/2011.

Secondly, a growing body of international evidence suggests that farming on a smaller scale is more productive per acre in terms of yield, profit and other social and environmental benefits, including biodiversity[6]. These findings have emerged as a result of a change in priorities for food and farming, from that of plentiful food and food security to farming that delivers on these whilst also supporting the ecosystems upon which we all depend.

[2] Defra (2010) *Farm Accounts in England* Table B. http://www.defra.gov.uk/evidence/statistics/foodfarm/farmmanage/fbs/published-data/farmaccounts/2010/FAE.pdf. Accessed 01/02/2011.

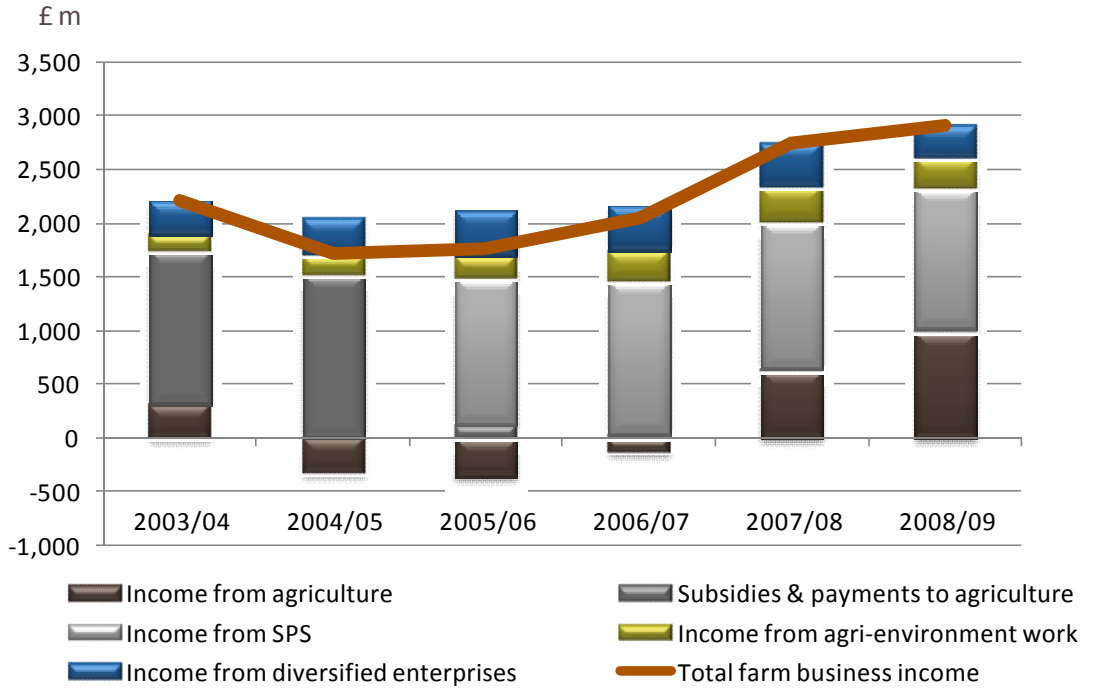
[3] This is Income from agriculture alone and excludes income from subsidies and non-agricultural work. A breakdown of farm income by cost centre is available from Defra's website: http://www.defra.gov.uk/evidence/statistics/foodfarm/farmmanage/fbs/published-data/farmaccounts/index.htm, Table 5.19. Accessed 01/02/2011. Data on farm income by *physical farm size* and cost centre (agriculture, agri-environment schemes, diversification and the single payment) is not currently produced.

[4] The average size of a cereal farm has been taken from Defra (2010) *Farm Accounts in England* Table B. http://www.defra.gov.uk/evidence/statistics/foodfarm/farmmanage/fbs/published-data/farmaccounts/2010/FAE.pdf. Accessed 01/02/2011.

[5] FBS Government Office Region Reports. http://www.farmbusinesssurvey.co.uk/regional/GOR.asp.

[6] Butler, D. (2010) *What it will take to feed the world*? Nature 464, 969; Global Conference on Agricultural Research for Development (GCARD) (2010). This collection of the world's top agricultural researchers concluded that small-scale farming is more productive than large-scale farming and called for a shift in focus of world aid and research from large-scale farming to small-scale farming, see http://gcardblog.wordpress.com/. Accessed 16/11/2010.

Figure 1: Farm business income by source



Source: Defra (2010) *Observatory monitoring framework – indicator data sheet Process: Farm Business, Indicator B8: Diversification.* http://www.defra.gov.uk/evidence/statistics/foodfarm/enviro/observatory/indicators/documents/B8.pdf Accessed 01/02/2011.

Indeed, whilst government policies have been *responsible* for much of the push towards industrialisation, more recently they, too, have recognised the flaw in this approach and sought to *reverse* it by supporting farm diversification and more environmentally sensitive farming methods. Thirdly, then, sustainability is now at the heart of British planning, its countryside, food and farming[7]. Sustainability requires that farming produce economic, social *and* environmental benefits. There is no evidence that large farms deliver on sustainability more than smaller farms, in fact quite the opposite.

Fourthly, sustainability combines with the imperatives of climate change, peak energy and food security to ensure that our farming and food supply address their current dependence on fossil fuels. Evidence suggests that to address these overlapping challenges there will be significant growth in the number of people directly involved in producing, processing, marketing and selling food[8].

Whilst the above points *challenge* the assertion that farms need to be large, a final point directly *disproves it*. This is the fact that there are a growing number of successful land based enterprises operating throughout the UK on small acreages. These enterprises are so small that they often do not register on inventories of the sector. They usually rely on informal, local networks, with minimal marketing budgets and rarely qualify for agricultural grants or subsidies. Few people hear about them beyond their locality. Below we report on eight businesses which demonstrate that low-acreage livelihoods can be successful economically, socially and environmentally.

[7] See for example, ODPM (2005) *Planning Policy Statement 1: Delivering Sustainable Development*.

[8] Maynard, R. and Green, M. (2006) *Organic Works: Providing more jobs through organic farming and food supply. Soil Association, Bristol*, http://www.soilassociation.org/LinkClick.aspx?fileticket=60CVIT1Nw0U%3D&tabid=387. Accessed 31/1/2011; Maxey, L. and Dale, S. (2010) *Low Impact Development* in *Upsetting the Offset: The Political Economy of Carbon Markets* (Böhm, S. and Dabhi, S.) (eds.) Mayfly Books http://mayflybooks.org/?page_id=21 307 -316. Accessed 31/01/2011; Pickerill, J. and Maxey, L., (2009) *Geographies of sustainability: Low Impact Developments and radical spaces of innovation*, Geography Compass, 3, 4, 1515-1539.

The Case Studies[9]

Case Study 1—Longmeadow Organics

- Horticulture enterprise supplying Green Valley Farm Shop
- 2.5 acres under cultivation, plus small orchard and laying hens
- Business built from scratch, with home and business funded by livelihood
- Livelihoods for the two owners and one part-time employee
- £48,000 annual turnover
- £5,500 profit after owners are paid

Longmeadow is a nine acre Soil Association certified field in Godmanstone, near Dorchester in Dorset. It was sold to Hugh and Patsy Chapman in 1987 by organic dairy farming friends who wanted to diversify and support new entrants to farming. The land was bought outright, but a low mortgage was taken out to enable the Chapmans to build an energy efficient house.

The Chapmans first met at Emerson College in Sussex where they had volunteered to work on several Bio-dynamic farms, they gained further experience of agriculture in Wales and the U.S.A. They then learned field scale vegetable production “on the job” when they “share farmed” land for four years in Somerset.

Initially the Chaphams grew only five main crops, carrots, potatoes, onions, cabbage and leeks which they

[9] The level of detail provided by the enterprises varied as some were concerned about commercial sensitivity.

sold to supermarkets via a co-operative based in Somerset. The co-operative folded in 1992 due to a downturn in organic sales resulting from the recession. The Chapmans then diversified into more local markets including farm gate sales, local restaurants, wholefood shops and a vegetable box scheme. The latter started in 1994 with four boxes, but grew over 3-4 years to supply 140 boxes per week, providing a reliable income for them and a much appreciated source of fresh, organic vegetables for their customers.

After 12 years Hugh and Patsy decided to scale back their operation as they were getting older and the full box scheme was very demanding. Their box scheme customers were passed on to a young couple who they had trained. The farm shop was remodelled, enlarged and passed on to others to run. The Chapmans now supply vegetables to the farm shop.

Livelihood Strategy

Here we look at just the Chapman's current livelihood strategy.

£48,000 worth of vegetables are sold per year to the shop, £28,000 of which are produced by the Chaphams, and £20,000 are bought in. The business makes a trading profit of £5,500 per year after the directors' remuneration of £11,500 has been withdrawn. Hence, despite its reduced scale, the business is still able to provide a livelihood for the Chapmans, whilst the box scheme and farm shop, which are now separate businesses, provide for a further four full time workers. The Chapmans employ a part-time worker for nine months of the year, supplemented by the occasional WWOOFer[10].

The Chapman's vegetable field is divided into five 0.5 acre sections, four of which are managed on a 4-year rotation, with one section always being kept in a clover/ryegrass break. The fifth section is used for more intensive crops and rotates within itself. A total of 35 crops are grown, concentrating on those that grew well in that situation. Standard, 70m long, 1.5m wide beds are used to enable a 40 horsepower tractor to cultivate as much as possible, including sowing, planting and hoeing, as well as to harvest some vegetables. Other mechanisation includes an electric pump for drawing irrigation water from the river alongside the holding, and a strimmer. Two 20m by 5.5m polytunnels are used to grow winter spinach and salad, as well as beans, cucumbers and some tomatoes. The holding has a symbiotic relationship with the mixed organic farm next door, exchanging manure and grazing lambs for waste vegetables to be used as animal feed. However, much of the holding's fertility is generated using green manures. In 1995 a sixty tree orchard was planted to supply the shop and box scheme with 12 varieties of fruit and some raspberries. A small flock of laying hens provide mainly domestic eggs, but surplus are sold in the farm shop.

The Land

The land is reasonably flat, grade three agricultural land. It is quite flinty, and would possibly be grade two if it were not for the stones, which tend to wear down tractor implements (rotavator blades and cultivator shares). It lies next to a river, which is an advantage, in that they are able to extract irrigation water using an electric pump. However, during wet winters, the lower part of the field tends to get waterlogged as the water table rises, and it is necessary to harvest crops from the lower part first to reduce damage and ensure accessibility. The width of the field enables 70m long beds to be cultivated, which works well as they are not too long for hand work, yet long enough to reduce turning too often for the tractor operations. The river valley runs north-south, so has generally good light, and minimal periods of shadow. The land is next to a main road, which brings passing trade to the farm shop. The impact on traffic from the farm shop has been minimal, and the Chapmans stress that they are reliant on the road being fairly busy for the success of the business.

