LAND AT WOLFESTER PADDOCK, SPARKFORD HILL LANE, SPARKFORD, SOUTH SOMERSET

Siting of three temporary agricultural workers' dwellings for a period of five years together with an agricultural barn with PV array and alterations to existing highway access, to provide three affordable small-holdings for new entrants to ecological agriculture

PLANNING, DESIGN AND ACCESS STATEMENT

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1. Introduction

1.1 This Planning, Design and Access Statement has been prepared on behalf of the Ecological Land Co-operative ["ELC"] in support of a full planning application for the '*Siting of three temporary agricultural workers' dwellings for a period of 5 years together with an agricultural barn with PV array and new vehicular access to provide three affordable smallholdings to new entrants to ecological agriculture'* on land at Wolfester Paddock, Sparkford Hill Lane, Sparkford, BA22 7JE.

1.2 The ELC is a not-for-profit community benefit society and social enterprise set up in 2009 to address the lack of opportunities for new entrants to ecological farming and horticulture by supporting the creation of sustainable land-based livelihoods. These create social and environmental value, whilst also generating income from a farm, horticultural or other land-based businesses.

1.3 This Statement has been prepared in accordance with the requirements of the Town and Country Planning (Development Management Procedure (England) Order 2015. It sets out how the proposed development conforms with the relevant planning policies, making a positive contribution to the rural economy, district housing need and local character of the area. The Statement demonstrates that the proposal complies with Policy HG9 of the South Somerset Local Plan in that it will meet a functional need by providing for the accommodation needs of agricultural workers, and would be well designed, sited and landscaped so as to protect the landscape character and visual amenity of the countryside.

1.4 Supporting evidence includes:

- Evidence of local need for accessible ecological agriculture.
- Evidence that viable agricultural businesses can be established having regard to soil conditions and local markets/outlets.
- Evidence of an operational need for on-site living drawn from published evidence and case studies including other ELC operated sites at Greenham Reach in Mid Devon and Arlington in East Sussex.

1.5 In addition to this Planning, Design and Access Statement, the planning application comprises:

- Completed application forms.
- Completed ownership certificates.
- Plans and drawings, including:
  - Location Plan.
  - Proposed Site Plan ref: AL – 100C.
  - Barn Floor Plans and Elevations ref: L-002.
  - Details of photovoltaic panels.

1.6 The application is accompanied by:

- Completed Community Infrastructure Levy (CIL) form 0.
- Ecological Assessment by Philip Wilson and Marian Reed.
- Landscape Appraisal by Tony Harris.
- Noise Impact Assessment by Acoustic Consultants Ltd.
- Odour Modelling Assessment by White Young Green.
- Draft ELC Management Plan.
- Draft Heads of Terms for Section 106 Agreement.
- Confidential sample business plan.
- ELC Statement of Community Engagement.

2. The application site and surrounds

2.1 The application site, shown edged in red on the site location plan in figure (1) below, lies within open countryside, outside of any designated Local Plan settlement boundary. It lies on the north side of Sparkford Hill Lane and comprises 0.35ha, forming part of a larger undeveloped, grassland field measuring 8.6ha which is owned by the applicant. Vehicular access is from Sparkford Hill Lane via two separate access points. The field slopes gently upwards from the road towards a high point in the southwest corner. The land was most recently used for sheep grazing.



Figure (1): Site Location Plan – ELC owned land is edged in blue and the application site is edged in red

2.2 The northern and eastern boundaries of the applicant's wider landholding are delineated by a post and wire fence and hedgerow, beyond which lie further agricultural fields. To the south is a hedgerow and an area of Woodland Copse, beyond which lies Sparkford Lane. The western boundary of the applicant's landholding is delineated by a hedgerow beyond which lies a railway cutting hosting the Yeovil to Castle Cary line. The prevailing character is semi-rural, the site being surrounded by agricultural fields, interspersed with farm steads and utilities infrastructure, including an electricity substation to the north west and sewage treatment works to the south west. Photographs of the site and surrounding area are included in Figure (2).

2.3 The site is surrounded by agricultural land and woodland. The closest residential properties lie 250m to the east at Weston Mill and circa 300m to the northeast in Church Road. A sewage treatment works is located off the south side of Sparkford Hill Lane, 200m to the southwest of the application site.



The wider landholding viewed from the southwest corner looking north and northeast



View looking north towards the site from Sparkford Hill Lane



View looking north towards the site from Sparkford Hill Lane



View looking east along Sparkford Hill Lane – the established main site access is on the left



View looking south from Sparkford Hill Lane towards STW



View from Jays Bridge looking east towards the woodland planting to the immediate southwest of the site

Figure (2): Photographs of the site and its surrounds - courtesy of Google Maps

2.4 The site is located 0.2km south of the village of Sparkford, 0.5km northeast of Queen Camel and 0.5km northwest of Weston Bampfylde. It is therefore considered to be a sustainable location within walking distance of the community facilities and services within these surrounding villages, which include two public houses, two churches, two schools, convenience stores, a restaurant/takeaway and tennis club. In addition, Cadbury Business Park immediately to the northeast of Sparkford provides employment opportunities. Bus stops serving routes to Yeovil, Wincanton and Shepton Mallet are located 1km from the site.

2.5 The application site lies within Flood Risk Zone Level 1 – at the lowest probability of flooding from tidal and fluvial flooding. There is a low to medium risk of surface water flooding adjacent to the eastern site boundary and in the south-east corner of the site as shown on the extract from the Environment Agency Flood Map for Planning in Figure (3) below. The new dwellings will be sited to avoid this area and therefore flooding is not a constraint to the proposed residential use of the site. The site is unencumbered by any heritage asset or designated areas of high landscape value or designated sites of ecological significance.



Figure (3): Extract from environment Agency Flood Map for Planning showing area of low to medium risk of surface water flooding

2.6 Figure (4) below summarises the main opportunities and constraints which have informed the design of the proposals. Option A was finally chosen as the application site, following pre-application advice from the LPA which advised that Option B would have a greater impact on landscape character.

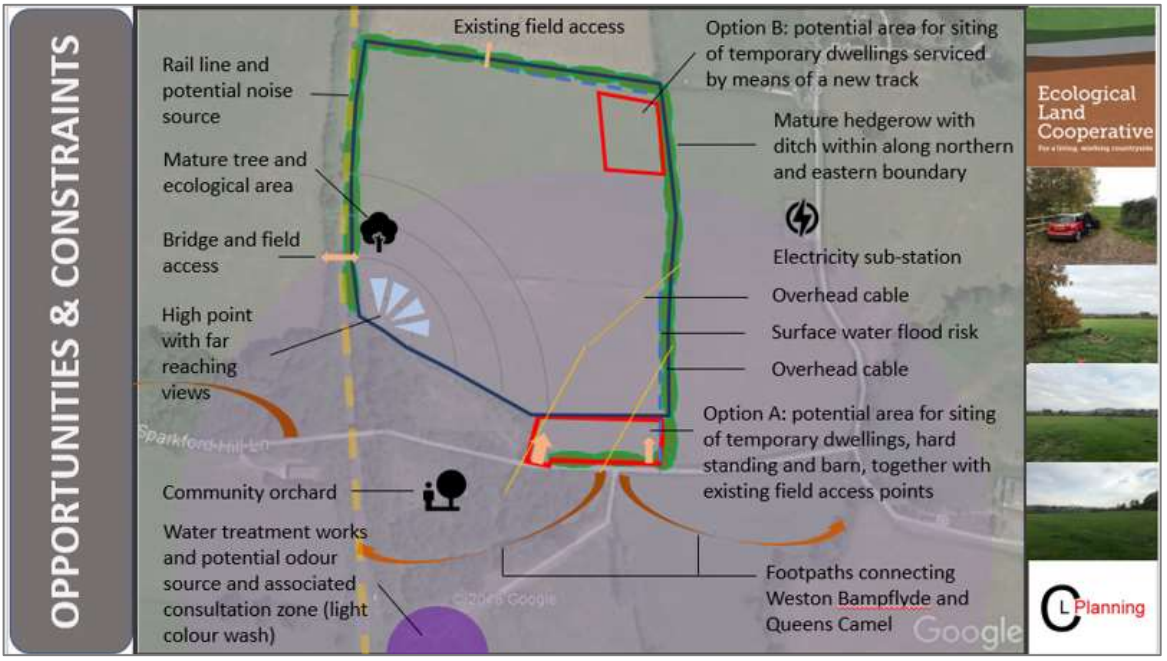


Figure (4): Site opportunities and constraints

3. Relevant planning history

3.1 A review of the Council's on-line planning register did not reveal any relevant planning history. The land is currently given over to agricultural use.

3.2 The ELC has already established a much-lauded cluster of three affordable smallholdings at the Greenham Reach, Holcombe Rogus, Mid-Devon. The proposal received planning officer recommendation but was refused by the planning committee and then granted on appeal on 18th April 2013 under PINS ref: APP/Y1138/A/12/2181808-821-807. A copy of the appeal decision notice forms **Appendix A** of this Statement. This has proven to be a highly successful scheme. Since 2013, three families have been developing their small holdings at Greenham Reach. Elder Farm is a business centred around herb production; Wild Geese Acres focusses

on intensive salad production and has expanded to include sheep, pigs and flowers; and Steepholding is a mixed enterprise including fruit and tree propagation, a vegetable box scheme and a micro dairy herd of Golden Guernsey goats. The 8.85ha site provides five full-time jobs in agriculture, and organic, local produce to shops and restaurants and directly to customers. As of November 2016, the smallholders at Greenham Reach had between them hosted 7 school visits and 14 educational, open and workdays, reaching some 390 participants. There has been over £130,000 of investment into the farm businesses, 18,000 kwh of renewable energy generated and site wide improvements in soil health. The annual monitoring reports have contributed to third party research, and the site has been profiled by media, including twice by BBC Radio 4's *Farming Today*, and by multiple organisations including the Council for the Protection of Rural England. The ELC submitted applications (ref: 18/00563/FUL, 18/00564/FUL and 18/00565/FUL) for the permanent siting of the three agricultural dwellings in 2018, with planning permission granted the following year in June 2019.



3.3 The ELC secured planning permission (ref: WD/2018/1473/F) to bring forward a similar scheme for three small affordable smallholdings on a 7.5ha site at Arlington in East Sussex on 8th August 2018. Work has begun at Arlington, with a new entrance way, gate, hard standing and pond in place. Construction of the shared timber barn, incorporating solar PV panels and rainwater collection points, servicing each of the three holdings is due to take place later this year. A copy of the LPA decision notice forms **Appendix B** of this statement.

3.4 Whilst it is recognised that each application must be determined on its merits, there are clear parallels between the consented schemes at Greenham Reach and Arlington and the current proposal.

3.5 The ELC is looking to replicate their success and bring forward further sites in England and Wales. The ELC receives widespread support for its work and its organisational supporters include:

- A-Team Foundation
- Action in Rural Sussex
- Big Potential (Big Lottery)
- Biodynamic Land Trust
- Campaign For Real Farming
- CAF Venturesome
- Charities Aid Foundation
- Co-ops UK
- Family Farmers Association
- Just Growth
- Kindling Trust
- Lush Cosmetics
- Ngage Solutions
- Organic Lea
- Permaculture Association
- Plunkett Foundation
- Polden-Puckham Charitable Foundation
- Scottish Crofting Federation

Fund for Enlightened Agriculture	SE-Assist Sussex
Friends Provident Foundation	Shared Assets
Small Farm Training Group	Soil Association
Sustrans	Tenant Farmers Association
Sustainable Food Trust	Transition Network
Sustain: the alliance for better food and farming	Wakelyns Agroforestry

Pre-application advice

3.6 In the spirit of paragraphs 39 and 40 of the NPPF, the applicant sought pre-application advice (ref 18/03986/PREAPP) on 10th December 2018. A meeting was held with the Planning Officer on 5th February 2019 and written advice was provided thereafter on 8th February 2019. The principle of the proposed development is supported subject to the satisfaction of the provisions set out in Local Plan Policy HG9 titled 'Housing for Agricultural and Related Workers'. Officers also indicated a preference for the dwellings to be sited towards the south east corner of the site closest to the access subject to achieving sufficient separation from the sewage treatment works (STW); in the interests of the amenity of future occupiers and to reduce conflicts with the established plant. The Officer Advice also recommended that further consideration be given to the potential impact of noise from trains passing to the west of the site. This Statement, together with the supporting reports and appendices, demonstrate how the application has taken account of the pre-application advice.

Community engagement

3.7 The ELC held a community meeting for Sparkford residents on 5th February 2019 to explain the ELC's visions and aims and introduce the proposal. Various questions and comments were posed by attendees, including:

- Seeking comfort of the visual impact of the proposed development of the site;
- The protection of any agricultural tie;
- The nature of the Section 106 legal agreement;
- Potential traffic and access details; and
- The business and financial viability of small farm.

3.8 The ELC captured the feedback (see the Statement of Community Engagement accompanying this application) and this has helped inform the proposals, as well as the form and content of the planning application.

3.9 Dialogue has also been held with the Parish Council, Wessex Water, local stakeholders, local producers, distributors and outlets as set out in the Statement of Community Engagement.

4. The proposed development

4.1 The application seeks full planning permission for a *'Siting of three temporary agricultural workers' dwellings for a period of 5 years together with an agricultural barn with PV array and new vehicular access to provide three affordable smallholdings to new entrants to ecological agriculture'.*

4.2 The proposal has evolved through an iterative process informed by:

- Site opportunities and constraints.
- The operational needs of prospective ecological smallholdings.
- The ELC's ideological principles, notably the delivery of a low impact development.
- Community engagement – as detailed in Statement of Community Engagement.
- The findings of the technical assessments which accompany the application.
- Pre-application discussion with the Local Planning Authority as detailed in section 3 of this Statement.
- Viability – ensuring that the proposals remain affordable and deliverable.

Physical attributes of the proposed development

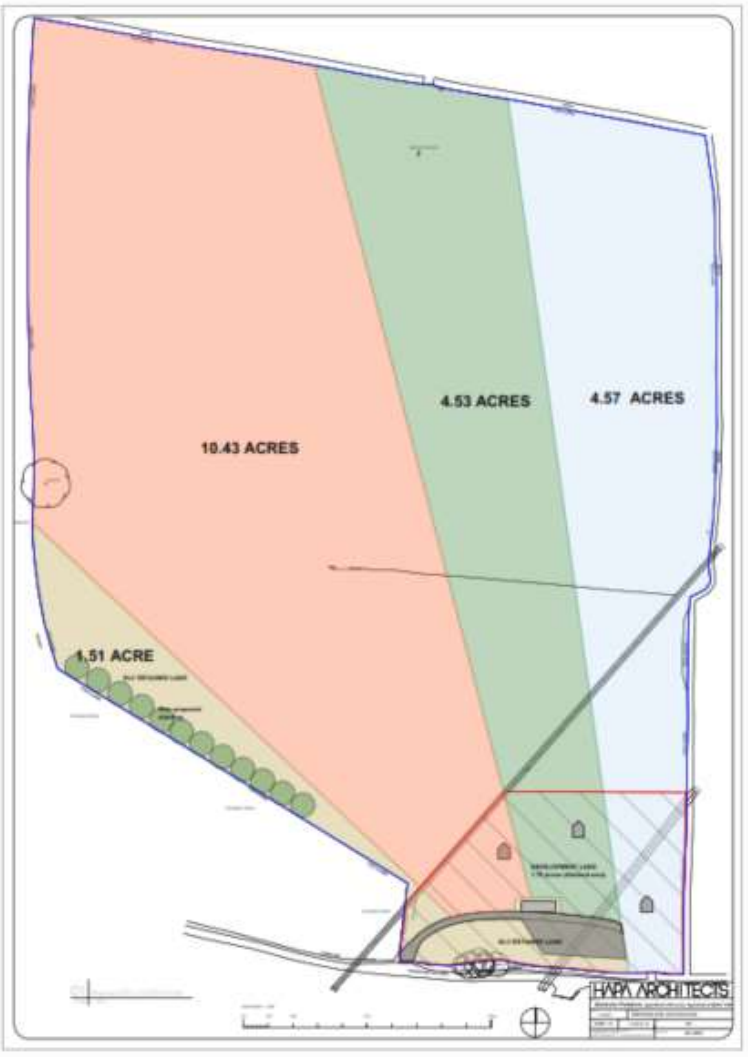
4.3 The smallholdings would follow a similar configuration to the consented schemes at Greenham Reach and Arlington and entail:

a) a change of use of the land to allow the siting of three temporary agricultural workers' dwellings (comprising single-storey lodge or traditional caravan's falling under the definition within the Caravan Sites and Control of Development Act 1960).
b) the erection of a shared timber barn.
c) photo-voltaic array, mounted on the barn roof.
d) rainwater collection from the barn roof with adjacent storage.
e) an area of hard-standing to be used for parking and maneuvering.
f) a new access track.
g) waste water treatment for grey water.
h) composting toilets.

4.4 The proposed shared facilities access track, barn, rainwater storage, drainage infrastructure and parking optimize efficiency and ensure the effective use of land. It will also enable the siting of the three temporary dwellings close together. As illustrated in figure 5 the residential dwellings will be sited in the south-east corner of the site, close to the established accesses and site boundaries. The topography is relatively flat and enjoys a degree of containment by virtue of boundary hedgerows and the raised topography to the west. The remainder of the field will continue to be used for agricultural purposes, supporting the three enterprises, with c.0.6ha set aside as a landscape buffer to the woodland copse.

4.5 New native tree and shrub planting will be introduced along the north-eastern edge of Wyvern Copse, around the field boundaries as shown on the illustrative planting plan forming part of the landscape appraisal accompanying the application.

Figure (5): Proposed Site Location Plan – courtesy of HAPA Architects



Form of the application

4.6 The application takes the form of a single application rather than three separate planning applications. This takes stock of the Inspectors guidance in allowing the the Greenham Reach appeal - see **Appendix A** - that:

"*Since the land at Greenham Reach has been sub-divided into three separate plots, each to be leased to different occupiers, I can understand why the Council requested three separate planning applications detailing the agricultural activities that would be taking place on each. However, the evidence indicates that the development proposal as a whole, which has remained consistent throughout the application and appeal process, does not straightforwardly equate to establishing three conventional independent smallholdings.*

Rather, the co-operative society would retain ownership of the land and would provide communal facilities for the benefit of all three enterprises … The co-operative society would also have the responsibility of monitoring …

In my judgment the ongoing involvement of the co-operative society is an integral component of the development that is here proposed, and forms part of the context in which the individual appeals should be considered."

4.7 Furthermore, the submission of a single application for the three smallholdings at Arlington was embraced by the Local Planning Authority – see **Appendix B**.

Temporary planning permission

4.8 A temporary planning permission will enable the ELC to demonstrate that the smallholdings are a viable ongoing concern. The application consciously seeks a temporary five-year permission instead of the more conventional three-year period for agricultural enterprises for the following reasons:

a) The ELC will need 12 months to advertise for and select smallholders and should it be required, afford South Somerset District Council an opportunity to consider the smallholders' business plans;
b) The three-year provision was created with conventional farms in mind. In general, it takes considerably more time to establish a mixed ecological holding than a farm business developed on fewer outputs (milk, pigs, etc.) and which makes use of artificial inputs and machinery. Indeed, the Welsh Assembly, in the *Technical Advice Note 6: Planning for Sustainable Rural Communities* recommends that new sustainable farm businesses are granted, in the first instance, a five-year temporary permission; and
c) The ELC is focusing on providing affordable smallholdings to help those enter the sector that otherwise would not be able to afford to do so. In the course of the ELC research for its *Small is Successful* publication (copy attached as **Appendix C**), it was found that in order to avoid incurring debt, successful ecological farms followed a slow development trajectory, investing in the growth of the business as and when they could.

4.9 This is in line with the ELC's previously approved schemes at Greenham Reach and Arlington which both benefit from five-year temporary permissions.

Delivery, security and on-going management

4.10 A key tenet of the proposal is the security provided by the ELC's ongoing involvement and active management.

4.11 By financing its work through community shares and loans, the ELC can provide a smallholding, infrastructure and package of support at far below market rates. The ELC is registered with the Financial Conduct Authority Mutuals Team and, like all community benefit societies, its rules prevent its members from selling the ELC's reserves for their own financial gain. The ELC retains ownership of the land it develops into small holdings, selling affordable and long-term farm business tenancies of 100 – 150 years to new entrants. The ELC includes in the farm business tenancy agreements a resale formula which prevents the smallholder from unduly gaining from the planning permission or planning 'uplift'. The tenancy agreement requires the smallholder, should they wish to sell, to sell the smallholding back to the ELC, and only at the cost that they purchased it for, multiplied by inflation, and with the value of their improvements.

4.12 Tenants and carefully selected and would be obliged to operate their smallholdings in strict accordance with principles of low-impact living and land-based livelihoods set out in an over-

arching Management Plan, and could, ultimately, have their lease terminated if they failed to do so.

4.13 The ELC would monitor the small holdings on an annual basis and report the performance against the objectives set out in the Management Plan. The proposed Management Plan for Sparkford forms part of the planning application and the ELC encourage South Somerset Council to secure its implementation through a Section 106 legal agreement. A draft S106 Agreement has been submitted alongside the planning application.

4.14 The annual report would cover the financial performance of each enterprise, the impact of the project on landscape quality and biodiversity. This transparent approach helps to foster confidence in new schemes and continues to be well received at the ELC's two other sites. By way of example, the fifth ELC annual monitoring report for the smallholding development at Greenham Reach, Mid Devon, forms **Appendix D** of this Statement.

5. Planning policy context

National Planning Policy Framework and Planning Practice Guidance

5.1 Section 2 of the NPPF confirms that at the heart of the Framework is a presumption in favour of sustainable development and that the purpose of the planning system is to contribute to the achievement of sustainable development. Paragraph 8 confirms that achieving sustainable development means that the planning system has the following three overarching objectives, which are interdependent and need to be pursued in mutually supportive ways:

- An **economic** objective – to help build a strong, responsive and competitive economy, by ensuring that sufficient land of the right types is available in the right places and at the right time to support growth, innovation and improved productivity; and by identifying and coordinating the provision of infrastructure;
- A **social** objective – to support strong, vibrant and healthy communities, by ensuring that a sufficient number and range of homes can be provided to meet the needs of present and future generations; and by fostering a well-designed and safe built environment, with accessible services and open spaces that reflect current and future needs and support communities' health, social and cultural well-being; and
- An **environmental** objective – to contribute to protecting and enhancing our natural, built and historic environment; including making effective use of land, helping to improve biodiversity, using natural resources prudently, minimising waste and pollution, and mitigating and adapting to climate change, including moving to a low carbon economy.

5.2 Paragraph 11 confirms that plans and decisions should apply a presumption in favour of sustainable development and that for decision-taking this means:

- '*approving development proposals that accord with the development plan without delay; or*

- *where there are no relevant development plan policies, or the policies which are most important for determining the application are out-of-date, granting permission unless:*
  - *the application of policies in the Framework that protect areas or assets of particular importance provides a clear reason for refusing the development proposed; or*
  - *any adverse impacts of doing so would significantly and demonstrably outweigh the benefits, when assessed against the policies in the Framework taken as a whole*'.

5.3 Footnote 7 confirms that the instances when the most important policies for the determining the application are out of date include, '*for applications involving the provision of housing, situations where the local planning authority cannot demonstrate a five year supply of deliverable housing sites (with the appropriate buffer, as set out in paragraph 73); or where the Housing Delivery Test indicates that the delivery of housing was substantially below (less than 75% of) the housing requirement over the previous three years*'.

5.4 South Somerset District Council cannot currently demonstrate a five-year supply of deliverable housing sites and therefore the tilted balance in favour of sustainable development is engaged.

5.5 The NPPF seeks to ensure Local Planning Authorities deliver a sufficient supply of homes; build a strong, competitive economy; promote healthy and safe communities; promote sustainable transport; make effective use of land; achieve well-designed places; and conserve and enhance the natural environment.

5.6 Section 5 of the NPPF is concerned with delivering a sufficient supply of homes. Paragraph 59 states that to support the Government's objective of significantly boosting the supply of homes, it is important that a sufficient amount and variety of land can come forward where it is needed, that the groups with specific housing requirements are addressed and that land with permission is developed without delay. [Underlining our emphasis]. Paragraphs 77 – 79 of the NPPF specifically give support to the principle of the proposed development. Paragraph 77 confirms that *'In rural areas, planning policies and decisions should be responsive to local circumstances and support housing developments that reflect local needs'*.

5.7 Paragraph 78 confirms that: *'To promote sustainable development in rural areas, housing should be located where it will enhance or maintain the vitality or rural communities. Planning policies should identify opportunities for villages to grow and thrive, especially where this will support local services. Where there are groups of smaller settlements, development in one village may support services in a village nearby.'* The site lies in a sustainable location close to several villages as identified in figure (1) above.

5.8 Paragraph 79 goes on to state that: '*Planning policies and decisions should avoid the development of isolated homes in the countryside unless one or more of the following circumstances apply: … a) there is an essential need for a rural worker, including those taking majority control of a farm business, to live permanently at or near their place of work in the countryside;..*'

5.9 Section 11 of the NPPF is concerned with making effective use of land, stating that planning decisions should promote an effective use of land in meeting the need for homes and other uses, while safeguarding and improving the environment and ensuring safe and healthy living conditions. Paragraph 118 states that planning policies and decisions should ... *'d) promote and support the development of under-utilised land and buildings, especially if this would help to meet identified needs for housing where land supply is constrained and available sites could be used more effectively..'* Paragraph 122 confirms that planning decisions should 'support development that makes efficient use of land, taking into account:

a) 'the identified need for different types of housing and other forms of development, and the availability of land suitable for accommodating it;
b) local market conditions and viability;
c) the availability and capacity of infrastructure and services - both existing and proposed – as well as their potential for further improvement and the scope to promote sustainable travel modes that limit future car use;
d) the desirability of maintaining an area's prevailing character and setting (including residential gardens), or of promoting regeneration and change; and
e) the importance of securing well-designed, attractive and healthy places'.

5.10 Section 12 of the NPPF reaffirms the requirement for new development to achieve well-designed places. Paragraph 124 confirms that the creation of high-quality buildings and places is fundamental to what the planning and development process should achieve, and that good design is a key aspect of sustainable development, creates better places in which to live and work and helps make development acceptable to communities.

5.11 Paragraph 127 sets out that decisions should ensure developments:

- '*Will function well and add to the overall quality of the area;*
- *Are visually attractive;*
- *Are sympathetic to local character and history, while not preventing or discouraging appropriate innovation or change;*
- *Establish or maintain a strong sense of place;*
- *Optimise the potential of the site; and*
- *Create places that are safe, inclusive and accessible*'.

5.12 Paragraph 130 advises that where the design of a development accords with clear expectations in plan policies, design should not be used by the decision maker as a valid reason to object to development. Planning Practice Guidance (PPG) provides further context on design principles[1].

[1] Ref ID: 26-023-20140306

The Development Plan

5.13 Section 38(6) of the Planning and Compulsory Purchase Act 2004 requires planning applications to be determined in accordance with the adopted Development Plan unless material considerations indicate otherwise. In this instance, the Development Plan comprises:

- South Somerset Local Plan (2006-2028) (adopted March 2015);
- Somerset Minerals Plan Development Plan Document up to 2030; and
- Somerset Waste Core Strategy up to 2028

South Somerset Local Plan (2006 – 2028)

5.14 The South Somerset Local Plan sets out 12 strategic objectives, the following of which are relevant to the proposal:

- '*A comprehensive, high performing economy that is diverse, adaptable and provides job growth and inward investment through a …. diversified rural economy;*
- *A natural and built environment able to attract and retain visitors, a vibrant tourism industry and encourage inward investment of high-quality sustainable businesses;*
- *A balanced housing market with a range of both general and affordable housing to meet the required growth and sited and built to support sustainable lifestyles with low carbon emissions, delivered through a sustainable district settlement strategy and hierarchy;*
- *Address climate change through both mitigation and adaptation and move towards a Carbon Neutral economy by the Government date of 2030 by delivering high quality and energy efficient development with exemplar development at Yeovil to move towards more sustainable, lower carbon consumption living and to provide a boost to new low carbon technologies; and*
- *Protection and enhancement of our natural environment, historic environment and biodiversity, retaining the distinctiveness of settlements and reflecting known environmental constraints, including flood risks in locating growth*'.

5.15 Local Plan Policy SD1: 'Sustainable Development' confirms that the Council will take a proactive approach to reflect the presumption in favour of sustainable development in the NPPF and seek to secure development that improves the economic, social and environmental conditions within the District. The Policy confirms that where necessary, the Council will work with applicants to improve proposals so that they are capable of being approved.

5.16 Notwithstanding that Policy EP5: Farm Diversification' does not specifically relate to the proposed development, the preceding paragraphs 9.45 – 9.48 to this policy do give tacit support to the principle of the smallholdings.

'*9.45 Farming employs a small proportion of the South Somerset workforce and employee numbers have steadily declined over the years, from approximately 3,189 jobs in 2007 to 3,035 jobs in 2010 (a reduction of 5%)175. The nature of the industry locally has also changed in recent years, and reflects the trends that are occurring at a national level - whilst there is a*

growth in the number of farm holdings, the size of holdings is declining and the amount of land farmed is declining (between 20072010, there has been an 8% reduction in the amount of land farmed in South Somerset176) illustrating a shift in the rural way of life and the rise in 'hobby farming'.

9.46 Despite these changes, farming and its associated businesses remain integral to the present and future of South Somerset. Food security, local produce and reducing 'food-miles' remain nationally important, and an increasing onus on a low carbon economy, will provide opportunities for key sectors such as land-based industries and renewable energy. It is therefore important to establish policy, which supports a productive countryside and the transition from traditional to new rural enterprises.

9.47 National Guidance recognises that farm diversification, the diversification from the dependence on production of agricultural commodities into non-agricultural activities, is vital to the continuing viability of many existing farm enterprises. The District Council is keen to support development that delivers diverse and sustainable farming enterprises, for example, farm shops, Bed and Breakfast and leasing of land or buildings to other non-agricultural businesses. It is important that proposals for diversification bring long-term and genuine benefits to individual farming enterprises and the wider rural area'.

5.17 The contribution and functional linkages to the prosperity of the wider rural area is explored further within the confidential sample business plan accompanying the application.

5.18 Local Plan Policy HG9: 'Housing for Agricultural and Related Workers' presents the critical policy test against which to determine the application, as confirmed in the pre-application advice received from the LPA. Policy HG9 reads as follows:

'*A development proposal in the countryside to meet the accommodation needs of a fulltime worker in agriculture, horticulture, forestry, equestrian activities or other business where a rural location is essential should demonstrate that:*

- *There is a clearly established existing functional need;*
- *The enterprise is economically viable;*
- *Provision on-site (or in the immediate vicinity) is necessary for the operation of the business;*
- *No suitable accommodation exists (or could be made available) in established buildings on the site or in the immediate vicinity;*
- *It does not involve replacing a dwelling disposed of recently as general market housing;*
- *The dwelling is no larger than that required to meet the operational needs of the business;*
- *The siting and landscaping of the new dwelling minimises the impact upon the local landscape character and visual amenity of the countryside and ensures no adverse impact upon the integrity of nationally and internationally designated sites, such as AONB*.'

5.19 A detailed assessment of the proposal against the criteria of Policy HG9 is provided in Section 6 of this Statement.

5.20 Local Plan Policy SS4: 'District-Wide Housing Provision' states that the overall district housing requirement is at least 15,950 dwellings during the Plan period April 2006 – March 2028. Policy SS5: Delivering New Housing Growth confirms the distribution of development across the settlement hierarchy, including 2,242 dwellings (14%) in rural settlements. Notwithstanding that the proposal is for temporary agricultural workers dwellings, the fact that the Council cannot currently demonstrate a 5-year housing land supply lends support for the proposed housing, given the accessibility of the site to the neighbouring villages of Sparkford, Queen Camel and Weston Bampfylde which host shops, services, education and leisure opportunities.

5.21 Local Plan Policy TA1: 'Low Carbon Travel' advises that new residential and employment developments should aim to reduce single car occupancy and the need to travel or encourage the use of more sustainable travel or alternative fuels where travel is necessary. Measures for achieving this include: encouraging electric car use; encouraging cycling and walking; and encouraging home working. By providing living accommodation for the small-holders on site, the proposal will accord with the aims of policy TA1 by reducing the need for car travel to and from work. Also the proposed Management Plan places limitations on all traffic movements to and from the site, with controls in place via the proposed S106 Agreement to guard against vehicle movements exceeding those stipulated.

5.22 Policy TA5: 'Transport Impact of New Development' requires new development to address its own transport implications and be designed to maximise the potential for sustainable transport. This includes: securing safe and convenient access; ensuring the nature and volume of expected traffic will not have a detrimental impact on the character or amenity of the area and will not compromise the safety and/or function of the local or strategic road network; and will provide car parking in accordance with the Council's adopted standards identified in Policy TA6. Policy TA6: 'Parking Standards' confirms that parking provision in new development should be design-led and based upon site characteristics, location and accessibility. It must be provided in accordance with the parking standards in the Somerset County Council Parking Strategy. Section 6 of this Statement demonstrates how the proposals will provide safe shared access and adequate communal on-site parking for the three smallholdings and that, based on evidence from the applicant's other existing smallholdings in Mid Devon, will not generate a significant increase in the volume of traffic using the site.

5.23 Policy EQ1: 'Addressing Climate Change in South Somerset' confirms that the Council will support proposals for new development where they have demonstrated how climate change mitigation and adaptation will be delivered, including: minimising carbon dioxide emissions through energy efficiency measures and renewable and low carbon energy; directing new development away from medium and high flood risk areas; incorporating Sustainable Drainage Systems; and incorporating measures to address climate change such as solar orientation, maximising natural shade and cooling, water efficiency and flood resilience. The intention of the proposed development is to follow the aims of Policy EQ1 through low impact development principles to minimise environmental impact. There is evidence that ecologically produced food minimises fossil fuel-based inputs for farm machinery and

fertilizers, contributing to a reduction in GHG emissions from agriculture, including carbon and nitrogen[2]. The proposal will be sited outside any areas of flood risk it will incorporate the following low-impact development (LID) sustainable development elements.

a) In construction, the use of renewable and recyclable materials, including locally-grown and processed timber for the barn's structure and cladding;
b) For the proposed barn, minimal foundations, and restricted use of concrete by using micro- screw piles to support a lightweight timber frame structure;
c) Rainwater harvesting and storage;
d) Composting toilets and grey water treatment through a soakaway;
e) Permeable surfaces for hard standing;
f) Off-grid energy production through the use of solar PV panels and biomass heating;
g) Low or no-input agriculture; and
h) Limits on the use of vehicles.