At the time of purchase, the only buildings present were two 20m x 10m barns, which were supplied with an electricity and water supply. The presence of these buildings was essential in the early days of business start up, when the Chapmans and their young family lived in a caravan. Planning permission for a house was fairly quickly granted to the farmer from whom the Chaphams bought the land - a long-term and trusted member of the local farming community - and after a year and a half the family were able to

[10] WWOOF = World Wide Opportunities on Organic Farms, this organisation link people who want to volunteer on organic farms or smallholdings with enterprises requiring volunteer help.

move into a highly insulated, newly built house.

Capital Investment

Over 23 years, approximately £15,000 has been invested in machinery, tools and other equipment to enable the horticultural side of the business. For example, the irrigation system cost £1,500, and the tractor cost £500 (although it has had significant amounts spent on it and would be more than £2,000 to replace now). In 2003 a new farm shop was constructed at the end of one of the barns, and expanded to double the size in 2008, costing in total £45,000. All capital for the business development came from personal finance, and no subsidies or grants have ever been used. A low mortgage was taken out to pay for the building of the house, which was finally paid off three years ago.

Community and Education

The main connection the farm has with the community is through the farm shop which attracts both local customers and passing trade. Every year an open day is held, to enable customers to learn how the vegetables are produced. Last year a local food festival was also held in September, and this was such a success that it will be repeated in future years.

Since May 2009 two groups of people with learning difficulties from local day centres have been coming to work at easy tasks on the farm and share tea. Although the farm is paid a small amount for offering this service, it is the pleasure they gain from watching the visitors' lives enriched by being outside and involved in practical tasks that motivates the Chapmans to continue hosting the groups.

The Future

The Chapmans are contemplating the end of their time as growers, and plan to cease commercial production within the next five years. As their children do not want to continue the business, they may sell the property when it becomes too expensive and physically demanding to continue managing the land.

The vegetable production model at Longmeadow has worked well for the Chapmans. Although challenging at times, time has been the main limitation to production rather than acreage. They have made a living from 3-6.5 acres of cultivated land, but stress that it is not the acreage but the soil quality and how the produce is marketed which determines success.

Strengths

- The location is well suited to the enterprise with good soil and aspect, proximity to a river and close to a main road.
- Direct marketing adds value to produce and makes it possible to earn a living at a relatively small scale. It would not be possible to earn a living by wholesaling vegetables from this acreage. It also provides instant feedback about vegetable selling quality, and enables problems to be rectified quickly.
- The scale of production gives the owners control over the enterprise.
- The business has a regular and loyal customer base.
- Production is accurately matched with markets for all produce.

Weaknesses

- Organic vegetable production means long hours of physically demanding work for relatively low financial returns. Motivation must come from sources other than money.
- The business is too small to justify large capital expenditure, yet without it some processes are less efficient than they could be.
- The overheads for a property such as this are high, and the machinery required to manage the land needs maintenance.

Opportunities

- Care farming (hosting groups with disabilities/learning difficulties) could be increased.
- If closer to a city, a community supported agriculture scheme would be a good way of connecting with people who want fresh, organic food, but do not have the time or the ability to grow their own produce.

Threats

- The high cost of land means that it would be difficult to expand, even if land were available for purchase nearby.
- Production costs (machinery and labour) continue to rise, while prices obtained for produce have remained static for several years.
- Modern machinery is complicated (electronically), expensive and not being built to last. Enterprises such as this rely on a supply of good quality, easy to maintain, second hand equipment to keep costs down, and there is a risk that over time the supply of this will diminish.
- The recession and a surge in “grow your own” are causing a drop in demand for the traditional box scheme (where the farmer decides what goes into the boxes).
- The smaller scale box scheme has been overtaken by larger schemes operated by co-operatives and wholesalers that offer the customer a choice of what goes into their box.

Case Study 2-The Real Seed Collection

- Mail order not-for-profit selling seeds to home growers
- Family business with 13 years experience
- Supports three full-time and two part-time paid workers
- 0.5 acre under cultivation
- £188,188 annual turnover (2009)

An interest in growing food which began on two allotments in Cambridge led the founders of The Real Seed Collection to invest their life savings of £15,000 into a house and farm land in Spain. They launched their seed business there in 1997 and relocated it to West Wales seven years later, having moved to their current site in 2009. The three very different climates they have grown on provide a good understanding of how their diverse varieties do in different conditions.

Livelihood Strategy

Founded and run by Ben Gabel & Kate McEvoy, the Real Seed Collection Ltd. is a not-for-profit company based in Newport, Pembrokeshire, west Wales. The company runs the Real Seed Catalogue, a member-ship-based seed club through which they sell unusual and heirloom varieties of seed suitable for small-scale food production in the UK.

The business' aim is to "assemble the best collection of really reliable, tasty and interesting non-hybrid vegetables for the home gardener, allotment grower, or smallholder."
This involves several stages:

1. Identifying and sourcing varieties
2. Testing each new variety or species
3. Growing the seed or identifying and employing seed growers
4. Drying, labelling and packaging the seed
5. Posting seed to customers

The company carries out each of these stages and has built up considerable expertise and contacts. Due to the limitations of the 0.5 acre site 50% of the seed sold in 2010 was grown on-site while the remaining was contracted out to growers with whom they have built a close working relationship. They have personally tested and continue to grow, prepare and consume each variety sold, providing a high level of quality control over the final product. They are so committed to customer satisfaction they offer the following guarantee:

> *"If you are in any way not completely happy with your seeds, plants, or even the flavour of the resulting crop, we will cheerfully replace your seed, refund your money, or send a credit note - whichever you prefer."*

The business is run as a membership-based seed club in part to avoid EU legislation which restricts seed sales to registered varieties. Registration is so costly that only varieties used and sold on a large-scale are registered. The first penny of a new customer's order makes them a member of the club and thus able to purchase varieties not featured on the EU register. The club is an important part of the business. Feedback, suggestions, recipes, and donated varieties from members all contribute to the business' development, whilst an annual newsletter offers further feedback and support.

Mr. Gabel and Ms. McEvoy use solely natural growing methods, including green manures and no synthetic fertilizers or pesticides. The holding is not organically certified due to the cost and bureaucracy involved. Their customers (home gardeners) do not need organic certification, whereas if they were selling to farmers this might be more important.

The business uses an intermediate level of mechanisation. A small tractor is used for initial cultivation then once the seed has been sown all subsequent cultivation is done by hand. A walking rotavator was sufficient in Spain as the weather was more predictable. Wales' climate, means that all the cultivation must be completed in whatever dry spells are available. All packing, sowing and drying is done manually.

They obtain and test varieties and species that sound promising. Those that do well in the trials are added to the collection. Sources are diverse and include other plant collectors, heirloom vegetable projects, government seed banks, and donations from the public. They also look for interesting plants that are well known in other countries, and could do well in the UK, but have so far remained relatively unknown.

In April 2010 they purchased 2 acres of bare pasture adjacent to the 0.5 acre field they began renting in 2009. This has been the most expensive purchase. The second greatest cost is labour, with additional expenditure including the tractor, tractor roller, ridger, flail mower and front loader. They have also in-

vested in fencing against both sheep and rabbits, a rotavator, push hoe and push seeder (£650). Machinery depreciation costs are c. £3,000/year.

The company is now highly successful, with a turnover of £188,188 in 2009, it was assessed by the Western Mail as the 38th fastest growing business in Wales. Whilst they break even or better every year, as a not-for-profit they are not obliged to pay share holders and as matter of principle they pay out any profit in wages. However, they do retain some surplus for capital needs each year.

Everyone in the company earns an equal rate/hour and the profits are shared equally according to the number of hours worked each year. In 2009, £70,950 was paid out to the two directors and one full-time and two part-time employees.

The Land

Since 2009 the main growing area has consisted of ½ acre of improved or semi-improved pasture located 100m above sea. The main advantages of this piece of land are primarily that it was available near to where the company employees live (Newport) and it is reasonably flat with an open aspect. Whilst a lower elevation would have afforded a longer growing season and a wider range of varieties to be grown, it has the advantage that they are able to test the seeds in difficult conditions and thus be confident that they will work for most of their customers. Whilst soil fertility on this site is low, they are actively improving it through the use of green manures and composting. In April 2010 they purchased 2 acres of similar quality land adjoining the ½ acre growing field and have begun developing this so that eventually 1-1.5 acres will be used for seed production and 1-1.5 acres for green manures.

The business is currently split across three locations in and around Newport. The growing field is located on the edge of Newport, to which employees cycle daily. A business unit is rented from the council in Newport for office and seed storage space, whilst the family home is used for drying and some admin and is located near the business unit in Newport.

The Future

Two acres was recently purchased adjacent to the ½ acre growing field to allow expansion of seed production and green manures.

Strengths

- Apart from an initial investment (£15,000), all capital has come from money generated by the business itself. No loans have been taken out, rather the business' growth has been incremental over several years.
- Mr. Gabel has a degree in plant science and Ms. McEvoy a degree in economics. The couple have gained practical experience in seed production and in day-to-day business management.
- The level of commitment demonstrated by all staff is matched by the high levels of customer satisfaction.
- The business has a number of unique selling points including its guarantee (see above) and including detailed seed saving instructions with every packet of seeds sold.
- The rare and unusual seeds produced are fresher than large corporate competitors, avoiding the several years most seeds require to transit through brokers and agents.
- Every seed sold has been thoroughly trialled and used by employees.

Weaknesses

- Having moved site for the third time in 2009 the new operation is still being established.
- Key facilities are missing on the site, including a barn for drying and polytunnel. A polytunnel cannot be erected due to planning restrictions.
- Access is also a challenge as they are spread across three sites, rather than located in one place. This reduces their responsiveness and limits their ability to develop the land and business. A polytunnel, for example, containing such high value crops would require continual on-site presence which is not currently possible.
- The water supply is through another field at the moment and this appears to be less reliable in dry spells. In the longer term they are looking for land with better water access.

Opportunities

- If fuel price increase lead to the increase in the price of food there may be a growth in demand for grow your own vegetables.

Threats

- They see the planning system as the largest single threat, predicting that it may involve considerable "time, grief and effort" to build the barn they need, for example, and that the bureaucracy this involves means they may have to employ consultants and architects, rather than doing the work themselves.
- Polytunnels are likely to be even more of struggle as they are in a National Park.
- They see climate change as a threat, bringing uncertainty in terms of rainfall and extreme weather events
- If the Royal Mail service is undermined they could be adversely affected as currently they are dependent on that functioning efficiently (though they have some flexibility to change their business if necessary, by selling vegetables for the local market, for example).

Case Study 3 - Bridge Farm

- Largest commercial forest garden in the UK
- 75% of market garden cultivated by hand
- 85% of produce sold within 5 miles radius
- Supplies weekly market stall, restaurants and hotels and local whole food shop
- 1.5 acres productive area
- Sales of £22,000, £11,000 available to pay owners/workers

Bridge Farm was purchased by John Harding in 1985 and has been managed ecologically since 1990. Mr. Harding studied conventional agriculture (BSc), but became disillusioned with it, and completed a Masters degree in ecology and animal behaviour, and a PhD on the social behaviour of cows. His vision for Bridge Farm was "to create a rural sanctuary that demonstrates the interdependence of all life and encourage an appreciation of the relationship between respecting the earth and nourishing our souls".

In 2000 the Bridge Farm Trust was established to offer environmental and sustainability education to visiting school children, and continued in operation until 2007 when funding ran out. During this time 45 schools visited the farm each year, paid for through grant funding. Other groups also attend the farm for courses and demonstration tours.

Mrs. Harding joined the holding in 2004 and plays an active role in the business, running courses on seasonal, healthy cooking and preparing food for volunteers and visitors.

Livelihood Strategy

Bridge Farm is a thriving market garden and forest garden run by John and Rachel Harding. Annually it produces £22,000 worth of Soil Association certified organic fruit, and vegetables sold locally. Although the total area of the land is 4.5 acres, the majority of the food is grown on 1.5 acres of which 1 acre is devoted to vegetable production, with 0.75 acres of raised beds managed entirely by hand. Half an acre is a mature forest garden, comprising 65 different varieties of apple tree, 20 pears, 20 plum, cob nut and filbert trees and a walnut tree. It is probably the largest example of a commercially operative forest garden in the UK. Six ponds, a bog garden and half an acre of native woodland add a variety of habitats to increase the biodiversity of the holding. Also found around the farm are areas of coppiced willow and willow structures including arches and a labyrinth. Black willow for basket making and Bowles hybrid rods suitable for sculpture are available for sale.

A large quantity of soft fruit is also grown in the forest garden, and sold at the market and to local hotels. There are tayberries, Summer and Autumn raspberries, Japanese wineberries, blueberries, gooseberries, and red, white and black currants. In season, 25 kilos soft fruit is sold at market and 15 kilos to hotels and restaurants each week. The availability of labour to pick the fruit, in the form of WWOOFers, makes this scale of soft fruit production possible.

The top fruit harvest varies annually. Last year (2010) saw 64 kilos plums sold weekly at market for 12 weeks, with 0.5 ton of pears and 8 tons apples harvested. Apples, along with potatoes, onions and garlic are stored in a shed in boxes, on shelves, in clamps and hanging from the walls.

Produce is sold at a weekly local market, from March to December. Bridge Farm has the only organic vegetable stall at the market, and is popular due to the exceptional flavour of their produce. Eighty-five percent of their produce is sold within five miles of the holding. During the summer £1,000 of produce is sold weekly.

Two support workers are usually taken on for a minimum of a six month season. They are paid £50 per week and provided with food and accommodation, in return for taking a shared responsibility for running different aspects of the garden. Bridge Farm is also hosts WWOOFers, and throughout the summer has 3-6 short term WWOOFers in addition to the support workers.

The main forms of mechanisation used on the holding are a small rotavator, which is used to cultivate a quarter of an acre each year, a strimmer and a chainsaw. All cultivated areas are hand dug, following a philosophy of maximising the productivity of a limited acreage. Thirty tons of manure is delivered to the farm every two years, and is used in conjunction with winter green manures of Hungarian grazing rye to build fertility. Fertility is further sustained by cultivating the land as little and as shallowly as possible, to avoid nutrient losses.

The land is certified organic with the Soil Association, but the production system goes far beyond organic principles.

Although it is not easy to earn a living from 1.5 acres, due to the commitment to energy efficiency and minimal soil compaction, this is considered to be a suitable acreage for the type of enterprise. The current scale of production also suits the markets they have available, and were they to expand it would be necessary to travel further to find markets.

The holding brings in £22,000 per year. This comes from a combination of the vegetables, top fruit, soft fruit, and vegetable plants during the spring.

Annual business expenditure	
Wages*	£5,500
Expenses for 8-9 WWOOFers and volunteers	£3,000
Seeds	£500
Manure	£100
Polytunnel covers	£150
Petrol and vehicle running costs	£700
Water rates	£450
Horticultural supplies and tools	£400
Land maintenance	£300
Total	**£11,100**

*Two long-term volunteers earn £50 per week for 11 months

Income from agriculture covers house insurance, heating bills, council tax and personal food bills. Additional income for other personal expenses come from the courses and their B&B business.

The Land

In 1985 the original holding included a house, barn, two outbuildings and 4.5 acres of land located within a National Park. The land is marginal, its north elevation places it in shadow for much of the winter. However, the soil is a silty loam, and was permanent pasture prior to purchase. At the time of purchase the land was quite exposed, but over twenty-five years considerable numbers of trees, hedges and shelter belts have been planted. Another limitation of the land - the fact that the soil compacts easily – has been overcome by creating raised beds throughout most of the vegetable growing area. The design and management of the land, rather than its inherent fertility, explains its current productivity.

Capital Investments

The farm has developed slowly, and hence it has been possible to keep investment costs low by waiting until resources become available. For example, the four polytunnel frames were bought second hand for between £50 and £100 each. Over 250 fruit trees (£10 each), a small wood and several hedgerows have also been planted over the years. Total development costs of the holding have been under £5,000. All investment has come from capital generated by the holding.

Future

Going beyond organic standards, the farm is positioning itself as a demonstration model of sustainable food production and Transition farming. Based on Biomimicry, the farm's system incorporates ecological models, organic methods and permaculture design principles. Increasing emphasis is being placed on replacing fossil fuels with human energy and other renewable resources.

Furthermore, due to its low acreage, the farm is being developed as a model of people centred agriculture that could be applied in both urban and rural situations.

Strengths

- Mr. Harding's scientific background and thorough, thoughtful approach have combined high productivity from a small area with a high degree of sustainability in terms of soil management, biodiversity and energy efficiency.
- The production system is not reliant on high levels of energy inputs, or energy related inputs such as feed, fertilisers or pesticides, so is well positioned to survive increases in energy prices.
- The location, near to an affluent and well-educated population makes marketing easier.
- High levels of biodiversity and integration with the natural environment has created a resilient system, which will be much better able to withstand the adverse effects of global climate change than industrialised monocultures.

Weaknesses

- The scale of economically viable soft fruit production requires a supply of low cost labour to pick it. This is only possible due to the number of WWOOFers that Bridge Farm can host, which is reliant either on people being willing to camp or having sufficient accommodation to host 8-9 people at a time.

Opportunities

- Hotels are beginning to recognise the value of real food. Good quality local food is experiencing an upsurge in interest, and Bridge Farm is often in the running for awards.
- Good weather – The 2010 summer was been particularly good for fruit production, leading to an increase in income.

Threats

- Competition within the local area - Currently Bridge Farm is the only organic market stall at the local market, and is able to charge prices that reflect production costs. When new businesses start, they tend to undercut existing producers to get into the market. Although they cannot sustain this in the long term, such short-term competition can prove very damaging to existing businesses.
- Early and late frost – A single early or late frost can cause devastation, by cutting short cropping seasons.
- Climate change – Although in the short-term, climate change could bring benefits to growers, in the long term the extremes of weather are likely to make it more difficult to grow food.

Case Study 4 - Holly Tree Poultry Hatchery

- 12,000 day old ducklings supplied annually to producers in the region
- Oven ready ducks and geese sold at farm gate, and to local butchers
- Infrastructure developed by reinvesting profits rather than using loans
- Niche skills and contacts built up “on the job”
- 2.5 acre holding
- Annual turnover £25,000-£30,000, generating an income of over £10,000

For 12 years Toby Jones has run a duck hatchery and oven ready poultry meat enterprise from his 2.5 acre holding. Mr Jones grew up on a small farm and had gained livestock experience there. Mr. Jones now supplies organic and free range duck producers in his region with 250 day old birds per week for 48 weeks a year (12,000 total) from his breeding stock of 100 birds. He also produces 150 oven ready geese and 300 oven ready ducks and chickens, which are sold directly from the farm gate and via local butchers.

The ducks are a large white hybrid commercial variety which gain weight fast and have high disease resistance. Similarly, the geese and chickens are both commercial breeds. Commercial breeds are favoured over rare breeds due to their significantly higher yields[11]. All duck eggs are incubated in an electric setter and then an incubator, which could keep the temperature and humidity constant, to ensure a hatching rate that could generate a profit. If ducks are allowed to incubate their own eggs, they tend to stop laying.

The poultry is sold as “naturally reared” rather than organic, with the emphasis being on providing the ideal nutritional and environmental conditions for them to thrive. Hence the meat birds and breeding

[11] For example, Holly Tree’s ducks lay on average 240 eggs per year each, producing 190 viable day old ducklings (an 80% hatch rate – industry standard), which is necessary to make the business profitable, whereas a traditional breed such as Aylesbury would only lay 100 eggs per year.

stock have access to grassland in eight 0.25 acre paddocks, with access to a shelter house (concrete floor to keep rats out and disease down, tin roof and wooden walls) between which they are rotated. Within the houses, the stocking rate is 4 birds per m^2. The ducks and geese are kept at a stocking rate outside of 1 bird per $5m^2$. The fencing between the paddocks is stock fencing, reinforced with chicken wire for smaller birds. The entire perimeter of the land is surrounded by a waist high electric fence, with a low wire one foot out and four inches above the ground to keep foxes out.

The day old ducklings are sold to a select group of organic and free-range poultry rearers in the region. The business is well placed to supply "naturally reared" ducklings to producers in the region, whereas the production of day old chicks is so competitive that it is hard to be profitable. Due to restrictions on sending birds by train, the market is restricted to the region since it is necessary for producers to drive to collect their birds.

One necessary skill in producing the ducklings is assessing the future market to plan production to meet demand, due to lag time. It is necessary to be very precise, since ducks grow quickly and go from being 80 grams at one day old to 1.2 kilos at 21 days old. This has implications for both the food and space used by the birds. The profit margin can easily be lost if they are not sold quickly.