5.24 Furthermore the evidence submitted at the planning appeal relating to the ELC site at Greenham Reach by Dr. Larch Maxey LLB., M.Sc., Ph.D., FRGS, Research Fellow at the Centre for Sustainable Futures documented that at carbon and ecological foot-printing (CFP & EFP) carried out for existing low impact developments (LID) shows that they deliver significant improvements on national and regional CFP and EFPs.

"Independent research over the last fifteen years has found that LID represents some of the most sustainable development and innovation in the UK, and has been unusually successful at delivering on all three components of sustainability (economic, social and environmental)" (para 3.7).

5.25 By way of example, Lammas, a similar proposal to the current scheme, a cluster of 9 ecological smallholdings in Pembrokeshire, won the Low Carbon Communities Challenge with an ecological footprint of 1.5/hectares per capita, or 34% the Welsh average.

5.26 Policy EQ2: 'General Development' confirms that development will be designed to achieve a high quality, which promotes South Somerset's local distinctiveness and preserves or enhances the character and appearance of the district. This will be assessed against a number of criteria including:

- Sustainable construction principles;
- Creation of quality places;
- Conserving and enhancing the landscape character of the area;
- Reinforcing local distinctiveness and respect local context;
- Creating safe environments addressing crime prevention and community safety;
- Having regard to South Somerset District Council's published Development Management advice and guidance; and

[2] Evidence presented by Dr Wright PhD, MSc, PgDp, BA, Deputy Director, Centre for Agroecology and Food Security, Coventry University, in support of the Greenham Reach appeal.

- Making efficient use of land whilst having regard to:
  - Housing demand and need;
  - Infrastructure and service availability;
  - Accessibility;
  - Local area character;
  - Site specific considerations.

5.27 Policy EQ2 also confirms that innovative designs delivering low energy usage and/or wattage will be encouraged. Development must not risk the integrity of internationally, nationally or locally designated wildlife and landscape sites. It must also protect the residential amenity of neighbouring properties and new dwellings must provide acceptable residential amenity space. Section 6 of this Statement will demonstrate that the proposal has been designed to comply with Policy EQ2 of the Somerset Local Plan in that it will be well designed in a highly sustainable manner in accordance with the criteria listed in paragraph 5.24 above, and will be of a high quality, and will respect the site and its surroundings by virtue of its scale, density, layout, siting, character and appearance, will provide a high standard of amenity to meet the functional day to day requirements of the future agricultural tenants, and will contribute positively to the appearance and safety of the public realm.

5.28 The Odour Modelling Assessment and Noise Impact Assessment accompanying the application demonstrate that the occupiers of the new smallholdings need not experience any significant amenity impacts as a result of the proximity to the sewage treatment plant to the southwest and the railway line to the west. The relatively isolated location of the site in relation to the closest residential properties, as detailed in Section 2 of this Statement, means that there will be no materially harmful impacts on neighbouring residential properties by virtue of privacy or overlooking.

5.29 Local Plan Policy EQ4: 'Biodiversity' requires new development to conserve and enhance biodiversity and to demonstrate that it will not result in any adverse impact on the integrity of national and international wildlife and landscape designations, including features outside the site boundaries. The Ecological Report accompanying the application confirms that the existing grassland is of little intrinsic ecological importance and is species-poor. With the exception of a beech tree, located within the wider landholding, the report confirms that ecological interest is restricted to the field boundaries, which provide useful habitat for birds, insects and mammals. The proposal will not result in the loss of any existing boundary hedging/landscaping and the new development will be sited at least 200m from the beech tree. The proposal will provide for ecological enhancement of the site through the improvement of the pasture grassland and through additional hedge, tree, and shrub planting and potentially the provision of a new pond as shown on the Landscape Proposals Plan set out in the Landscape Appraisal**.** Furthermore, ecological farming practices, with a wide range of crops, potentially including tree crops, could present opportunities to increase the diversity of the habitat.

Somerset Minerals Plan Development Plan Document up to 2030

5.30 Minerals Plan Policy SMP9: 'Safeguarding' states that planning permission should not be granted for non-mineral development that would lead to the sterilisation of mineral resources within the Minerals Plan designated safeguarded areas. The application site lies within a designated building stone safeguarding area. The proposal will not prejudice the objectives of Policy SMP9 given the small-scale size of the proposal in relation to the wider mineral safeguarding area, the temporary nature of the proposed development and the proposed continuation of the existing agricultural use of the wider landholding. Also, it is pertinent to note that the underlying mineral deposits will remain vested within the applicant's ownership

Somerset Waste Core Strategy Development Plan Document up to 2028

5.31 Waste Core Strategy Policy DM5 'Safeguarding Waste Management Sites' aims to safeguard existing waste management facilities and sites allocated for waste-related uses and states that proposals for non-waste development adjacent to such sites will be opposed unless it can be demonstrated that the operation of any existing waste management facility will not be detrimentally affected and the development proposal would not suffer unacceptable adverse impacts as a result of the waste management facility. As shown on the constraints and opportunities diagram in figure (4) and the Wessex Water odour consultation zone map in Figure (6), the application site lies within the Wessex Water Consultation Zone around the Sparkford Sewage Treatment Works (STW) located to the south-west of the site on the opposite side of Sparkford Hill Lane. The application site is within the low risk odour zone (confirmed by Wessex Water as lying within 228m from the STW). The application is accompanied by an Odour Modelling Assessment which demonstrates that the siting of the dwellings would not prejudice the operation of the STW.

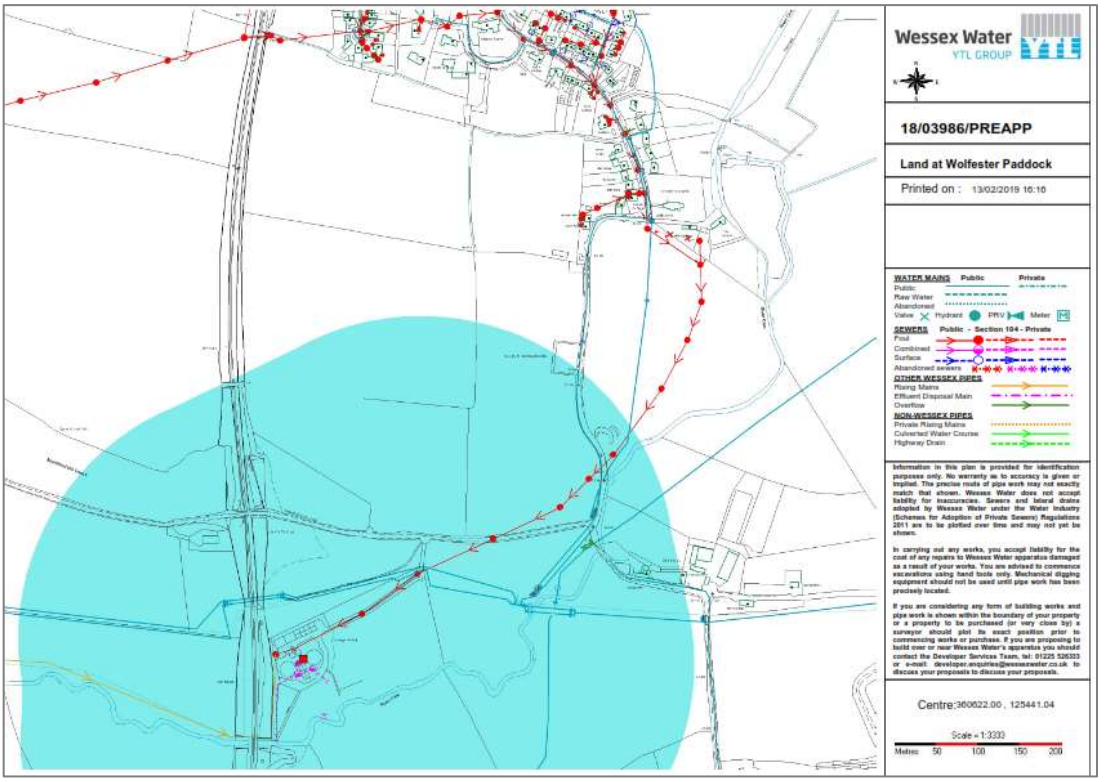


Figure (6): Extract from Wessex Water mapping showing the odour consultation zone (blue shading)

5.32 A dialogue has been maintained with Wessex Water throughout the formative stages of the application and this helped to inform the Odour Impact Assessment accompanying the application.

Relevant Material Planning Considerations

Lack of five-year housing land supply

5.33 The Council's most recent Five-Year Housing Land Supply Paper (August 2018) confirms that the Council can only demonstrate 'about 4 years' deliverable housing supply. Therefore, in accordance with NPPF paragraph 11(d) planning permission should be granted unless any adverse impacts of doing so would significantly and demonstrably outweigh the benefits, when assessed against the policies in the Framework as a whole.

5.34 The proposal delivers a wide range of benefits with little or no adverse impacts, having regard to the carefully thought-through set of safeguards as detailed in Section 4 of this Statement. The ambition and scope of the proposal with regard to sustainable development is novel and wholly exceptional. The experts who have given evidence on behalf of the ELC at the planning appeal for the Greenham Reach site or have come out in support of the work of the ELC include climate scientists, specialists on organic agriculture, agro-ecologists and others who have spent their lives attempting to study and practice sustainable development.

5.35 The appellant contends that the following benefits of the proposal weigh heavily in favour of the approval of the scheme when assessed against the NPPF:

<u>Opportunities for New Entrants to Farming</u>

5.36 It is widely acknowledged that new entrants to farming and horticulture face significant, largely insurmountable, barriers to accessing land to set up their own enterprises. This crisis is aptly identified in two letters of support:

"*With astronomical land values, new entrants to the agricultural industry need a steady supply of openings such as those provided by your co-operative. However, there is a significant unfulfilled new entrant demand*" George Dunn, Tenant Farmers Association

"*Our Future Growers scheme trains new organic growers, many of whom face significant difficulties in finding affordable and available land to set up their own enterprises … the Ecological Land Co-operative is able to create new opportunities for new and young farmers that are otherwise not available*" Rachel Harries, Soil Association

5.37 The provision of holdings for new entrants has been government policy since the 1908 Smallholdings and Allotments Act. Yet between 1966 and 2013, and contrary to government recommendations, the total number of smallholdings in England fell from 12,882 to 2,448, a reduction of 81%. Over the last decade 2006-2016, the average price of bare agricultural land

has increased by over 160% to £7,773 per acre, making it increasingly difficult for new farmers to finance the purchase of land.

5.38 Perhaps more significant, though, is the lack of affordable housing for rural workers. Average house prices in rural areas are higher overall than in urban areas, with hamlets having the most expensive housing. Matthew Taylor MP in his review of rural housing for the Prime Minister found that:

"many of the people who work in the countryside increasingly cannot afford to live there, while the people who can afford to live there increasingly do not work there".

5.39 The Taylor Review emphasises throughout that rural housing is "*unaffordable in relation to local wages*" and has reached a crisis point: "*for many villages and hamlets the choice is between becoming ever more exclusive enclaves of the wealthy and retired, or building the affordable homes to enable people who work in these communities to continue to live in them*". This was also the finding of the Affordable Rural Housing Commission.

5.40 That this crisis in rural housing extends to South Somerset is evident from paragraph 2.18 of the South Somerset Local Plan, which states:

"In line with the rest of the UK and the south west, affordability is an issue within the district, with the ratio of lower quartile house prices to lower quartile earnings being over seven to one. The mean average house price in 2011 was just under £207,000. This makes it very difficult for first time buyers to enter the housing market particularly in rural areas. Whilst this ratio has actually improved recently, the challenge of matching housing need and housing supply remains highly problematic and is a key consideration in defining South Somerset's housing provision target over the local plan period".

5.41 By delivering affordable smallholdings for new entrants the Scheme would be delivering on government policy, planning policy, and national guidance and legislation.

<u>Supporting the Transition to Sustainable Food Production and Distribution</u>

5.42 In a recent publication, New Model Farming, CPRE recommend that there are "*changes to land-use planning to deliver allotments, community right-to grow plots and smallholdings* [emphasis added]", and that this is "*needed for the government to increase the diversity, sustainability and resilience of the farming sector*". The CPRE included the applicant's Greenham Reach site as a case study in this publication.

5.43 Dr Wright PhD, MSc, PgDp, BA, Deputy Director, Centre for Agroecology and Food Security, Coventry University, wrote in evidence for the Greenham Reach appeals:

"*Significant reports including from government concur that agricultural business-as-usual is not an option, and that farming structures will need to change dramatically with the adoption of alternative models of production and distribution toward bio-diverse, multifunctional ecologically based farming practices".*

"ecological practices avoid ammonium nitrate fertiliser the production of which emits GHGs, it encourages carbon sequestration, and livestock emissions are lower if the livestock are fed on legume pasture rather than feed concentrates."

"Because of the tendency toward polycultures, organic methods, and localised cropping systems, ecological agriculture practices are more successful at supporting a broad and adapting diversity of crop species and livestock breeds … As well as this broad range of agrobiodiversity, wild diversity is also encouraged because of the low or zero use of toxins and the more diverse range of environmental niches on farm."

5.44 As evidenced by Dr Wright (see para above) the ELC demonstrates such practice.

5.45 The accompanying Ecological Appraisal considers for the Sparkford Site states:

'In the absence of significant existing ecological interest, there are few constraints on agricultural and horticultural development, and considerable potential for ecological enhancement. While the management will be at the discretion of the smallholders, some consideration should be given to overall ecological enhancement of what is currently a low-value site.' …

'A priority should be the planting of marginal hedges and tree belts and shrub belts to divide separate holdings within the site. New hedges should consist of native species and should contain a high proportion of species such as hawthorn, blackthorn and hazel which are of the greatest value to wildlife. A well-managed, dense, species-rich hedge will be of great value to many forms of wildlife'….

'Low macro-nutrient levels in the soil and high lime content mean that improvement of the species-richness of pasture grassland and any marginal grassland areas would be relatively easy.'

<u>Facilitating Domestic Horticultural Production</u>

5.46 The total area of horticultural land in England has declined over the last 28 years from 222,431ha to 161,445ha (2014), representing a fall of 27%. In light of the fact that the UK has been steadily increasing its consumption of imported fresh fruit and vegetables, the Government's Council of Food Policy Advisors established the Fruit & Vegetable Task Force through DEFRA to "*consider a strategy for increasing …. domestic production of fruit and vegetables*". The Task Force reported that "*fruit and vegetable growing has become a high risk, low reward industry*" and recommended amongst other things, that "*improving the planning situation for food production is essential for many crops in order to compete against imports*".

"One of the aims in DEFRA's Business Plan is to promote increased domestic food production, as we recognise the benefits that regional and local and seasonal food can bring to both producers and consumers alike."

5.47 If permitted, the proposal would provide for three new primarily horticultural businesses supplying into the local community.

Sustainable Rural Diversification and Growth

5.48 By allowing this Scheme, South Somerset District Council will see the creation of c. 5 full-time rural jobs in Sparkford and the provision of low cost tied housing alongside improvements in the site's ecosystem services and reduced atmospheric emissions from agriculture, housing, energy, and transport. This will accord with the strategic objectives 4, 5 and 6 of the Local Plan helping to realise:

'a comprehensive, high performing economy that is diverse, adaptable and provides job growth and inward investment through a thriving Yeovil, regenerated market towns and a diversified rural economy;

A natural and built environment able to attract and retain visitors, a vibrant tourism industry and encourage inward investment of high-quality sustainable businesses;

A balanced housing market with a range of both general and affordable housing to meet the required growth and sited and built to support sustainable lifestyles with low carbon emissions, delivered through a sustainable district settlement strategy and hierarchy;…'

Climate Change Mitigation and a Transition to a Low-Carbon Future

5.49 The proposal also supports Local Plan strategic objective 7 to '*address climate change through both mitigation and adaptation and move towards a Carbon Neutral economy by the Government date of 2030 by delivering high quality and energy efficient development with exemplar development at Yeovil to move towards more sustainable, lower carbon consumption living and to provide a boost to new low carbon technologies*'.

5.50 The Office for Civil Society's Inclusive Economy Unit calls on civil society organisations to help deliver public services. Should the proposed Scheme be granted planning permission, the ELC would be able to provide new entrants with a low cost, albeit unconventional, route into agriculture. The ELC would provide the smallholders with security of tenure while protecting the holdings for ecological agriculture and affordability in perpetuity. It would be a form of affordable housing that remained available only to those wishing to operate a productive and sustainably managed smallholding. The ELC would be providing a public service that is recognised as being vital to the future of farming and in the public interest.

5.51 The benefits of the scheme outlined in the preceding paragraphs are contended to weigh heavily in favour of approval of the proposal in the light of NPPF paragraph 11.

Heart of the South West Local Enterprise Partnership ["LEP"]

5.52 The proposed creation of new agricultural small-holdings will accord with the objectives of the Heart of the South West LEP which revolve around the long-term ambition to raise economic productivity within the area. The LEP confirms that one of the existing economic strengths of

the area is its expansive rural and agri-food economy and that the LEP vision to double the economy over the next 20 years will involve focussing on:

- *'Ideas – developing new and better ways of doing things*
- *People – developing skills for good jobs and greater earning power for all*
- *Infrastructure – investing in enabling infrastructure*
- *Business environment – helping businesses to grow*
- *Places – improving prosperity for all our communities'*

Towards a one nation economy: A 10-point plan for boosting productivity in rural areas: August 2015

5.53 In August 2015, DEFRA published 'Towards a one nation economy: a 10-point plan for boosting productivity in rural areas'. Under Point 7 titled better regulation and improved planning for rural businesses, the Government pledged to:

- Review the planning and regulatory constraints facing rural businesses and measures that can be taken to address them; with a subsequent call for evidence tabled and decisions to be made by 2016 (I am not aware that this was fulfilled);
- Take further action to ensure that planning decisions are taken on time.

5.54 The plan pledged to make it easier to live and work in rural areas highlighting that:

'*Improving the conditions for people to live and work in rural areas would help create more flexibility of labour markets, ensure that people with the right skills can be matched to job opportunities in rural areas, and facilitate the creation of new businesses. … …*

Lack of housing is a national challenge but in rural areas it is a particular constraint to labour and entrepreneurial mobility. The stock of housing is limited in rural areas relative to demand and house prices are on average 6.7% higher in rural areas than in urban areas'.

6. Detailed assessment against the criteria of Policy HG9

6.1 Given the relatively unique nature of the proposed development, it does not fit neatly with the traditional means of judging functional need and financial viability with respect to new agricultural workers accommodation. However, conformity with the aims and objectives of Policy HG9 can be demonstrated using similar evidence to that produced in support of the consented schemes at Greenham Reach and Arlington. The ELC is cognisant of the fact that agronomy (soil conditions and microclimate), as well as markets and outlets for produce do need to be considered on a more localised basis. This is duly reflected in the evidence accompanying this application and drawn together in the confidential sample business plan.

Established Existing Functional Need

6.2 Policy HG9 requires demonstration of a 'clearly established existing functional need'. Whilst the application falls to be determined against the criteria of Policy HG9, this criteria specifically

relates to proposals for new residential accommodation on existing agricultural enterprises, where as the ELC propose to support the establishment of three new enterprises. In summing up the case R. (on the application of Vale of White Horse DC) v Secretary of State for DCLG (2009) Robin Purchas Q. C. found that:

"a need will often necessarily be for accommodation to be put in place so as to secure the particular project. A construction that recognises needs as existing for an intended enterprise in this sense would well serve the overall purpose. However, I can see no purpose achieved by denying a need that has arisen to make provision for an intended enterprise. It would seem to constrain agricultural enterprise on a somewhat arbitrary basis" (para 45)

6.3 The view taken by Robert Purchas QC in this decision is supported by the position taken in the case of Petter and Harris v Secretary of State for DETR (1999).

6.4 This Statement demonstrates that there is a functional need for the proposed dwellings and that their occupation would be intrinsically linked to the operation of the agricultural enterprises across the wider landholding. This would be secured by means of a Management Plan and S106 agreement. There is clearly some cross over with the criteria requiring provision on site (or in the vicinity) only where it is necessary to the operation of the business – so I will return to such considerations in a subsequent sub-section.

The enterprise is economically viable

6.5 The ELC can without doubt provide evidence that the new smallholdings will be economically viable. In the 10 years since the ELC was formed it has:

a. Established a community benefit society, developed a model to deliver affordable smallholdings, including bespoke lease, Section 106 Agreement, Management Plan and monitoring programme;
b. Developed three affordable smallholdings at Greenham Reach, Devon and facilitated over £130,000 of investment in the three farm businesses. As detailed in paragraph 4.5, the three smallholdings are occupied and two are already profitable, producing organic food for sale locally.
c. Submitted to the LPA each year a monitoring report reporting on the Greenham Reach site. This includes: an annual ecological survey by an independent ecologist; annual traffic movements and renewable electricity production; the results of regular site-wide soil tests; and an annual consultation with the Parish Council.
d. Conducted a year-long research project into the viability of small-scale ecological agriculture, featured in the Research Councils UK's publication Big Ideas for the Future showcasing "UK research that will have a profound effect on our future";
e. Created a free publicly accessible web-resource on ecological agriculture (http:/ecologicalland.coop/uk-agroecology);
f. Harnessed the support of food and farming organisations who have provided the applicant's existing smallholders with support, and agreed to support future ELC smallholders in establishing their farm businesses; and

g. Participated in four research programmes and given evidence to the All-Party Parliamentary Group on Agroecology on two occasions.

6.6 Also of relevance are the Planning Inspector's observations when determining the Greenham Reach appeal, namely:

"I consider that the co-operative society's role in assessing applicants, and subsequently assisting and monitoring their progress, would also help to ensure that prospective tenants were genuinely committed to this type of rural enterprise" (para 30); and

"the five years' work the appellant has put in to researching, consulting on and preparing its applications for this site constitute clear and convincing evidence of its firm intentions". (para 33)

6.7 A sample business plan accompanies the application. It is based on an expression of genuine interest and owing to the fact that it includes personal and commercially sensitive information, the ELC has requested that this be treated in confidence. The ELC respectfully suggests that should the District Council be minded to approve the current planning application, a condition be attached requiring the submission of business plans for each smallholding prior to the temporary accommodation being occupied. This approach has been developed in response to the practical difficulties in securing tenants prior to the grant of planning permission.

6.8 The ELC has undertaken in depth research into local markets, supply chains and outlets. This serves to highlight gaps in the market and opportunities to for complementary enterprises that deliver greater economic resilience and retain the benefits within the local community. The ELC take great pride in collaborate with existing businesses wherever possible and in selecting tenants the ELC will give preference to local applicants assuming they fulfil the other necessary criteria. The ELC's existing tenant enterprises include a vegetable box scheme, salad bags, cut flowers, sheep & pigs, herbs, micro goat dairy and fruit tree grafting. There is substantial local support for the ELC's work from existing food producers, new entrant farmers, potential applicants as well as local people working in the food sustainability sector.

6.9 To demonstrate smallholding viability, the application is accompanied by the 2011 ELC publication *Small is Successful* (**Appendix C**) which provides examples of smallholding businesses. The research was well received, inviting such comments such as this one from the Sustainable Food Trust:

"*The Ecological Land Co-operative's research into the viability of smallholdings (see their report, 'Small is Successful') illustrates that the creation of affordable and sustainable land-based livelihoods is not only possible, but desirable*"

6.10 Small is Successful was featured in the Research Councils UK's publication Big Ideas for the Future showcasing "UK research that will have a profound effect on our future".

6.11 More recently, the ELC conducted further research and compiled a booklet of ten case studies of farms making a profit on small acreages from across the UK entitled 'Small Farm Profits' (**Appendix E**) which provides proof that ecological agriculture can create economically viable, highly productive and sustainable enterprises on small acreages.

6.12 There are other ways available for the Local Planning Authority to establish sound financial planning for the new smallholdings:

a. As above, the ELC carried out research into the viability of smallholdings and has continued to work with researchers and practitioners in the area of smallholding and small-farm viability, including the Soil Association, Coventry University, the Land Workers Alliance and the Organic Research Centre. The ELC brings the knowledge it has gained in this work when selecting smallholders; and
b. The ELC brings sector experts directly into smallholder selection and later mentoring and support. At Greenham Reach the applicant provided each smallholder with a farm business mentor. The ELC would also provide mentoring to the smallholders at Sparkford.

6.13 Notwithstanding the above, as per the Court of Appeal judgement Petter and Harris v SSETR and Chichester DC 1999:

"*the financial viability test is only relevant [our emphasis] in the determination of whether the grant of permission, in whatever terms it might be granted would, because of the uncertain future of the agricultural activity, threaten to produce, in the future, a non-conforming residential use that would pass with the land; a use that had lost its agricultural justification*".

6.14 On this basis, the financial viability test is not considered to be strictly relevant in determining this application. The future of the proposed holdings here is certain: they would always remain in agriculture due to the status of the ELC and its operational arrangements as detailed in Section 4 and the accompanying draft Section 106 Agreement and Management Plan. The ELC has clear objectives in its constitution that promote sustainable rural livelihoods and community and co-operative ownership of land. It has as much protection as possible within its assets for the sole purpose of facilitating sustainable rural livelihoods. The ELC will retain the freehold of the entire site and will be bound by a Section 106 Agreement and corresponding Management Plan to ensure that the site is only occupied by agricultural workers providing a livelihood for themselves from the holding. The applicant has a history of providing and monitoring landholdings for agriculture, including selecting suitable smallholders. The smallholders are supported by the ELC and its supporters through the establishment of the smallholding business in farm business planning and accounting, site development, land management and co-operative working. The ELC has the support of numerous other organisations committed to facilitating land-based livelihoods and to protecting land for sustainable and affordable use. Should the smallholder not be operating a farm business on their holding, the lease allows the ELC to evict the smallholder from their holding.

Provision on-site (or in the immediate vicinity) is necessary for the operation of the business

6.15 The ELC's years of working with small scale ecological growers has provided it with specialist detailed knowledge of the operation of such businesses. The ELC experience has found that small ecological farm and horticultural enterprises integrate many different complementary activities to spread economic risk and even out the annual workload. Many of the crops that a smallholder grows will require diligent tending and at times intense attention if the high yields and quality of produce necessary to make a smallholding viable are to be achieved. The tasks involved in running complex smallholdings will stretch over an extremely long working day, lasting from 5am to 10pm, and on some days to midnight. Night-time presence is required where there are animals (for lambing, to monitor hatching, etc.), and in all cases, for weather and pest emergencies.

6.16 It is vital that smallholders are able to maximise efficiency and attend immediately to even small crises so as to prevent unnecessary losses. Such efficiency relies on being able to integrate work on the smallholding with home life without the need of time-consuming travel. It's not the single emergencies, but rather the accumulation of losses from numerous emergencies, small or large, arising from not living on site, that threaten the viability of a smallholding business.

6.17 The restrictions placed on ELC smallholders to manage their land ecologically, live a low-impact life, participate in extensive site monitoring and host school visits and open days place further demands on the smallholders' time. This was recognised by the Inspector when determining the Greenham Reach appeals (**Appendix A**).

6.18 The need for a worker to be readily available on small-scale horticultural units and mixed farms has been recognised in numerous planning decisions. A table of some of these planning decisions is provided in **Appendix F** including Elbow Farm:

"the individual tasks involved in running the horticultural enterprise may not appear so great as to warrant a permanent on-site presence. However, taken together the labour commitment is intensive and spread out over the day and night … without living on site, there is no doubt that the venture would come to an end … and the supply chain of vegetables built up in the locality would cease. This would be contrary to the NPPF's aim of supporting a prosperous rural economy."

6.19 In determining the ELC applications at Greenham Reach the Inspector summarised the case regarding essential need:

"The proposed development seeks to use the land's resources in a sustainable manner, aiming to develop ecosystems which have the diversity, stability and resilience of natural systems. Each of the smallholdings proposes to minimise its reliance on imported materials and energy derived from fossil fuels, so as to minimise its carbon footprint, and thus would be more labour-intensive, and require more human intervention, than more conventional, mechanised agricultural enterprises.

While some elements of ecological smallholding such as the production of top fruit, could be wholly managed during the course of a normal working day there are other aspects which require 'out of hours' attendance, and so generate a need for a permanent on-site presence. Such tasks include: morning and early-evening irrigation of crops to minimise evaporation loss; night-time hand-picking of slugs to minimise depredation of crops; shutting up poultry at dusk; responding to extreme weather conditions, large pests and escaped livestock; and making judgments about whether or not to use fleece to protect the salad crops late in the evening, if cloud clears unexpectedly."

6.20 The agricultural assessor giving evidence at the Greenham Reach inquiry, Rebecca Laughton BSc MSc, was asked if she knew of examples of ecological smallholders who don't live on site and are reliant on their business for their livelihood. She could provide no examples; all smallholders that depend on their holding for their livelihood live on site. When the Council's agricultural witness, Adrian Berryman BSc MSc of Acorus, was asked to provide examples of smallholders that lived off site, he could provide none.

6.21 Smallholdings can deliver more value when the workers are able to live close to their place of work. This allows them to cut commuting and rental /mortgage costs and removes the need for two pieces of land on which to work and live. It allows money to be unlocked for investment in the business, makes it easier to maintain infrastructure, systems, and site security, eliminates the need to commute, and improves family life and work/ life balance. Finally, insofar as delivery of the proposal for practical reasons hinges upon the smallholders being permitted to reside on site, residence is also essential to the proposed work at the site. **Appendix G** contains details of the illustrative functional need of an ecological, off-grid smallholding.

6.22 We acknowledge it is usual for an application for an agricultural worker's dwelling to be accompanied by a business plan which evidences functional need by detailing the labour needs of the proposed or existing crops and/or livestock. However, in this instance the ELC are unable to submit detailed business plans for each of the proposed smallholdings. This is because experience has found that the ELC can only responsibly advertise the smallholdings and invite applicants to submit their business plans after planning permission has been secured. By involving prospective smallholders before permission has been secured means asking people to put their lives on hold for an unknown period until planning consent is granted. This approach was tried at the Greenham Reach development when prospective smallholders were recruited before the planning application was determined. Two years later following refusal of the application and the subsequently allowed appeal, each of the original applicants for the smallholdings had taken up farm business opportunities elsewhere. It is therefore contended that the requirement for business plans to be submitted to the LPA prior to the occupation of the temporary dwellings can be secured by means of a planning condition, as per the approval of the ELC scheme at Arlington Hailsham (see **Appendix B**) where condition 2 states:

'Prior to the provision on site of each of the temporary dwellings hereby permitted:

Business plans for each of the three agricultural businesses to be operated on site shall be submitted to the Local Planning Authority. Each business plan shall show how it would be essential for the proper functioning of the enterprise for one or more workers to be readily available at most times'.

6.23 Each of the business plans would include precise details of the main hours required and the tasks that would demonstrate the functional need for the smallholders to be readily available on site at most times, day and night.

No suitable accommodation exists (or could be made available) in established buildings on the site or in the immediate vicinity

6.24 Policy HG9 requires applicants to establish that there is no other suitable residential accommodation (either existing or which could become available) on the site or within the site vicinity sufficiently close and affordable within the local area.

6.25 The average price for the 138 properties sold *within one mile* of the postcode BA22 7HY in the seven years up to 02/05/19 £301,400. In the ELC's experience, the build cost of a *low-impact* self-built dwelling is far lower than the average cost of a self-built dwelling (£168,033 according to 'Build It Yourself', Wallace, A, et al, 2013). Other low-impact developments report build costs between £27,000 (Simon and Jasmine's Family House, Lammas Low Impact Initiative as featured on Grand Designs, October 2016) to £100,000 (Chris Smaje's family house, Vallis Veg, Somerset) significantly below the average price of properties sold within one mile of the site. Surpressing the cost of living is absolutely essential to allow new entrants into ecological farming.

6.26 Assuming a 10% deposit, and an interest rate of 3.90%, the annual repayments on a 25-year interest-and-capital repayment mortgage for a property sold for £301,400 would be £17,000 per year. In a recent publication from Exeter University (Is There a Future for the Small Family Farm in the UK?, Winter, M, 2016), small farms in England and Wales are reported to have a Farm Business Income of less than £15,000. This demonstrates that affordability of open market housing is an issue.

6.27 South Somerset District Council clearly recognise that affordability of housing is an acute problem in the District:

'In line with the rest of the UK and the south west, affordability is an issue within the district, with the ratio of lower quartile house prices to lower quartile earnings being over seven to one. The mean average house price in 2011 was just under £207,00030. This makes it very difficult for first time buyers to enter the housing market particularly in rural areas. Whilst this ratio has actually improved recently, the challenge of matching housing need and housing supply remains highly problematic and is a key consideration in defining South Somerset's housing provision target over the local plan period.' (para 2.18).

6.28 Furthermore, the Council's failure to demonstrate a deliverable 5-year supply of housing has already been noted in Section 5 of this Statement. The supressed supply is likely to compound affordability issues and only serve to hinder access to land-based industries.

It does not involve replacing a dwelling disposed of recently as general market housing

6.29 The development entails three new agricultural enterprises. There are no existing dwellings on the site or within the immediate vicinity of the application site connected with its existing agricultural use. Furthermore, it is paramount that if the ELC is granted planning permission that the smallholdings are: used for an ecological agricultural business; occupied by the person(s) operating the smallholding business; and kept affordable. The ELC retain the freehold on its smallholdings and offer a strict tenancy agreement to the smallholders. Just as with county farms, the farm business tenancy that it uses allows the ELC to evict a smallholder if they are in breach of their tenancy agreement. The tenancy agreement requires smallholders to operate a farm business on their holding, and adhere to the site's Management Plan. The Plan places obligations on the smallholder, including to manage the land ecologically. Tenants cannot receive a windfall from their properties: if a tenant wishes to sell their holding, their tenancy requires that it must be offered back to the ELC in the first instance and in all cases must be sold at the re-sale value provided in their tenancy agreement, based on their improvements and not the housing market. Tenants cannot sub-let, and any future tenants would still be governed by the lease and management plan.

The dwelling is no larger than that required to meet the operational needs of the business

6.30 The application seeks an initial temporary permission in order that South Somerset District Council can garner comfort that the small holdings are viable and operating in a sustainable manner before granting permanent consent. Therefore, at this stage, full details of the proposed three temporary dwellings are not included. Their dimensions will however be restricted to that allowed under the Caravan Act 1968, resulting in dwellings of modest size. It is proposed that the details of the proposed temporary dwellings be submitted to the Local Planning Authority via a planning condition.