The oven ready ducks and geese are sold mainly through farm gate sales and private customers, attracted by advertisements, and through a local butcher. In addition to the poultry, Mrs. Jones grows vegetables for sale on a small-scale. While this is not very significant financially, it contributes to the business by drawing in new local customers.

The business has grown to the level where it is generating a turnover of £25,000-£30,000 per year, and an annual profit of over £10,000. It is able to provide a livelihood for Mr. Jones. In the last 3-4 years, Mr. Jones has been able to generate extra income through duck hatchery consultancy work, and teaching at a local agricultural college, which contributes to his income. The business has never employed any regular workers, apart from for specific building jobs, and does not rely on WWOOFers or volunteers.

The main costs for the business are the electricity to run the incubators (1kw), and the cost of feed and straw.

The Land

The land for this enterprise is 2.5 acres of good quality pasture, with a predominantly south facing aspect. It is sheltered and situated on a B road, with good visibility either side. The holding was bought in 1998 with no infrastructure apart from a 12m x 4m tin barn. This barn, however, made starting the enterprise easier, since it meant that they were not building on an entirely Greenfield site.

Capital Investment

The initial start up costs for the business totalled less than £10,000. Subsequent investment of over £50,000 over the first four years has all come from the business' profits. This growth was sustainable and affordable, because it grew at its own pace. No loans have ever been used to fund investment.

Infrastructure installed includes a perimeter electric fence, land drainage, the establishment of a private water supply and an off-grid electricity system. Buildings erected include a barn, a workshop, a processing unit (where poultry are killed, plucked and eviscerated) and livestock housing and stock fencing to divide the paddocks. Mr. Jones' practical skills have allowed him to avoid paying for skilled tradesmen. He has built poultry houses and barns, engineered the electrics and plumbing, erected fencing, and undertaken repairs himself. This has significantly cut the costs of infrastructure development, since the costs of skilled tradesmen are considerably higher than the income from farming.

Mechanised tools are used wherever possible to make the business more efficient. A tractor is employed for topping the grass and pulling fences tight. Electric incubation of eggs is imperative to make the business profitable. It is also legally necessary to use separate incubators for setting the eggs (24 days for ducks) and hatching them (the final 4 days for ducks), in order to prevent cross contamination with salmonella and campylobacter. The two different incubators require different temperatures and humidity, which need to be very precise. Incubator setting capacity has been built up to 1,200 eggs at a time.

Strengths

- Apart from initial investment (£10,000), all capital has come from business profits , with no loans taken out. Business has grown slowly with finance generated by the business itself.
- Mr. Jones has positioned himself as a duck raising specialist, a skill learned on the job, and has been able to offer consultancy and teaching on the subject at a local agricultural college.
- "In house" practical skills in electricity, carpentry and building has significantly reduced set up costs.
- Good road access – the site is located on a B road, with good visibility for 30m either side, which significantly helped when gaining planning permission.

Weaknesses

- Small acreage (2.5 acres) has limited expansion capacity and made it very hard work to earn a living. No adjoining land has been available. Ten to twelve acres would be the preferred scale for this enterprise, since it is "genuinely manageable and justifies the purchase of machinery".

Opportunities

- This is still a niche area, with good prospects for strong local and regional markets.
- Potential to develop advice and training roles further.

Threats

- Exhaustion and stress – Although it is possible to earn a living from such a small acreage, it is extremely hard work and requires absolute commitment.

Case Study 5 - Spring Grove Market Garden

- Organic vegetable and flower grower
- Provides a livelihood for two workers
- A mixture of field scale vegetables and beds managed by hand
- 6.5 acres on Devon/Somerset border
- Annual turnover £70,800 (2007)

Spring Grove Market Garden is owned and run by Mandy Goddard. The farm occupies 6.5 acres to the west of Taunton and produces certified organic vegetables, flowers and herbs and some eggs.

The site was purchased in 2001 as bare pasture with no infrastructure. One acre was cultivated initially to produce the first crops in 2002. Discussion over several years with the local planning authority has now resulted in their acceptance of the need for a tied agricultural workers' dwelling. A mains water connection, soil improvements, windbreak trees and polytunnels have all been introduced. A successful box scheme was run for several years. Although this generated a profit, it required significant time to market and administer, so it was recently ended in order to concentrate more time on growing. Produce is now sold primarily through a local town market.

Ms. Goddard has training in horticulture, but says she found that 6 months experience working as a volunteer at Pencoed Organic Growers in South Wales more valuable.

Livelihood Strategy

Most produce is sold at a local town market, with some going to regional retailers and most of the herbs sold through a national wholesaler.

A wide range of crops and flowers are grown in the larger 4 acre field, mainly in a series of long beds. This

field also houses three 40' x 18' polytunnels on the eastern side, and caravans used for worker's accommodation. Work sheds and parking are also clustered in this area. The beds rotate in crop variety, with green manures and fallow periods. Below this, a rented 2.5 acre field is tilled by tractor and this tends to grow more of the roots and onions, brassicas and squash. The vegetables are planted and picked by hand as the scale means investing in machinery is inefficient. Spring Grove use increasing amounts of green manures including rye grass, vetch, chicory, tares and phacelia. Approximately a fifth of the growing area is currently under green manure.

In addition to the crops, there is a flock of 30 Silver Link chickens kept for egg production. Their financial value to the enterprise is marginal, however due to their costs.

The most recent year for which figures are available is 2007. In 2007 Spring Grove had sales of £46,900, with a profit of £23,100. £16,300 of this £23,100 was withdrawn for workers and £6,300 left for working capital. Since 2001, £30,000 has been invested developing buildings, polytunnels, water supply, access and equipment. Bank and personal loans helped fund this as the only income has been produce from the land. The bank loans are now fully paid off, whilst the personal loans are still being repaid.

Of the £46,900 income, £20,200 came from vegetable box sales, £18,000 from at the local market, £800 from eggs, £1,200 flowers and £3,300 from retail. The biggest single cost was £12,600 for additional produce to top up the boxes. Other farm costs such as manures, seeds and packaging totalled £2,800. A further £8,400 was spent on vehicles, fuel, insurance, machinery and administration leaving a net profit of £23,100. Of this £16,300 was withdrawn for workers. While wages are comparatively low there is also a financial surplus to reinvest each year.

Land

Spring Grove's 6.5 acres are Grade II pasture, with a Southeast aspect. The slight slope provides good drainage. It is well protected by trees to the north and northwest.

It is directly adjacent to a B road with good access and visibility. The soil is a good loam, though not suited to brassicas.

Future

Sales to restaurants and local food outlets are increasing, as well as some farm gate sales. A contract with a national herb company provides a good price and guaranteed sales and presents promising opportunities. The aim is to concentrate on higher value crops like salads and herbs over the next few years, as demand currently exceeds their ability to supply.

Strengths

- The mixture of land managed by hand and mechanization.
- A resolved planning issue so more stability.
- Well protected and productive land.
- The soil quality is good for horticulture.
- Considerable infrastructure has been built up and largely paid for.
- The business has experienced, competent workers and a good track record.

Weaknesses

- Additional polytunnels unlikely due to space and planning constraints.
- Highly dependent on one main town market outlet.

Opportunities

- To expand flower and herb production.
- To expand farm gate sales.
- Increase higher value crops such as salads.

Threats

- Gaining residential planning permission took time and energy.
- Local consumers favouring local over organic produce. As there are several growers in this rural area, but not too many organic ones, that means more competition for Spring Grove and a potential loss of its marketing niche.

Case Study 6 - Maesyffin Mushrooms

- Fresh and dried Shitake mushrooms
- Value added through processing and internet sales
- Rural location means highly dispersed market and high distribution costs
- Micro scale – 30m x 20m holding
- Annual turnover £10,000

Maesyffin Mushrooms is an award winning[12] shiitake mushroom business run by Gary Whiteley, from a small rural garden in West Wales. The business has been running since 2003, and sells Soil Association certified fresh and dried Shiitake mushrooms. Mr. Whiteley has always been a gardener, but only started growing mushrooms when he moved to Wales seven years ago. He still considers himself a journeyman.

Livelihood Strategy

Shiitake cultivation takes place on artificial logs made from wood chippings and sawdust. The sawdust comes from clean mill waste and planings, and the chippings are made from small oak and other hard-wood branches. Ideally the sawdust comes from slab wood, rather than heart wood, since it is alive rather than dead, and Mr. Whiteley is increasingly finding local wood workshops that can provide the sawdust.

The sawdust and woodchip are combined in a 50:50 mix, and pasteurised in pressure cookers to get rid of any competitor spores before being inoculated with the Shiitake spawn. The mixture is put in specially manufactured polypropylene bags, to form a block. From inoculation it takes 8-12 weeks for the blocks to start fruiting, and each block can produce several flushes of mushrooms. The mushrooms need to be

[12] On November 11th 2010 Maesyffin Mushrooms' Fresh Organic Shiitake Mushrooms won a Gold True Taste Speciality Product award and Bronze in the Organic Product category to add to their 2008 True Taste Speciality Product (Healthy Options) Winner's award and Commended awards for 2006 and 2007.

picked 3-4 times per day, to ensure they are harvested when at their prime.

The quantity of mushrooms produced per week varies, but Mr. Whiteley is constantly trying to improve the system so that more mushrooms are produced from fewer blocks. He can now get as many mushrooms from 60 blocks as he used to be able to get from 120. In the past 120 blocks per week were made, but it was hard then to find sufficient outlets for the quantity of mushrooms. Currently 48 blocks are made per week, producing 12-15 kilos mushrooms.

The cultivation relies on constant observation, and Mr. Whiteley feels that he has at least five more years of learning to do before he will have mastered the craft of Shiitake mushroom production.

The fresh mushrooms are delivered to local whole food and organic shops and distributors and to a few restaurants and private customers. He sells 12-15kg fresh mushrooms each week at £12 per kilo (retail £16-£17 per kilo). The wholesale price for fresh Shiitake in London would be £15 - £18 (retail £25 per kilo). A few private customers also buy fresh mushrooms directly.

Maesyffin Mushrooms has a website[13], which Mr. Whiteley has designed, on which he sells dried Shiitake mushrooms, a Shiitake paté of his own devising, and organic Shiitake fruiting blocks to enable people to grow their own fresh Shiitake mushrooms. Now that the website has developed he could sell more dried mushrooms and is increasing production to meet the demand. The dried mushrooms do not sell well in local shops, since he can't compete with the prices of imported dried mushrooms. It takes 1 kilo of fresh mushrooms to make 100 grams dried mushrooms, and only on the internet are people willing to pay enough to cover the costs of producing and drying mushrooms produced in Wales.

The paté is made by Mr. Whiteley in his own kitchen which is certified by the Environmental Health Office. The business holds both a producer and processor licence with the Soil Association but, as his processing turnover is under the Soil Association threshold (£30,000), he only has to pay for the producer's license.

All the work is carried out by Mr. Whiteley, who works physically about 35 hours spread over a seven day week. He doesn't employ anyone else, since the business only produces enough money to support him. However, he is intending to pass on his old blocks after their third flush to a neighbour who has more space, and they will harvest subsequent flushes and sell them back to Mr. Whiteley. The earlier flushes are more productive, and he wants to keep the space he has available for the most productive blocks. He doesn't rely on volunteer labour or WWOOFers, since there would not be enough for them to do, or enough space for them to live.

Maesyffin Mushrooms produces an annual turnover of £8,000 to £10,000 and is yet to produce a profit, after costs and withdrawings have been deducted.

The main running costs for the business are electricity for the heating, lighting and fans, and gas for the

[13] http://www.maesymush.co.uk/. Accessed 02/02/2011.

cookers that pasteurise the block mixture. Raw materials include bran and gypsum to mix with the sawdust and wood chip, and polypropylene bags for the blocks, which currently have to be imported from Belgium or Holland. The business provides sufficient for Mr. Whiteley to live on as he lives simply and partially self-sufficiently to keep costs down. Maesyffin Mushrooms is his sole source of income.

The only mechanisation used in production is the reclaimed washing machine motor which drives the mixer and the occasional hire of a log chipper. A car is used for deliveries, since the customers are widely spread in this rural area of Wales, but small quantities of mushroom could easily fit on a moped (or even bicycle) if deliveries were more locally concentrated. Where possible, Mr. Whiteley shares delivery rounds with other local producers since, due to the need to ensure mushrooms are sold when fresh, frequent small deliveries are necessary.

Electricity, water, vehicle costs, Soil Association fees and communication together account for 70% of outgoings.

The Land

The entire plot upon which the business is based is only 30m by 20m (0.15 acres), including the footprints of the house, garage, polytunnels and shipping container. Although it is a tiny area, it is ample for the mushroom business and provides enough space for Mr. Whiteley to grow his own summer vegetables. The main active areas for mushroom production are the 6.5m shipping container, a 6.5m x 2.5m polytunnel, and half of a 6m x 13m garage, which is used as an incubation area. The garage was present when he bought the house, but the shipping container and polytunnel have been added.

Capital Investment

Over the seven years of its operation approximately £10,000 has been invested. The equipment needed for mushroom growing is quite expensive, both for the block production and due to the need to adjust the climate in the growing room. The enterprise has so far been saved the cost of investing in block-making equipment through an equipment loan from a supporting enterprise (Humungus Fungus, who developed the system).

Some mushroom growers suggest it is necessary to spend £25,000 on equipment, but this has proved unnecessary as the business has relied on a D-I-Y approach to building its own equipment. It has been important to remain adaptable, so that as the business develops the equipment can evolve to meet its needs.

The business has been self financed, and no loans or grants have been used in its development.

Important Advice

Before establishment, identify both your local markets and local competition. Due to the specialist nature of Shiitake production, each grower's local niche is fragile and hard won. There is a risk that an extra supplier in a particular area could lower prices for mushrooms due to a limited market being shared out between too many. In well populated areas, especially those with a strong local food culture, there are more potential buyers within a small radius and a business stands a better chance of success. Shiitake production is likely to be well suited to cities, since it doesn't require much space and there is likely to be a dense concentration of shops, restaurants and private customers. Restaurants are harder than shops to sell to as they periodically change menus and chefs, disrupting trading relationships.

Although the mushrooms are light, their production is heavy work since the blocks weigh 2 kilos, and each one must be picked up over sixty times over its lifespan, including mixing the substrate, pasteurising, moving into, out of and around rooms, into and out of water tanks and tunnels, lifting to crop mushrooms, and final disposal. It is not a good trade for people with bad backs!

Future

The business is now in the process of expanding as regular sales for the current level of production have been secured. There are also plans to purchase part of the block making equipment so the business will own its own equipment rather than relying on goodwill.

Although having sufficient land to provide the hardwood for wood chip would be useful, it would need to be the right kind of woodland. Oak, beech, ash and chestnut are good, whereas pine is too resinous and birch and willow don't produce as many flushes.

Strengths

- Very little land needed, so mushrooms could be produced alongside other enterprises on a larger holding.

Weaknesses

- Market fragility. Highly niche market means if there is an existing producer in the area there is a danger of a competitor causing the price to drop too low for either to stay in business.
- Dispersed market due to rural location requires considerable time and petrol for delivery (the nearest town is 12 miles away).
- Labour intensive. Low returns for long working hours.

Opportunities

- Technical expertise, on-going careful observation and willingness to experiment mean that the business is constantly evolving and becoming more efficient.
- Practical ability to design and adapt tools and equipment saves capital costs.
- A tariff on aviation fuel would create a more level playing field, and enable UK mushrooms to compete with imports.
- Marketing of fresh mushrooms would be easier in more densely populated areas.

Threats

- Cheap imports from China. Due to lower wages, cost of living and cheaper inputs it is impossible to compete with imports, yet whether they have the same organic standards as in the UK is questionable. Shiitake blocks are being made in factories in China, bulk-imported into the UK in shipping containers, and then sold as British mushrooms because they are harvested in the UK.
- Mislabelling. Shiitake mushrooms are being sold as “Wild Mushrooms”, yet they are not found indigenously in the UK.
- Demand for firewood is creating greater competition for hardwood logs.

Case Study 7 - Honeypot Farm

- Main enterprises – apples and bees
- Value added products – chutneys, vinegars and elderflower cordial
- Sell at farmers markets, country fairs and their own farm shop
- 5.5 acre holding
- Annual turnover £12,300, net income of £7,500

Honeypot Farm is a 5.5 acre, mixed smallholding, owned and run by Colin and Julie Comben. It was purchased in 1995 when the Combens sold their house and bought a cheaper, derelict house and the land with some of the resulting capital. The land was just a bare field, with no infrastructure. Very little was done with the field until the Combens had refurbished the house. Since then, investment in infrastructure development has been gradual, as and when time and money allowed. Mr. Comben has worked as a quantity surveyor and invested in the land whenever money became available. Both the Combens completed courses with the Devon Association of Smallholders. These courses have combined with learning through experience to provide them with the skills necessary to build up the smallholding.

Livelihood Strategy

The main enterprises are apples, from which cider and apple juice are made and bees. A small amount of income is also earned from sheep; chickens; and vegetables, as well as from a range of value added products such as chutney and elderflower cordial. The holding is not organically certified, due to the paperwork required and cost of certification. However, no spraying occurs and livestock medication is minimised.

The Combens also teach three 1-day courses a year – two on cider making and one on bee keeping – on behalf of a local rural education centre. Honeypot Farm is paid £120 per course by the centre, who deal with all the booking, administration and catering.

The land is divided into 7 x 3/4 acre paddocks, around which forty standard apple trees are planted. Altogether 63 standard apple trees and 17 bush trees have been planted. There are 11 varieties of cider apple and 33 varieties of eating apple.

Cider and apple juice have emerged as the most profitable enterprises, and production of these is being scaled up as the apples become available. Last year 4,500 litres cider were made, and it is planned that this year 6,000 will be made. There is no intention to increase production above 7000 litres, which is the point at which duty must be paid. The cider is sold by the bottle (£2.00 each), the barrel (£50 each) and the glass (£2.40 per pint) at events. Sales by the glass increase the value of a 25 litre cider barrel considerably, making it worth £120. In addition, 600-700 bottles of apple juice are made annually, and sold at £2.20 per bottle. Value is also added to the apples by making cider vinegar and chutney. Elderflower cordial is also made (400 bottles rising to 800 next year). The Comben's domestic kitchen is certified for this processing by the local Environmental Health Office.

The main mechanisation for the farm is connected to the cider making and bee keeping enterprises. An electric pulper and 2 x 25l presses are used for pressing the apples, and a pasteuriser is used for the cider, apple juice, honey and elderflower cordial. A tractor is used on the holding occasionally.

Produce is sold at four regular farmers markets per month, as well as twelve to fifteen extra events (such as country fairs and festivals) each year. The extra events are usually quite profitable, but require advance investment.

A small farm shop started in August 2010, to take advantage of passing trade on the A303. It is currently open one day a week and only attracts a few customers a day, but it is still very new. Cider is also sold wholesale to a whole food shop in a local town. The Combens don't sell to pubs due to the low price paid by pubs for cider—£18 per barrel as opposed to £37.50.

The turnover for 2009/2010 was £12,300, and total costs, not including their own wages, £4,800. Costs include feed, fuel, travel, market costs, bottles and jars, electricity and water, and the alcohol license for the cider. The marketing costs have increased, since they have had to travel further to find really profitable farmers markets where people are willing to pay more for food and drink. Also, the most profitable markets, such as the larger country fairs where it is possible to sell cider by the glass, usually have higher stall fees (£100 per time) than the farmers markets (£20/time).

The Combens have two children, one of whom is fifteen and fully dependent, and the other is twenty-

three, and semi independent. Whilst they are still building up the enterprise they supplement their income with part time work off-site. The Combens aim to increase business turnover to £18,000-£24,000. At present they don't employ any additional labour, although as cider making increases it may become necessary to do so for the month of October, when apple pressing takes place.

The Land

Honeypot Farm is grade one agricultural land, being free-draining and light sand in an area well known for horticulture. It is 500 yards from a roundabout on the A303, so is in a very good position for passing trade. The land has houses on three sides, so is overlooked by neighbours, which has restricted development of the business, due to their objections to erecting necessary buildings.

In addition to their own land, they have access to 3 or 4 acres of grazing for the sheep belonging to a neighbour, which frees up some of their land for other projects. Ideally, they would like another five acres so that they could increase the number of paddocks, and plant 2 acres of woodland. However, due to the quality of the land, 5.5 acres is sufficient for the enterprise mix they have chosen. Their experience suggests the marketing of produce is more important than the acreage in determining the level of success.

Capital Investment

It has taken £30,000-£40,000 and considerable work to get the holding to its current state. Major infrastructure investments include fencing and the barn, which Mr Comben built himself, reducing costs considerably. Equipment costs have been the other main investment, and include the cider press and mill, pasteurising equipment (used for cider, apple juice, vinegar and elderflower cordial), a honey separator and milking equipment for the sheep.

All investment has come from private capital, and no loans or grants have been used.