The siting and landscaping of the new dwelling minimises the impact upon the local landscape character and visual amenity of the countryside and ensures no adverse impact upon the integrity of nationally and internationally designated sites such as AONB

6.31 The proposed siting of the new dwellings (and associated barn, access track and carparking) has been carefully considered in order to minimise any visual intrusion into the surrounding landscape. The application is accompanied by a Landscape Appraisal which demonstrates that there will be no significant visual impact on the landscape character and visual amenity of the countryside. As noted in Section 5, above, the application site is not subject to any national or international landscape or biodiversity designations. The new built development will be sited in the south-east corner of the site where land levels are lower, the proximity to the road will minimise the length of the new access track, and existing screening exists by means of the frontage and eastern site boundary landscaping. This will be reinforced where necessary and

new landscaped tree and hedge planting along the northern and southwest site boundaries will also provide additional screening to the development and biodiversity enhancement to the site.

7. Design and access

Use

7.1 The proposal will further the existing agricultural use of the site and this is wholly appropriate within the rural context of the site, within open countryside outside the designated settlement boundary.

Amount

7.2 The amount of new built development will be the minimum required to accommodate the needs of the proposed three smallholdings. As noted above, the size of the proposed temporary dwellings will be limited by that allowed under the Caravan Act 1968 and can also be controlled by a planning condition. The provision of a single shared access and parking area and a shared agricultural barn, will also minimise the amount of new built development on the site. The barn will be constructed to provide a communal storage/processing area for the small holders and to minimise the need for additional ancillary structures for each farm business.

Layout

7.3 The proposed layout of development, shown in Figure (5) above, is based on the proposed grouping of the new dwellings and built development in the least visually sensitive, south-eastern corner of the site, with the remainder of the land outside the application site and within the applicant's ownership, being assigned to each of the three smallholdings.

Scale

7.4 The new temporary dwellings will comprise single-storey lodges / caravans. The barn building will be single storey and of a scale appropriate to a small agricultural holding. It will have a footprint of 22.8 m long by 4.9 m wide and a ridge height of 5.6 m. The scale and dimensions of the barn have been developed to meet agricultural/horticultural requirements and the scale would be in keeping with similar functional agricultural buildings elsewhere in the locality.

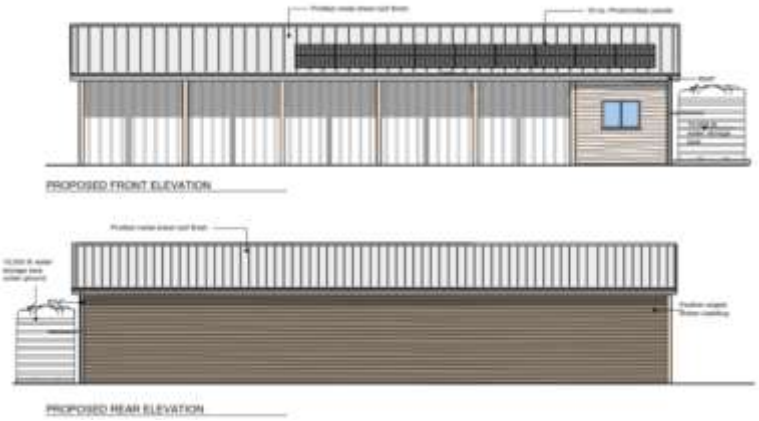






Figure (7): Proposed Barn Elevations and Floor Plan – courtesy of d h design

Appearance

7.5 The proposed barn will have a functional, agricultural appearance. It will be constructed via a round pole/sawn timber frame and will utilise timber sourced from nearby woodland where possible. By utilising screw pile foundations, the ground impact will be minimal and the structure will be dis-mountable and removable should the need arise. The external elevations would use horizontal timber boarding and the pitched roof would be covered in standard agricultural-grade coloured metal profile sheeting. Solar panels would be installed on part of the south-facing roof slope. Rainwater collection from the roof guttering would be captured and stored in two 10,000 litre black plastic storage tanks. Photographs of the barn installed at Greenham Reach are shown in Figure (8).



Figure (8): Barn constructed at Greenham Reach

7.6 The precise details of the three temporary dwellings are not yet available, since the smallholders, who cannot be responsibly recruited until after planning consent has been granted, will choose their dwelling according to their family size and budget. Notwithstanding this, it would not be permissible for any of the three temporary dwellings to be larger than that permitted by the Caravan Sites Act 1968. It is proposed that the individual dwelling details be submitted for approval by way of a planning condition as per the planning permissions at Greenham Reach and Arlington (copies of decision notices attached as Appendices A and B). As an indication of the likely design of the new dwellings, Figure (9) shows the dwellings sited on the Greenham Reach smallholdings.



Figure (9): Temporary smallholder dwellings at Greenham Reach

7.7 The proposed ELC Management Plan will require the smallholders to observe a number of requirements with regard to visual impact, including limited vehicle numbers and seasonal worker dwellings, and to removal of redundant vehicles and structures within 15 and 40 days respectively. It requires that smallholders locate agricultural structures sensitively and screen their temporary dwelling. They would not be allowed to site any residential infrastructure outside of the proposed residential area. Screens are to be of natural colour or material and in keeping with existing vegetation.

7.8 The Management Plan will also require any constructed structures, i.e. the barn and toilets, be built using natural materials, in keeping with the local aesthetic and able to be removed at the end of the temporary period unless superseded by a permanent caravan. Figure (10) below shows the compost toilet that was built at Greenham Reach.



Figure (10): Composting toilet at Greenham Reach

Landscaping

7.9 The proposal will not result in the loss of any existing boundary hedging/landscaping and the new development will be sited at least 200m from the only significant tree within the immediate site vicinity, a beech tree located adjacent to the western boundary of the wider

landholding. New native tree and shrub copse planting will be introduced along the north-eastern edge of Wyvern Copse, around the field corners and around the existing beech tree near the western site boundary. A new pond feature within the southeast corner of the site would add a significant wildlife habitat to the site and aid surface water run-off. The details of the proposed landscaping and biodiversity enhancement are shown in the Landscape Proposals Plan.

Access

7.10 The development will utilise the established main vehicular access from Sparkford Hill Lane. These are located such that adequate visibility splays can be achieved to the east and west by trimming the frontage hedging on land owned by the applicant. The trimming would not have a significant impact on the screening that the hedge currently provides from Sparkford Hill Lane.

7.11 A multi-purpose hard standing area is to be provided to serve the smallholdings, linking the highway access with the agricultural barn, and the curtilage of the proposed 'residential' area (where temporary dwellings would be sited). This area has been designed to be suitable for agricultural traffic, allow for safe turning and loading / unloading of vehicles visiting the site. The hard standing would be made from porous stone laid over geotextile to enable free drainage and avoid run-off. This area is sufficient for parking and general agricultural activities.

7.12 Traffic movements are anticipated to be less than 12 movements on / off the site per day. This has been derived from actual measurements taken at the similar sized ELC smallholdings in Devon. Restrictions on parking, limiting overnight parking to two vehicles per dwelling, and restrictions on traffic generation form part of the Management Plan.

Water Supply and Drainage

7.13 The site would be supplied with rainwater through rainwater harvesting from the barn roof, and collection in two 10,000 litre above-ground storage tanks. Should additional horticultural need require a supplementary supply over that which can be provided from rainwater, a connection to mains water supply would be implemented.

7.14 The generation of waste water from the site would be minimised through the use of composting toilets by the residential smallholders, and grey water from washing would be initially dealt with through soakaways.

8. Conclusion

8.1 The ELC provides an affordable route into ecological horticulture and small- scale mixed farming to new entrants. It helps to address the lack of opportunities for new entrants, and support small start-up businesses and rural diversification. Through facilitating low impact development, and a transition to ecological farming, its work supports a transition to a low

carbon economy, provides biodiversity gains and contributes to climate change mitigation and adaptation.

8.2 This Statement describes the benefits of the proposed development. The proposed development would deliver economic, social and environmental benefits that are closely aligned to the spatial objectives and policies of the Development Plan:

- Promote sustainable economic growth, enterprise and rural diversification.
- Access to ecological farming and rural employment, helping to create a living working countryside and maintain a thriving village community;
- Minimise the need to travel – both in terms of commute and food miles;
- Using the land sustainably to deliver multiple benefits – food production, biodiversity enhancement; decentralised energy and rain water harvesting.
- Provide much needed affordable accommodation tied to the use of the land.
- Support the transition to a low carbon future

8.3 In accordance with the NPPF, consideration needs to be given as to whether the proposals constitute sustainable development, for which there is a presumption in favour of planning permission being granted. In this case the proposals are sustainable for the following reasons:

- From an economic perspective, the proposal will make an efficient use of this accessible site, create jobs and bolster the resilience of the local economy;
- From a social perspective, the proposal will provide three new homes for rural workers which are of an appropriate design and will respond well to the character of the area, and shall be accessible to local services; and,
- From an environmental perspective, the proposal shall preserve the character and appearance of the area, using natural resources, in this case land, efficiently to provide rural housing in an accessible location.

8.4 Furthermore, the LPA is unable to demonstrate a 5-year housing land supply. The Council's most recent Five-Year Housing Land Supply Paper (August 2018) confirms that the Council can only demonstrate 'about 4 years' deliverable housing supply. As such paragraph 11 of the NPPF prevails and sustainable development should be approved without delay. As set out in section 5 of this statement, paragraph 79 recognises that special circumstances such as the essential need for a rural worker to live permanently as or near their place of work in the Countryside. Coupled with the compelling benefits of the scheme set out in this Statement, the Appellant considers that the proposal constitutes a truly sustainable development.

8.5 It is therefore considered that the planning justifications and design rationale identified in this Planning, Design and Access Statement demonstrate that the proposed development is acceptable.

APPENDIX [A]

Greenham Reach Inspectors decision letter

The Planning Inspectorate

Appeal Decisions

Inquiry held on 29, 30 and 31 January 2013
Site visit made on 31 January 2013

by Jessica Graham BA(Hons) PgDipL

an Inspector appointed by the Secretary of State for Communities and Local Government

Decision date: 18 April 2013

Appeal A Ref: APP/Y1138/A/12/2181808
Land at Greenham Reach, Holcombe Rogus, Devon (NGR 307117/120011)

- The appeal is made under section 78 of the Town and Country Planning Act 1990 against a refusal to grant planning permission.
- The appeal is made by Ecological Land Co-operative against the decision of Mid-Devon District Council.
- The application Ref 12/00045/MFUL, dated 27 December 2011, was refused by notice dated 7 June 2012.
- The development proposed is the siting of a temporary agricultural worker's dwelling for a period of 5 years together with an agricultural barn with PV array, greenhouse, W.E.T. waste water treatment system and alterations to the existing highway access and private ways as part of a scheme for new entrants to ecological agriculture.

Appeal B Ref: APP/Y1138/A/12/2181821
Land at Greenham Reach, Holcombe Rogus, Devon (NGR 307117/120011)

- The appeal is made under section 78 of the Town and Country Planning Act 1990 against a refusal to grant planning permission.
- The appeal is made by Ecological Land Co-operative against the decision of Mid-Devon District Council.
- The application Ref 12/00107/MFUL, dated 17 January 2012, was refused by notice dated 7 June 2012.
- The development proposed is the siting of a temporary agricultural worker's dwelling for a period of 5 years together with an agricultural barn with PV array, W.E.T. waste water treatment system and alterations to the existing highway access and private ways as part of a scheme for new entrants to ecological agriculture.

Appeal C Ref: APP/Y1138/A/12/2181807
Land at Greenham Reach, Holcombe Rogus, Devon (NGR 307117/120011)

- The appeal is made under section 78 of the Town and Country Planning Act 1990 against a refusal to grant planning permission.
- The appeal is made by Ecological Land Co-operative against the decision of Mid-Devon District Council.
- The application Ref 11/02007/MFUL, dated 5 December 2011, was refused by notice dated 7 June 2012.
- The development proposed is the siting of a temporary agricultural worker's dwelling for a period of 5 years together with an agricultural barn with PV array, poultry hatcher/brooder, W.E.T. waste water treatment system and alterations to the existing highway access and private ways as part of a scheme for new entrants to ecological agriculture.

These decisions are issued in accordance with Section 56 (2) of the Planning and Compulsory Purchase Act 2004 (as amended) and supersede those issued on the 4th April 2013

Summary of decisions

1. All three appeals are allowed, and planning permission is granted in accordance with the conditions scheduled in the appendices attached to this decision letter.

Procedural matters

2. The description of the proposed development given in each of the three planning applications included the creation of a borehole. That element of the proposals was withdrawn during the application process, and the Council determined the applications on the basis that no borehole would be created. My determination of these appeals proceeds on the same basis.

3. At the inquiry the appellant submitted a S.106 Undertaking [Document 15] which has, as subsequently established by submission of Document 18, been duly executed by all necessary parties. I have taken the existence of this legal deed into account in my consideration of the appeals, and discuss its content and implications below.

Background

4. The appellant is a co-operative society founded to support the creation of affordable and sustainable land-based livelihoods in the UK. It purchased the freehold of some 8.85 hectares of land at Greenham Reach with the intention of creating a pathway into ecological farming for new entrants, by selling leasehold agreements to operate smallholdings on the land. It now seeks planning permission for three temporary dwellings, each associated with one of three smallholdings to be established on the site, for a period of five years.

5. Since the land at Greenham Reach has been sub-divided into three separate plots, each to be leased to different occupiers, I can understand why the Council requested three separate planning applications (now the subject of these three linked appeals) detailing the agricultural activities that would be taking place on each. However, the evidence indicates that the development proposal as a whole, which has remained consistent throughout the application and appeal process, does not straightforwardly equate to establishing three conventional independent smallholdings.

6. Rather, the co-operative society would retain ownership of the land and would provide communal facilities for the benefit of all three enterprises. Tenants would be obliged to operate their smallholdings in strict accordance with principles of low-impact living set out in the co-operative's over-arching Management Plan, and could, ultimately, have their tenancies terminated if they failed to do so. The co-operative society would also have the responsibility of monitoring, on an annual basis, the business accounts of the smallholders and (among other things) the impact of the development on landscape quality and biodiversity.

7. In my judgment the ongoing involvement of the co-operative society is an integral component of the development that is here proposed, and forms part of the context in which the individual appeals should be considered.

Main issue

8. The main issue, common to each of these three appeals, is whether there are circumstances that would justify the creation of the proposed new homes in the countryside, having regard to relevant local and national planning policy.

Reasons

The proposed development

9. The area of land in question is currently laid to grass, and used for grazing sheep. It lies some 1.5 miles from the village of Holcombe Rogus, which is the nearest settlement, along an unclassified road. The appellant's proposal is to subdivide this land into Plots A, B and C, for the establishment of 3 separate smallholdings, with some 0.3ha retained for the provision of shared facilities and landscaping. A track would be constructed from the sole vehicular access point on the northwest boundary to the communal barn, and onward to provide access to the three plots. Other communal facilities would include a barn, water storage, a solar PV array, a waste water treatment system and visitor parking. The proposed use of the land would be in keeping with the agricultural character and appearance of the surrounding landscape.

10. The supporting information submitted in respect of Plot A (now the subject of Appeal A) explained that this plot is located on 2.8 ha of relatively flat land. The Business Plan provided by the prospective tenant sets out his intention to develop a profitable business that would benefit the local economy, while also playing a positive role in improving soil fertility, ecological diversity, the drawing down of atmospheric carbon and the aesthetic appearance of the site. The produce would be organic, and its production and transportation as close to fossil-free as practically possible. The plot would be used to grow vegetables and salad crops for a box scheme; a variety of grains; a willow plantation, to produce wood for hand-crafted willow furniture and baskets; a 2 acre agroforestry scheme comprising a fruit and nut orchard under-sown with herbs and perennial vegetables; and a flock of hens and ducks would be kept.

11. Plot B (the subject of Appeal B) extends to about 2.2 ha. The supporting information submitted with the planning application explained that the proposed business activities on this smallholding would be horticultural, revolving in the first few years around the production of quality salad bags, culinary herbs and gourmet salad dressing ingredients, with production of fruit juices and cider vinegar in later years once the proposed orchard was established. Bees and a flock of Maran hens would also be kept. I heard at the inquiry that the prospective tenants who had drawn up this Business Plan were no longer involved, but were happy for it to be adopted by others. The evidence of the appellant was that it has a long list of prospective smallholders, and would have no problem finding a suitably experienced grower to implement these proposals.

12. Plot C (the subject of Appeal C) comprises some 3.6 ha of land, some of it steeply sloping, and part of it adjoining the river. The supporting material prepared by and on behalf of the prospective tenants is that their business would consist of several components, to provide income throughout the year. These would include a market garden; a vegetable and herb nursery; a silvopastoral agroforestry scheme based on a forest-edge ecosystem, with the floodplain meadow grazed by sheep and further up the slope, native woodland trees, top and soft fruit, perennial vegetables and mushroom-bearing logs; poultry for sale as point-of-lay hens; and the processing of surplus produce and purpose-grown and gathered fruit into preserves for year-round sale.

The policy context

13. Paragraph 55 of the government's *National Planning Policy Framework* (NPPF) explains that locating new isolated homes in the countryside should generally be avoided, unless there are "special circumstances". It goes on to list four examples of such special circumstances, which include "the essential need for a rural worker to live permanently at or near their place of work in the countryside".

14. It is worth emphasising here that the guidance set out in the NPPF replaces that formerly contained in the government's Planning Policy Statement (PPS) 7: *Sustainable Development in Rural Areas.* Annex A of PPS 7 advised that where permission was sought for a dwelling on a temporary (rather than a permanent) basis to support a new farming activity, the proposal would need to demonstrate a firm intention and ability to develop the enterprise, provide clear evidence that the enterprise had been planned on a sound financial basis, and pass the "functional need" test: that is, show that it would be essential for the proper functioning of the enterprise for one or more workers to be readily available at most times.

15. The evidence given on behalf of the Council proceeded on the basis that the tests formerly set out in PPS 7 would be helpful in gauging whether an "essential need" for the proposed temporary dwellings exists, and cited in support of that approach the findings of an Inspector in a recent appeal decision (Ref APP/C1625/C/12/2171928 & 2172069). I share that Inspector's view that in some circumstances the methodology set out in Annex A can still be a material consideration, albeit on the basis that it is no longer government policy, but it is crucial to note (as he did) that the terms of paragraph 55 of the NPPF do not preclude the demonstration of "essential need" by evidence that does not seek to, or cannot, show that all of the Annex A tests have been met.

16. Against that background, I note that the Council's emerging "Local Plan Part 3" contains a draft policy dealing with rural workers dwellings (DM/10), which not only seeks to amalgamate the "essential need" test set out in the NPPF with a more restrictive version of the old "functional need" test from PPS 7, but also to re-introduce, for the purposes of assessing whether a temporary dwelling may be permitted, the other superseded PPS 7 tests of "a firm intention to establish a rural enterprise" and "sound financial planning".

17. I understand the appellant's concerns about the extent to which such a policy could be considered "consistent" with the NPPF, since it was open to the government to include the old Annex A tests as part of this new guidance, and it chose not to do so. However, paragraph 1 of the NPPF explains that it is intended to provide a framework within which communities can produce their own plans, and in my view there is nothing to prevent the Council formulating a policy that seeks to "flesh out" the terms of this framework, provided it has sound reasons for so doing. Since the soundness of draft policy DM/10 has yet to be tested at a public examination, and since a number of unresolved objections to its terms persist, I consider that for the purpose of determining the current appeals this emerging policy should be afforded only limited weight.

18. Of more significance, since it forms part of the adopted Development Plan for the area, is Policy COR 18 of the Mid-Devon Core Strategy. The appellant rightly points out that in dealing with dwellings in the countryside, this policy refers to the needs of "agricultural or forestry" workers rather than the more

inclusive term "rural workers" preferred by paragraph 55 of the NPPF, and in that respect I agree that it is inconsistent with the NPPF; aside from that important point, I consider the provision it makes for "housing essential to accommodate [an agricultural or forestry worker]" to be consistent with the relevant part of paragraph 55.

19. The appellant also points out that Policy COR 18 differs from paragraph 55 of the NPPF in that the former could be interpreted as providing an exhaustive list of the circumstances in which development would be permitted in the countryside, whereas the latter could be interpreted as leaving open the possibility that such development may also be justified if other "special circumstances" exist. While it is true that Policy COR 18 makes no specific provision for the existence of any other "special circumstances", it seems to me that this absence does not necessarily render individual policies out-of-date or inconsistent with the NPPF, but rather should be considered as a matter on which the Development Plan as a whole is, as yet, silent.

Essential need

20. The proposed development seeks to use the land's resources in a sustainable manner, aiming to develop ecosystems which have the diversity, stability and resilience of natural systems. Each of the smallholdings proposes to minimise its reliance on imported materials and energy derived from fossil fuels, so as to minimise its carbon footprint, and thus would be more labour-intensive, and require more human intervention, than more conventional, mechanised agricultural enterprises.

21. As a fellow Inspector noted when determining an appeal concerning an enterprise based on principles of permaculture (Ref APP/X1118/A/12/2180401), it is understandable that those pursuing the aim of developing a sustainable livelihood, as an integral part of a low impact lifestyle, would choose to live on-site. I accept that for any such enterprise (indeed, for most conventional agricultural enterprises too) the presence of a resident worker would have obvious benefits in terms of enabling a quicker response time to emergencies and changes in weather conditions than if all workers were living off-site, and would also reduce the need for journeys involved in commuting to and from the site. However, those acknowledged benefits do not in themselves amount to an "essential need" for a worker to live on site.

22. The evidence of the appellant is that while some aspects of the three proposed smallholdings, such as the agroforestry plantations, could be wholly managed during the course of a normal working day there are other aspects which would require "out of hours" attendance, and so generate a need for a permanent on-site presence. I am told that such tasks, common to all three plots, would include morning and early-evening irrigation of crops to minimise evaporation loss; night-time hand-picking of slugs to minimise depredation of crops; shutting up poultry at dusk; and responding to extreme weather conditions, large pests and escaped livestock. I am also told that the wood burners proposed on Plot C to maintain temperatures within polytunnels would need to be re-stoked during cold winter nights, and the off-grid electricity powering heat lamps for chicks would require diligent monitoring: further, judgments about whether or not to use fleece to protect the salad crops proposed on Plots A and B may need to be made late in the evening, if cloud clears unexpectedly.

23. The Council contends that some of these arrangements appear to adopt a "hair shirt" approach to the management of the smallholdings, and points out that other less labour-intensive methods of controlling pests and heating polytunnels could be adopted.

24. However, it is important to have regard to the full extent and context of the proposals for Greenham Reach. Fundamental to the establishment and operation of the smallholdings are the appellant's aims of addressing the need to reduce the negative environmental impacts of conventional farming and globalised food distribution, and the need to facilitate and learn from low-impact development. To that end, they have put in place extensive safeguards to ensure that the proposed smallholdings would be operated in accordance with the principles of low-impact development, while providing opportunities for research into its operation and effect.

25. The prospective tenants were carefully selected by the appellant on the basis of, among other things, their experience of low-impact living and the quality of their business proposals. The leasehold agreements for the smallholdings would require the occupiers to comply with the terms of the co-operative society's overarching Management Plan for Greenham Reach, and the S.106 Undertaking executed by the appellant makes the co-operative society (and any subsequent owner of the land) responsible for ensuring the implementation of that Management Plan.

26. The Management Plan itself is an extensive document, which places a number of obligations and requirements upon the tenants of the smallholdings. Among these are a prohibition on the use of agro-chemicals, and the use of artificial inputs in the form of synthetic pesticides, herbicides or fertilisers; a requirement to manage, on a communal basis, the on-site facilities for rainwater harvesting, biological treatment of grey water and compost toilets; a requirement to generate electricity on-site from a renewable source, and to meet their heating needs through the use of solar energy and/or biomass crops; a requirement that their temporary dwelling must achieve at least a Code 4 rating within the BRE Code for Sustainable Homes; and a restriction on the number of vehicles to be kept at the site and the overall number of vehicle trips to and from the site each year.

27. Further, the Management Plan requires the operators of the smallholdings to comply with, and contribute to, the co-operative society's provisions for the extensive monitoring of all aspects of the proposed development, including an annual assessment of the ecological and biodiversity condition of the site by a qualified professional, reports on soil condition and water erosion, carbon footprint analysis and the provision of annual business accounts for each smallholding.

28. Supporting evidence submitted with the planning applications demonstrates that there is abundant and wide-ranging interest in taking up the research opportunities offered by the proposed development at Greenham Reach. At the inquiry I heard convincing evidence as to the particular value of such research opportunities. While other low-impact development initiatives are in existence, the proposals for Greenham Reach would provide a unique opportunity to undertake baseline surveys and monitoring before the proposed smallholdings were established; importantly, the Management Plan would secure tenants' continuing involvement in monitoring the progress, impact and

success or otherwise of the proposals, forestalling difficulties experienced elsewhere in securing smallholders' cooperation with researchers.

29. The Management Plan, then, is clearly aimed at securing the use of the proposed smallholdings to create and sustain low-impact livelihoods, while facilitating research into the viability of such livelihoods. In this context it is not unreasonable that prospective tenants should adopt and seek to develop, as part of their business proposals, methods of pest-control, crop-care and eco-agriculture that both comply with this ethos and are proportionate to their particular small-scale enterprises. I accept that the labour-intensive nature of such practices, necessary to ensure that a sustainable livelihood could be developed without resort to agro-chemicals and reliance on fossil fuels, would require the worker's presence and involvement to such an extent that the need could only be met by living on-site.

30. Moreover, the requirements and restrictions of the Management Plan, along with others contained in the leasehold agreements and the S.106 Undertaking, would be likely to deter prospective tenants who might simply be seeking a means of obtaining a dwelling in the countryside. Living a low-impact lifestyle and developing a symbiotic relationship with the land involves foregoing some of the normal trappings of modern day life while engaging in extensive, and at times very intensive, physical labour. I consider that the co-operative society's role in assessing applicants, and subsequently assisting and monitoring their progress, would also help to ensure that prospective tenants were genuinely committed to this type of rural enterprise.

31. Taking all of these considerations into account, I am satisfied that the requirements of the proposed smallholdings at Greenham Reach, which are considered here as integral components of the development proposals for the site as a whole, give rise to an essential need for a worker to live at each of those smallholdings. For the avoidance of doubt, this finding applies to Plot B even in the current absence of an identified tenant, since I accept the appellant's undisputed evidence that it has an ample supply of prospective tenants willing and able to implement the Business Plan submitted with the planning application; such tenants would also be bound by the restrictions of the leasehold agreement and Management Plan.

32. I conclude that the proposed development now the subject of these three appeals would comply with Policy COR 18 of the Mid Devon Core Strategy.

33. The Council raised a number of legitimate concerns about some of the financial information and forecasts supplied with the applications, which place in doubt the size, and timing, of some of the predicted profits. While I do not consider the identified extent of the potential reduction in profitability sufficient to undermine the overall viability of any of the proposals, it is fair to note that acknowledged omissions from the projected profit and loss accounts limit the extent to which the proposal could be said to accord with the requirement in emerging Policy DM/10 for "clear evidence of… sound financial planning." In all other respects, I consider the requirements of DM/10 to be met: the five years' work the appellant has put in to researching, consulting on and preparing its applications for this site constitute clear and convincing evidence of its firm intentions.

34. As discussed above, Policy DM/10 is not yet a part of the adopted Development Plan, and there remains some doubt about whether it will, in its current form,

become so. I therefore attach little weight to the limited extent to which the proposed development conflicts with this emerging policy. I attach much greater weight to the material consideration that the proposed development would have substantial benefits in terms of not only its own sustainability credentials, which are considerable and are not disputed by the Council, but also the contribution it could make, through facilitating much-need research, to informing and improving future developments in the field.

Other matters

35. The Council's second reason for refusing the proposals was its concern that they would set a precedent for further dwellings, in association with permaculture and agroforestry proposals, in the countryside. Firstly, it is important to note that development does not proceed by way of precedent; each proposal must be considered on the basis of its own individual merits. Secondly, the particular circumstances of the current proposals, which combine (a) strict requirements for the establishment and maintenance of low-impact livelihoods with (b) unique opportunities for research and (c) the ongoing involvement of a purpose-formed co-operative society, clearly demand a great deal of commitment and investment from those involved and are unlikely to be easily replicated by people merely seeking a dwelling in the countryside. Thirdly, provided that proposals for other dwellings associated with permaculture and agroforestry complied with the relevant policies, it is not clear to me why the Council would consider encouragement for them to be undesirable.

36. Concerns were expressed by some local residents about the impact that additional traffic associated with these proposals would have on the local road network. The highway authority considers that the proposals would be acceptable in highway safety terms, subject to conditions securing the provision of visibility splays at the site entrance and the creation of passing spaces, and I have no reason to doubt that professional assessment. Further, the leasehold agreement for prospective tenants places strict limits on the number of vehicle movements to and from the site, and the need to comply with that limit would inform the operations of the smallholders, for example sharing transport to take produce to markets and local buyers.

Conditions

37. The Council suggested a list of conditions that it considers should be imposed if I were minded to grant planning permission for the proposed development. I have considered these in the light of the advice set out in Circular 11/95 *The Use of Conditions in Planning Permissions.*

38. It is necessary to attach the standard condition requiring development to be carried out in accordance with the submitted plans, which differ for all three proposals. Since the proposals for Plots A and B do not (unlike the proposal for Plot C) include details of the design and dimensions of the proposed dwelling, it is necessary to attach a condition to each of these permissions requiring the Council's approval of these details prior to the construction of those dwellings. Other than these, the suggested conditions are common to all three proposals, and I deal with them together below.

39. Since it is fundamental to the acceptability of the proposals that the dwellings are needed to house workers on the land, it is necessary to attach a condition

restricting their occupation to such workers. As the permission granted is for temporary dwellings to subsist for a period of five years, it is also necessary to attach a condition requiring their removal at the end of this period, and the reinstatement of the land to its former condition.

40. I agree with the Council that if any of the three plots were to be amalgamated with either (or both) of the others, it would be appropriate to require the removal of the temporary dwelling(s) thus rendered excess to requirements, and have attached a condition to that effect. I also agree with the Council that a condition is needed requiring its prior approval of the timetable for constructing the communal facilities and implementing the proposed landscaping is needed, to ensure that these are provided in a timely manner to serve the occupiers of the dwellings. I have also attached the Highway Authority's suggested conditions securing the provision of visibility splays, hardsurfacing at the start of the access track, and the provision of 2 passing bays. Finally, I have attached the Council's suggested condition requiring retention of a riparian buffer, to prevent disturbance to otters.

Conclusions

41. Each of the three proposals accords with the objectives of the adopted Development Plan, and taken together, other material considerations weigh heavily in favour of granting planning permission. I therefore determine that the appeals should be allowed.

Formal decision: Appeal A

42. The appeal is allowed and planning permission is granted for the siting of a temporary agricultural worker's dwelling for a period of 5 years together with an agricultural barn with PV array, greenhouse, W.E.T. waste water treatment system and alterations to the existing highway access and private ways as part of a scheme for new entrants to ecological agriculture on land at Greenham Reach, Holcombe Rogus, Devon (NGR 307117/120011) in accordance with the terms of the application, Ref 12/00107/MFUL, dated 27 December 2011, subject to the conditions scheduled at Appendix 1 to this decision letter.

Formal decision: Appeal B

43. The appeal is allowed and planning permission is granted for the siting of a temporary agricultural worker's dwelling for a period of 5 years together with an agricultural barn with PV array, W.E.T. waste water treatment system and alterations to the existing highway access and private ways as part of a scheme for new entrants to ecological agriculture on land at Greenham Reach, Holcombe Rogus, Devon (NGR 307117/120011) in accordance with the terms of the application, Ref 12/00107/MFUL, dated 17 January 2012, subject to the conditions scheduled at Appendix 2 to this decision letter.

Formal decision: Appeal C

44. The appeal is allowed and planning permission is granted for the siting of a temporary agricultural worker's dwelling for a period of 5 years together with an agricultural barn with PV array, poultry hatcher/brooder, W.E.T. waste water treatment system and alterations to the existing highway access and private ways as part of a scheme for new entrants to ecological agriculture on land at Greenham Reach, Holcombe Rogus, Devon (NGR 307117/120011) in accordance with the terms of the application, Ref 11/02007/MFUL, dated 5

December 2011, subject to the conditions scheduled at Appendix 3 to this decision letter.

Jessica Graham

INSPECTOR

APPEARANCES

FOR THE LOCAL PLANNING AUTHORITY:

Mr P Wadsley, of Counsel	Instructed by the Solicitor to Mid Devon Council
He called:	
Mr P Rowan DipTP MRTPI	Director, Rowan & Edwards Ltd
Mr A Berryman MRICS	Consultant, Acorus Rural Property Services Ltd

FOR THE APPELLANT:

Mr P McLeish, of Counsel	Acting "pro bono"
He called:	
Dr J Wright BA, PgDp, MSc, PhD	Deputy Director, Coventry University Centre for Agroecology and Food Security
Dr L Maxey LLB, MSc, PhD, FRGS	Director, Ecological Land Co-operative Ltd
Ms R Laughton BSc, MSc	Agricultural Consultant
Mr R Hitchings BSc, PGCE	Principal Consultant, Elm Farm Organic Research Centre
Ms S Aldworth Chartered Accountant	Director, Ecological Land Co-operative Ltd
Ms Z Wangler BSc	Managing Director, Ecological Land Co-operative Ltd

INTERESTED PERSONS:

Mr R Wiltshire	Local resident
Ms G Gale	Member of "Sustainable Villages"
Mr C Smaje	Market gardener, writer and researcher
Mr P Bowers	Member of "Sustainable Villages"
Mr C Vernham	Researcher at the University of Bristol, Trustee of the Centre for Sustainable Development
Ms E Thompson	Climate Scientist
Ms J Fernandes	Experienced smallholder
Ms G Westcott	Member of Parish Council
Mr H Chapman	Experienced smallholder
Mr D Washington	Agricultural worker

DOCUMENTS SUBMITTED AT THE INQUIRY

1 List of appearances for the appellant
2 S.106 Unilateral Undertaking, executed by the appellant
3 Signed Statement of Common Ground
4 Copy of Agenda Item 8 of the Planning Committee of 9 May 2012, described as "joint background information" in respect of the three proposals now the subject of these appeals
5 Copy of opening submissions made on behalf of the appellant
6 Copy of opening statement made on behalf of the Council
7 Copy of appeal decision ref: APP/Y1138/A/12/2177825
8 Copy of appeal decision ref: APP/X1118/A/12/2180401
9 Updated version of the Management Plan for the proposed new smallholdings at Greenham Reach
10 Transcript of the judgment in J R Cussons & Son (A Firm) v Secretary of State for Communities and Local Government & Anor [2010] EWHC 2463 (Admin) (15 October 2010)
11 Copy of Plot A "Profit and Loss Account" for years ending 31/10/12, 31/10/14 and 31/10/16
12 Copy of representations made orally to the inquiry by Ms G Westcott
13 List of suggested conditions, agreed between the Council and the appellant
14 List of the plans submitted for each proposal, agreed between the Council and the appellant
15 Updated version of S.106 Unilateral Undertaking, executed by the appellant
16 Copy of closing submissions made on behalf of the Council
17 Copy of closing submissions made on behalf of the appellant

DOCUMENTS SUBMITTED AFTER THE INQUIRY CLOSED, WITH THE PRIOR AGREEMENT OF THE INSPECTOR

18 Letter from Lloyds TSB dated 13 February 2013, confirming that its legal charge over the appeal sites has been released
19 Copy of an e-mail from the Council dated 14 February 2013, confirming that as a consequence of the discharge letter from Lloyds TSB [Document 18 above], it would not require Lloyds TSB to be a party to the appellant's S.106 Undertaking [Document 15 above]

Appendix 1: Schedule of Conditions for Appeal A

1) The development hereby permitted shall be carried out in accordance with the following approved plans: L-01 A (site location plan); L-02 A (site plan and block plan); L-03 (barn elevations and floor plan); L-06 (greenhouse elevations and floor plan); L-09 (landscape plan).