The Future

The Combens are planning to increase the income they can derive from the smallholding by the following means:

- Champagne Cider - Extra value will be gained from the apple juice by making champagne cider, which can command a higher price than ordinary cider (£7.50 as opposed to £2.00 per bottle).
- Farm shop – As the range of produce increases and it becomes better known this will draw in more customers.
- Increasing top selling products, such as elderflower cordial.
- Increasing vegetable production – Root vegetables that keep well, such as potatoes and carrots, will be concentrated on, and will be grown in bulk (¾ acre at a time). A half acre mixed vegetable plot is also being established.
- Growing food crops for the animals (sheep and chickens) to cut production costs. For example, sunflowers and maize for the chickens.

Strengths

- Honeypot Farm's proximity to the A303 means there is potentially passing trade for the farm shop to draw from.
- The soil quality is very good for horticulture.
- The holding is owned outright and there are no loans/mortgages to pay on it.
- The Combens are well linked with neighbouring smallholders, in a mutually supportive network.

Weaknesses

- At present the combination of enterprises isn't making enough for a full livelihood
- Insufficient land for the sheep grazing plus all the other enterprises limits the scope for expansion.

Opportunities

- A sheep's milk cheese enterprise would be possible on five acres, plus the rented land. This could make a significant additional income.
- Further products from existing enterprises e.g. Champagne Cider.

Threats

- Competition from new entry cider makers and farm shops.
- Planning and Red Tape – The Combens feel bombarded by regulations. For example planners complained to DEFRA about their use of recycled windows. The high level of bureaucracy is, they say, disheartening and may eventually lead them to quit.

Case Study 8 - Lower Farm

- Main enterprise – salads with a small box scheme
- 13 years of successful horticulture on a “no- dig” system
- 2 acre farm in mid Somerset
- Annual turnover of £40,335, profits of £9,877 with an additional £12,581 turnover, £5,419 profit from courses

Lower Farm in Somerset, near Bruton is a 2 acre farm owned and run by Charles Dowding. Mr Dowding grew up on a dairy farm, so he had early experience of the reality of running a farm business. He began growing organic vegetables commercially in 1982, over 28 years experience. This includes working in the Hebrides, France and Zambia before settling back in Somerset. Mr. and Mrs. Dowding moved into their current home at Lower Farm in 1997, taking over a farmhouse belonging to the Dowding family and a little bit of land next to it. Mr. Dowding has gradually taken over more land, in 3 different blocks, from the arable field next door. In 2003 Mr. Dowding began concentrating on salad bags at the suggestion of a local retailer.

Livelihood Strategy

In 2009 he made a profit of over £15,000, growing salad and other vegetables on two acres and running regular vegetable growing courses. 2009 was not an unusual year and recent profits are in line with this figure. Mr. Dowding works full-time and employs one person part-time. Although costs have risen recently, so has his income as his knowledge increases and the system he uses gains in productivity. In addition, he supplies the vast majority of his family’s vegetable consumption and much of its fruit; to a value of over £1,000 annually, plus the savings in energy, transport and packaging.

Mr Dowding is well known within the growing world for his efforts in pioneering a “no dig” system of hor-

ticulture. For several years he has been conducting a small on-going experiment comparing the productivity of a dug and "no-dig" growing bed. Rather than digging over his growing beds each winter, he applies a large dressing of well rotted manure or compost on top, and leaves nature to create the necessary soil structure for good plant growth.

In addition to the raised vegetable growing beds, there are two polytunnels, sized 14' x 60' and 18' x 30' and a glasshouse of 12 m^2 where 90% of plants are propagated. Strict weed control is maintained to ensure minimal competition and very little cover for slugs and pests.

Lower Farm has a dozen hens, lots of apple trees and some soft fruit, although the vast majority of the work and income revolve around salad leaves and other vegetables. As the farm is not certified organic, produce is labelled "compost grown". Mechanisation is limited to a lawnmower for grass areas around the beds, a tractor to deliver compost and a car to deliver vegetable boxes and salad bags. Consequently it is a very "on foot" operation: planting out, weeding, watering, pulling off pests, protecting from inclement weather and harvesting. This means 2 acres is the right size; any larger area would be more difficult to manage.

The vegetable produce business is now supplemented by running 10 educational day courses a year on gardening and vegetable growing. Approximately 12 people attend each course and this helps to provide new customers, networking and good financial income.

Labour is perhaps the greatest in-put, amounting to nearly 100 hours per week at peak times over the summer and 30 hours per week in winter. Seed and potting compost are purchased annually, although the main agricultural input is 20 tonnes of manure or ex-mushroom compost used to cover the beds each autumn. The business pays for the upkeep of its lawnmower and car, replaces tools and buys in some vegetables and fruit to supplement its own produce in the box scheme.

The most significant produce from Lower Farm is the 250 gram bags of mixed salad leaves which sell for £2.75. "Cut and come again" varieties are favoured with a mixture of other leaves for flavour and interest including herbs, rocket and oriental greens. The amount of produce varies according to water, light and pest levels, but this is the mainstay of his business. In season, from a 12m^2 area of polytunnel he can provide between 5 and 10 kilos of lettuce leaves a week. The polytunnels provide the majority of production

in the darker months, but are most useful in March and April. From May-November the majority of salad comes from outdoor plants. Understanding what these plants need and then harvesting them carefully and efficiently is highly skilled work.

Lower Farm also provides over a dozen vegetable boxes to local people each week through most of the year. These are less profitable and at times he has to supplement them, particularly with fruit. However, they provide variety and rotational possibilities as well as income and the vast majority of the fresh produce consumed by the Dowding family.

All of the produce is sold within a 4 mile radius and 75% of the salad goes to within 3 miles. His salad bags go to four separate shops on Bruton High St and two shops in Castle Cary. Pubs and restaurants in the surrounding villages are also supplied.

Outline Business Figures for 2009		
Income	Courses	£9,000
	Vegetable boxes	£5,100
	Salad bags	£20,006
	Total	**£34,106**
Expenses	Wages	£10,000
	Tools, services	£1,000
	Bought in vegetables	£700
	Website	£1,300
	Seeds and compost	£1,000
	Administration	£500
	Lunches on courses	£3,000
	Tool depreciation	£300
	Packaging	£260
	Accounts	£400
	Car	£350
	Total	**£18,810**

Running educational courses brings in about 25% of annual income (36% profit), while vegetable boxes constitute 15% annual income and salad bags 60%.

Little capital investment has been required, with much of the early equipment being found, reclaimed and borrowed. Start up costs totalled £4,000 for polytunnel covers, a lawnmower and propagating equipment. These were paid for from savings, allowing the enterprise to survive through its first year with virtually no income. Mr. Dowding reduces costs by using labour rather than expensive equipment. For example, watering is done with a hand held hose rather than an automated irrigation system.

Living on the farm means that pest and weed prevention can be a flexible, ongoing job at any time of day or night. Sudden detrimental weather events can be responded to at short notice. The close proximity of every aspect of the business means tasks can be integrated more easily and adjustments made incrementally. For example, the polytunnel can be opened or shut to adjust heat levels when passing by on some other job. It is the close attention to detail and intimate knowledge of the plants and soil that allows such a high level of productivity from such a small area.

Mr Dowding has proven the success of his system over many years now and with 25 years of practising "no-dig" horticulture he is one of the countries' leading experts on such matters. Indeed, he is in demand as a speaker to gardening groups across the country and as far away as Tokyo where he has spoken on behalf of the Royal Horticultural Society. He has written two books on the pleasures and lessons of small-scale vegetable growing, and his one day courses remain much in demand. He has a third book, on winter vegetables, due out this year[14].

The Land

Lower Farm is situated south of Bruton, Somerset, in a sheltered hollow. Classified as Grade III agricultural land, it has a slight north facing aspect, lies at 70 metres above sea level and annual rainfall is 1 m per year. The soil is heavy clay over limestone and was a heavily compacted arable field when Mr Dowding began growing there 12 years ago. The soil has a pH of 8, slightly alkali. Its most favourable characteristic is probably being so near to the house, followed by good moisture retention on the rather heavy soil. Its worst feature is a tendency towards suffering from frost.

Future

Mr Dowding is quietly confident about future prospects. Good outlets and market opportunities are crucial and provided by the local shops in the nearby towns. Restaurants and shops can be hard task masters. The produce needs to be delivered on time and to the desired standard. Having hardly missed a week's supply in 5 years the enterprise has an excellent track record and ensures buyers remain loyal.

[14]Dowding, C. (2008) *Salad Leaves For All Seasons: Organic Growing from Pot to Plot*, Green Books, Totnes; Dowding, C. (2010) *Organic Gardening - The Natural No-Dig Way*, Green Books, Totnes; Dowding, C. (2011) *Winter Vegetables*, Green Books, Totnes.

Strengths

- Loyal client base and high quality production.
- Being an authority on “no dig” horticulture means a high profile and profitable courses.
- The right amount of land for the type of activity.
- Costs and overheads are kept low, no debts or mortgage to repay.
- The business has built up a diverse and loyal local customer base, with good access to local markets.
- Produce is closely tailored to customers’ needs.

Weaknesses

- The box scheme’s margins are low at this scale.
- Dependent on imported fertility in the form of manure or compost.
- The land can suffer from frost damage.
- The business requires year-round attention and is labour intensive.

Threats

- A changing market.
- Keeping restaurants happy with a fragile product.

Opportunities

- The business is always seeking to improve the range and quality of fresh produce it offers.
- The business and growing system are responsive to change and adaptable.
- There is increasing demand for the short courses and books as interest in low carbon food and “grow your own” increases.
- Using author and pioneer’s profile to develop educational or consultancy work.

Key Findings

Creating Sustainable Livelihoods on 10 Acres or Less

1. **Ten acres or less can provide economically viable, highly sustainable livelihoods**
   When livelihoods are carefully designed it is clear that 10 acres is enough to provide a land based livelihood. Indeed, throughout the UK there are a growing number of people earning their livelihood from under ten acres. The Real Seed Company, for example, (case study 2) supports five people based on a growing area of 0.5 acre. Whilst much is possible on micro holdings, more land increases the possibilities. Longmeadow Organics (case study 1), for example, have spawned several businesses from 9 acres and created an annual turnover of £48,000 on 3 acres.

2. **Small-scale livelihoods can increase the productivity of marginal land**
   Most of the case studies began with the purchase of marginal sites, with high elevations, north facing aspects and/or exposed, denuded and compacted soils. Only one case study, Honey Pot Farm, is located on Grade I agricultural land. The case studies have demonstrated an ability to work sensitively with each site to develop livelihoods appropriate to each location and capable of improving the fertility and productivity of the land available. Lower Farm, for example, has taken unproductive pockets of land, marginal to conventional farming, and turned it into a series of highly fertile, productive raised beds, producing a £53,000 turnover from 2 acres.