2) Prior to the provision on site of the temporary dwelling hereby permitted details of its dimensions, means of construction, design and materials shall be submitted to and approved in writing by the local planning authority, and development shall be carried out in accordance with the approved details.

3) Prior to the provision on site of the temporary dwelling hereby permitted a timetable shall be submitted to and approved in writing by the local planning setting out the timing of the provision of

   - the communal barn and solar PV array, in accordance with the approved plans;
   - the provision of the landscaping scheme, in accordance with drg. no. L-09;
   - the provision of the W.E.T. waste treatment facilities, in accordance with the approved plans; and
   - the provision of the composting toilets

   and development shall be carried out in accordance with the approved timetable.

4) The occupation of the temporary dwelling hereby permitted shall be limited to persons solely or mainly employed in the agricultural business operated on Plot A or a widow or widower of such a person, together with their spouse or partner and any resident dependants.

5) No other part of the development hereby permitted shall begin until

   - Visibility splays have been laid out and constructed in accordance with details first submitted to and approved in writing by the local planning authority; and
   - For a minimum of its first 6m back from the nearside edge of the carriageway the site access road, including the bellmouth radii, has been hard-surfaced and drained in accordance with details first submitted to and approved in writing by the local planning authority.

   The visibility splays and access road shall thereafter be retained in accordance with the approved details at all times. Any site access gates shall be set back a minimum of 6m from the nearside carriageway edge and shall be hung to open inwards only.

6) Within 12 months of commencement of the development hereby permitted, two passing bays shall be provided on the site ownership frontage with the public highway in accordance with details first submitted to and approved in writing by the local planning authority, and shall thereafter be retained in accordance with those approved details.

7) A riparian buffer of 6m from the river edge, when it is at the top of its typical river range (1.09m) shall be retained at all times to prevent disturbance to otters on the River Tone.

8) When the temporary dwelling hereby permitted ceases to be occupied by persons specified in condition 4 above, or on the date 5 years from the date of this decision letter, whichever is the sooner, the dwelling shall be removed, and the land restored to its former condition, in accordance with a scheme of work which has first been submitted to and approved in writing by the local planning authority.

9) If Plot A (the subject of this permission) should be amalgamated with either Plot B (the subject of Appeal Ref APP/Y1138/A/12/2181821) or Plot C (the subject of Appeal Ref APP/Y1138/A/12/2181807) or both of them, so as to constitute one holding, only one temporary dwelling shall be permitted to remain on the amalgamated site and the other(s) shall be removed from the land within 6 months of the date that the amalgamation of the plots occurred, in accordance with a scheme of work which has first been submitted to and approved in writing by the local planning authority.

Appendix 2: Schedule of Conditions for Appeal B

1) The development hereby permitted shall be carried out in accordance with the following approved plans: L-01 B (site location plan); L-02 B (site plan and block plan); L-03 (barn elevations and floor plan); L-09 (landscape plan).

2) Prior to the provision on site of the temporary dwelling hereby permitted details of its dimensions, means of construction, design and materials shall be submitted to and approved in writing by the local planning authority, and development shall be carried out in accordance with the approved details.

3) Prior to the provision on site of the temporary dwelling hereby permitted a timetable shall be submitted to and approved in writing by the local planning setting out the timing of the provision of

    - the communal barn and solar PV array, in accordance with the approved plans;
    - the provision of the landscaping scheme, in accordance with drg. no. L-09;
    - the provision of the W.E.T. waste treatment facilities, in accordance with the approved plans; and
    - the provision of the composting toilets

    and development shall be carried out in accordance with the approved timetable.

4) The occupation of the temporary dwelling hereby permitted shall be limited to persons solely or mainly employed in the agricultural business operated on Plot B or a widow or widower of such a person, together with their spouse or partner and any resident dependants.

5) No other part of the development hereby permitted shall begin until

    - Visibility splays have been laid out and constructed in accordance with details first submitted to and approved in writing by the local planning authority; and
    - For a minimum of its first 6m back from the nearside edge of the carriageway the site access road, including the bellmouth radii, has been hard-surfaced and drained in accordance with details first submitted to and approved in writing by the local planning authority.

    The visibility splays and access road shall thereafter be retained in accordance with the approved details at all times. Any site access gates shall be set back a minimum of 6m from the nearside carriageway edge and shall be hung to open inwards only.

6) Within 12 months of commencement of the development hereby permitted, two passing bays shall be provided on the site ownership frontage with the public highway in accordance with details first submitted to and approved in writing by the local planning authority, and shall thereafter be retained in accordance with those approved details.

7) A riparian buffer of 6m from the river edge, when it is at the top of its typical river range (1.09m) shall be retained at all times to prevent disturbance to otters on the River Tone.

8) When the temporary dwelling hereby permitted ceases to be occupied by persons specified in condition 4 above, or on the date 5 years from the date of this decision letter, whichever is the sooner, the dwelling shall be removed, and the land restored to its former condition, in accordance with a scheme of work which has first been submitted to and approved in writing by the local planning authority.

9) If Plot B (the subject of this permission) should be amalgamated with either Plot A (the subject of Appeal Ref APP/Y1138/A/12/2181808) or Plot C (the subject of Appeal Ref APP/Y1138/A/12/2181807) or both of them, so as to constitute one holding, only one temporary dwelling shall be permitted to remain on the amalgamated site and the other(s) shall be removed from the land within 6 months of the date that the amalgamation of the plots occurred, in accordance with a scheme of work which has first been submitted to and approved in writing by the local planning authority.

Appendix 3: Schedule of Conditions for Appeal C

1) The development hereby permitted shall be carried out in accordance with the following approved plans: L-01 C (site location plan); L-02 C (site plan and block plan); L-03 (barn elevations and floor plans); L-04 (hatchery elevations and floor plans); L-05 (dwelling elevations and floor plan); L-09 (landscape plan).

2) Prior to the provision on site of the temporary dwelling hereby permitted a timetable shall be submitted to and approved in writing by the local planning setting out the timing of the provision of

   - the communal barn and solar PV array, in accordance with the approved plans;
   - the provision of the landscaping scheme, in accordance with drg. no. L-09;
   - the provision of the W.E.T. waste treatment facilities, in accordance with the approved plans; and
   - the provision of the composting toilets

   and development shall be carried out in accordance with the approved timetable.

3) The occupation of the temporary dwelling hereby permitted shall be limited to persons solely or mainly employed in the agricultural business operated on Plot A or a widow or widower of such a person, together with their spouse or partner and any resident dependants.

4) No other part of the development hereby permitted shall begin until

   - Visibility splays have been laid out and constructed in accordance with details first submitted to and approved in writing by the local planning authority; and
   - For a minimum of its first 6m back from the nearside edge of the carriageway the site access road, including the bellmouth radii, has been hard-surfaced and drained in accordance with details first submitted to and approved in writing by the local planning authority.

   The visibility splays and access road shall thereafter be retained in accordance with the approved details at all times. Any site access gates shall be set back a minimum of 6m from the nearside carriageway edge and shall be hung to open inwards only.

5) Within 12 months of commencement of the development hereby permitted, two passing bays shall be provided on the site ownership frontage with the public highway in accordance with details first submitted to and approved in writing by the local planning authority, and shall thereafter be retained in accordance with those approved details.

6) A riparian buffer of 6m from the river edge, when it is at the top of its typical river range (1.09m) shall be retained at all times to prevent disturbance to otters on the River Tone.

7) When the temporary dwelling hereby permitted ceases to be occupied by persons specified in condition 3 above, or on the date 5 years from the date of this decision letter, whichever is the sooner, the dwelling shall be removed, and the land restored to its former condition, in accordance with a scheme of work which has first been submitted to and approved in writing by the local planning authority.

8) If Plot C (the subject of this permission) should be amalgamated with either Plot A (the subject of Appeal Ref APP/Y1138/A/12/2181808) or Plot B (the subject of Appeal Ref APP/Y1138/A/12/2181821) or both of them, so as to constitute one holding, only one temporary dwelling shall be permitted to remain on the amalgamated site and the other(s) shall be removed from the land within 6 months of the date that the amalgamation of the plots occurred, in accordance with a scheme of work which has first been submitted to and approved in writing by the local planning authority.

APPENDIX [B]

Arlington Decision Notice

Town and Country Planning Act 1990

Notice of Decision
Application No. **WD/2018/1473/F**

Chapman Lily Planning Ltd
Unit 5, Designer House
Sandford Lane
Wareham
Dorset
BH20 4DY

Council Offices
Vicarage Lane
Hailsham
East Sussex
BN27 2AX

DESCRIPTION AND LOCATION OF DEVELOPMENT
RESUBMISSION OF WD/2017/0340/F FOR THE SITING OF THREE TEMPORARY AGRICULTURAL WORKERS' DWELLINGS FOR A PERIOD OF 5 YEARS TOGETHER WITH AN AGRICULTURAL BARN WITH PV ARRAY AND ALTERATIONS TO EXISTING HIGHWAY ACCESS TO PROVIDE THREE AFFORDABLE SMALLHOLDINGS TO NEW ENTRANTS TO ECOLOGICAL AGRICULTURE.
FIELD TO THE SOUTH OF COPYHOLD COTTAGES, FORMERLY PART OF WILBEES FARM, ARLINGTON, HAILSHAM , BN26 6RU

With reference to the proposals set out in the application numbered as above and shown on the plans submitted therewith, Wealden District Council, in pursuance of powers under the Town and Country Planning Act 1990 (as amended), hereby **GRANTS PLANNING PERMISSION** for the said proposals, subject to the conditions stated below imposed for the reasons stated thereunder:-

1. The development hereby permitted is granted for a limited period only expiring on 6 August 2023. On or before this date, the development carried out in pursuance of this permission shall be demolished/removed from the site and the land restored to its former condition in accordance with a scheme which shall have been previously submitted to and been approved in writing by the Local Planning Authority.

   REASON: Having regard to the special circumstances of this case, temporary consent for persons employed on the site in agriculture, it is necessary to impose conditions to seek removal of the temporary buildings having regard to SPO1 SPO13, and WCS14 to the Wealden Core Strategy Local Plan 2013, Saved Policy DC2 of the adopted Wealden Local Plan 1998, coupled with the requirements of paragraphs 79 of the National Planning Policy Framework 2018.

2. Prior to the provision on site of each of the temporary dwellings hereby permitted:

   a. business plans for each of the three agricultural businesses to be operated on site shall be submitted to the Local Planning Authority. Each business plan shall show how it would be essential for the proper functioning of the enterprise for one or more workers to be readily available at most times.

   b. visibility splays shall have been laid out and constructed in accordance with approved plan (L-003 date stamped 9 July 2018 by the Local Planning Authority).

   c. details of the temporary dwellings' dimensions, means of construction, design and materials shall be submitted to and approved in writing by the Local Planning Authority, those details complying with the definition of a caravan within the Caravan Sites and Control of Development Act 1960 (as amended)
   and the development shall be carried out in accordance with the approved details only.

REASON: To ensure suitable residential accommodation for persons employed locally in agriculture having regard to SPO1 SPO13, and WCS14 to the Wealden Core Strategy Local Plan 2013, Saved Policy DC2 of the adopted Wealden Local Plan 1998, coupled with the requirements of paragraphs 79 of the National Planning Policy Framework 2018.

3. The occupation of the temporary mobile units hereby permitted shall be limited to persons solely or mainly employed in the agricultural business operated on the site or a widow or widower of such a person, together with their spouse or partner and any resident dependants.

REASON: To reserve suitable residential accommodation for persons employed locally in agriculture having regard to SPO1 SPO13, and WCS14 to the Wealden Core Strategy Local Plan 2013, Saved Policy DC2 of the adopted Wealden Local Plan 1998, coupled with the requirements of paragraphs 79 of the National Planning Policy Framework 2018.

4. When the temporary dwellings hereby permitted cease to be occupied by persons specified in condition 3 above, or, on or before 6 August 2023, whichever is the sooner, the dwellings shall be removed.

REASON: Having regard to the special circumstances of this case, temporary consent for persons employed on the site in agriculture, it is necessary to impose conditions to seek removal of the temporary buildings having regard to SPO1 SPO13, and WCS14 to the Wealden Core Strategy Local Plan 2013, Saved Policy DC2 of the adopted Wealden Local Plan 1998, coupled with the requirements of paragraphs 79 of the National Planning Policy Framework 2018.

5. If any one of the smallholdings should be amalgamated with either one of the other two smallholdings, or both of them, so as to constitute one holding, only one temporary dwelling shall be permitted to remain on the amalgamated site and the other(s) shall be removed from the land within 6 months of the date that the amalgamation of the plots occurred.

REASON: Having regard to the special circumstances of this case, temporary consent for persons employed on the site in agriculture, it is necessary to impose conditions to seek removal of the temporary buildings having regard to SPO1 SPO13, and WCS14 to the Wealden Core Strategy Local Plan 2013, Saved Policy DC2 of the adopted Wealden Local Plan 1998, coupled with the requirements of paragraphs 79 of the National Planning Policy Framework 2018.

6. All planting, seeding and/or turfing comprised in the approved details of landscaping shall be carried out in the first planting and seeding seasons following the erection of the barn or the stationing of a mobile home, whichever is the sooner.

Any trees, shrubs, hedges or plants which within a period of five years from the completion of development die, are removed, or become seriously damaged or diseased shall be replaced in the next planting season with others of similar size and species, unless the Local Planning Authority gives written consent to any variation.

REASON: To protect visual amenity and the character of the area and to ensure a satisfactory environment having regard to SPO2, SPO13 and WCS14 to the Wealden Core Strategy Local Plan 2013, Saved Policies EN14 and EN27 of the Wealden Local Plan 1998, coupled with the requirements of paragraphs 17 and 109 of the National Planning Policy Framework 2018.

7. No floodlighting, security lighting or other external means of illumination of the site shall be provided, installed or operated in the development, except in accordance with a detailed scheme which shall provide for lighting that is low level, hooded and directional,

and has been submitted to and approved in writing by the Local Planning Authority. The scheme shall be implemented in accordance with the approved details and retained thereafter. EL02

REASON: To preserve the rural and residential amenities of the locality having regard to SPO2, SPO12, SPO13 and WCS14 to the Wealden Core Strategy Local Plan 2013, Saved Policy EN29 of the adopted Wealden Local Plan 1998, coupled with the requirements of paragraphs 180c of the National Planning Policy Framework 2018.

8. This planning decision relates solely to the information contained within the application form, the following plan(s) and (where appropriate) documents:

Ref.	Date Stamped.
L-001 Rev B	9 July 2018
L-002	9 July 2018
L-003	9 July 2018
LP-01 Rev A	9 July 2018
Details of PV Panels	9 July 2018
Planning Statement	9 July 2018
Ecology Statement	9 July 2018
Traffic Movements	3 August 2018
Tree and Hedge Planting Proposals	9 July 2018
Management Plan	9 July 2018
Report on New Entrants to Farming	9 July 2018
Report on Economics of Farming less than 10 Acres	9 July 2018
Report on Small Farm Viability	9 July 2018
Business Plan	9 July 2018
Draft Monitoring Sheet	9 July 2018
Functional Need (illustrative)	9 July 2018

REASON: For the avoidance of doubt.

The local planning authority's reasons for its decision to grant planning permission are set out in the officer's report which can be viewed on the Council's website at www.planning.wealden.gov.uk

NOTE: Should alterations or amendments be required to the approved plans, it will be necessary to apply either under Section 96A of the Town and Country Planning Act 1990 for non-material alterations or Section 73 of the Act for minor material alterations. An application must be made using the standard application forms and you should consult with us, to establish the correct type of application to be made.

NOTE 1: The existing public right(s) of way across the site must remain undisturbed and unobstructed unless or until legally stopped up or diverted prior to the commencement of any of the development hereby permitted. The alignment of any public right of way should be protected throughout the course of development by being clearly demarcated, signed, surfaced or fenced as may be necessary. STN10

NOTE 2: This permission is subject to an agreement under Section 106 of the Town and Country Planning Act 1990. STN1

NOTE 3: The upgrade works to the access onto The Street involves alteration to the existing highway network and must be undertaken by the Highway Authority or its appointed agents. An Agreement under Section 278 of the Highways Act 1980 will likely be required.

The Local Highway Area office will need to be contacted prior to commencement of work on the access.

Western Area Office
The Broyle
Ringmer
Lewes
East Sussex
BN8 5NP
0345 60 80 193

NOTE: Your attention is drawn to the requirements of the Building Act 1984 for the deposit of Plans under the Building Regulations and associated legislation. ACCESS FOR FIRE BRIGADE: Your attention is hereby drawn to the provisions of Section 35 of the East Sussex Act 1981.

DISCHARGE OF CONDITIONS: It is advised that under The Town and Country Planning Act 1990, the Council has up to 8 weeks from the date of an application to discharge any condition(s) and advise the applicant of the Council's decision. This information should be submitted using the 'Approval of Details Reserved by Condition' Form which can be downloaded from the Council's website. Please note there is also a fee payable for this type of application.

IMPORTANT: See Notes overleaf
DATE OF ISSUE: 8 August 2018

Chris Bending
Head of Planning & Environmental Services

Application No. WD/2018/1473/F

NOTES

Appeals to the Secretary of State

- If the Applicant is aggrieved by the decision of the Local Planning Authority (LPA) to refuse permission for the proposed development or to grant it subject to conditions, then an appeal may be lodged with The Planning Inspectorate (PINS) under Section 78 of the Town and Country Planning Act 1990.
- Appeals must be made on a form which is obtainable from:
  The Planning Inspectorate, Temple Quay House, 2 The Square, Temple Quay, Bristol BS1 6PN
  Tel. No. 0303 444 5000
  www.gov.uk/appeal-planning-inspectorate

Appeal Timescales

- Householder planning application or minor commercial application:

  12 weeks from the date on the decision notice

  However, if an enforcement notice has been served for the same or very similar development the time limit is:
  - **28 days** from the date of the LPA decision if the enforcement notice was served before the decision was made yet not longer than 2 years before the application was made.
  - **28 days** from the date the enforcement notice was served if served on or after the date the decision was made (unless this extends the appeal period beyond 12 weeks).

  NB – if the LPA have failed to determine the householder planning application, or for an appeal against the grant of permission subject to conditions, please follow the time limits under "Planning application" below.

- Planning application:

  6 months from the date on the decision notice, or
  6 months from the expiry of the period which the LPA had to determine the application.

  However, if an enforcement notice has been served for the same or very similar development within the previous 2 years, the time limit is:
  - **28 days** from the date of the LPA decision if the enforcement notice was served before the decision was made yet not longer than 2 years before the application was made.
  - **28 days** from the date the enforcement notice was served if served on or after the date the decision was made (unless this extends the appeal period beyond 6 months).

  NB – the LPA determination period is usually 8 weeks (13 weeks for major developments and 28 days for non-material amendment applications). If a longer period has been agreed with the LPA, the time limit runs from that date.

Further information

- The Planning Inspectorate has discretionary power to allow a longer period for the giving of a notice of appeal but will not normally be prepared to exercise this power unless there are special circumstances which excuse the delay in giving notice to appeal.
- The Planning Inspectorate is not required to entertain an appeal if it appears that the local planning authority could not have granted planning permission for the proposed development or could not have granted it without the conditions they imposed, having regard to the statutory requirements, to the provisions of any development order and to any directions given under a development order.
- The Planning Inspectorate does not in practice refuse to entertain appeals solely because the decision of the local planning authority was based on a direction issued by the Secretary of State.

Purchase Notices

- If either the LPA or Secretary of State refuses permission to develop land or grants it subject to conditions, the owner may claim that the land has become incapable of reasonably beneficial use in its existing state nor rendered capable of a reasonably beneficial use by the carrying out of any development which has been or would be permitted.
- In these circumstances the owner may serve a purchase notice on the District Council. This notice will require the Council to purchase their interest in the land in accordance with the provisions of Part VI of the Town and Country Planning Act 1990.

APPENDIX [C]

Small is Successful

ECOLOGICAL LAND CO-OPERATIVE

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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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

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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 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. 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.

[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.

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.

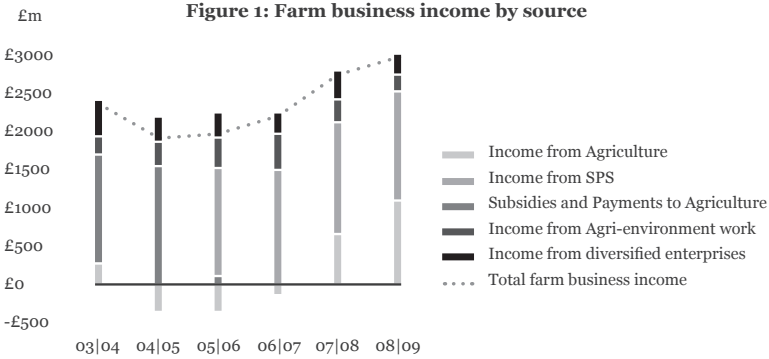
Table 1: Average English Farm Business and Corporate Income From Agriculture

	05/06	06/07	07/08	08/09	09/10	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.

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.

[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 break-down 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.

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* (BÅhm, 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.

Case Studies [9]

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

Case Study One
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 Biodynamic 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 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

£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 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 Long-meadow 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.

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

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.*

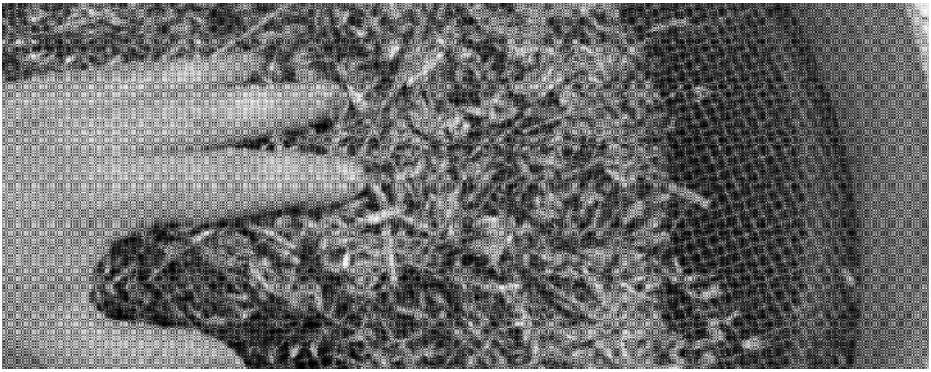
Opportunities

- *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 Two
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 membership 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 certifieddue 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 invested 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 Three
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.

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.

See next page for Annual Business Expenidture table.

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

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.

The 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 Four
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 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

[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.



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 Five
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 poly-tunnels 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.

The 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.

The 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.


Spring Grove
Market Garden
Fresh Local
Organic Produce
SPRING GROVE
MARKET GARDEN
PRICE LIST

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 Six
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 plan-ings, and the chippings are made from small oak and other hardwood 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 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 Shii- take 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 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.

[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.

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

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!

The 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 Seven
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 (3/4 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 Eight
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 horticulture. 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.

The 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.

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.*

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.*

Threats

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

[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.

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 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.

[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.

[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.

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, and are well placed to meet the growing demand for local, artisanal foods produced to high envi- ronmental 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.

[17] See, for example, Holmgren, D. (2002) *Permaculture Principles and Pathways Beyond Sustainability*. Holmgren De- sign 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) rockspringgardenclub.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.

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 agrienvironment 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

[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. 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.

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 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

[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.*

[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.

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.

[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.

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 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.

[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.

[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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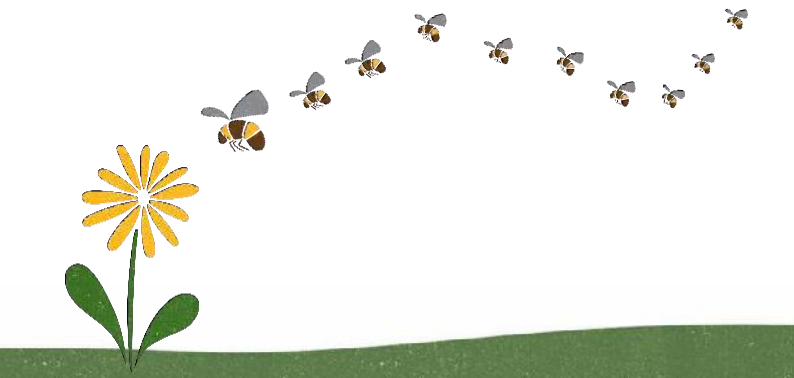
APPENDIX [D]

Fifth ELC annual monitoring report for the smallholding development at Greenham Reach

Greenham Reach
Annual Monitoring Report
Year 5

19th November 2017 to 18th November 2018

Report prepared by the Ecological Land Cooperative detailing progress to date against the aims and objectives of our site Management Plan for Greenham Reach smallholdings.



Ecological
Land
Cooperative

For a living, working countryside

Greenham Reach
An aerial view



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The transformation of Steepholding's market garden.

About the ELC

The Ecological Land Cooperative (ELC) is a social enterprise, established to address the lack of affordable sites for ecological land-based livelihoods in England and Wales. We work to address a range of complex and deep-rooted social and environmental challenges in a uniquely simple, pragmatic way: by removing barriers to land access for sustainable uses.

Our mission and core business is the creation of residential smallholdings aimed at new entrants to horticulture and mixed farming. We protect our sites for affordability and ecological agricultural use in perpetuity. Greenham Reach is our first cluster of smallholdings.

Our vision is of a living, working countryside, providing sustainable rural livelihoods to smallholders alongside a range of benefits to communities and ecosystems. Small-scale ecological production protects the environment and reduces greenhouse gas emissions by reducing fossil fuel use. Such businesses help build a vibrant, living countryside in which people flourish alongside our cherished landscapes and natural biodiversity, and have a crucial role to play in ensuring food and energy security.

They also provide employment, access to local, sustainable food and crafts and educational opportunities for urban visitors, helping to maintain rural skills and to improve ecological literacy.

Our model is to create clusters of smallholdings. This helps us to keep costs down through the provision of shared infrastructure, shared planning applications and subsequent site monitoring. It allows the smallholders to work together and provide mutual support.



About This Report

This report relates to Greenham Reach, the Ecological Land Cooperative's (ELC) first project. Greenham Reach is a cluster of three affordable smallholdings in Greenham, Mid Devon.

This is the fifth annual monitoring report for Greenham Reach, the ELC's first cluster of farms. GR is made up of three small farms for new entrants into ecological agriculture, in Mid Devon. A temporary 5 year permission was granted in 2013 and in 2018 this permission became permanent.

Since 2013 three families have been developing their smallholdings. Elder Farm is a business centred around herb production; Wild Geese Acres focuses on intensive salad production and has expanded to include sheep, pigs and flowers; and Steepholding is a mixed enterprise including fruit tree propagation, a vegetable box scheme and a micro dairy herd of Golden Guernsey goats.

For more information about Greenham Reach, please visit our website, www.ecologicalland.coop

As in previous years this report is structured to reflect the Greenham Reach Management Plan.

Overall, we are still happy with progress on the three smallholdings. The heavy, late winter, coupled with a long and dry summer meant difficult weather conditions again, especially for farms with only basic infrastructure. Across the site as a whole there have been some big steps forward, although of course much work is still needed to maintain and improve what is there.



Landscape Character

Management Plan Objective: ' It is important that Greenham Reach will maintain and enhance Mid Devon's typical landscape features as well as the specific nature of the locality and the site itself.'

We continue to be satisfied with the landscape character.

Visual amenity

The increased work and production across the 22 acres means more buildings, more materials and more human activity – with the expected result that the fields look a lot busier than they did when they were purely arable and pasture fields. This is a sign of regeneration and productivity and as last year's ecology reports show, has gone alongside a significant increase in wildlife and biodiversity.

There is one additional polytunnel on the lower slopes of Steepholding's market garden, a new small caravan behind the polytunnel at Wild Geese Acres, and a new lean-to shed on a caravan at Elder Farm.

Alongside the existing buildings and polytunnels these structures are small and/or hidden, and the planted hedges, orchard trees and shelter belts provide both weather and visual protection whilst also creating more habitat.

From the roadside gate one still sees a broadly open field, a track and young trees — a very pastoral sight.

Hedgerows and Trees

These continue to grow on well. Some of the shelter belts are at a significant height now, and will soon need to be cut back to ensure they don't interfere with sunlight.

Grassland

This has continued under similar management as in the previous years. The field areas in Wild Geese Acres and Steepholding have been stocked with a shared herd of sheep and have been topped and mowed. The field area in Wild Geese Acres that was suffering heavily from weeds has been flail mowed three times over the summer and is looking significantly better; the grass is flourishing, and the weeds are smaller and thinner.

The steep MG5c meadow was not monitored by an ecologist this year, but is being well managed. Large areas of bramble and scrub on this slope were removed from encroaching areas this year.

There are no concerns with waste management, the riverside edge or with invasive species.



Steepholding's meadow

Ecosystems and Biodiversity

Management Plan Objective: 'The enhancement of the site's existing ecosystem and biodiversity.'

The flourishing of human activity at Greenham Reach has given rise to a marked increase in habitat and biodiversity as indicated by Dr Wilson's report last year (Audit Year 4).

More planted shelter belts, trees and small buildings has meant more edges where different ecological niches interact and more micro-habitats. Together with a lack of large scale cultivation this appears to be increasing the beneficial environment for insects and therefore all the predators that follow on from those.



New trees growing on the ELC communal land

Soil fertility

The soil continues to be well cared for. There is very little exposure of bare soil to weather elements, and no fungicides or poisons being used. The soil tests this year showed no significant changes and no cause for any concern. Elder Farm has continued to remove the rushes from the field and plant trees to improve the ground and flow of water. The pig field area in Wild Geese Acres has been fallow and under plastic since the summer and will be given over to plant production next year.

Water

The management of water at Greenham Reach continues to be a major challenge. Periods of prolonged drought or persistent heavy rain seem possible at almost any time. The dry summer meant that water levels in the borehole went down, and the water pump struggled at times. This confirmed the need for a much larger system of on-farm ponds and reservoirs – but they have cost implications.

Wild Geese Acres has filled the pond behind the polytunnel, using waste water from the water filtration process, and also has a new small pond in the poultry area. This is simply made from old tyres and strong black plastic.

Steepholding has carried out a good deal of work on drainage at the bottom of their market garden, making ditches and swales to carry away water. No contamination issues have been observed.

Energy, Carbon Emissions and Bio-Sequestration

Management Plan Objective: 'Sustainable development requires that households use significantly less fossil fuel... the ELC [also] aims for its sites to be exemplars of bio-sequestration (the absorption and storage of carbon dioxide).'

The wind turbine was erected at the beginning of the year and has been busily adding to total generated power which has been a very useful addition. However, all the businesses are still being held back somewhat by a lack of electricity. To some degree this is partially because of the increased power needs of the water filtration, but in any event, all the holdings are doing well to manage their homes and business on a shared system of 4.3 kW. The total usage up until mid-November 2018 was 18330 kWh, with 6311 kWh used on the communal supply.

Greenham Reach continues to be an excellent example of productive farms with good soil care, widespread tree planting, and plenty of perennial vegetation — all indicators of good carbon sequestration. We continue to hope for funding to help us monitor this area more effectively and see where improvements could be made.



The wind turbine at Greenham Reach

Animal Husbandry

Management Plan Objective: ' The ELC believes that animals should be managed with care for their welfare and health. As set out by the Farm Animal Welfare Council, animals should be managed in such a way as they enjoy the five freedoms from: malnutrition, physical discomfort and extremes of temperature, injury and disease, fear and distress, and unnecessary restrictions on behaviour.'

There have been no reports of mistreatment or cruelty to animals. Elder Farm has its six geese and a flock of runner ducks for slug control, plus four chickens.



Wild Geese Acres has no more Oxford Sandy and Black pigs. Though popular they did make quite a mess of their field and James has now opted for Kunekune pigs. These are a breed from New Zealand which are smaller than many other varieties, who cut up the ground less and eat more grass. James currently has two pigs and aims to add more. There are also the geese keeping the grass down around the market garden and the hens for eggs. The sheep are shared with Steepholding.

Steepholding has reduced their goat herd and stopped milking over the latter part of the year (see livelihood section) but still have five nannies and the shared sheep flock with Wild Geese Acres, as well as their 30 hens with eggs for the box scheme.





A new kid at Steepholding, Kunekune pigs at Wild Geese Acres and geese on Elder Farm

Next page - the shared sheep at Steepholding and Wild Geese Acres



Open Day

Management Plan Objective: 'The objective of the annual open day is to spread understanding of the ELC's approach to sustainable agriculture and living.'

There was a busy open day on September 15th. There were around 70 people on the day which included: farm tours, a Tombola, a 'guess the weight of the marrow' competition, tea and cake stall, and £115 raised for Refugee Aid Taunton.

There were two school visits, to Elder Farm, from Westminster Boys school in October.



Steepholding's Ruth shows open day visitors around the farms

Transport

Management Plan Objective: 'The project provides an integrated livelihood and residential scheme which will by its very nature result in a low traffic development. However, smallholders will be limited on the number of vehicles on site and number of vehicle journeys.'

There are three vehicles for road use at Greenham Reach, one for each holding. The electronic count of vehicle movements at the gateway was 5863 this year. That is a figure very similar to the previous year, with an increase of 25, or 0.43%. This is still more than our target of 4380, but less than the average for three comparable rural UK dwellings.

Renewably powered vehicles or other strategies to reduce fossil fuel use would require considerable financial investment that neither ELC nor the farm businesses currently have, but we will keep this situation under review.