3. **The range of enterprises capable of supporting low acreage livelihoods is diverse and growing**
   This report has found that vegetable growing combined with direct marketing is currently the most reliable and common way to generate a livelihood from a small acreage, due to its high productivity, high value per unit area and labour intensive nature. Even within this niche, however, there is considerable scope for variety in the crops grown and methods used for marketing. The latter include direct distribution such as box schemes, delivery rounds, market, fair and show stalls, farm shops and mail order as well indirect distribution by supplying to other local growers/distributors as well as shops, restaurants and hotels. Local marketing of fresh produce that is consumed regularly by most of the population will continue to offer the greatest opportunities. This avoids the risk of local market saturation for niche products such as shiitake mushrooms (see case study 6).

   However, livelihood options are proliferating for small-scale producers, and this trend is set to continue. As public interest in and awareness of food's role in terms of health and social, economic and environmental impacts rises, demand for quality, local food increases. Food, energy and other commodity prices are increasing. The range of products capable of supporting low acreage livelihoods increases directly with such trends. Added to this is the ability of smallholders to proactively shape demand and use technology to produce and market a growing range of land based products. These factors combine to offer a burgeoning palette of options for small-scale land based livelihoods.

4. **Livelihoods follow a low and slow development trajectory**
   This allows livelihoods to be largely self-funding, with practitioners investing time and money as these become available. As with the land based sector generally, margins are often small, so avoiding the need to repay commercial loans is a strategy adopted by most successful low acreage livelihoods. Skills and knowledge are often built up "on the job", reflecting smallholders' practical, solution-focused attitudes. Producers prefer to commence their livelihoods and refine them as they go along rather than wait until they have all the "ideal" array of resources in place. Skills built up in this way often include "trade" skills, such as carpentry and plumbing, as well as self-sufficiency skills. Practitioners typically grow some, if not most, of their own food, for example, and employ a range of such strategies to reduce costs[15].

   'Low and slow' also fits with the need for close observation and the willingness to work with each site's inherent qualities. This trajectory reflects the way low acreage livelihoods often co-evolve

[15]This reflects published research into small-scale market gardeners who keep costs down as part of their business survival strategy, see: Maxey, L (2006) *Can we Sustain Sustainable Agriculture? A comparative study of small scale organic producers and suppliers in Canada and the UK*. The Geographical Journal, 172, 3, 230-244.

with their eco-systems. Establishing a commercially productive forest garden (case study 4), for example, requires 1-20 years for trees to commence productivity. Equally important, though less obvious, however, is the time, observation and interaction required during this time to establish the most effective relationships between plants and the wider communities of flora and fauna.

5. **Mental attitude and approach are the strongest determinants of success**
   Acreage, aspect, soil conditions and levels of knowledge are all important factors in establishing viable livelihoods. However, such factors are less crucial than the attitudes and approaches of those establishing and running small acreage livelihoods. This is demonstrated by all the case studies which, despite divergent physical conditions and socio-economic backgrounds, share remarkably similar attitudes and approaches. Commitment and a willingness to work long hours constitute only one facet of this. Other components include patience and the ability to take a long-term perspective, attention to detail, creativity and solution-focused thinking.

6. **'Adding value'[16] brings viability to low acreage livelihoods**
   All eight case studies achieve high levels of income per unit area by intensive and/or diverse cropping and then increasing the value of the raw products through some form of processing or direct marketing. For example, at Maesyffin Mushrooms (case study 6), shiitakes are dried and made a into a mushroom pate. The ability to develop ways of adding value to produce from the land further illustrates mental attitude and approach outlined above.

7. **Livelihoods often mix and match different enterprise options**
   Combining a range of enterprises allows robust, resilient and efficient livelihoods on small acreages. Efficient use of resources can be made by choosing enterprises where the bi-product of one can become the raw material of another. For example, at Honeypot Farm (case study 7) pomace from pressing apples for cider and apple juice is fed to pigs, whilst cider vinegar, a bi-product from cider, is processed into chutney.

   The adage "don't put all your eggs in one basket" has been recognised within the case studies along with generations of traditional smallholders and contemporary permaculture practitioners[17]. By drawing upon a range of enterprises, livelihoods are able to withstand changes in weather, market conditions and supplies. Livelihoods which use and value diversity in this way are often more balanced nutritionally, socially, economically and environmentally.

8. **Attention to detail is a key asset**
   The old adage "the best fertilizer is the gardener's shadow"[18] is confirmed by the case studies. An intimate knowledge of their land, produce and markets allows viable livelihoods to be created on small, previously marginal sites. Most profitable land based enterprises on 10 acres or less are labour intensive and use labour that cannot readily be replaced by large-scale, mechanised production. These livelihoods can therefore compete on their own terms within the wider market place. For example, growing, harvesting and processing salad leaves, soft fruit, seeds and mushrooms all require careful attention to detail. A small acreage brings the benefit of being able to focus more attention per unit area of land, to maximise its productivity and profitability. This also explains why small farms are consistently more productive per unit area than larger farms[19].

   Smallholders are able to offer greater attention to detail than farmers managing a large acreage,

[16] Added Value' is a term used in economics and can be defined as the difference between a product's final selling price and the direct and indirect input used to make it. See, for example, Kay, J. (1993) *Foundations of Corporate Success*, Oxford: Oxford University Press.

[17] See, for example, Holmgren, D. (2002) *Permaculture Principles and Pathways Beyond Sustainability*. Holmgren Design Services, Hepburn, Australia. Chapter 10 explores the links between this adage and permaculture.

[18] This adage is quoted by several gardening writers, see for example Roos, D. (2010) rockspringgarden-club.blogspot.com/. Also see www.quotegarden.com/gardens.html. Both accessed 02/12/2010.

[19] Altieiri, M. (2009) *Agroecology, Small Farms, and Food Sovereignty* Monthly Review July-August 2009 http://www.monthlyreview.org/090810altieri.php. Accessed 02/12/2010. See also footnote 4.

and are well placed to meet the growing demand for local, artisanal foods produced to high environmental and animal welfare standards. Many products that are labour intensive to produce or harvest, such as French beans or cut flowers, are imported from countries where labour costs are lower. Growing interest in minimisation of food miles provides an opportunity to substitute high value imported goods with those that are produced locally. On a small-scale, where handwork rather than machinery is employed, it is feasible to devise systems that utilise the land's resources more productively. For example, fruit trees and bushes can be planted where the micro-climate is most suitable and harvested by hand. Hence, a variety of different fruits can be harvested when they are perfectly ripe and either sold or processed into jams in batches small enough to optimise their flavour, which results in a product that customers are willing to pay more for. At a larger scale it would not be possible to give such care.

9. **Horticulture is generally more suited to low acreage livelihoods than livestock**
Whilst this research has uncovered several case studies which demonstrate that low acreage livelihoods are possible in the UK on ten acres or less, it found only one based upon livestock. The classic ecosystem food pyramid is at play here, with species such as herbivores requiring more space to feed themselves than species lower down the pyramid such as plants. In addition to this nutrient requirement, livestock requires space for rotation of grazing to control parasites. Although pigs and poultry can be kept in smaller spaces, they generally rely on "ghost acres" off-site for feed. However, these constraints do not necessarily apply to cows, which develop immunity through exposure and can be kept in numbers suited to low acreages. Micro-dairies are emerging as one example of a livestock-based low acreage livelihood, particularly where they can establish a secure, concentrated consumer base nearby. Simon Fairlie, for example, runs a micro-dairy in Dorset which makes a livelihood on 4.5 acres. As this enterprise is still being established it does not yet have a full year's accounts and was not featured as a case study in this report.

   Further research in this area is crucial for two principle reasons. Firstly, this research will identify and learn from emerging enterprises such as micro-dairies. We have noted above that the range of enterprises capable of supporting low acreage livelihoods is diverse and growing and this is an important illustration of this. Lessons drawn from these emerging case studies may have implications for many sectors of farming.

   Secondly, this research can explore wider and deeper issues of farm viability and sustainability. In some respects this finding supports recent calls to reduce the role of animal products in the average UK diet, and increase the consumption of fresh fruits and vegetables in the interests of climate change mitigation, resource depletion and human health. Whilst horticulture can generate highly profitable yields from very small areas of land, livestock may in some situations be combined with profitable horticultural enterprises to increase net yields, productivity and profits. This is illustrated by case study 7, where the waste product or "mash" from cider production is fed to pigs. Furthermore, as has been established over millennia, animals can play an important role in helping to build soil fertility. The main in-put at Lower Farm (case study 8), for example, is a considerable amount of manure from animals kept on local farm holdings. This illustrates that horticulture based livelihoods may also rely to some extent on "ghost acres". The issues of off-farm resources must therefore be investigated in a thorough and holistic manner within future research. All key inputs should be analysed in this way, including labour, chemical in-puts, fossil fuels, subsidies, animal feed and manure.

10. **High property prices and the planning system are the greatest barriers to growth in this sector**
Where growers can self-build on their smallholding, they have an affordable route into farming. Without this costs are prohibitive. An entry level holding with residential permission costs at least £250,000, with growers required to demonstrate earnings over £50,000 in order to qualify for the requisite mortgage. Based on our knowledge of small-farm incomes, this is clearly impossible. The self-build route is therefore essential for any new entrant who cannot afford to invest over quarter of a million pounds in a dwelling. Due to the complex nature of the planning system, a fraction of those willing and able to establish viable smallholdings have been able to pursue this route. The current overhaul of planning within the National Planning Policy Framework and Localism Bill is thus welcome, promising to simplify and streamline the planning system. This should create conditions in which independent businesses can operate on a more level playing field.

Recommendations for Earning a Livelihood on a Small Acreage

The following are some pointers, drawn from the case studies, which provide clues about how best to earn a livelihood from a small acreage.

- Keep set up costs low. The capital costs for setting up can be reduced if the smallholder has the skills and materials to develop infrastructure themselves, rather than relying on trades people. Savings can also be made by waiting until second hand equipment becomes available, rather than purchasing costly new equipment. In many cases second hand equipment is more robust and better suited to smallholders than new equipment.

- Adding value by direct marketing and/or processing is the secret to maximising the income from a small acreage of land, and features in each of the case studies. For example, at Maesyffin Mushrooms, shiitakes are dried and made a into a mushroom pate which is sold on a website. Care must be taken, however, to market produce effectively and avoid adding to costs by buying in too many extra ingredients.

- Several of the case studies supply local shops and restaurants, which favour fresh, local produce over that available from wholesalers. In any area with a reasonably wealthy, well educated market, such outlets represent a growing market with a huge potential .