Volunteers

Volunteers have again played a crucial role in work activities across all three holdings. All the holdings have had a mixture of WWOOFERS (people staying on the farm as part of the World Wide Opportunities on Organic Farms network) and volunteers who come for the day.

As in previous years, volunteers play a crucial part in many activities at Greenham Reach. They have helped the businesses grow, whilst also themselves gaining experience and skills and health benefits from working there.

Elder Farm calculate about 3000 volunteer hours over the year, Wild Geese Acres about 1200 and Steepholding about 595 hours.



Land Based Livelihoods

Management Plan Objective: 'The ELC exists to support the creation of land-based livelihoods. At Greenham Reach this comprises the growing of crops and/or livestock and/or bees for personal use and for sale'

All the holdings continue to grow in their own way and all have at least one FTE person working on them.

Elder Farm

Elder Farm received its organic certification early in the year to get things off to a good start. They sold their skullcap crop after it passed various tests, to the Organic Herbal Trading Company (OHTC). Thirty more fruit trees were planted in the orchard and have done well as has the perennial thyme beds planted on mounds to keep them out of the wetter ground. They have got more ducks to aid with pest control.

Elder Farm has been very active in attending and supporting the growth of a UK herbal growers network. A huge percentage of UK herb use comes from overseas, so it's heartening to see this network expand. The issue of drying herbs is a challenge for many, as the processing facilities do not widely exist — for Elder Farm there is also a lack of electricity to power heaters to dry plants at scale. The profits from the business have nearly doubled since last year.



Getting ready for herb growing in 2018





Trees growing at Elder Farm (above) At the Green Scythe Fair (below)

Wild Geese Acres

Obvious progress has been made with the agroforestry field this year. The (kindly donated) flail mower has been put to good use and the grass crop is looking lush and a lot less weed burdened. The trees may also have benefited as they have put on girth and are looking stronger with individual wooden protection around each one to guard against the sheep.

The market garden has seen steady progress. This year saw an extended season of growing, and more bulk selling, getting away from individual salad bags, to save time on handling and packaging. The polytunnel has a new gutter fitted to it, meaning less flooding problems inside and less issues with mould. The trial flower sales have been steady, proving there is a market and good possibilities, so production will be expanded next year.

The new Kunekune pigs have settled in and so far, seem to be living up to expectations to eat more grass and do less damage to the soil; James has purchased two pedigree Kune Kune sows for breeding purposes. he will be breeding from the better of the two sows in july and expects 8 -10 piglets. The males will go for meat at 10 months old, their meat is highly prized in the charcuterie sector, and the females can be sold on as weaners for breeding stock. Due to their pedigree they will command a good price, over double that you would get for a regular rare breed. A local bee keeper now also keeps bees on the site. The geese continue to do a good job guarding James's best salads from pests. Wild Geese Acres' sales have increased, and profits have nearly doubled since last year.





Steepholding

Steepholding continues to expand its operations and push on with developing a range of produce.

They have been working on plans for a new dairy, processing and packing shed, which received permission during the year, and hope to get this built over the winter. This will allow them to make the goats cheese a proper part of the business.

Ruth had a major operation in the late summer which meant they reduced their goat herd and the subsequent milking regime. This will expand again next year.

The new market garden area in the lower field has come into operation and has grown a good crop of squash, brassicas, alliums and others. New swales and ditches have been put in to manage the water at this lower location in the field. The new lower polytunnel has also allowed for increased vegetable production. The box scheme has stayed at around 30 weekly customers, but now has capacity to increase a little more. The online fruit tree business has continued, and new fruit trees have been added to the orchard.

They have also been developing exciting plans for tree planting in the lower field, to increase tree forage for the goats and make better use of that wet field. They have also seen sales and profits increase again this year.








Pumpkins, aubergine, fennel and tomatoes grown on Steepholding.

Previous page: onions in the market garden.

Monitoring

There have been no areas for concern this year.



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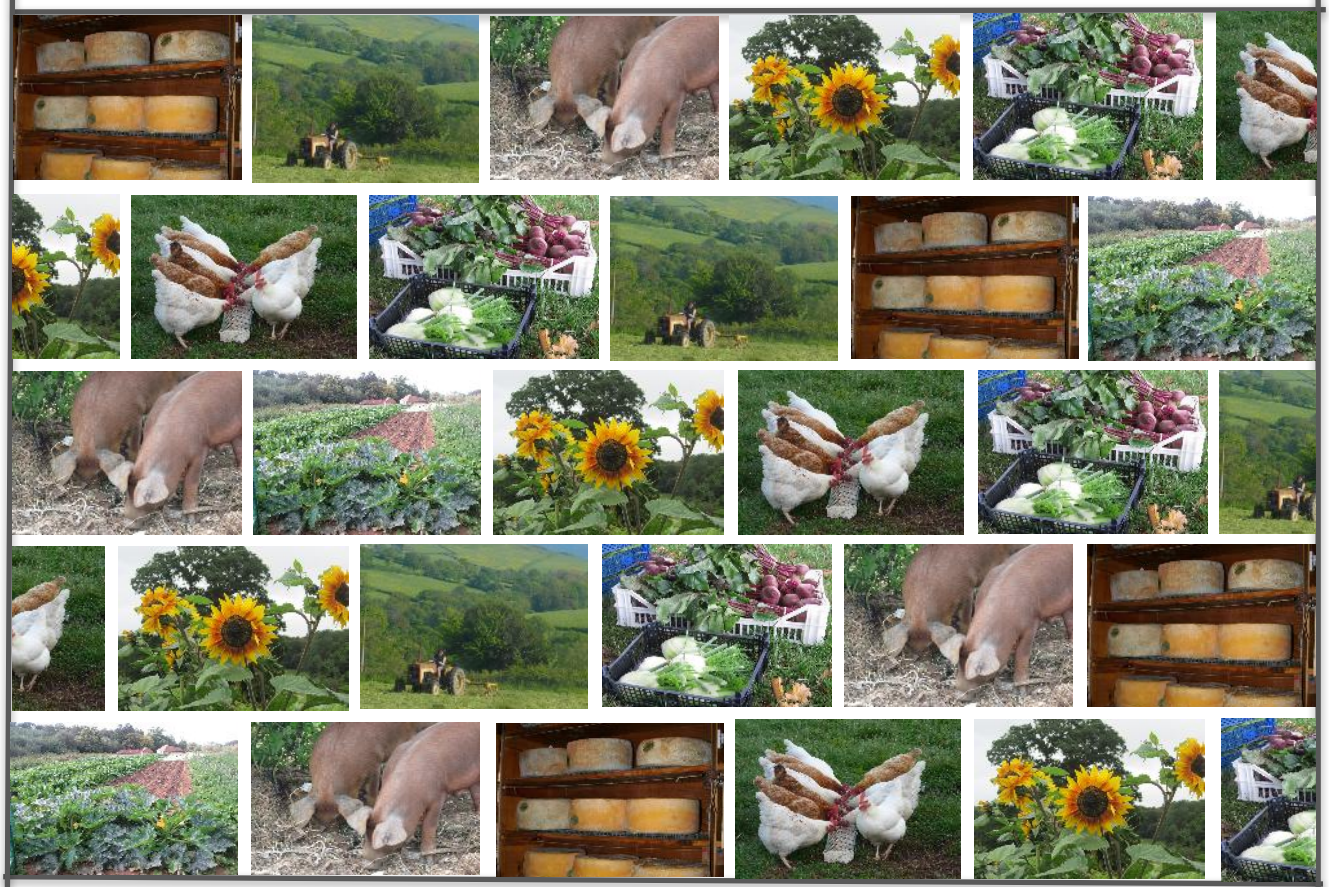
APPENDIX [E]

Small Farm Profits

A Matter Of Scale

A study of the productivity, financial viability and multifunctional benefits of small farms (20 ha and less)

2017



Rebecca Laughton
of the Landworkers' Alliance

Supported by
the Centre for Agroecology, Water and Resilience (CAWR)

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The Landworkers' Alliance (LWA) Core Group, for adopting this initiative and supporting me to obtain funding, involve LWA membership in the survey and surrounding events, and for encouragement from beginning to end.

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Executive Summary

A survey of 69 small, agroecological farms showed a diverse and vibrant sector, which attracts new entrants and incubates entrepreneurs. Many of the holdings were five hectares or less and, while some were focussed on horticulture, others were operating several different enterprises including eggs, meat and micro-dairy. Key findings include:

- Productivity data for 18 indicator vegetable crops showed small farm yields being higher than non-organic field-scale yields for those which benefit from more intricate husbandry and hand picking (e.g. salad leaves, French beans, kale leaf-beet and chard). At a few established market gardens vegetable yields were much higher than average non-organic yields.

- The prevalence of integrated, mixed farms, means that inputs and waste are reduced compared to monoculture farms. Such diversity may also lead to resilience, by spreading economic risk, improving ability to cope with extreme weather and increasing resistance to disease.

- Despite low average net farm income levels, when compared to average UK farm incomes the 'A Matter of Scale' (AMOS) sample were performing well financially. 78% were receiving no farm subsidies, and subsidies made up less than 20% of the income for 19% of those who were receiving subsidies.

- Most of the farms were adding value either by direct marketing or processing their produce into cheese, juices or preserves. Vegetable box schemes, farmers' markets and community supported agriculture schemes enable better incomes, while building customer trust through provision of fresh and sustainably produced food. Many holdings supplemented income with off-farm employment, or had diversified by running courses, campsites or holiday lets.

- An average of 2.3 full time equivalents work on each holding, with the average per ha being 3.2. This is much higher than the mean for the UK of 0.026 annual work units (AWU) per hectare (Eurostat 2011, p. 5). Workers are attracted by the meaningful nature and variety of agroecological farm tasks. Despite this, labour issues were frequently mentioned as a limiting factor in increasing productivity.

- Other barriers to productivity included: lack of capital to invest in equipment and infrastructure, meaning the efficiency of some holdings was less than optimal; affordability of land and accommodation; and lack of technology suitable for small scale farmers.

- Small farmers are highly motivated to provide environmental and social benefits. Care of the soil, water and biodiversity, reduction of greenhouse gas emissions, as well as provision of public education about farming and the building of community were cited as multifunctional benefits generated by the farms.

Until now, little research has been conducted into the productivity and viability of small-scale, agroecological farms in the UK. This study shows that they deserve closer attention by both policy makers and academics as they simultaneously address many of the challenges facing twenty-first century food production, including efficient UK provision of vegetables and fruit, fulfilling employment opportunities, reduction of greenhouse gas emissions and food waste, and the re-building of rural communities.

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Chapter 1 – Why study small farm productivity?

In the battle for hearts and minds that underlies most public discussion about food and agricultural policy, the issues of food security and environmental management are used to support most perspectives. A debate about whether or not organic farming can feed the world has raged since the early days of the organic movement. Meanwhile, the sustainable intensification and industrial farming lobbies argue that more people can be fed from less land and fewer resources if we adopt technologies such as precision farming and genetically modified crops. These two perspectives feed into the 'Land sharing versus land sparing debate', in which integration of production with ecological management is differentiated from maximising productivity on some areas to free up land for wildlife conservation (Fischer et al. 2014). Productivity underlies all these arguments, and 'agricultural efficiency' is seen by many as a holy grail to be sought at all costs.

The impact of scale, or farm size, has been an important aspect of this debate. Large farms are often viewed as more efficient because they can achieve economies of scale through using larger machinery and bulk buying inputs, giving an advantage when competing in a low-price environment (Rosset 2006, p. 10). Small farms are often viewed as an old fashioned, romantic anachronism – unprofitable, inefficient and not to be considered as serious contributors to food security or rural economic growth. Small farms are at best considered to be niche – producing 'high end' products for an elite market – and at worst to be simply 'hobby farms'.

This dismissive attitude to small farms ignores the fact that 70% of the world's food is produced on small scale, family farms (ETC 2009, p. 1) and evidence that in many countries there is an inverse relationship between farm size and productivity (Cornia 1985). Peter Rosset (1999) documented the multiple functions and benefits of small farms both in the United States and worldwide and argued that even in industrialised countries small farms can outperform larger ones in terms of productivity and economic viability. It is hard to find evidence of productivity comparisons between small and large farms in the UK, despite the fact that a growing small farm sector is providing food for local people and livelihoods for farmers. Small farms are more often lauded for the wide range of environmental and social benefits they generate. However, producing food is the most important function of agriculture and all farms, large and small, need to be more than just parks for biodiversity conservation and landscape aesthetics.

The purpose of this study is to discover how much food small scale farms (20 ha and less) in the UK are producing, as well as to ascertain their financial viability, and set these findings within the context of the multifunctional benefits they deliver. Measuring performance of small farms in terms of productivity, economic viability and delivery of public goods will provide evidence for policy makers about the role that small scale farms have in the UK food system and indicate how policy can support the growth of this sector. The study aims to prompt debate and encourage others to build on this work with further research on the role of small farmers in UK food system.

Chapter 2 – Background Information

2.1. Agroecology in the UK

Although used in relation to tropical agriculture since the 1980s, agroecology in the UK is a relatively recent phenomenon (Wezel et al 2009). In contrast to the longer established UK organic movement, agroecology combines an understanding of the complex ecological relations in a field with a social perspective, which recognises the influence on the agroecosystem of wider social factors, such as a collapse in market prices or changes in land tenure (Hecht 1995, p. 5). There are interesting parallels between agroecology and the UK permaculture movement, in which design principles incorporate 'people care' and 'fair shares' alongside 'earth care' (Whitefield 2004, p. 5). While organic and biodynamic agriculture are legally defined terms, requiring a system of inspection and certification to be labelled as such, the boundaries of what is permissible within agroecology are more fluid. Thus it can be viewed as 'a development pathway from input-intensive industrial systems through to highly sustainable, ecological systems', whereby industrial systems become increasingly efficient before progressing through input substitution and system redesign towards sustainable food systems (Lampkin et al 2015, p. 10). Hence, agroecology is more accessible to small scale producers, who are often unable to afford the high cost of organic certification, yet whose diverse, integrated and resource efficient production systems and short supply chains clearly locate them within the definition of agroecology.

2.2. Can Britain feed itself using agroecological methods?

In 2007 Fairlie undertook a desk top study to compare the ability of five different systems of agriculture, including organic and chemical farming with and without livestock, to provide enough food for the British population. It concluded that a 'permaculture livestock system', which most closely equates to a small scale, diverse agroecological farm, could feed a UK population of 60.5 million on 7.5 million ha arable and 5.9 ha pasture by operating a more integrated crop and livestock system, in combination with a reduction in meat consumption. Such a finding reflects how, in contrast to traditional organic farming whose yields are typically 75–80% of conventional agriculture, wider social changes of behaviour (like reduced meat consumption) along with agroecological farm system innovations such as multi-cropping, have the potential to close the yield gap and meet UK dietary requirements (Lampkin et al. 2015).

At present there is a significant trade gap between imports and exports for all major food groups, with the level of imported fruit and vegetables being particularly significant. The UK is 58% self-sufficient in vegetables and 11% self-sufficient in fruit (Schoen and Lang 2016, p. 12). 76% of UK vegetable imports and at least 18% of fruit imports come from EU countries (Defra 2015, p. 101). The impending departure of the UK from the European Union brings the question of domestic self-sufficiency into sharp relief, when it is noted that, as well as being reliant on the EU for imported fresh produce, the UK industrial horticulture industry is reliant on a high level of casual labour, including some EU migrants (Schoen and Lang 2016, p. 20). Farmers report finding it difficult to recruit more local labour, yet growing numbers of people are keen to work on organic and agroecological holdings, due to the meaningful work they offer (Fairlie 2012/13; Timmerman and Felix 2015).

2.3. The role of smallholders in global food security

Debate about the relationship between farm size and productivity has a long history, with studies in the 1950s providing empirical evidence of an inverse relationship between farm size and productivity

in both Asian and Latin American countries (Cornia 1985, p. 515). Cornia (1985) sums up these trends by observing that greater deployment of labour enables higher yields for four main reasons:

(i) a *more intensive use of labour in each crop activity,* whereas larger farmers tend to deploy more capital in the form of machinery;
(ii) *cultivation of a higher proportion of the available land on the farm,* compared to larger farms where large areas are allocated to low intensity uses or put down to fallow;
(iii) *more intensive use of the land during the year (*double or at times triple cropping more frequent on small farms);
(iv) a *choice of labour-intensive crops,* such as *v*egetables and other crops where the role of mechanization remains limited.

A more recent report by Grain (2014), reviews the available figures on land distribution, farm size and food production in 15 countries from Latin America and Africa to Eastern Europe and Russia. In each country, small farms have access to less than half of the land, yet produce over half of the food. For example, in Kazakhstan just over 97% of farms are small and operate on 46% of the land, producing: 98% of fruits and berries, 97% of milk, 95% of potatoes, 94% of melons, 94% of vegetables, 90% of meat, 78% of sugar beet, 73% of sunflower, 51% of cereals and 42% of eggs, while in Kenya using just 37% of the land, small farms produced 73% of agricultural output in 2004 (Grain 2014, p12).

2.4. Agroecological production on UK small farms

Of the 98,000 holdings of under 20 ha that are operating in the UK there are 637 farms of 20 ha and less that are legally certified as organic and biodynamic by UK bodies (Defra 2016, p. 7; pers. comm. with UK organic certification bodies). This, however, does not reflect the true number of agroecological farms, as many small farms operate organically, or according to broader agroecological principles, and find it too expensive to certify as organic, or unnecessary due to short supply chains.

It is tempting to extrapolate the phenomenon of the 'inverse relationship' between size and productivity to farms in the UK, but claims that small farms in developed countries can be more productive than larger ones tend to be backed only by financial data, rather than data about the physical productivity (yields or total output). For example, Rosset (1999) shows how small farms (27 acres and less) have more than a ten times greater dollar output per acre than larger farms. This is in large part due to the fact that smaller farms tend to specialize in high value crops like vegetables and flowers, but also that more labour and inputs are applied per unit area, and the use of more diverse farming systems. Eurostat figures for the UK suggest that the Standard Gross Margin/ha for smaller farms is 839 Euros and for larger farmers it's 142 Euros, indicating smaller farms are financially more productive by a magnitude of 5.9 (Martins and Tosstorf 2011, p. 4).

Studies of small farms in the UK have been polarised between the micro level and the traditional family farm. Sustain (2016) measured the total yields of allotments, community gardens and urban farms over two years, but no equivalent study of commercial small scale farms appears to have occurred. A study into the future of small, family farms carried out by Winter et al. (2016), took their definition of 'small' from Defra's Standard Labour Requirement (SLR), in which they employ between one and two full time equivalents (FTE). With this size definition, farms with a large acreage could be included, due to low labour requirements of an extensive grazing system or highly mechanised arable one. Furthermore, the focus of Winter et al. was traditional family farms, most of

which are non-organic mixed, cereal and livestock farms, rather than agroecological ones. While studies quoted implied that 'there is an underlying tendency for larger farms (in financial terms) to be slightly more economically efficient than smaller ones' (2016, p. 40) due to producing more output per unit input, this is only apparent when 'compounding factors', such as unpaid labour (charged at the full economic rate) are included. They note that 'there is a *very large* level of variation within this relationship, and the top performing small farms are more efficient than *many* larger farms' (2016, p. 40). Due to the complexities of the farm size-intensity relationship, Winter et al. conclude that there is no simple, unequivocal answer. In recognition of the fact that the definition of 'small farm' varies according to the type of farming being discussed, the Landworkers' Alliance have taken a values based approach to defining what is meant by 'small farm' (see text box below)

Small Farm Values

The Landworkers' Alliance represents UK small-scale, ecological and family farms. Members' farms are distinguished from industrial farms by the values that are central to their organisation.
Ecology – Nature is the primary resource of all production. Small farms put ecology at the centre of farming because a healthy soil and a diverse ecology is the foundation for producing nutritious food.
Autonomy – Autonomy is an essential part of a farm's resilience and viability. Small farms work to reduce reliance on bought-in inputs, limit dependency on borrowed capital and keep decision making in the farmers' hands.
Cooperation – Cooperation is at the heart of our farming culture. Small farms work together to share ideas and resources, and maintain access to the industry for new entrants and successors.
Community – Farms are a central pillar of rural communities and culture. They play an essential role in maintaining the fabric of rural life by creating jobs, providing services and maintaining culture.
Livelihood – Small farms value the local distribution of healthy food above the production of commodities for export. The small farm works to create markets that ensure both fair prices for farmers and good food for customers.
Accountability – Small farms take pride in producing high quality products that are healthy, nutritious and made with integrity. Supply chain traceability is important and creates public confidence in quality farming.

2.5. Measurement of productivity

When the question of productivity is examined in detail it becomes apparent that there are multiple ways to measure it. Rosset (1999) critiques the use of yield (output of a single crop per unit area) as a measurement, and advocates instead the concept of 'total output', in which yields for single crops may be lower than average, but are exceeded by the combined output of different crops from a unit land. This yield advantage, from growing multiple crops together, or 'poly-cropping' is usually expressed as the Land Equivalent Ratio (LER), which relates the monoculture land area required to produce the same amount as one hectare of polyculture using the same plant populations (Altieri 1995, p. 112).

Further refinements occur when the unit against which the output is measured are varied. Garnett (2013) compares three perspectives adopted in the sustainability debate, 'Efficiency', 'Demand Constraint' and 'Food System Change', and shows how the use of different metrics in Life Cycle Analysis lead to varying conclusions about the merits of different farming systems. Likewise, Smaje (2011) applied seven measures of efficiency and sustainability in the comparison of an industrial farm of 100 ha with an agroecological one of 6 ha. His findings were that industrial agriculture produces more macronutrients (though not more food) per unit area and per unit labour, whereas agroecological

smallholding produces more food and more macronutrients per unit green house gas (GHG) emissions and per unit energy used. He concludes that both types of farming are efficient in their own ways, and the question should be which type of efficiency do we wish to emphasise? Contemporary understanding of agricultural efficiency places emphasis on labour efficiency as opposed to land use efficiency, with the result that the agricultural workforce has declined dramatically over the last seventy years (Devlin 2016, p. 3).

While each of these measurement methods has its strengths, a traditional quantitative measurement of yield was chosen for this study, on the basis that it would be easier to compare this with other data sources. However, survey respondents were also asked qualitative questions about the number of enterprises they operate, the eco-management systems they employ and the multifunctional benefits they aim to deliver, to provide a wider context for the output of the farm as a whole.

2.6. Multifunctional benefits of small farms

Identifying the strands of the extensive literature about the multifunctional benefits of organic and agroecological farms which relate directly to scale is a complicated process due to the frequent association between smaller scale operations and those that apply agroecological or organic management systems. A comprehensive analysis of benefits attributable to agroecological farms can be found in IPES Food (2016), while Rosset (1999) discussed many social and environmental benefits arising from small scale farms in the US and further afield.

Environmental benefits can be summarised under the following broad headings: Efficient use of natural resources; Biodiversity and ecosystems services; Soil and water care; Greenhouse gas emissions and energy efficiency. Very little of the literature on environmental benefits focuses specifically on scale, although, D'souza and Ikerd's (1996) paper 'Small Farms and Sustainable Development: Is Small *More* Sustainable?' addressed the issue head on. It concluded that in the new post-industrial paradigm for American agriculture, from a sustainability perspective, the smallest effective size will be the most competitive size for farms, as for other knowledge-based enterprises of the future (1996, p. 81).

2.6.1. Efficient use of resources – Agroecological systems are characterised by cyclical, rather than linear systems, that minimise the use of external inputs by integrating crop and animal systems to make efficient use of natural resources (IPES Food 2016, p36). For example, fertilisers are replaced by composted plant waste or animal manures, and few, if any, pesticides and herbicides are used.

2.6.2. Biodiversity and ecosystem services – Griggs (2012, p. 54) lists a number of practices common at small scale, agroecological market gardens that enhanced functional biodiversity, leading to healthy ecosystems which keep pests at manageable levels. Wider research has shown that practices such as conservation of wild biodiversity, polycropping, crop rotation and a general movement away from monoculture have a positive impact both on wild biodiversity and the incidence of pest and diseases within crops (IPES Food, p. 35–36).

2.6.3. Soil management – Practices common with small-scale growers such as zero or minimum tillage, use of permanent beds, mulches or shallow cultivations with machinery, have multiple beneficial impacts on the soil including a reduction in soil erosion, soil compaction, damage to earthworms and germination of weed seeds (Hall and Tolhurst 2006, p. 26–28; Dowding 2007). The combination of livestock with arable and horticultural crops on mixed farms has further benefits for

soil, compared to pure arable farms, adding animal manure to enhance soil health, fertility and carbon sequestration, although use of green manures can have the same effect (IPES Food, p. 36).

2.6.4. Energy efficiency and greenhouse gas emissions – The short supply chains which characterise the marketing strategies of many small scale agroecological farms bring further reductions of CO_2 equivalents through reduction of transport and refrigeration (Griggs 2012, p. 46). Small farms using agroecological techniques may be two to four times more energy-efficient than large conventional farms, in terms of total energy input/output ratios (IPES Food, p. 34).

Turning to the social benefits, Pretty (2002) has argued that 'social connectedness, trust and participation in community life was greater where farm scale was smaller' (qtd. in Winter et al. 2016, p. 42). By contrast, Winter et al. (2016) focus on the changing role of farmers in society in response to agricultural restructuring. They note the withdrawal of farmers from community and civic life as demands on their time grow due to increasing farm size, leaving less time for community engagement, and report isolation due to longer hours of work, and having to reduce the labour force in order to streamline the farm business. These are seen as a source of loneliness, stress and loss of work satisfaction among small farmers in the modern context. The SW Farm Survey showed that when asked how satisfied they were with life in general compared to 12 months ago, 47% of famers with 200 to 250 ha and 35.9% of farmers with over 250 ha reported feeling less satisfied compared to just 17.9% of farmers with 50 ha or less (Winter et al. p. 43–47). By contrast, Timmerman and Felix (2015) report greater engagement and satisfaction with work on agroecological farms.

Claims to provision of healthier food by small, agroecological farms can fall into two main categories: Those relating to the food being fresher and less processed, and physical differences brought about by organic/agroecological management compared to non-organic husbandry. Small scale farmers tend to sell their produce direct to the customer, rather than via long food chains, meaning that it is usually fresher when it reaches the customer (Griggs 2012, p. 46), while focus on using organic methods of production brings potential benefits in the nutritional quality of the produce (Leifert 2014). Grigg's study of agroecological market gardening in the UK is also notable for its focus on community involvement in growing, which brings additional mental and physical health benefits, alongside increasing the affordability of fresh produce to low income groups.

Small farms also bring economic benefits to rural areas. Rosset (1999, p. 11) points to studies highlighting how in towns surrounded by family farms, income circulates in the local economy generating further jobs and a thriving community characterised by more local businesses, schools, newspapers and a more thriving civic society. He also notes how radical land reform in Japan, Taiwan and South Korea enabled thriving small farmers to provide the guaranteed domestic markets for fledging industries that led to the 'miracles' of economic development in these countries post second world war (Rosset 1999, p. 14).

Winter et al. (2016) used employment as an 'approximate measure of rural community well-being' (Midmore and Dirks qtd. in Winter et al. 2016, p. 37), because *paid* employment is the most important means of achieving other ends. They found that farms of under 50 ha employed a mean of 7.72 FTE/100ha, compared to farms of 200–250 ha, which employ 2.27 FTE/100ha and those of over 250 ha which employ 1.23 FTE/ha (Winter 2016, p. 38). Maynard and Green (2004) show how organic farming creates 140% more jobs than non-organic farming, highlighting that small, organic farms with an average size of 36 hectares supported the greatest number of jobs (5.23 jobs per farm). Likewise, drawing from older studies, Hird (2015, p. 21) quotes two studies that show an employment

dividend from conversion to organic farming practices. Organic farms are able to offer more secure year-round employment, due to their diverse, mixed nature and direct marketing activities (Hird 2015, p. 27), greater contentment with work, and optimism about the future of the farm (Maynard and Green 2006, p. 53). Timmerman and Felix (2015, p. 528) contrast the skilled and meaningful work provided by agroecological systems to the lack of opportunity for skilled workers on large industrial farms, which leads to less stable rural communities as workers are forced to migrate. Devlin (2016) confirms that such trends exist in the UK, where casual seasonal labour represented 5% of the agricultural labour force in 1980, 7% by the mid-1990s and had risen to around 14% by 2014.

Chapter 3 – Methodology

The 'A Matter of Scale' (AMOS) study was composed of three research phases:

- An online questionnaire survey
- Filmed visits and semi-structured interviews at eight of the holdings found to be most productive when the survey results were analysed
- A one-day skill share workshop

3.1. Definition and recruitment of sample

An area-based definition of 'small farm' was selected over Defra's definition, which is based on the number of full time equivalent workers, to allow for the variety of management systems and levels of labour intensity anticipated among small scale, agroecological farms. While the area which is considered to be 'small scale' varies with the type of farming (horticulture uses less land than grazing of livestock) and the Land Workers' Alliance's (LWA) value based definition of small farm is based on a suite of qualitative factors, an area based definition was considered to be simpler for potential respondents to be able to understand. For the purposes of the AMOS study, 20 ha (50 acres) and under was chosen as the definition for small farms as this is large enough to allow the inclusion of livestock farms as well as horticultural holdings. Respondents were requested to be commercial, rather than producing entirely for subsistence. Recruitment for the survey took place at six regional LWA meetings, as well as via as articles and advertisements placed in magazines, newsletters and at events targeted at potential respondents.

3.2. Questionnaire design

The survey was designed to collect quantitative data on yields, enterprise diversity and financial viability, as well as information about the variables that might influence productivity, and qualitative information about barriers to productivity, trends and environmental and social benefits. It was designed in consultation with a statistician and a representative of the Farm Business Survey, to ensure that the results could be compared with data for large organic and non-organic farms. In formulating the questionnaire, a number of differences were discovered in the frameworks of reference for defining holding size, output and labour used by Defra, which made comparisons more difficult than initially anticipated, and these are discussed later in the report (See Chapter 11).

3.3. Online surveys

An initial online survey was run in Spring 2015, and was followed by a second in Autumn 2015. Results were analysed using spreadsheets and descriptive statistical methods, while responses to qualitative questions were grouped by theme.

3.4. Filmed interviews and farm visits

Eight farms were selected for in-depth visits and interviews, based on their high ranking yields, financial viability and the different types of enterprise and marketing method they demonstrated. Story boards, focussing on five themes arising from the survey results, were devised to provide a framework for the interviews. A set of interview questions consisting of generic ones and questions tailored to each farm, enquired how the holdings succeed in being so productive and financially viable, and explored the themes of employment, barriers to productivity, and multifunctional benefits. At each farm, a filmed interview was carried out, followed by a farm walk during which interviewees were invited to discuss and show specific approaches used to increase productivity/viability. Footage

was then logged, integrated and edited into five short films on the themes of productivity, financial viability, employment, barriers to productivity and multifunctional benefits.

3.5. Skill share day and other peer review meetings

At various points during the research, results were presented to groups with interest and knowledge in agroecological methods, providing opportunities for discussion of findings and input of new perspectives.[1] This facilitated the triangulation of information with a wide section of actors, as well as peer review of research perspectives, the results of which honed final analysis of the data and presentation of the films. The most significant event was the Skill Share Day (October 2016), a one-day event to which all respondents from the survey were invited. It combined a first showing of the films, and presentation of results with the opportunity to take part in enterprise focussed workshops to share details of good practice and how barriers to productivity have been overcome.

[1] Meetings/conferences where such presentations took place included the Democratising Agricultural Research Conference (DARE4) at Monkton Wyld (July 2015) and the International Permaculture Conference (September 2015).

Chapter 4 – A Profile of Small Farmers in the Twenty-First Century

4.1. Geographical distribution

A total of 69 smallholders responded to the questionnaire. Most respondents were from the south of England, especially the south west, with 32 (46%) being located there, and 15 (21%) being in the south east. Only one holding from the east of England took part and five to six from the Midlands, north west and north east. Wales and Northern Ireland returned one holding each, and four were in Scotland.

4.2. Sizes of holding

The distribution of the sizes of holdings taking part in the survey can be seen in Figure 4.1. 64% of the holdings were under five ha, with 19% (of the full dataset) being less than one ha. 14% were between five and 10 ha, 10% falling in the 10–15 ha class and 12% in the 15–20 ha class. Of the sample of 69 holdings, 54 (78%) were using less than five ha for food production, including 24 (35% of total sample) who were using less than one ha. Seven holdings (10%) were using 5–10 ha and eight holdings (12% of sample) were using 10–20 ha for food production.

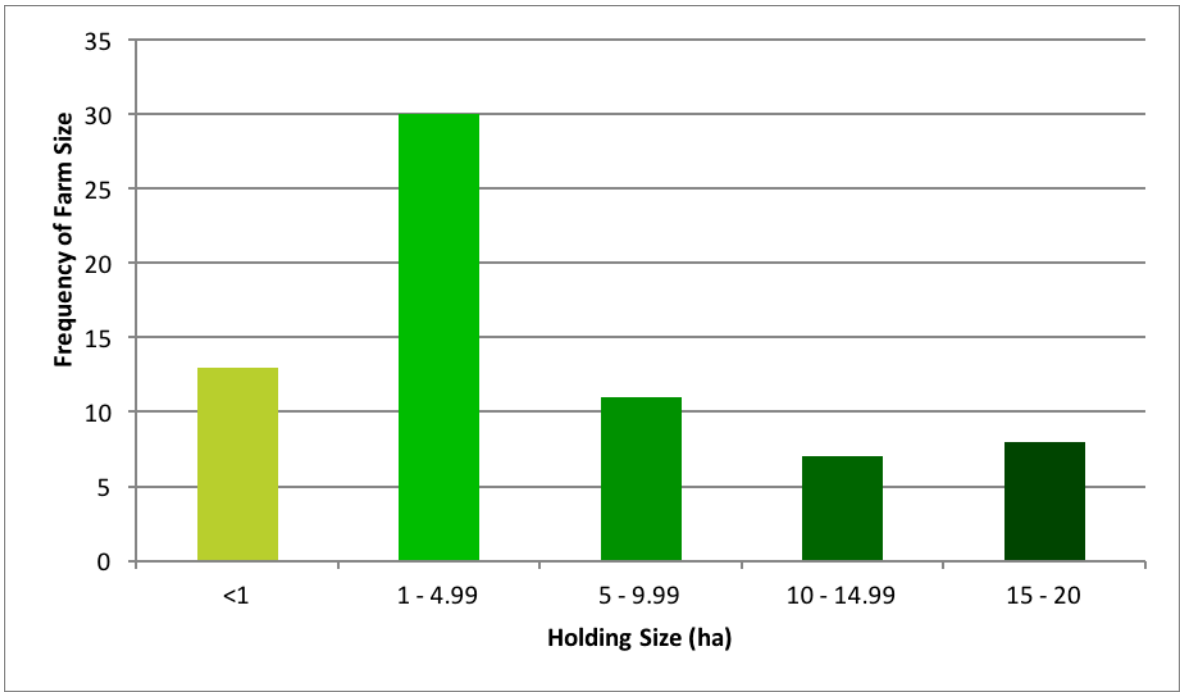


Figure 4.1. Distribution of holding sizes

4.3. Enterprise diversity

A wide diversity of different enterprises was represented among the respondents (see Figure 4.2). Not surprisingly, horticulture, poultry and pigs were commonly represented, since these are less land hungry than ruminant livestock. Other goods reported as being produced included: cut flowers (6); firewood/coppice (3); honey/bees (4); mushrooms (2); hops (1); a fruit tree nursery (1); medicinal herbs (1), alpaca fibre (1) and herbal teas (3). One striking feature of the dataset was the number of different enterprises that many holdings were operating. Nearly 47% were operating only one or two enterprises, and often these were horticulture, 23% were operating three to four enterprises, 21% five to six enterprises, 7% seven or eight, and 2% more than eight enterprises. These highly diverse businesses included holdings of less than five hectares.

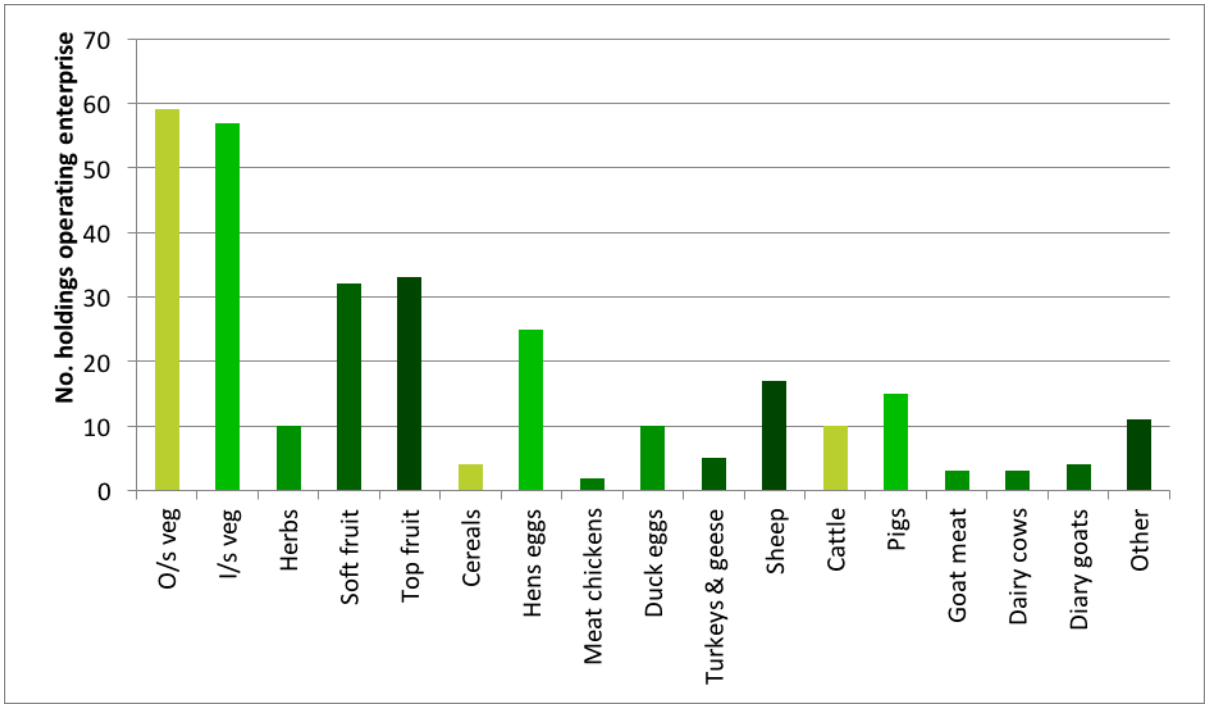


Figure 4.2. Frequency distribution showing how many holdings were operating each enterprise (O/s veg refers to vegetables grown outside, I/s veg refers to vegetables grown under cover)

4.4. Eco-management systems

The answers to the question 'What eco management system do you use for your farm?' were diverse and respondents were allowed to give more than one answer. While organic, both certified (42%) and non-certified (43%), dominated the answers, permaculture was mentioned by 14% of respondents, agroforestry, forest gardening or no dig/no till (9%) and biodynamic (7%). The following were mentioned by one or two respondents each: stock-free organic, bio-intensive, biochar and companion planting. One respondent stated that he followed conventional methods.

4.5. A youthful sector

The age profile of the sample was youthful, with 20% under the age of 39 (see Figure 4.3), compared with 3% of UK farmers being under the age of 35 years. Likewise, only 13% were over the age of 60, compared to 34% of UK farmers being 65 years and over (Defra 2015, p. 9). It is notable that many of the businesses were recent start-ups, with 42% having been running for five years or less and 22% having been running for 6–10 years (total of 64% running for 10 years or less). Seven businesses (10%) had been running for over 30 years, and the remaining 26% for 11–25 years. Furthermore, the results showed a marked tendency towards the new entrant end, with 23% being in their first five years of farming or growing, and 52% being in their first 10 years. Only 14% had more than 25 years of experience and 70% of respondents did not come from a farming family.

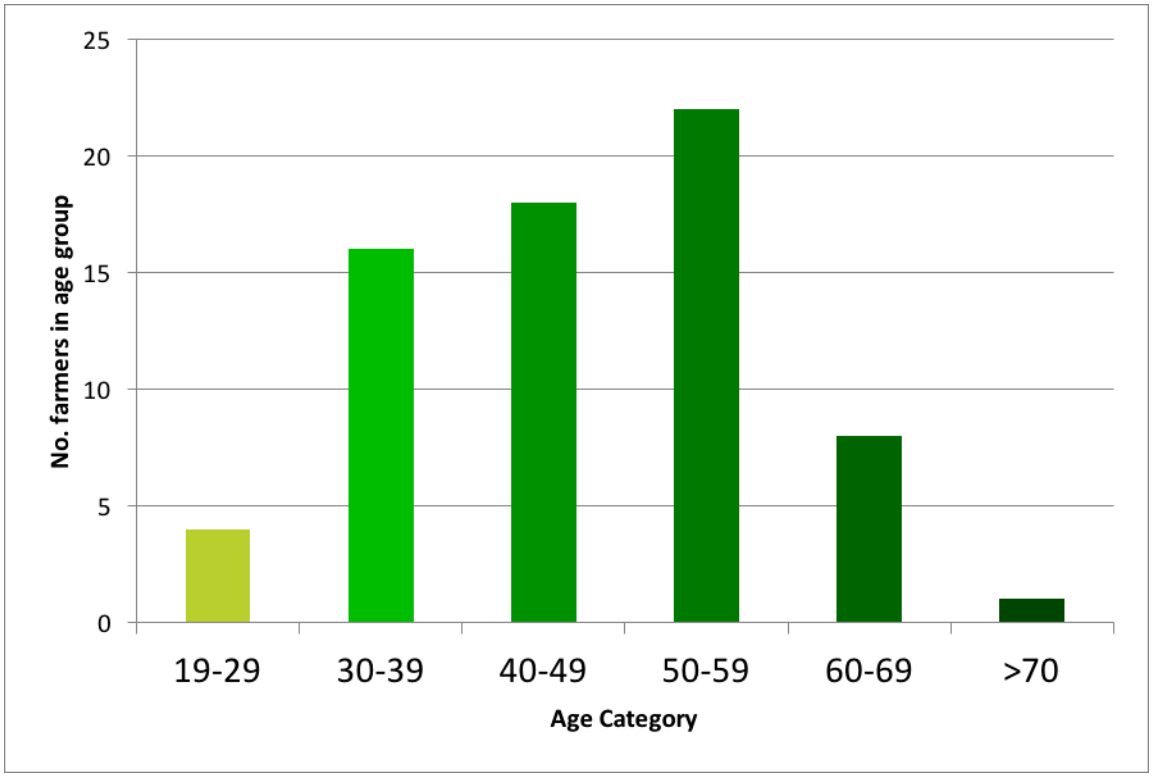


Figure 4.3. Age profile of AMOS sample

Chapter 5 – Productivity

5.1 Vegetable productivity

Vegetables were the most popular enterprise, being grown by 59 respondents while vegetable yields were the simplest to collect and provided the largest and most robust dataset. 86% of respondents were producing between 11 and 40 different types of vegetable, with most producing around 30. Yield data was collected for 18 indicator vegetables, and is summarised in Table 5.1 below, with more detail in Appendix 2 (Tables A2.5–A2.6). For most vegetables, the dataset was characterised by some very high yielding holdings at one end, with a larger number of lower yielding holdings. For such a skewed data set, the mean (calculated by adding all values together, and dividing by the number of values) was overly influenced by the highest yielding holdings, and thus did not provide an accurate representation of the average yield. For this reason, the median (middle) average, rather than the mean was used when comparing yields with standard organic and non-organic data. An adjustment was made to account for the fact that some of the survey did not specify whether paths should be included in the growing area recorded and it is assumed that some of those growing on raised beds will have omitted paths. For comparison with field scale data, which includes access land, all median and mean yields were multiplied by 0.85. This figure was chosen on the basis that paths typically take up 25% of a growing area (for each 0.75 m bed there is a 0.25 m path), but increased to allow for the fact that respondents growing row crops were instructed to measure from mid-points between rows for their growing area figures.

Table 5.1. Vegetable yields (kg/square metre) for small farms survey, compared with average data for organic and non-organic farms

	2014/2015 Median AMOS yield	2014/2015 Median AMOS Yields (w/ path adjustment * 0.85)	2014/2015 Mean AMOS Yields (w/ path adjustment * 0.85)	Organic (kg/sq m) (from OFMH 2014)	Non-Organic (kg/sq m) 2012
Potato	2.1	1.8	2.2	2.3	4.5
Tomato	4	3.4	4.4	n/a	40.7*
Carrots	2.2	1.9	2.7	2.5	6.1
Leeks	3.3	2.8	3.7	1.2	2.1
Broad beans	1.5	1.3	1.7	n/a	0.4
Squash	2.1	1.8	2.4	n/a	4
French beans	1.8	1.5	1.6	n/a	0.9
Chard	3.0	1.5	2.8	n/a	0.8
Kale	1.7	2.3	1.9	n/a	0.9
Salad	3.1	2.6	2.1	n/a	0.6
Parsnip	2.6	2.2	2.5	1.8	2.6
Beetroot	2.9	2.4	3.2	2.5	3.7
Onions	3.1	2.6	2.2	2.5	4.2
Calabrese	1	0.9	1.0	0.5	0.9
Cabbage	2.8	2.4	2.6	2.5	3.0
Courgette	4.0	3.4	3.3	0.5	2.5
Sweetcorn	0.7	0.6	1.2	2.5	n/a

Notes: *This is for heated tomato production – A figure for conventional, unheated production was not available

The 85% figure arguably disfavours the AMOS data when compared to other sources, but this is considered better than over-estimating AMOS yields. It is a fundamental flaw in the questionnaire design that growers using a fixed/raised bed system were not clearly instructed to include paths in their growing area, and it should be a priority in any future productivity research to ensure that such an error is not repeated.

When the AMOS results are compared with standard organic yields, the average yields for all but sweetcorn are higher in the AMOS sample, with differences especially pronounced for crops such as leeks, parsnip, beetroot and courgette.

When the AMOS dataset are compared to non-organic standard data, (see Figure 5.1 below). The yield differences are more varied, with small farm yields being higher than non-organic yields for some crops (leeks, broad beans, French beans, leaf-beet and chard, kale and salad, while for other crops (potatoes, carrots, squash and onions) yields were lower. Several of the former crops are those which benefit from more intricate husbandry and hand picking (e.g. salad leaves, French beans), while the crops that benefit from mechanisation and economies of scale (e.g. potatoes, carrots and onions) gave highest yields in the non-organic data set.

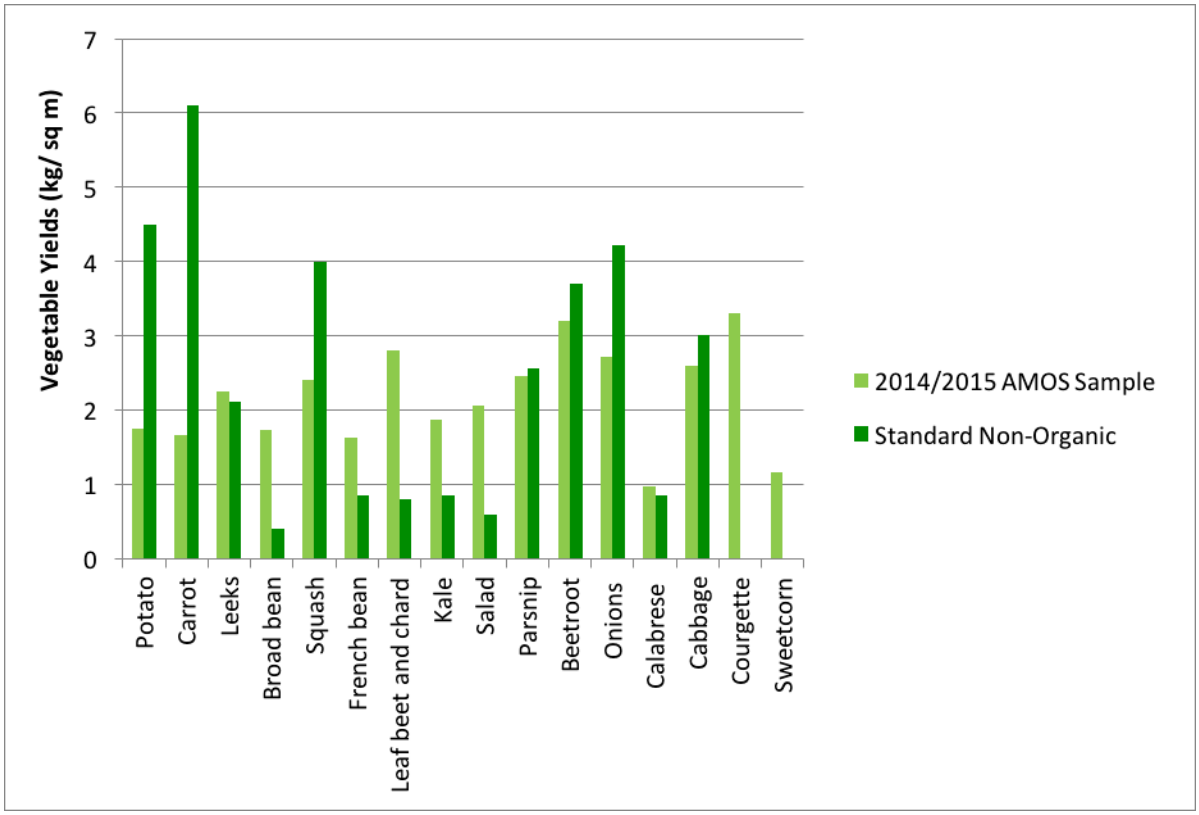


Figure 5.1. Comparison of yields (kg/m^2) from 'A Matter of Scale' survey with data for non-organic producers (British Growers' Association, pers. comm.)

5.2. Other enterprises

The small size of samples for other enterprises made it hard to draw any meaningful conclusions about productivity, as did the lack of scale appropriate organic and non-organic data with which to compare AMOS yields. However, the following descriptions show the diversity, scale and integrated nature of the holdings.

5.2.1. Livestock – Nine different types of livestock being kept for meat or egg production, but the size of flock/herd varied greatly (see Appendix 2 for tables of results). Furthermore, the complexities of mixed holdings, where livestock are rotated between different areas, and closely integrated with vegetable, fruit or cereal enterprises, created complications in allocating yields to specific areas. Of the livestock data, the egg-laying hens provided the best data since it is relatively simple to calculate an egg/bird figure which can then be compared to industry averages. The dataset (n=26) was variable, with flock sizes ranging from 3 to 150 hens, and it was interesting that the three highest laying rates (>300 eggs/hen) came from smaller flocks (see Appendix 2).

5.2.2. Dairy – As well as meat and eggs, six dairy producers responded, four of whom kept Jersey cows (1–3) and two kept goats (4–5). The average annual yield per cow of one respondent exceeded the industry average for non-organic channel island breeds, but on the whole yield per cow was lower than both organic and non-organic standard yields. All dairy producers were processing the milk into cheese, yoghurt or ice cream and had direct markets for their produce.

5.2.3. Fruit and cereal crops – Although fruit was the second most frequent enterprise after vegetables, produced by 33 respondents, data provided was patchy and productivity variable. On the whole yields for top fruit were poor compared to mean organic and non-organic field scale yields. AMOS yields for general soft fruit were better (mean 2014 – 1.4 kg/sq m, 2015 – 1 kg/sq m), but no standard figures were available for comparison. In 2014 the AMOS mean yield for strawberries of 1.27 kg/sq m, exceeded the standard of 0.73 kg/ha for organic field scale crops (Measures et al. 2014), but in 2015 it fell to 0.35 kg/sq m. Both years fell below the standard non-organic field crop yield for strawberries, of 2.1 kg/sq m. Most notable was the variety of both top fruit and soft fruit being grown, with 12 types of each being mentioned at least once, including unusual fruits such as apricots, logan berries and kiwi fruit. Five holdings were growing cereals or field beans, mainly for on-farm feed.

5.2.4. Productivity Trends – When asked, 'How would you say productivity has changed on your holding over the years?' the majority (76%) reported an increase, with over a third of those saying it had increased considerably. 12% reported that it had stayed the same, 7% that it had declined. The most common reasons given for increasing productivity were increased skill and experience and improvements in various aspects of soil quality.

5.3. What made some farmers productive?

The interview phase of the research was designed to collect examples of best practice and the question 'what distinguishes the top ranking growers from the rest of the sample?' formed a central line of enquiry during the visits to the most productive holdings. The following points, provide a summary of key findings from the interview responses:

- *Harvesting and marketing systems* – Hand picking of crops allowed for a longer harvesting period than a 'once through' mechanised harvest, and reduced crop wastage as vegetables could be selected and handled more carefully. Direct sales provided a better market for the variety of sizes and quality of produce, due to diversity of customer preference.
- *Efficient systems* – Thoughtfully designed systems ranged from field scale, tractor cultivated vegetables to small scale raised beds. Minimum tillage and no-dig techniques were sometimes employed to reduce weed seed germination and protect soil.
- *Skilful combination of machinery and hand labour* – Technology appropriate to small-scale operations was employed within systems designed to combine handwork and machinery use to maximise efficiency.
- *Good soil and aspect* – Some of the high yielding growers benefitted from grade 1 or 2 agricultural land, with good soil and a south facing aspect or shelter from a walled garden.
- *Experience and training* – Many top ranking growers had at least 10 years experience, providing time to develop skills, improve soil, establish good systems for cropping, pest and weed control. Several had also benefitted from formal agricultural or horticultural training.
- *Secure land tenure* – All of the high yielding farms had sufficiently secure land tenure to give them the confidence to invest in infrastructure, such as buildings, irrigation equipment and fencing, thereby increasing the efficiency of their holding.
- *High inputs* – Some systems were using high rates of either physical inputs, such as municipal compost or wood chip, or labour in the form of volunteers.

5.4 The challenge of quantifying diverse, integrated systems

The quantification of the productivity of small-scale, agroecological holdings, so as to compare their output with larger operations, highlights the limitations of using the yields of individual crops as a way to measure productivity. Rosset (1999, p. 5–6) suggests the concept of 'total output', the sum of everything a small farmer produces, is preferable to that of yield, when comparing smaller farms with large ones. For, 'while yield almost always biases the results toward larger farms, total output allows us to see the true productivity advantage of small farms'. As the following quotes demonstrate, to take a narrow definition of yield is to ignore the sophistication and complexity of what agroecological systems are capable of producing.

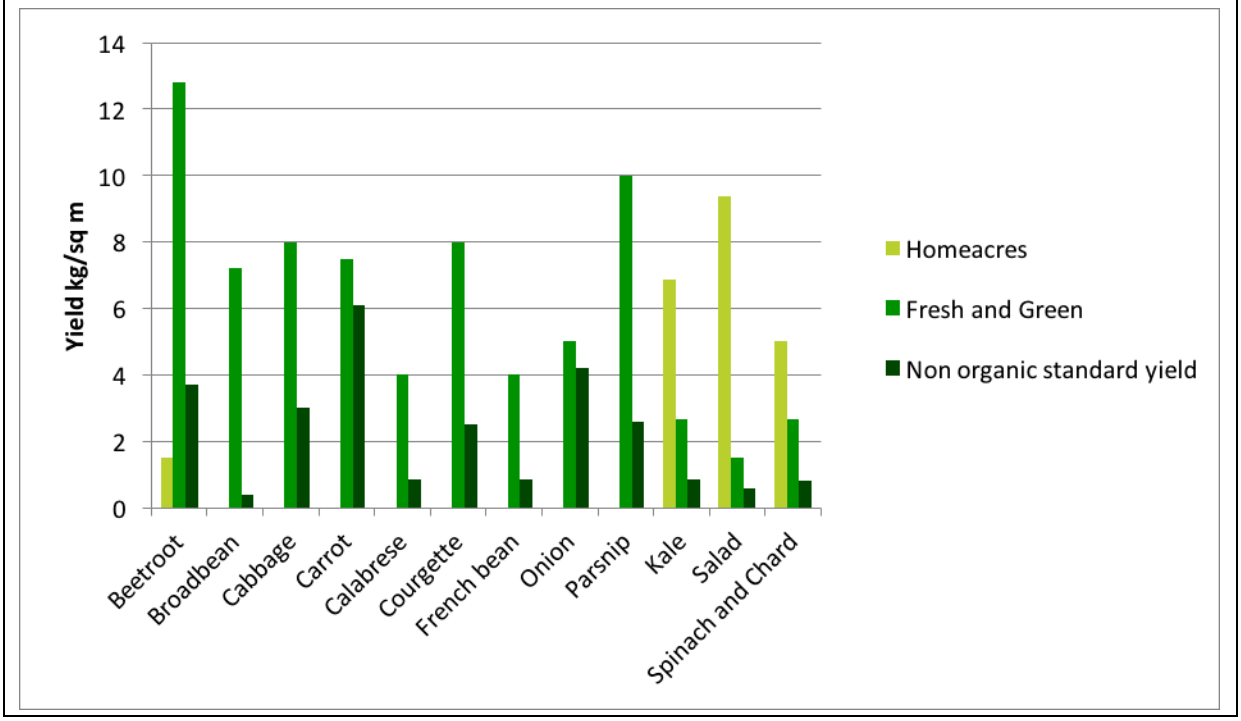
> *'I don't always look at yields in terms of tonnes per hectare. We're looking to give our customers a good variety of things. I often grow vegetables that aren't necessarily the most productive, so what I'm looking for is healthy plants that are giving us vegetables when we need them.'*
>
> Mark Stay, North Aston Organics (5 ha market garden supplying 260 boxes per week)

> *'When I think of productivity in the context of this garden, first of all I'm thinking how much can we produce in the time that we have, as we are working part time and managing volunteers. We think of productivity as being consistent with how much we can give the café. Every week we are harvesting something, according to the season. The volunteers and also the staff, they come out here to learn, so its productivity in terms of knowledge. And also its how people enjoy the site, the value of just being outdoors, with nature in an urban environment'.*
>
> Ida Fabrizio, Castle Climbing Centre (0.4 ha urban mixed use garden)

One of the reasons Cornia (1985) gives for the inverse relationship between holding size and productivity recorded in tropical countries is the more intensive use of land, with double or sometimes triple cropping on one piece of land in the same year. A study focussed on fewer holdings could employ the concept of Land Equivalent Ratio (LER), which calculates the total land needed to grow two crops in monoculture to achieve the equivalent yield from a single hectare grown in polyculture (Liebman 1995, p. 206–207). However, this level of detail was beyond the scope of the AMOS survey, which aimed at a larger dataset.

What is Possible?

A good system, combined with experience and reasonable land can result in organic holdings producing significantly higher yields than non-organic averages. Several horticultural holdings stood out as having outstandingly good yields, due to the factors mentioned above. The results for two such holdings are shown below. Fresh and Green is a 4.98 ha mixed holding in Devon (Grade 1 land), supplying 95 weekly vegetable boxes alongside laying hens and pigs. Homeacres is a 0.1 ha no-dig garden in Somerset specialising in salad (Grade 2 land). Both are run by growers with over 25 years of experience.



Instead, a qualitative approach was used to identify instances of polycropping, by asking, *'How do you use your land in ways which result in two or more crops from the same land in a given year?'* A wide range of practices were reported (see Appendix 2 for table summarising results), but by far the most common was succession cropping, or growing two to three crops sequentially within a season. This was sometimes achieved by starting one crop in modules, so it was ready to plant out as soon as the previous crop was harvested. Such tight cropping schedules are characteristic of the successful

Canadian grower Curtis Stone, who distinguishes between 'High Rotation' (HR) and 'Bi Rotation' (BR) beds. In the HR beds, he grows quick crops such as rocket, spinach and radishes, aiming to get four crops per year, whereas the BR beds are for the 'slow and steady' crops such as tomatoes or kale, which will also be preceded or followed by a quick crop (Stone 2016, p. 17–18).

The polycropping principle of 'stacking' was in evidence at several holdings in different forms (see "Productivity Film" below). In its most traditional UK form, this included under-grazing orchards with sheep, chickens or geese. At one farm, multiple enterprises (cider and desert apples, sheep, chickens both for eggs and meat, and pigs) are integrated spatially to maximise the yield coming from a total area. Another farmer uses the leaf fodder which is a bi-product of coppicing or pollarding hazel as a supplement to the diet of his cattle. In the forest garden at Castle Climbing Centre, a diverse range of standard fruit trees, shrubs such as black currents and gooseberries, and groundcover herbs and strawberries grow together, with the walls of the Castle also being used to support vertical growth of climbers such as kiwi fruit. Such a complicated integrated system requires an intense and knowledgeable input of labour, to find and efficiently pick the fruits which are then processed by the café into cordials, cakes and deserts. The herbs are harvested on a regular volunteer day each week, and dried in a solar drier, processed and mixed into blends, which again are served at the café. Arguably, a system this diverse is only viable because of the high input of volunteer labour, and the fact that the garden manager is employed by the Climbing Centre rather than self-employed (see Chapter six), yet the education and pleasure gained by the volunteers is also counted by the garden manager as a form of productivity.



Video 1: A combination of experience, good soil and aspect, system design and specific production details are the ingredients for success in achieving productivity at a small scale. Available here: https://vimeo.com/222364577

5.5 Relationship between inputs and outputs

The AMOS survey has focused on outputs, not inputs. The decision not to ask detailed questions about inputs was deliberate, since this would have added to the length of the questionnaire. The aim

was to collect data from a large sample and the response rate would have been lower if detailed input data had also been asked for. Since one of the selection criteria for the study was that farms should be operating under some form of agroecological management system, it was taken as given that most would be aiming to minimise inputs.

Some data on inputs was collected, including an indication of the percentage of animal feed and forage that was produced on farm and bought in. While for sheep and cattle, the majority of holdings were producing 80–100% of their feed and forage on farm, for pigs and poultry, a much higher proportion of bought in feed was being used. This reflects standard practice throughout pig and poultry farming, including on many organic farms, since the tendency is to feed these non-ruminant animals a more grain based diet, which is more complicated to produce on farm than grass forage. Nevertheless, there was some variation in the balance between farm produced and bought in feed, and the high yields of one highly productive livestock farm were reliant on a higher proportion of bought in feed, even for the cattle and sheep.

An input that did not show up on the questionnaire, yet had a significant influence on the yields, was compost. At least one of the highly productive farms was using high applications of municipal compost, combined (33:66) with home made compost in a no-dig system (applied 4-5cm deep annually, with 10-15cm in the first year) on a quarter acre plot. Others mentioned buying in animal manure from other farms as a fertility input for horticultural systems, representing, along with animal feed, significant imports of nutrients from another system. Such reliance on 'outside' fertility represents an extension to the 'boundary' of where the 'small farm'begins and ends, since it relies on land elsewhere. Often such "inputs" from elsewhere are wastes, and their use is a beneficial form of recycling which should be viewed within the broader context of industrial agriculture, in which many inputs are bought in having been specifically extracted/manufactured for the purpose at considerable environmental cost. It was suggested at the Skill Share day that employing an Ecological Footprint approach to the study of small farm productivity might be a way to measure inputs and compare these with larger farms. This would, however, require a significantly more detailed approach than was within the scope of 'A Matter of Scale'.

Others mentioned buying in animal manure from other farms as a fertility input for horticultural systems. Compost, manure and animal feed represent significant imports of nutrients from another system. Such reliance on 'outside' fertility represents an extension to the 'boundary' of where the 'small farm' begins and ends, since it is relying on land elsewhere to grow the animal feed and compost/manure. The use of some 'bought in' compost, animal feed and other inputs by AMOS respondents should be viewed within the broader context of industrial agriculture, in which the majority of inputs are bought in. It was suggested at the Skill Share day that employing an Ecological Footprint approach to the study of small farm productivity might be a way to measure inputs and compare these with larger farms. This would, however, require a significantly more detailed approach than was within the scope of 'A Matter of Scale'.

5.6 How to measure productivity

Throughout the two-year period of conducting, analysing and presenting initial results of the 'A Matter of Scale' survey, the question of how productivity should be measured has been considered. At a workshop early in the process, the idea of 'productivity as a ratio of outputs per inputs' was introduced, which led to an understanding that there are various parameters against which productivity can be measured – land area (space), fossil fuels (energy), subsidies/capital (money) and

labour (time). Such parameters represent either scarce or abundant resources and in aiming for sustainable food production, productivity or efficiency should be measured against the scarce resources, such as land or fossil fuel energy. Another suggestion was that the percentage of organic matter in the soil should be a core parameter against which yield should be measured. All of these, alongside the indicators highlighted in the literature review, are valuable measures. However, to be meaningful, any measure of productivity must be sufficiently commonly used as to enable comparability with other systems. Since a key purpose of 'A Matter of Scale' was to find out whether (or not) small farms could be as productive as larger ones, it was necessary to use a unit of measurement which would be well understood and comparable within the tradition of measuring yield. Hence, for all its weaknesses, the measurement of productivity by yield against unit land area retains value, within a broader understanding of total output, diversity and agricultural systems.

Chapter 6 – Financial Viability

6.1. A financial struggle

Analysis of the mean income and costs data for three years showed a tendency towards low net farm incomes, with 72% of those providing financial data having a net income of £10,000/year or less. Even when the value of subsistence produce consumed on the holding was included, 63% of those providing financial data appeared to be generating £10,000/year or less net income. On the other hand, three holdings were generating a net income of over £25,000, and this rose to four when subsistence is included. A further 10–13 holdings, representing 22% of the sample who provided data, were generating an income of £10,000–£20,000. It was interesting that the most financially successful farms were not the same as those that consistently produced the top yields, which could be due to the labour costs on highly productive farms. The top earning holdings were all selling via box schemes (two vegetables and one meat), which provide a reliable market and confidence to invest to produce a high volume of produce.

Analysis of mean net income hides the fact that many individual holdings were showing a progression towards a higher net income, and that some of the larger vegetable box schemes have turnovers of £150,000–£350,000/year. These high turnovers include supplementary, bought in produce (30–50% by value), but the merging of the retail side of the business with the growing side, means it is difficult to isolate financial performance. Furthermore, it became apparent that some farms have included the main growers' wages in the costs, reducing the net farm income, which was assumed to represent the income for the farmer/grower.

The survey asked what percentage of income came from sales of produce; farm subsidies, other employment, tax credit or pension and 'other'. For 'Sales of Produce' there was a relatively even distribution, with nearly half (31) gaining over 40% of their income from farm sales and the others (33) gaining 40% or less of their income directly from farm produce. Of the 12 (19%) earning over 80% of their income from farm produce, four were earning 100% from it. All of these 12 were horticulturalists, with all but one growing on an area of 3.2 ha or less. Those who were earning less than 20% from produce sales were on the whole gaining the rest of their livelihood from other employment, or 'other', with a few having a significant contribution from tax credit or pension. On the whole these people tended to be new start-ups or retirees.

It is notable that 78% were receiving no farm subsidies, and of those who were, 10 gained 5% or less of their income from subsidies, three received 5–20% from them and only one was reliant on subsidies for 80% of their income. 59% of the respondents had some form of extra employment although for 21 (33%) this provided 40% of their income or less. Only 9% were getting more than 80% of their income from other employment and in most cases this was the only additional income besides farm sales. Nearly 60% were not gaining any income from tax credits/pension, and of those who were for nearly two thirds these contributed 20% or less of income.

The diversity of livelihood strategies displayed makes it hard to typify any particular pattern. However, it seems that income from produce sales makes a significant contribution to overall income, with 31% earning over 80% from this. A low reliance on farm subsidies or tax credit/pension is demonstrated, while most small-holders are earning any extra income they need from off-farm employment.

The contribution of subsistence consumption to the livelihood strategy should not be underestimated. 59% of the sample valued produce they consumed at £1000–5000, with another 20% using up to £1000. For those living on their farm, living costs can be further reduced if there is no rent or a mortgage, and energy, water and sewage services are 'off-grid'.

Income data highlights:

Produce sales generate more than 60% of total income for 33% of AMOS sample, 40–60% for 33% and up to 20% of income for 28% of respondents.

50 (78%) receive **no subsidies at all**.

38 (59%) of the respondents had some form of **off-farm employment**, but for over half of these such income represented less than 40% of total household income.

6.2. Small farms compared with national data

Small farms appear to have greater economic resilience and less reliance on subsidies, when financial data from the AMOS survey is compared with farm income data for UK agriculture and horticulture (see Figure 6.1). For 2013/2014, corresponding to the years for which AMOS data was collected, the average contribution to farm incomes from production was £6600, with the bulk (65%) of income coming from Single Farm Payment or agri-environment schemes. For mixed farms, an average annual loss from agricultural production of £10,400 meant 100% of total income was coming from subsidies and 27% from diversification. For comparison with the horticulture dominated AMOS sample, mean UK horticulture production contributed £14,100, representing 42% of overall income, of which another 42% came from diversification and the remainder from subsidies or agri-environment schemes. By 2015/2016, an average loss from production was being made across all farms. Subsidies, including Basic Payment Scheme and agri-environment payments, now constitute 85% of farm business income (Defra 2015 and 2016, p. 8).