- Consider adding processing facilities. Environmental Health Office (EHO) approved processing facilities are required for any processed product that will be sold to the public. For some cooked products (chutney, cordial, baked products), this can be as simple as having a domestic kitchen adapted and checked by the local authority EHO. We recommend that clear and constructive communication with EHOs is given a high priority whatever facilities are being considered.

  Other processes, such as cheese making and butchery require more specialist facilities, which require investment. Sharing investment in processing facilities between several smallholders can make a difference when weighing up viability, if a central location can be found. The Ecological Land Co-operative lends itself to this model, in that clusters of co-operating smallholdings are planned.

- Many smallholders avoid borrowing money by growing their business incrementally as surplus capital becomes available from profits. Although this slows the rate of development, the absence of loan interest reduces the financial pressure and stress in the early years.

- Ten acres offers little space for economically viable livestock production, unless value is added to the product. Sheep or cattle on their own would not be economic on a small acreage, whereas making cheese, yoghurt or ice cream from cows', goats' or sheep's milk could potentially work. However, few examples exist of such enterprises working with ten acres or less. Due to parasite issues, even goats need quite a large acreage for rotation.

Policy Recommendations

Whilst sustainable development (SD) is at the heart of our planning and political system, its achievement to date has proven elusive. There are few examples of genuinely economically, environmentally and socially sustainable developments. Low acreage livelihoods offer rare examples of this and should therefore be supported by planning policy[20].

These livelihoods offer opportunities for new entrants into farming, farm diversification and for the creation of truly affordable homes. They are not dependent on subsidies[21], whereas, by comparison, in 2009/10 the average English farm would have operated at a loss had it not been for their income from the Single Payment Scheme[22].

Low acreage livelihoods also offer solutions to the challenges of enhancing biodiversity and protecting Britain's countryside in a time of cuts. DEFRA's Geoff Sansome, for example, wrote: "*Current agri-environment programmes are only sustainable with continued funding. Sustainable solutions, delivering economic benefits from environmental enhancements must be facilitated*" [23]. Low acreage livelihoods offer precisely this type of solution.

Furthermore, against a background in which DEFRA expects UK agricultural emissions to rise by 6.5% between 2010 and 2020[24], low acreage livelihoods can play a valuable role in helping agriculture to play its part in addressing climate change[25]. It is widely accepted that labour-intensive farming helps reduce emissions[26]. Small scale enterprises such as those featured in this report go further by sequestering carbon in soils, switching land to tree-based and perennial production, creating local, low carbon food chains and supporting the type of lifestyle changes which research shows support both carbon savings and health benefits[27].

1. Supporting farm diversification through Land Based Innovation Centres

Whilst the range of enterprises capable of supporting low acreage livelihoods is already diverse, there is significant scope for new and emerging sustainable land based businesses and products. This report clearly demonstrates that practitioners' attitudes towards devising, growing, developing and marketing produce is crucial to their ability to establish economically as well socially and ecologically viable livelihoods (see, for example, Key Findings 3-7).

It has been UK Government policy to support farm diversification[28] for decades. But business skills and

[20] University of the West of England and Land Use Consultants (2002) *Low Impact development – Planning, Policy and Practice*. Countryside Council for Wales.

[21] Maxey, L (2006) *Can we Sustain Sustainable Agriculture? A comparative study of small scale organic producers and suppliers in Canada and the UK*. The Geographical Journal, 172, 3, 230-244 and Maxey (2011) *Can we Sustain Sustainable Agriculture?* in Williams Forson, P. and Counihan, C. (eds.) *Taking Food Public: Redefining Foodways in a Changing World*. Routledge, London, 2011.

[22] DEFRA (2010) *Farm Business Survey.* http://www.defra.gov.uk/evidence/statistics/foodfarm/enviro/observatory/indicators/documents/data-b.xls . Accessed 01/02/2011.

[23] Sansome, G. (2007) *Facilitating rural development* www.nuffieldscholar.org/uploads/downloads/sansomefinal.doc p.7. Accessed 01/02/2011.

[24] DEFRA (2008) *The UK climate change programme,* DEFRA, London, UK.

[25] Wimbush, P. and Swallow, N., (2009) *Initial Carbon Investigation Into the Lammas Project* http://www.lammas.org.uk/lowimpact/documents/lammascarboninvestigation.pdf Accessed 01/02/2011.

[26] Barclay , C. (2010) How UK farmers could reduce greenhouse gas (GHG) emissions House of Commons Standard Note: SN/SC/4340 http://www.parliament.uk/briefingpapers/commons/lib/research/briefings/snsc-04340.pdf Accessed 30/01/2011.

[27] Audsley, E., Brander, M., Chatterton, J., Murphy-Bokern, D., Webster, C., and Williams, A. (2009). *How low can we go? An assessment of greenhouse gas emissions from the UK food system and the scope to reduce them by 2050*. FCRN-WWF-UK, London, UK.

[28] Farm diversification is when a farm branches out from traditional farming by adding new money making activities' NI Business Info (2010) *Increase your farm income: diversification.*

planning remain significant barriers, as they were when the Joint Industry-Government Working Group (JIGWG) reported its findings on farm diversification. JIGWG made several recommendations, which we echo and develop, including that:

> "regional agencies should establish a network of business development mentoring and demonstration farms to illustrate effective farm diversification."[29]

Drawing on the success of business innovation centres such as the Pool Innovation Centre, Cornwall[30], **we recommend the establishment of Land Based Business Innovation Centres** (Land BICs). These would be demonstration farms+, offering training, work experience, mentoring and practical resources such as food processing/packing units and marketing support. They could be networked regionally and nationally to coordinate expertise, training and volunteer opportunities amongst small scale land-based enterprises and projects. They offer high levels of value for money and warrant seed funding. Irrespective of external funding, however, Land BICs will thrive with the right planning and policy framework, including **coordinated support from LPAs, EHOs and small business advisers**. This directly addresses the problem of "Red Tape" experienced by several case studies within this report. Indeed, many respondents in this study, as well as those reported in the literature, describe Red Tape as the biggest obstacle to successful land based businesses.

2. Planning Reforms

As mentioned several times in this report, Red Tape is a significant deterrent to small scale producers. We know of many growers who have left farming after being overwhelmed by planning applications and regulations. These burdens are often so bureaucratic and onerous that they can only be shouldered by larger operations[31]. We would like to see the reforms to the planning system as suggested in the JIGWG's Recommendations[32] 13 and 14:

> "thresholds for minor commercial development should be raised to allow small scale developments with minimum external impact to proceed outside the planning system" and "More work should be done on the existing Section 106[33] Regime to enable its full potential to be realised."

In this respect the changes due in 2011 under the Localism Bill and National Planning Policy Framework (NPPF) are most welcome. We **strongly recommend specific policies**, in both the Localism Bill and the NPPF **that allow for sustainable self build smallholdings**. These should be combined with strengthened Section 106 ties to ensure they remain productive and highly sustainable, with binding traffic management plans, for example. If ties are removed, these holdings should revert to affordable housing in perpetuity, monitored/managed through a local Land BIC, Community Land Trust or Neighbourhood Assembly.

Small scale self-build initiatives offer enormous potential to support low acreage livelihoods. Self build remains a massively under developed house building route in the UK. In times of recession it offers a particularly resilient mechanism[34]. As our research has shown, those fortunate enough to find themselves

[29] DEFRA (2007) *Barriers to farm diversification: Report of the Joint Industry-Government Working Group* http://www.defra.gov.uk/foodfarm/farmmanage/diversify/documents/barriers-diversification.pdf. Accessed 31/01/2011.

[30] University of Plymouth News Centre (2011) *Pool Innovation Centre Shatters Forecasts with Early Success*. 25/01/2011. http//www.plymouth.ac.uk/pages/view.asp?page=34883 Accessed 27/01/2011.

[31] E.g. see Laughton, R. (2008) *Surviving and Thriving on the Land: How to use your time and energy to run a successful smallholding*. Green Books; Fairlie, S. (2009) *Low Impact Development: Planning and People in a Sustainable Countryside*, John Carpenter.

[32] DEFRA (2007) *Barriers to farm diversification: Report of the Joint Industry-Government Working Group* http://www.defra.gov.uk/foodfarm/farmmanage/diversify/documents/barriers-diversification.pdf. Accessed 31/01/2011.

[33] Section 106 Agreements allow local planning authority to attach binding conditions to the granting of planning permission, as set out in the Town and Country Planning Act 1990 and Circular 05/2005.

[34] AMA (2009) Self Build Housing Market - UK 2009-2013. http://www.amaresearch.co.uk/SelfBuild_09s.html. Accessed 20/02/2011. See also http://www.cloughjordan.ie/mainpage/index.htm. Accessed 20/02/2011.

with a house on their smallholding are the lucky ones. The ability to live on one's smallholding is often the make or break factor determining its viability. It **is imperative that smallholdings which clearly demonstrate high levels of economic, environmental and social sustainability be recognised by the planning system.** The Low and Slow livelihood development trajectory outlined above means that these smallholdings should be assessed over a time scale in keeping with the enterprise. Drawing on the One Planet Development Policy[35], as well as the research reported here, and the wider literature in this field[36], we recommend 5 years is the minimum time-frame for this.

If we are to deal with the myriad challenges of climate change, food security, and biodiversity loss, it is incumbent upon us to make changes across the planning and tax systems, to public funding, and to regulations, so that food produced through small-scale, local, non-fossil fuel farming becomes cheaper and more available than its opposite. The sooner such changes happen, the less extreme they will have to be.

For example, why not regulate chemical rather than organic farming? Rather than organic farms paying to be registered and regulated, farms using chemical inputs could have to pay to be registered and regulated. To address the imbalance in power between farmers and supermarkets planners could put policies in place to protect sites for Farmers' Markets and local centres and furthermore, help could go to farmers selling there. It is necessary for us all to engage more with farming and with the management of our land. One such way, and the work of the Ecological Land Co-operative, is to facilitate small farms and enable more people to become farmers and land managers. This would help to address the chronic deficiencies in opportunities for people to learn about sustainable land management. However its done, the more people are involved with our land, the stronger our rural communities, the deeper our food security and the more care there will be for our landscapes. Small farms are a win – win solution to a myriad of problems, social, economic and environmental. Supporting and enabling them should be an urgent priority for us all.

[35] Welsh Assembly (2010), *Technical Advice Note 6: Planning for Sustainable Rural Communities.* http://wales.gov.uk/docs/desh/policy/100722tan6en.pdf. Accessed 01/02/2011.

[36] Laughton, R. (2008) Surviving and Thriving on the Land: How to use your time and energy to run a successful smallholding. Green Books.

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