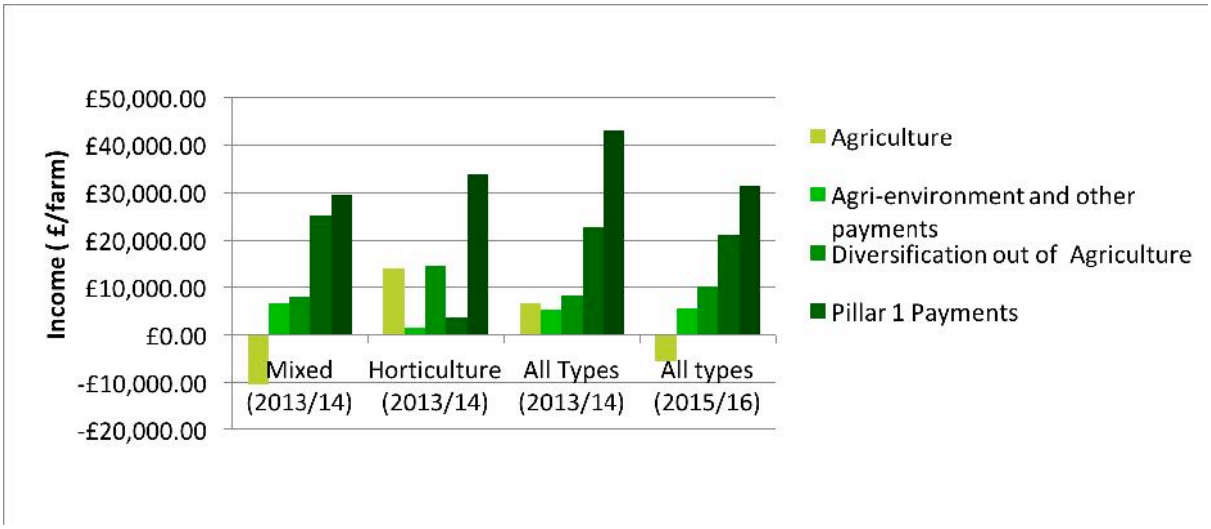


Figure 6.1 UK annual farm business income by farm type (£/farm) summarised from Defra (2015/2016, p. 8)

It is fairly typical for farming households to benefit from an income from 'off-farm' employment. A survey of the distribution of income sources across the south west showed that for farms of less than 50 ha, 44% would come on average from agriculture on that farm, 15.5% from non-agricultural

activities on the farm, 13% from off-farm employment and 20% from pensions, savings and investments (Winter 2016, p. 59). The income distribution farms of 20 ha and less in the AMOS survey appears to be relatively typical, when compared to the farms in the south west survey.

6.3. Adding value

Almost all respondents were adding value in some way, either by processing or direct marketing or both, to compensate for the low prices obtainable for basic produce, reflecting the findings of other studies, for example Maynard and Green (2006). Adding value was a clearly a key ingredient for success in the farms featured in the "Financial Viability" film on page 23. In one interview, the point was made that even salad leaves, when mixed and put in a bag, are elevated from raw vegetable to 'ready meal', for which customers are willing to pay a premium compared to a vegetable which they have to prepare. Other processing activities are more involved, such as cheese making, but despite the labour and time required, the increase in milk value from 20p/litre to £1.50/litre makes the effort worthwhile. Milk processing, as well as the making of jams, chutneys, cordials and juices, has the benefit of converting a perishable product into one with a shelf life, while often also enabling the utilisation of produce which is not cosmetically suitable for retail. The reduction of waste thus achieved has economic as well as environmental benefits, in that a much larger proportion of produce is made saleable.

Adding Value by Processing

Fivepenny Farm Catering

Fivepenny Farm (10 ha) is a highly diverse mixed farm, comprising top and soft fruit production, vegetables, livestock (pigs, sheep and cattle), a micro-dairy and sometimes chicken eggs or meat. The farm succeeds in generating a livelihood through intensive adding of value to the basic produce, much of which is then sold when the farmer caters for weddings and other local events. Fivepenny Farm Feasts are therefore made up of a mouth-watering selection of cheeses, pickles and jellies, processed meats (Parma ham, sausages, chorizo), salads, fresh fruit desserts, cider and cordials all grown or raised and processed on the farm.

Apricot Centre

Over 20 years Marina O'Connell has planted a diverse orchard on 1.4 ha in Essex, resulting in a long cropping season for apples, pears, plums, gages, peaches, currants, gooseberries and other soft fruits. These are sold fresh at an organic farmers' market stall in London, where customers are willing to pay a premium for good quality produce. Surplus and blemished produce is processed into jams, chutneys and cordials and sold alongside the fresh produce, increasing the range and turning potential waste into a high value, non-perishable product.

The most frequently recorded forms of direct marketing were more traditional systems such as box schemes (18) and farmers' markets (11), followed by informal sales through word of mouth (8), farm shops and farm gate sales (5) and community supported agriculture (4). Innovative forms of marketing such as internet sales (2), food co-ops (4) and food assemblies/hubs (2) were less common. One step removed from direct marketing was the most frequent channel of all, wholesale to catering or independent shops, which 26 respondents undertook. While prices obtained are not as high as for direct marketing, a greater proportion of the sale price (50–75%) is obtained compared to sales via a wholesaler or retail multiple (1–10%) (CPRE 2012, p. 22). Such channels bring the convenience of

picking to order and flexibility in what is offered each week. Typically one form of marketing, for example the box scheme or market stall, accounted for 80–95% of produce, with other methods such as wholesale to restaurants and independent shops acting as supplementary markets to sell surpluses.

Prices can be dramatically increased when processing is combined with direct sales. For example, by retailing herbal teas by the mug in the on-site café at Castle Climbing Centre, the value of teas that had been collected, dried and blended from the garden was increased from £800 wholesale value to £2500. On the negative side, such processing and direct marketing takes time away from the running the farm, and thus potentially eats into the time that could be spent producing food. Processing also requires significant investment in infrastructure, since facilities must pass the rigorous inspections of environmental health. At Fivepenny Farm, this obstacle has been overcome by forming a co-operative to obtain funding to build a processing barn comprising a juicing room and catering kitchen, butchery room and dairy which can be rented by the day by members (See "Financial Viability" film below).



Video 2: Most successful small farms achieve financial viability through adding value, whether by processing or direct marketing their produce. Available here: https://vimeo.com/221393133

6.4. Diversification

In contrast to diversification on many larger farms, where a tourist or hospitality enterprise is often a profitable 'add on', but may not even feed guests food from the farm, the diversification activities reported by respondents were closely integrated with the farm. There appeared to be a market for on farm 'experiences', which were providing a valuable income for several holdings. From hosting corporate away days and 'pick, eat and learn' events to running youth development courses, the public appetite to pay for an authentic experience is not only an opportunity to supplement income, but also to educate customers. For example, G and S Organics in Northumberland offer 'Farm Focus Days', which include a tour of the farm, a butchery demonstration and a dinner of meat and vegetables produced on the farm. They also offer wild camping to enable visitors to enjoy a simple and traditional opportunity to 'get away from it all' and enjoy the beauty of the farm and its wider landscape. At least two other holdings were also offering simple camping, and a fourth now offers 'glamping' in a yurt, all inviting campers to pre-order food from the farm to cook over a campfire.

Through such enterprises, the farm is the subject of courses/events, rather than being merely a pleasant venue. The informal education that arises from people being able to spend time on a farm, and maybe understand the economic struggle of running a sustainable farm in the twenty-first century, may result in greater willingness to pay a little more for agroecologically produced food.

6.5. Contrasting strategies

While several farms had deliberately specialised in high value crops like salad leaves or ones that required technical investment, such as hops and cider apples, to become viable at a small scale, others considered that their enterprise diversity provided them with financial resilience against changes in the market and the weather. Furthermore, the interactions between multiple livestock, fruit and vegetable enterprises on some farms enabled costs to be cut as bi-products from one enterprise could become inputs for another. These contrasting strategies for achieving economic viability are interesting and deserve further research.

A Creative Partnership

Castle Climbing Centre in Stoke Newington, London ingeniously integrates a highly diverse, productive garden with a popular sport centre, in such a way that all parties are enhanced and thrive. Since 2009 the acre surrounding the centre has been converted into a mixed use, community garden. While growing food for the Climbing Centre's Café is one objective, the garden has amenity value for staff and climbing centre clients, is a site for wildlife conservation and waste management, and acts as a link with the local community by providing 'mini-allotments' for local families. The garden is managed by Ida Fabrizio, who is employed three days per week by the Climbing Centre, and leads a team of volunteers plus two other staff to grow and process food, make compost from the Centre's kitchen waste and manage the land to achieve its different objectives.

The relationship between the Castle Climbing Centre and its garden opens up possibilities, which alone would not be economically viable. As an employee, paid with income from the climbing centre, Ida is able to devote time to labour intensive and initially non-remunerative activities, such as creating a forest garden and picking berries, which a self-employed farmer/grower would find hard to justify. Equally, as Ida is quick to point out, 'Because we grow high value food, the café wouldn't necessarily buy what I'm growing, because it would cost them a lot of money. For example, we grew 20 kg of apricots, and out of those apricots they've made deserts, they've made cordials, they've dried them and put them into flapjacks. They've added value to what we've given them, but they wouldn't necessarily have bought 20 kg of apricots'. In turn, the green credentials of the climbing centre and the reputation of the café, which serves herbal teas and cordials grown and made on site and meals made from ultra fresh produce from the garden, attract climbers from other more standard sport centres, increasing its profitability.

Chapter 7 – Labour

7.1. Labour patterns on small farms

Across the whole sample, an average of 2.25 full time equivalents (FTE) were working on each holding, with the average FTE per ha being 3.2. This is significantly higher than the mean annual work units (AWU) per hectare for the UK, of 0.028 (Defra 2015, p. 8), or the 0.026 AWU/ha figure Eurostat (2011, p. 5) provide for smaller farms (which include farms of up to 891 ha, according to their system of definition). Although it was anticipated that labour intensity would be higher, since the AMOS sample contains a high proportion of two of the most labour intensive forms of farming (organic, and a predominance of horticulture), the magnitude of increase of labour intensity is surprising.

The labour required by farms in the AMOS sample was largely provided by the farmers/growers themselves and their spouse/family, with 46% of the sample employing no outside labour and 32% of the holdings having over half of the work done by the proprietor. This is in line with general trends for UK agriculture in which 68% of farm labour is family labour (Eurostat 2015, p. 50). Across the data set, the farms were employing an average of 0.7 FTE per holding. The number of FTE employed per hectare was 0.4 FTE/ha. Sometimes the farms generating employment were very small. Of the 10 farms employing two or more FTE, seven were five hectares or less.

The AMOS survey asked respondents about the average number of hours they worked on the farm in the summer and the winter, and from a weighted average of these two figures, a full-time equivalent (FTE) figure was calculated by dividing the average by 40 (taking 40 hours per week to be full-time). To compare employment across the holdings, a FTE per hectare figure was calculated by dividing FTE by total holding size (no. ha). The high figure for FTE/ha can partly be explained by 13 of the 69 holdings being less than one hectare, causing a magnification effect on the employment figure. For example, a 0.2 ha holding employing 0.9 FTE, appears to be employing 4.5 FTE/ha. When holdings of less than one ha are excluded from the average employment calculation, the average FTE/ha figure comes down to 0.68. Nevertheless, the fact remains that very small holdings were generating paid employment at an extremely high level of labour intensity.

The higher labour demand for organic farming is well documented (Maynard and Green 2006; Hird 2015). A survey of 25% of the organic farms in the UK in 2003 found organic farms providing 14% more jobs per 100 hectares than non-organic farms, with small farms (average size of 36 hectares) supporting the greatest number of jobs (5.23 jobs per farm) (Morison, Hine and Pretty 2005). Furthermore, Maynard and Green (2006, p. 25 citing ISEC 2000) state that UK farms under 100 acres provide five times more jobs per acre than those over 500 acres. Within UK agriculture, horticulture accounts for by far the most jobs (0.23/ha), followed by specialist poultry (0.13/ha) and specialist pigs (0.09/ha). Cereals (0.02/ha), mixed farming (0.025/ha) and dairy (0.03/ha) represent the lower end of the employment spectrum (Devlin 2016, p. 11).

7.2. Long hours for low pay

The majority of those working on the farms were self-employed whose payment generally comes from the net farm income. For about half the sample this was less than £10,000 per annum, so it is likely they were paying themselves less than a minimum wage rate, when income was divided by total

hours worked on the farm business (as opposed to time spent on 'non-business' activities). Such long hours for low pay are characteristic of farming, which is often described as a 'lifestyle choice'. It could be argued that long hours without adequate remuneration do not constitute a livelihood. However, as Chapter 6 showed, by a combination of direct marketing, processing and other ingenious solutions, the economic contribution of the farm produce sales to respondents' livelihoods was significant, and shortfalls were made up by subsistence benefits of living on the farm and off-farm employment.

Nevertheless, the imbalance between the high labour demands of small-scale agroecological farming and food prices that do not reflect the costs of production creates a significant obstacle, as reflected by responses to the question about barriers to productivity (see Chapter 8 and Table A1.9 in Appendix 1). Indirectly, the stereotype of 'long hours for low pay' has contributed to a cultural prejudice against farming as a viable livelihood, resulting in a shortage of skilled labour, as young people are deterred by the education system from training in agricultural occupations. Although a couple of respondents reported experiencing difficulties in recruiting skilled labour, the high rate of volunteering indicates that many workers find rewards other than payment motivate them to work on agroecological farms. Such rewards include the acquisition and development of skills, the enjoyment of working with others in a pleasant environment and the satisfaction of contributing towards a meaningful goal. Over 75% of respondents benefited from volunteer labour, with 40% hosting them for less than 100 days per year, and 36% for more than 100 days per year. Reliance on volunteer labour on commercial organic farms is a matter of debate within the organic movement, with some viewing it as an economic weakness or even exploitation, while others as a fair exchange for board and lodging and informal training (Harries 2016, p. 26–27; Keeves 2016, p. 28; Fairlie 2012/13, p. 61–63).



Video 3: There is a growing appetite among young people for the skilled, meaningful and varied land-based work that small farms offer. Available here: https://vimeo.com/221392869

7.3. A meaningful job

While the payment for labour may not be high, a point that arose during the farm visits is the sense of enjoyment and satisfaction that both workers and employers gain from working at a small – or as several of them put it, human – scale (See "Employment" film, on p26). These findings support Timmermann and Felix's (2015) observations of the greater attraction of work on small scale agroecological holdings, compared to large scale industrial agriculture, because it is meaningful, skilled and values the application of the worker's intelligence in overcoming challenges. Specific themes identified in the AMOS interviews included:

- Variety of work – diversity provides day to day interest and more opportunity for year round employment (or at least a longer season).
- Sociable nature of working on a small scale
- Being able to see and understand the whole process
- Training opportunities
- Possible to be more sustainable at small scale.
- Meaningful work – skilful and interesting (problem solving), healthy and safe, contributing to environmental care and societal benefits.

A worker at a market garden selling via a vegetable box scheme (5 ha) specified that while she liked the small scale, she also appreciated the farm being large enough to enable her to do a variety of jobs, harvesting different vegetables throughout the year. She also works at the micro-dairy enterprise on the same estate, where she valued being involved in all the steps from milking to selling bottled milk at the farmers' market. She compared this to a larger farm where she had worked for a couple of months, where 30,000 table birds were fed automatically by tractor and cows were milked with a robot, and expressed a sense of disempowerment about being part of a system that relies on complex machinery that she was unable to fix.

Likewise, an intern at Stroud Community Agriculture (18 ha), who described the farm as 'small-medium size', stated that he valued learning about intensive vegetable production from a small acreage, but also the opportunity to learn about livestock husbandry on the same farm. Another student worker had specifically chosen his farm for it being small scale and organic because he imagined it would be friendlier and the employer would have more time to explain things to him. Even his employer stated,

> *'On big farms its one man to a thousand acres, maybe more, now. I'd hate to be stuck on a tractor, on my own, just driving up and down a field. What we do here is really sociable, and we're not using noisy machinery all the time, so people can have conversations while they're doing their work, whether that be in the field hoeing or hand weeding or in the pack house. We're not in some great warehouse. It's definitely a sociable work that we do here. I think the fact that we've got members of staff who've been with us many years shows that the work is pleasurable and they want to come back.'*

A couple of workers expressed appreciation for the broader issues of working on a small scale agroecological farm, as opposed to an industrial scale monocultural farm. One compared the experience with working for large scale organic farms in the fens growing for the supermarkets:

'It's not farming, its industry. I don't think organic production should happen at that scale because you've just got these vast mono-cropped areas with no real chance for a diverse ecology to evolve. I think that's what works here, and that's why it's so nice to be growing in a well established site, where we've got incredible diversity around us of insects and birdlife and mammals and these things all enable the agroecology to find its balance.'

'I think small-scale, organic farming is the solution for many problems. There's less transport, and maybe if more villages had their own farms, people could talk with the farmer, and have better knowledge about what they are eating'.

These last two quotes point towards a sense of appreciation of working in an environment where the employee's values are in harmony and understanding, rather than at odds, with the work place. The interest and satisfaction of work, consistency of values and working in a pleasant, comprehensible environment and with other people, combine to create a pleasant working experience. Such consistency with values is a factor that motivates many to work for a lower wage than were the work less enjoyable and satisfying.

7.4. Return on employment

Since the Second World War, there has been a drive to minimise agricultural labour, to reduce the costs and provide leisure time to the farmer and to release workers for other more remunerative forms of employment. Timmermann and Felix (2015, p. 353) challenge 'the rationale that the overall reduction of labour in agriculture is something necessarily to be welcomed'. Their concept of 'contributive justice' focuses on the fair distribution of meaningful and interesting work, and views the increased labour demands of agroecology as a benefit, because of increased opportunities to participate in such work. Thus, two major global challenges are confronted: the reduction of the environmental footprint of agriculture and improvements in the quality and security of rural employment.

While hours are long and pay is low, agroecological farmers provide good 'returns' to society on their labour investment. Within the weekly hours noted down, many tasks do not lead directly to a financial return, but instead contribute to their environmental benefits (e.g. management of hedgerows, watercourses, meadows) and social benefits (such as social events for customers, farm walks and informal engagement with visiting customers). These create unpaid for time demands on the farmer/grower. Furthermore, direct marketing adds further time demands, yet shortens supply chains, producing benefits of fresher food, less transport, refrigeration and packaging, reduced waste and greater connectivity between the customer and the farmer/grower.

7.5. Work smarter not harder

While it is argued above that increased labour can be seen as a positive, due to the livelihoods it creates, rather than as a negative 'cost' to the business, it is still necessary for small farms to be economically viable. Inefficient use of labour is a drain on any business, and a feature that distinguished some of the most successful holdings was their attitude to system design and labour allocation. For Charles Dowding, the main motivation to develop a no-dig system was to reduce the weed burden he had witnessed causing massive labour costs to other organic businesses, while at Fresh and Green, Ruth Hancock highlights how machinery and labour are thoughtfully deployed for

different tasks to reduce time demands. This attitude of honing a system to the maximum efficiency is well illustrated by the Canadian grower Curtis Stone, who earns a decent living from half an acre of 'back yard' suburban plots. His detailed record-keeping and strategic systems for time-planning and work distribution, bed management and crop harvesting are central to his success (Stone 2016). Likewise, his colleague from Ontario, Jean-Martin Fortier states that, 'Although persistence, determination and hard work are all key ingredients for successful farming, these qualities on their own are not enough. Careful planning, design, good management practices and appropriate choices of equipment are all essential for developing an understanding of the farm as a whole system' (Fortier 2014, p. xv).

Chapter 8 – Barriers to Productivity

8.1. Labour and skills

By far the most frequently mentioned barrier to productivity related to labour, highlighting the importance of labour as an input on small farms (see Table A2.10 in Appendix 2). Issues raised included insufficient time and energy (21), insufficient labour (18), not being able to afford to hire sufficient labour (13) and lack of skills and experience (3). Not being able to afford labour was frequently linked to the low prices that are paid for food, making this the toughest challenge to address due to its being embedded in the macro-economic and global politics of food trade. Furthermore, the mismatch between the income possible from farming and the cost of accommodation and other living costs was a concern echoed by several respondents. Such themes arise repeatedly in the "Barriers to Productivity" film on page 32.

A couple of holdings reported difficulty in finding sufficiently skilled workers, and one elaborated that the base-line practical skills and common sense of school leavers were so poor that training up such workers was a significant investment. This grower commented that while several French agricultural colleges offer him students on work placement, in 18 years of growing not a single UK college had ever approached him. This could reflect a bias against organic production by UK agricultural colleges or poor connections between colleges and workplaces. Another grower identified a cultural bias in education that discourages bright and able students from pursuing rural training. Nevertheless, a growing number of people in their twenties and thirties are choosing agricultural/horticultural livelihoods, as shown by the younger age profile in this sample, and as discussed in Section 7.5, the skill-developing nature of the work is a key attraction to agroecological and organic production. Inexperience and lack of skill of the respondent themselves was also cited as a limitation and it would be interesting to see whether five years on the yield and viability results would be different when both their land and the skill of the farmers have had more time to develop.

Finally, one grower made a point about the impact of tightening labour legislation on the fluidity of hiring casual labour when it is needed on the farm. In contrast to 20 years ago, when people worked on each other's farms locally when the need arose, the paperwork required to employ casual labour now adds prohibitive demands on the business.

8.2. Investment in infrastructure and equipment

Another frequently occurring theme related to the lack of working capital, which was limiting efficiency by preventing respondents investing in adequate infrastructure and equipment. Often the bulk of start-up capital is spent on land, with insufficient funds being left over to invest in buildings, fencing and machinery. Although people manage and innovate with what is available, inefficiencies resulting from animals escaping due to poor fencing, machinery breaking down when needed and forage being ruined when stored under tarpaulins rather than in a barn were seen as a drain on the business. Lack of capital and time was also limiting developments that could improve resource efficiency, such as the installation of a rainwater harvesting system on the roof of a large barn. A frustrated farmer in one of the films pointed out that New Entrant schemes, offering capital grants to cover start-up costs exist in Scotland, Wales and other countries in the EU, but not in England.

8.3. Access to land and accommodation

The fact that those taking part in the survey generally had access to some land might have precluded 'access to land' arising as an issue. However, lack of space and limitations from the quality of the land were considered barriers to production by 14 respondents. For tenants or others with insecure land tenure, there is a disincentive to invest in long term improvements such as infrastructure, fruit trees or even soil, which can limit the potential productivity of a business. The theme of land affordability and access was developed during the visit North Aston Organics, where a contractor growing for the scheme spoke movingly of his frustration that after farming for 20 years he still could not find affordable land to establish an organic business in Oxfordshire (see "Barriers to Productivity" film on page 32) . He stated that he was a classic candidate to have benefited from a county council farm, but these had all been sold decades ago in Oxfordshire. Along with land being unaffordable, on-site accommodation was even more out of reach financially, causing inefficiencies when producers have to commute from a nearby village. The nature of organic mixed holdings, or even purely horticultural ones, means that the working day cannot be confined neatly between 9am and 5pm and not living on site causes stress, losses when accidents can't be responded to quickly and extra travel related costs.

8.4. Technology suitable for small scale farmers

A theme that arose during the farm visits was the lack of availability of equipment and inputs, particularly seed, appropriate for small scale producers. UK investment in agricultural research and development has focussed on technologies for industrial farming to the exclusion of small and medium scale technology. Hence, growers are forced to rely on old, and sometimes unreliable, machinery, or import equipment such as tractors and flame-weeders from mainland Europe or the United States, where the market has driven on-going development of modern equipment that is of an appropriate scale and price for small farmers. Similarly, the development of commercial plant varieties that accentuate the qualities desired by direct marketing, organic growers, such as flavour and disease resistance, is hampered by cost, regulation and lack of investment. Contrary to the stereotype of 'living in the past', young and technically able small farmers are keen to innovate and improve efficiency, but are hampered by the institutional bias towards high-tech, large scale solutions. As D'Souza and Ikerd (1996) point out, industrialization is being replaced by a 'knowledge based order', and when applying this to the achievement of sustainable agriculture, '"bigger" will be "better" only if the task cannot be done otherwise. The smallest effective size is best for enterprises based on information and knowledge.'(p73)



Video 4: Even the most successful holdings in the survey had had to overcome significant barriers on the journey to financial viability. Without such barriers, many more new entrants might be encouraged into farming. Available here: https://vimeo.com/221392625.

8.5. 'Outside pressure'

Although rather vague, the mention of 'outside pressure' reflects the fact that farming does not occur in a vacuum but within the broader context of people's lives. Pressures such as caring for elderly parents or off-site work, are by no means unique to small farms, but are a reminder that productivity is more than the result of a mere formula of contributing variables, and is influenced by a far more complex set of circumstances relating to family, society and even luck.

Chapter 9 – Multifunctional Benefits

9.1. The impact of scale

The multifunctional benefits of small scale, agroecological farms are well documented, and provision of such benefits was clearly a motivating factor for most of the farms in the survey. Yet it is difficult to isolate the influence of scale on these benefits from the choice of eco-management system. Visits to the most productive farms emphasised the valuable environmental and social benefits generated as a central aspect of running small scale, agroecological farms. The following discussion will attempt to identify where being small scale is an advantage in the delivery of the benefits cited in response to the qualitative questions about multifunctional benefits, summarised in Appendix 2 (Tables A2.10 and A2.11).

9.2. Environmental benefits

The environmental benefits detailed by participants in the survey (see Figure 9.1) reflect those discussed in other literature (Section 2.5), and can be broadly classified as those relating to biodiversity, soil care, efficient use of natural resources, and reduction of greenhouse gas emissions.

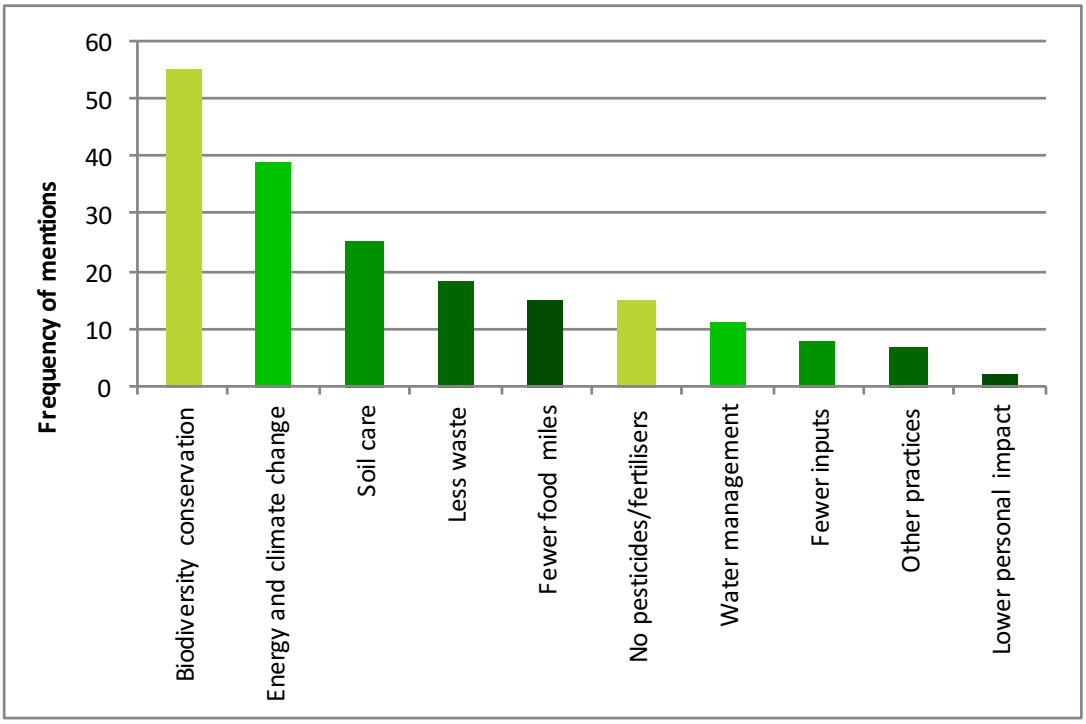


Figure 9.1. Categorisation of responses to the question, 'what are the main environmental benefits of the way you farm'

Biodiversity conservation frequently referred to habitat maintenance or creation, through practices such as hedgerow maintenance, sowing wildflower mixes and leaving wild areas, but the broader benefits of enterprise diversity and conservation of soil biota through organic management should not be ignored. That even holdings as small as five hectares were sometimes operating as many as six difference enterprises, and horticulturalists were growing an average of 30 different vegetables, and often soft and top fruit, reflects a significant difference from the tendency towards monoculture shown on larger farms. Such crop diversity within the production system, in terms of livestock as well as plant crops, has implications for resistance to disease, reducing reliance on pesticides and antibiotics

(IPES-Food 2016, p. 35–36). Furthermore, the beneficial impacts of ecosystem diversity on smaller cropping areas were more likely to be significant than when conservation occurs on the edge of very large fields. During the farm visits several examples were cited of wild predators controlling populations of pest species (see "Multifunctional Benefits" film on p.36). Crop rotations, absence of pesticides and heavy use of organic matter, usually generated by animals on the same farm, brought further benefits to soil biodiversity.

Although some holdings were using machinery for cultivation of vegetable crops, scale of operation enabled others to run no-dig systems using solely hand labour or a combination of the two. Such choices of system and technology use have implications for soil care and resource efficiency, reducing compaction, simultaneously improving water retention and drainage, and minimising fossil fuel use. Furthermore, the direct marketing carried out by the majority of respondents reduced the need for long distance food transport, packaging and refrigeration compared to more conventional, long supply chains. This supports the statement that 'Small farms using agroecological techniques may be two to four times more energy-efficient than large conventional farms, in terms of total energy input/output ratios' (Chappell & Lavalle qtd. in IPES 2016, p. 34).

The soil carbon sequestration benefits of organic farming are a matter for debate (Azeez 2009, p. 140; Audsley et al. 2009, p. 6), but the evidence is clear that the other practices on small, agroecological farms such as non-use of artificial fertilisers, minimal tillage, reduced reliance on soya based feeds for livestock and increased energy efficiency contribute to reduced greenhouse gas emissions (Lampkin et al. 2015, p. 77–85). At the other end of the supply chain the significant reduction in food waste and air freighting of fresh produce brought about through direct marketing has potential to reduce both methane and carbon emissions (Garnett 2006, p. 109–110; Griggs 2012, p. 46). Allen et al. (2013, p. 92) show how changes in land use and reduced meat diet, that are in line with the kind of diverse small-scale farming methods discussed in this report could bring about a 73% reduction in CO_2 equivalent emissions.

9.3. Social benefits

It is interesting that the most frequently cited benefits related directly to productivity of better food. Providing customers with food that is healthy, fresh, flavoursome and produced according to high animal welfare standards appeared to be a primary motivation for a majority of respondents, and linked closely with helping people to understand about how their food is produced, and providing a farm environment that nurtures the health and mental wellbeing of workers and customers alike. The high incidence of educational visits, on-farm courses, therapeutic activities and tourist activities directly integrated with the farm reflected their being safer, more interesting and pleasant places to host visitors than larger industrial ones, where tourist diversification activities are often isolated from the farm operation itself.

While community was directly referred to 46 times, local trade in food, and the educational and therapeutic activities, whether formal, or informal, also combine to form a community strengthening web around the farm, as illustrated in the "Multifunctional Benefits" film on page 36. Customers become friends, recipes are shared, produce is bartered, events are celebrated, children play together and volunteers create bonds through shared achievement. The fact that the small farms employ more people, and many offer volunteering opportunities, means that community can form within the farm workforce, in contrast to the loneliness that is becoming ever more prevalent in rural areas as modern farms shed labour (Winter et al. 2016). Furthermore, while the industrialisation of agriculture and the

increasing scale of farming are doing so much to erode trust, reciprocity and cohesion of rural areas (Winter et al. 2016), it appears that the human scale of small farms is making a positive contribution to re-weaving the fabric of rural areas.

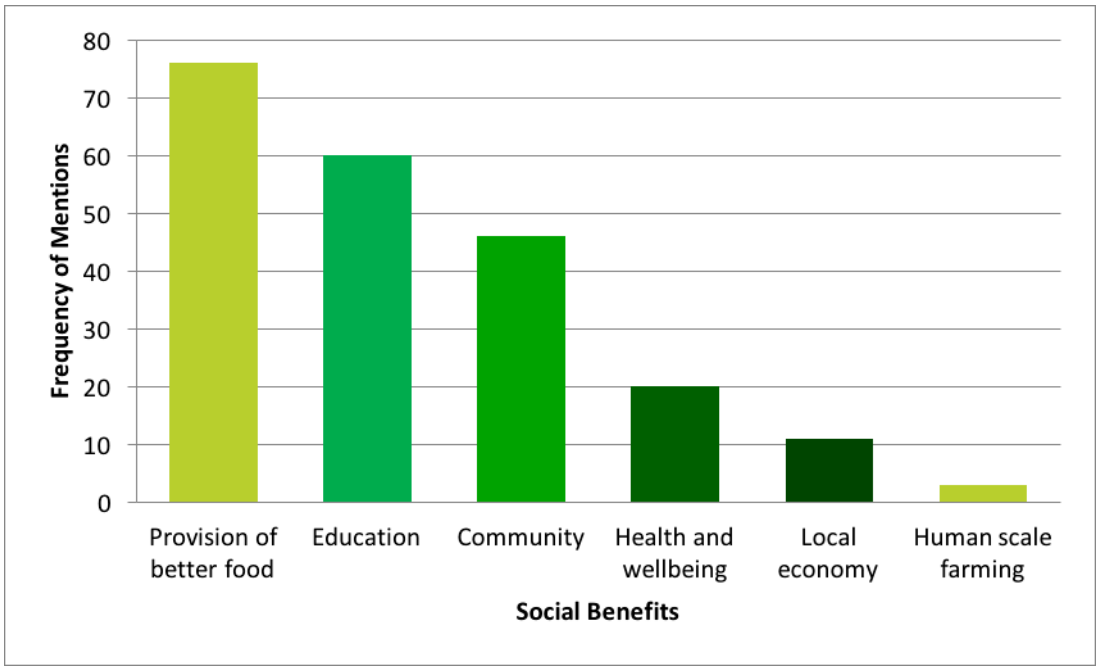


Figure 9.2. Categorisation of responses to the question, 'What are the main social benefits arising from the way you farm?'

9.4. The cost of environmental and social benefits

While some of the benefits discussed above, such as educational courses and campsites, generate a direct income, most are provided as part of the farm's activities with the cost of their provision being born by the farm in the form of the extra time demands on those working at the farm. For example, frequent personal contact with customers, whilst generating good will, takes the farmer away from production, while harvesting from a more diverse poly-cropped system, which encourages biodiversity, takes longer than from a simple monoculture. Although these practices may be rewarded in terms of customer loyalty or greater ecological resilience, the cost is reflected in the long hours that small farmers work, that are often not remunerated financially.

9.5. Inseparable qualities

The growing imperative to address issues such as climate change, anti-biotic and pesticide resistance and biodiversity loss, means that the multifunctional benefits discussed above can no longer be viewed as mere 'beneficial side effects' which come second to yield and viability. However, if any form of agriculture is to gain widespread adoption it is essential that it achieves a balance between productivity and the delivery of environmental and social benefits, which can be seen as three overlapping circles of a Venn diagram (see Wilson 2010, p. 367). Only where the three overlap can 'strong multi-functionality' be said to be achieved, while the environmental and social benefits that don't intersect with productivity are weakened if they can't also deliver economically. Agricultural policy that is aiming for true sustainability must require all three qualities to be met. D'Souza and

Ikerd suggest that in the future the vast majority of sustainable farms will be smaller than today's 'commercial-sized' farm because 'it will take "mind work," not physical or economic muscle, for farmers of the future to find a niche where they carry out their function by means that are ecologically sound, economically viable, and socially responsible' (d'Souza and Ikerd 1996, p. 82). If small scale agroecological farms are able to match larger ones on productivity and financial viability, whilst naturally delivering environmental and social benefits, there is a strong case for encouraging a significant increase of such farms.



Video 5: Small farms offer valuable social and environmental benefits, alongside being productive. Available here: https://vimeo.com/222364134.

Chapter 10 – A Role for Small Farmers in the Twenty-First Century

10.1. A modern mixture

At a time when land is being concentrated into ever larger holdings, to achieve economies of scale and access to global markets, farms of 20 hectares and less could be seen as an anachronism. Yet small farms are in a position to address some of the most pressing environmental, social and economic issues faced by rural areas, whilst providing adequate quantities of fresh and high quality food. Certainly, small farms are no panacea, and the type of agriculture, land quality and climate determines the most appropriate scale. While arable farms and those with poor quality grazing land may need to be larger than 20 ha in the UK, a healthy rural economy, landscape and society needs a mixture of farm sizes. The results of the AMOS survey suggest that small farms could play a significant role in providing healthy food and satisfying employment for the UK population, whilst revitalising rural areas by re-localising trade and re-building community.

10.2. UK fruit and vegetables for all

Since the 1980s there has been a 27% decline in the area given to horticultural production, and the latest available figures show that the UK is 38% self-sufficient in vegetables and 13% self-sufficient in fruit (Schoen and Lang 2016, p. 1; Farm Business Survey 2013/2014, p. 14–15). Fruit and vegetables are by far the greatest source of imports in the UK food system, representing 37% of the UK's total food trade gap of £21 billion in 2014 (Schoen and Lang 2016, p. 2). While many fruits could not be produced in the UK, others such as apples and most soft fruits could, while import substitution of most forms of vegetable would be possible. Schoen and Lang (p. 17) highlight the discrepancy between a health policy, which puts out a message to consume five portions of fruit and vegetables per day, and the lack of a Government strategy to increase domestic supply of fruit and vegetables. A recent meta study indicates that increasing fruit and vegetable intake to 600–800g (10 portions) per day is associated with further reductions in risk of cardiovascular disease, cancer and all-cause mortality (Aune et al. 2017).

The AMOS survey suggests that vegetable production is an area where small growers can produce equivalent yields, compared to national averages for non-organic horticulture, especially of vegetables that are labour intensive to harvest such as beans and leafy crops. A scaling up of the number of small, agroecological market gardens, especially in peri-urban areas, could help reduce the trade gap mentioned above, while providing pleasant and meaningful all year-round employment for local people. Furthermore, respondents in the survey suggested that the health and environmental advantages of vegetables and fruit being produced near to point of consumption and sold directly include freshness, less waste and less energy used in transport. Griggs (2012) outlines a compelling case for government intervention to scale up organic market gardening as a way to increase fruit and vegetable consumption among low income consumers, citing multiple examples of highly productive growing projects that increase accessibility to fresh produce. Similarly, the integrated supply approach taken by Growing Communities in London combines salad and other high value, intensive produce from urban market gardens with field scale crops grown on larger farms in Kent and Essex to supply 1000 households (Growing Communities, pers. comm. February 2017).

10.3. Attracting a new generation of farmers and growers

UK agriculture faces a recruitment issue on two fronts. Firstly, the economic struggles of farming over the last three decades have led many from the current 'working age' generation of farming

families to leave the industry to find easier ways to earn a living. This, combined with the reluctance of older generation farmers to cede 'ownership' of their farms to the active generation means the average age of farm holders in the UK is 59 years (Defra 2015, p. 9). Secondly, industrial horticulturalists struggle to find enough UK workers willing and skilled enough to undertake the manual jobs involved in large scale production horticulture and are reliant on migrant workers from the EU's new member states in Eastern Europe and elsewhere to meet the shortfall in skills and work quality (Schoen and Lang 2016, p. 21).

There is clearly an appetite for work on small-scale agroecological farms, as demonstrated by the younger age profile of the AMOS sample, and the willingness of people to run such holdings for low returns and undertake voluntary work. For agroecological holdings to be economically sustainable as an employment option, they need to be able to develop into businesses that can return a living wage to their workers, and many are already achieving this (Maynard and Green 2006, p. 13). However, the wider motivations to work on or run a small, agroecological farm should also be considered. This study supports the findings of Timmerman and Felix (2015) that work on agroecological holdings offers the opportunity to participate in meaningful, diverse and skill-developing work, as well as providing a congenial social workplace where observation and initiative are encouraged. This is due to organic systems being management-based systems, rather than heavily reliant on inputs (Maynard and Green 2006, p. 12). Since 1957, The Common Agricultural Policy's exhortation 'to increase agricultural productivity by promoting technical progress and […] the optimum utilisation of the factors of production, in particular labour' has been interpreted as maximising production per unit labour (*Treaty of Rome* 1957, Article 39). However, provided the second objective of 'ensuring a fair standard of living for the agricultural community, in particular by increasing the individual earnings of persons engaged in agriculture' is achieved, the provision of meaningful rural employment should be seen as positive, since it provides meaningful livelihoods.

Although the provision of a 'fair standard of living for the agricultural community' is still a struggle in some areas, value adding activities such as direct marketing or processing enable many small farms to offer regular or seasonal employment (Maynard and Green 2006, p. 29). Furthermore, alternative economic structures for farms, such as Community Supported Agriculture or partnerships with other organisations, such as illustrated by Castle Climbing Centre (see p. 21) increase the potential for meaningful employment to be properly remunerated.

The management challenges of farming more sustainably and adding value to make the business viable are already attracting back people who grew up on farms, as well as educated new entrants opting for a career change (Maynard and Green 2006). However, for agriculture, and particularly horticulture, to attract the number of new entrants they need in coming years, the intellectual challenges of agroecology and organic horticulture, with their emphasis on integrated systems (both ecological and economic), resource efficiency and community engagement could provide an added dimension of incentive. With the capital costs of purchasing and equipping a large farm being prohibitively expensive for most new entrants, small farms provide an opportunity to 'get a foot' on the farming ladder, whether through land purchase, tenancies or share-farming arrangements.

10.4. Plentiful food with a positive impact

Small agroecological farms offer multiple environmental and social benefits, whilst simultaneously providing significant quantities of nutritious food and dietary diversity. In conventional agriculture, the provision of agri-environmental benefits is often viewed as a trade-off against productivity, but

many studies show that over the long-term total output from agroecological systems can equate to or even exceed single crop outputs from the same area of land farmed industrially. The yield resilience inherent in agroecology is often a direct result of environment enhancing measures, such as more organic matter in soils helping them to hold water in times of drought or diversity of crops, variety and wild biodiversity enhancing resistance to pest and disease attack (IPES Food 2015, p. 31–34).

No matter how many environmental and social benefits they deliver, it is essential that farms that are addressing the ecological problems brought about by industrial agriculture are also able to produce sufficient food to meet UK requirements. If agroecological farms concentrate solely on their therapeutic and educational benefits, then food has to be produced in some other way and the negative impacts of industrial agriculture will continue. Without agroecological farms striving to be highly productive, they will not be viewed as an alternative for sustainable intensification that relies on high inputs and environmentally and socially damaging high tech solutions, and such practices will continue. This does not necessarily mean producing comparable yields as there is already enough food produced to feed more than the global population of seven billion, if it were not for inefficient industrial livestock, subsidised monoculture energy crops and large amounts of wastage (Schmutz, pers. comm.). One third (1.3 billion tonnes per year) of the edible parts of food produced for human consumption globally are wasted (FAO 2011), and UK households waste 7.3 million tonnes annually (Parfitt et al. 2010). The reduction in waste achieved by the short food chains common amongst agroecological farms could compensate to some degree for slightly lower yields.

Likewise, small scale agroecological farms need to be economically resilient. Chapter 7 showed that many farms in the AMOS survey are performing better than the UK average without the aid of subsidies. However, the economic struggles faced by many small farms arise partly from the fact that they are internalising costs that other farmers do not, and thereby operating on an unlevel playing field by competing on price against non-organic farms operating systems that cause externalities such as soil erosion, biodiversity loss and poor animal welfare. Although the organic premium compensates for this to some degree, it keeps organic food as a niche product only available to those who can afford it. A move away from an area based payment system towards one that rewards delivery of agri-environmental benefits and the production of healthy, affordable food for farms of all sizes would support a thriving small farm sector, while encouraging larger farms to become more sustainable.

10.5. Measures to support small-scale farming

For the benefits delivered by the current minority sector of small-scale agroecological farming to be scaled up, several pre-conditions are necessary. The policy bias towards large scale farming and high-tech agriculture needs to be transformed into a system that recognises the value of different scales and approaches to food production. Market interventions are necessary to support small farms as well as larger ones, to ensure that they can provide secure livelihoods for workers. The area based payments system should be replaced by one that that is size neutral and rewards the delivery of public goods.

A new attitude to farming is needed in the education system, so that students of all abilities are encouraged to consider agriculture and horticulture as fulfilling and remunerative careers for people with initiative and drive. Furthermore, students need to be encouraged to develop practical as well as intellectual skills from an early age. Affordable opportunities to start out in farming could be created by the breaking up of county farms into smaller units, and allowing a planning category for agricultural self-build ‘ecohamlets’. Capital grants or interest free loans to help new entrants purchase equipment and develop infrastructure would enable start up farms to improve efficiency and productivity.

Chapter 11 – Reflections on Methodologies for Measuring and Comparing Productivity

11.1. Lessons from a challenging endeavour

At the outset of the AMOS study it was anticipated that the data would be collected in such a way that it would be comparable with UK standard agricultural data collected by Defra through the June Census and Farm Business Survey (FBS). However, pressures relating to the timing of funding and the need to start the survey during the winter, when farmers/growers would have more time to take part in the survey, meant that insufficient time was spent considering the range of productivity measurement options that could be employed. It was not possible within the time available to undertake a full comparison between AMOS and FBS data. Another insight arising from the challenge of analysing the data was that the survey design and chosen metrics were insufficient to account for the complexity of agroecological systems. Hence, the yield data collected lacks the ability to account for increased productivity arising from poly-cropping, rotations and other agroecological practices, particularly for livestock systems.

11.2. Understanding the parameters of measurement

Over the course of the study, various discussions and farm visits led to a more nuanced understanding of what both farmers and academics mean by productivity, including the variety of parameters against which it could be measured. An early workshop led to understanding of productivity as a relationship between inputs and outputs, which could be either 'traditional' (inputs: capital, fossil fuels, agrochemicals; outputs: food as a commodity, GDP, poor water quality, soil nutrient depletion and CO_2 emissions/climate change) or non-traditional (inputs: skill and knowledge, labour; outputs: pleasure, well-being, health, biodiversity, good food/high nutrients). Such parameters represent either scarce or abundant resources and when aiming for sustainable food production, productivity or efficiency should be measured against the scarce resources, such as land or fossil fuel energy. The concept of productivity as such a relationship is central to the work of Smaje (2011), Garnett (2013) and Brookman (2005) who use concepts such as the comparison of productivity per unit area and per unit labour, and measurement of productivity against greenhouse gas emissions, lifecycle analysis and energy return on investment (EROI). While each of these methods are valuable, they are better suited to focussed surveys on a one or a few holdings, rather the larger sample AMOS aimed to study. Furthermore, they would have had limited value in enabling comparisons to be drawn with larger farms, unless suitable data for such farms had been specially collected, which was beyond the scope of this study.

11.3. Different frameworks of measurement

Advice was sought from the Farm Business Survey to ensure that the questionnaire was designed to deliver such comparable data. The Farm Business Survey is carried out annually to find out who is producing 90% of UK agricultural produce, and how it is being produced. Data is collected from a randomly selected sample from each farming type across different regions of the UK. Participating farms are offered a benchmarking service as an incentive to offer up their data, and give the Farm Business Survey access to their accounts for the relevant data to be extracted. Farm Business Survey data is used in conjunction with statistics collected in the June Census by Defra to provide information on national production. To allow for comparison of UK data with agricultural data across Europe, a common framework is used. It is based on the concept of Standard Output (SO) which is the level of output from an average farm under normal conditions, measured in terms of the financial

value of the main crop plus any bi-product. It varies according to region, to account for land and climate variation, but not method of production. Standard output is presented in the form of tables of co-efficients for each enterprise type. Total SO for each farm is calculated by multiplying its crop areas and average livestock numbers by the appropriate SO coefficient and then summing the result for all enterprises on the farm. SO coefficients are expressed in Euros per hectare of crop and per head of livestock.[2]

Alongside Standard Output, Standard Labour Requirements (SLR) are used to classify farm size. These are standard figures for the labour requirements associated with different livestock and crop types are calculated from a co-efficient based on the labour requirements under typical conditions for enterprises of average size and performance. The co-efficients represent labour requirements in terms of hours per head of livestock or per hectare per year. The number of full-time workers (FTE) required by the farm can be calculated by summing the SLRs for all the enterprises and dividing by 1900 (on the basis that a full-time worker works a 39 hour week and so 1900 hours a year). Defra classifies farms into sizes according to the number of full time equivalents (FTE) employed. A small farm employs 1–2 FTE, a part-time farm 0.5<1 FTE and a spare time farm <0.5 FTE.

Unfortunately, lack of a thorough understanding of how to use the Standard Output framework for comparing the data collected in AMOS meant that this framework for comparison with national data was not fully utilised in the analysis of the data. The advantages of the standardised system used by Defra are recognised as having a valuable function in enabling data to be collected and compared efficiently and accurately, and for enabling comparison with European data. However, the fact that both standard output and standard labour requirements are based on average figures for typical farm types in the UK does not allow for the measurement of variation between different types of management (for example organic versus non-organic). The focus of the AMOS study was the impact of scale and agroecological management methods on the yields, financial viability and multifunctional benefits of farm systems, so it was necessary to select a method of measurement of the actual yields and labour requirements from each farm. Late on in the write-up it was discovered that there would be a way to use the Standard Output system as a tool for comparison, but by then there was insufficient time to reanalyse the data in this framework. A further piece of work could be undertaken to reanalyse data from the AMOS survey in this context.

11.4. Metrics for diversity

Although it was understood from the outset that a distinguishing feature of small-scale, agroecological farms is their diversity, the system of measurement employed was inadequate to quantitatively capture any yield advantages or disadvantages from such systems. A more detailed study of smallholdings from the AMOS survey could have employed techniques such as the Land Equivalency Ratio (LER), which measures the land area required to grow the equivalent yield of three crops separately, as opposed to when they are grown in polyculture (Leibman 1995, p. 205; Lampkin et al. 2015, p. 83). However, the aim was to gather a large quantity of data so results would be statistically significant, and a highly sophisticated system of measurement would have been needed to collect sufficient quality data to apply the LER in the quantity that was aimed for.

[2] Farm Business Survey (2014) Farm Classification in the UK http://farmbusinesssurvey.co.uk/DataBuilder/defra-stats-foodfarm-farmmanage-fbs-UK_Farm_Classification.pdf

One of the biggest challenges was the definition of the area from which a given output of animal products (kilograms of meat, litres of milk, eggs) was produced that would take into the temporal nature of rotation between fields and the integrated nature of enterprises, where output from one system feeds into another (for example whey from cheese-making being fed to pigs). Furthermore, the fact that many pig and poultry enterprises, even on agroecological farms, are largely reliant on bought in feed renders the area in which they actually dwell as meaningless in terms of the land required to raise that quantity of meat or eggs. The latter could be calculated through an ecological foot-printing methodology (Wackernagel and Rees 1996), but as with the Land Equivalent Ratio, such techniques are better suited to studies of a few holdings rather than mass data collection. As outlined elsewhere, it was harder than anticipated to persuade farmers to take part in the survey, but nevertheless carrying out these practices on a dataset of 69 might have proved problematic.

11.5. The challenge of record-keeping

As mentioned above, an aim of AMOS was to attract a large enough sample to make the results statistically significant. The challenge of persuading small-scale farmers and growers to take part in such a survey was underestimated, with the result that the dataset is too small to be properly representative of agroecological farms of 20 ha and less. This could be attributed to the detailed nature of the questionnaire, the completion of which represented a significant time commitment, or a deeper reluctance of growers to keep or share records on productivity and financial viability. Over the course of the AMOS study it has become apparent that the collection of yield and financial data from small-scale growers requires the development of a system that is easy to use and has an in-built motivation, such as benchmarking, to encourage participation (Alderson 2016, p. 16). The AMOS survey, combined with initiatives in other parts of the organic sector, seems to have piqued interest in the issue of yield measurement and financial benchmarking among small-scale producers.

11.6. A trade-off between breadth and depth

On reflection, it is clear that there is a delicate balance to be struck between the sophistication of the system of measuring productivity and keeping a questionnaire simple and brief enough to motivate sufficient respondents to take part. The full complexity of measuring the productivity of diverse agro-ecological farms became apparent throughout the process of designing the questionnaire, conducting the survey and analysing the results. It seems likely that the length of the questionnaire deterred respondents, resulting in a smaller sample size, hence sacrificing breadth. Despite its length, the questionnaire used was still not sufficient to evaluate interesting aspects of small farms such as the impact of polycropping on productivity. Further efforts to research small farm productivity should combine a simpler questionnaire, aimed at motivating a much larger sample to take part, with a number of in depth quantitative case studies to investigate the impact of different cropping practices. Such in-depth studies would enable a better understanding of the productivity implications of integrating livestock and crop enterprises, or facilitate comparisons between simultaneous intercropping and multiple crops grown in succession within a year by using tools such as the Land Equivalent Ratio.

Chapter 12 – Conclusions

The AMOS study has laid the foundation for a more thorough understanding of how to measure the productivity of small holdings. Much work is still required to build on this understanding, to further develop methodology and an effective system for measuring the productivity from diverse and integrated small farms, so that results can be compared to larger farms in a meaningful way. However, a number of key findings can be concluded from this report

12.1. Small farms produce high yields of vegetables, and there is potential for further yield increases as the many new entrants represented become established and develop their skills

Average yields for vegetables that benefit from the labour intensive nature of small market gardens (e.g. salad leaves, beans and kale) are higher than for non-organic field scale operations. Some farms in the study, which were longer established and had more experienced growers, were achieving yields double or even triple those of standard non-organic farms (See Appendix 3). The fact that many of the holdings in the sample are relatively newly established, and run by young or inexperienced growers indicates that there is potential for average yields to increase as skills and experience grow, organic soils develop and the infrastructure of the holdings is refined to increase efficiency.

12.2. Small-scale farms are attracting and incubating a new generation of highly skilled entrepreneurs

A new generation of knowledgeable and motivated workers are choosing small farms as opposed to larger ones, as entrepreneurs, employees and volunteers. Such farms offer an access point for new entrants into agriculture/horticulture with more affordable farms, less investment risk and the opportunity to develop skills 'on the job'. The quality of work environment, which offers interest, meaning and a convivial atmosphere, means people are willing to work long hours for little pay. Although many farms are offering proper paid employment, many of those who are self-employed struggle to generate a sufficient livelihood and have to supplement their farm income with off-farm work. This is not unusual for farms of all sizes. When the financial performance of the AMOS sample is compared to Defra data on farm incomes, a greater proportion of income is derived from food production as opposed to farm subsidies in the AMOS dataset. Nevertheless, the imbalance between low food prices and the high labour demands of small farms creates an immense financial strain, impedes potential productivity increases and sometimes threatens the long term viability of the farm.

12.3. Small farms sell mainly via local supply chains

By selling direct via box schemes, farmers' markets and other short supply chains, food from small farms is fresher when it reaches the customer, as it has usually been picked within a day of delivery. The short time between harvest and delivery reduces waste and the need for refrigeration, while it is possible to sell produce of a greater variety of sizes and cosmetic appearances than supermarket buyers are willing to purchase. Packaging and transport costs are also reduced in comparison to centralised supermarket supply chains, as produce is collected from the farm or delivered within a limited radius of the farm, often using recyclable packaging. The short supply chains build trust and understanding between the farmers and their customers, strengthening community links around the farm.

12.4. Small-scale, agroecological farms deliver more social and environmental benefits than most other farm types

Most of the farmers in the AMOS sample are aiming to create a more sustainable and socially equitable food system. Hence they are naturally motivated to care for the soil and water quality, conserve and enhance diversity (both wild and crop diversity), use natural resources sustainably and reduce greenhouse gas emissions. In comparison to large farms, which often contribute to loneliness and community decline in rural areas, small scale farms are often the focus for strengthening community networks for customers and volunteers, while providing an educational resource for local people.

12.5. Small-scale farms face significant barriers to increasing productivity

The diverse nature and financial pressures of small farms mean success requires overcoming a constant stream of challenges. The cost of agroecological farms delivering environmental and social benefits, for which there is an additional labour cost, is often not remunerated. For example, organic production systems replace herbicide and fertiliser use with manual or mechanical weeding and the use of composts, animal manure and green manures, which have significant labour demands. While a premium price can be achieved for organic food, this does not necessarily cover the additional labour cost of a practice that generates multiple benefits, such as biodiversity and improved soil organic matter. The imbalance between low food prices and the high cost of labour mean a heavy workload for entrepreneurs, especially in the start-up phase. The high cost of land means that gaining secure access is difficult, and capital for investment in infrastructure and equipment, which would improve efficiency, is usually in short supply. Furthermore, UK under investment in appropriate scale technologies and seeds for small, agroecological farmers means they often have to import equipment and inputs from Europe or the United States.

12.6. Small-scale agroecological farms contribute to a healthy diet and lifestyle by producing mostly vegetables and less meat

Small-scale agroecological farms deliver significant quantities of a diverse range of fresh and processed foods, especially vegetables, for which there is a growing demand. Their mixed nature, weighted towards vegetable and fruit production, combined in some cases with high welfare, sustainable animal production, supports the recommended shift towards eating more vegetables and less meat (Schoen and Lang, 2016; Allen et al. 2013). Furthermore, this shift towards less meat and more plant crops, contributes to the changes in land management practices needed to reduce greenhouse gas emissions to 27% of their current levels (Allen et al. 2013). They are doing this largely without the benefit of subsidies, and are naturally delivering environmental benefits and helping local communities to engage with how their food is produced. The potential of such farms to contribute to feeding the UK in the twenty-first century deserves closer attention, since a thriving small farm sector could simultaneously address many of the environmental, social and economic challenges afflicting the food and farming system.

Recommendations for Further Research and Action

1) **A repeat study with methodology improvements**: Revisit the "A Matter of Scale" study in five years from 2014/2015, to identify whether further experience and time for soils to develop has had an impact on yields and financial viability, especially for the newly established holdings in the AMOS study**.** Such a follow up study would enable improved methodologies to be used, and methodological flaws identified in this study to be addressed. These include specifying precisely that the growing area in horticultural systems should include access paths (from mid point to mid point), whether a fixed (raised) bed or row crop system is used. An efficient methodology for collecting input data must be developed, to enable the outputs of different systems to be evaluated in light of different levels of input use. A simpler questionnaire, aimed at attracting a much larger number of respondents combined with in depth studies of fewer holdings, would enable investigation of specific practices that contribute to the productivity of small farms.

2) **Total input and output and diverse systems measurement**: Develop a methodology for measuring the total input and output of diverse small farms that enables them to be compared with large scale farms. The method would need to account for the integrated and cyclical nature of agroecology, rotation of livestock around the holding and distinguish between livestock raised on home produced or bought in feed.

3) **Recordkeeping and benchmarking**: Establish a system for small farmers to record and share productivity data that is simple and easy to use and ties in a benchmarking service to increase motivation to use the data. Work with the Farm Business Survey or Defra to design a system that meets the data needs of small farmers/growers. Defra should provide funding to develop such a system, which could then be used by the Farm Business Survey to expand their activities to take account of the production capacity of small scale and urban, multi benefit agriculture. Future work should continue to take into consideration work done by the Organic Research Centre on horticultural costings, and Sustain on measuring the productivity of urban growing projects.

4) **Quantification of multifunctional benefits**: To strengthen evidence that small scale farms offer environmental and social benefits not present on larger farms, it would be valuable to quantify some of the claims made about multifunctional benefits (including energy sovereignty), and to identify whether it is scale or agroecological/organic management (or a combination of both) that is the causal factor for these benefits. Such quantification would be valuable when collaborating on campaigns with other organisations in providing numerical facts for qualitatively claimed benefits, such as the reduction in food wastage achieved by direct marketing**.**

5) **Policy recognition of the role of small scale farmers:** At present farms of 5 ha and less are not eligible for payments under Pillar 1 of the Common Agricultural Policy, despite the fact that this study indicates that many such farms are producing high quality food in reasonable quantities, generating desirable employment and providing multiple social and environmental

benefits. Agricultural policy should value the role of small farms and urban market gardens as part of the mix of farm scales that is necessary to feed the United Kingdom. A move away from the area based subsidy scheme towards one that rewards public goods on a points based system would remove this inherent bias towards large scale agriculture.

6) **Start-up grants for agroecological farms:** New entrants face significant barriers when establishing farm businesses due to the cost of land, accommodation and capital demands to develop infrastructure and purchase equipment. Provision of grants or interest free loans would enable them to progress faster towards efficiency, productivity and financial success. Scotland and Wales provide such funding, but in England small farmers struggle for years with inadequate equipment and infrastructure due to lack of capital, restricting their capacity to fulfil their potential.

7) **Training and careers advice:** Small scale, agroecological farms already provide desirable employment opportunities due to the varied, skilled and sociable nature of the work. A thriving small farm sector could provide further such employment, attracting UK workers into agricultural jobs. Children should be encouraged from a young age to learn about farming and the practical skills it entails, and provided with informed careers advice about the employment opportunities offered in the agroecological farming sector. Agricultural colleges should provide more training in the highly specific skills required to be a successful agroecological farmer.

8) **Access to land:** The high cost of land and associated accommodation currently restricts the opportunities for new entrants to establish viable businesses. County farms, which traditionally provide a starting point for new entrants, are usually larger than 20 ha and are not appropriate for many of the types of businesses discussed in this study. Dividing some county farms into smaller units, with on-site accommodation, and encouraging land owners to rent or sell small parcels of land to new entrants are two ways in which local and national government could facilitate a rural renaissance.

Appendix 1 – Tables of Production Results

Table A1.1. Summary of meat livestock data

	N=	Average breeding herd/flock size (Range)	Average no. animals sold as meat (range)	Mean total kg meat/year (range)
Cattle	9	3.9 (1-9)	2.68(1-8)	575.38 (100-1760)
Sheep	17	15.77 (3-65)	22.4 (3-80)	496 (20-2000)
Pigs	15	2.9 (2-29)	6.84 (2-29)	416.7(100-2070)
Goat	4	(4-7) n=2	3.5 (2-6) incl. sold as meat stores from one holding	87.5kg (35-140 n=2)
Chickens	3	22.3 (12-40)	15 (both 15)	No data provided
Turkeys/ Geese	5	26 (3-100)	26(3-100)	161.5 (21-560)

Table A1.2. Summary of laying rates of hens, related to flock size

No. eggs per hen	Frequency and flock size
<100 100-199 200-299 300 and over	7 (flock sizes – 5, 32, 20, 10, 25, 50, 4) 6 (flock sizes – 12, 16, 30, 50, 25, 20) 8 (flock sizes – 140, 100, 15, 12, 150, 50, 15, 35) 3 (flock sizes 3, 20 and 50 hens)
N=24 (2 did not provide data)	24

Notes: For comparison, 280 eggs per hen is a standard laying rate for organic systems (Lampkin, M et al. 2014, p. 199), and 312–330 for non-organic (Redman 2015, p. 96).

Table A1.3. Summary of milk yield results from the four dairy holdings

No. milking cows	Total milk yield/yr (litres)	Average yield/cow (litres)	Percentage processed	Additional dairy products
1	2500	2500	75%	Cheese, yoghurt
2	8700	4350	75%	Cheese, yoghurt, cream, ice-cream, Indian sweets
2	3650	1825	30%	Cheese, yoghurt, butter, ice-cream
3	7300	2433	95%	Cheese

Table A1.4. Comparative yield data from organic and non-organic dairy farms (litres/cow/yea

	Organic* (Friesian/ Holstein)	Non-Organic** (Friesian/ Holstein)	Non-Organic Channel Island Breeds**	Organic Yield as % of Non-organic yield	Channel Is. Breed as % of Friesian/ Holstein average
Spring calving	5000	5250-6000 (average 5625)	4150	88%	74%
Autumn calving	No data	7000	5000	No data	71%
All year round calving	6200	8000-9500 (average 8750)	6250	74%	71%

*Notes: *Lampkin et al. 2014, p. 184–186, **Nix Farm Management Pocket Book 2016, p. 4551.*

Table A1.5. Top six yields (kg/m^2) for each of the indicator vegetable in 2014

	Rank of Yield						Mean	Median
	1	2	3	4	5	6	For full dataset	
Potato	8	3.85	3.66	3.2	3	2.9	2.58	1.64
Tomato	15	12.5	10.56	10	9	9	5.13	4
Carrot	10	7.5	5	4	3.3	2.5	3.2	2.5
Leek	12	10	9	6.7	4.2	4	4.37	1.56
Broad bean	7.2	5	4.2	3.6	3.3		2.04	1.03
Squash	11.3	10	7	5.6	5	3.8	2.32	2
French bean	8.4	8	6	4.8	4.6	4	1.92	2.1
Leaf beet and Chard	11.67	10	5.2	5	4	3.8	3.31	1.58
Kale	6.88	4.3	4	2.7	2.6	2.5	2.21	1.15
Salad leaves	9.36	6	4.3	3.3	3	2.7	2.43	1.42
Parsnip	10	3.3	3.2	2.5	2.5	2.4	2.89	2.33
Beetroot	12.8	10	8	5.1	4.5	3.3	3.77	2.95
Onions	6	5	3.6	2.9	2.5	2.15	3.2	2.88
Calabrese	4	2.5	1.67	1	0.6	0.4	1.14	1
Cabbage	10	8	7.5	4	3.6	3.5	3.05	3.25
Courgette	7.35	6.7	6.3	5	3.9	2.6	3.89	2.05
Sweetcorn	2	4	0.9	0.4	0.1	n/a	1.37	0.88

Table A1.6. Top six yields (kg/m^2) for each of the indicator vegetables in 2015

	Rank of Yield						Mean	Median
	1	2	3	4	5	6	For full dataset	
Potato	5.00	3.33	2.88	2.5	2.14	1.63	2.67	2.50
Tomato	17	8.68	7.78	7.5	5	4	5.5	4
Carrot	4	3	2	1.71			2.54	2
Leek	12.8	7.21	5	3.2	2.86	1.5	5.37	5
Broad bean	3.33	2.74	2.64	2	1.88	0.8	1.72	1.94
Squash	4.55	3.33	2.8	2.4	2.2	2	1.22	2.2
French bean	3.07	3	2.13	2	1	0.69	1.51	1.5
Leaf beet and Chard	6	4.68	4.22	2			4.22	4.45
Kale	6	3.11	1.7	1.6	0.2		2.6	2.35
Salad leaves	5	3.63	3	2.5	1.47	0.75	2.73	2.75
Parsnip	4.11	3.2	2.5	2			2.95	2.85
Beetroot	8	4.9	3.5	2.5	2	1.6	3.75	3
Onions	5	3.43	1				3.14	3.43
Calabrese	1						1	1
Cabbage	8	7.5	4	3.61	3.5	3	2.64	2.64
Courgette	6.32	6.25	6.22	6	4.82	2.45	4.81	6
Sweetcorn	1	0.56	0.4				0.65	0.56

Table A1.7. Summary of fruit yields and sample sizes for 2014 and 2015, and comparison with standard organic and non-organic yields

Fruit	N=	2014 Yield kg/sq m Mean (Min-Max)	N=	2015* Yield Kg/sq m Mean (Max-Min)	Organic Yields**	Non-Organic Yield***
Total top fruit	20	1.3 (0-2.5)	4	0.65 (0.02-1)	1.19	n/a
Total soft fruit	19	1.43 (0-13.33)	5	1.02 (0.2-1.67)	0.73	n/a
Apples*	7	0.21 (0-0.8)	4	0.96 (0.02-1.84)	1.19	3.5
Pears*	2	0.75 (0.25-1.24)	1	2	0.8	2.25
Strawberries*	7	1.27 (0-3.75)	4	0.35 (0.2-0.5)	0.73	2.1

Notes: *Autumn survey only ** Lampkin, Measures and Padel 2017, p132-153 *** British Growers Association (pers. comm.)

Table A1.8. Main themes in the answers to the question 'How do you use your land in ways which result in two or more crops from the same land in a given year?'

Method	**Total**
Succession cropping (2 or more crops in one season)	37
Companion planting/Intercropping/Polyculture	19
Green manures/catch crops	6
Rotation within a mixed farm	6
Orchard/Poultry	8
Undersow with legumes	4
Residues used as animal forage crops	3
Woodland coppice/pollard also used as leaf fodder	3
Agroforestry/alley cropping (eg cider apples and annual crops)	3
Stacking/use of vertical space	2
Education	2
Seedlings propagated elsewhere, not direct sown, so can get in extra crop	2
Deep beds	1
Grazing follows hay	1

Table A1.9. Categorisation of responses to the question, 'What are the main barriers that prevent you from increasing productivity?'

		Sub-Total
Time and Labour Issues	Insufficient labour	18
	Can't afford wages because prices too low.	13
	Lack of time	15
	Lack of energy/physical stamina, sometimes age related	6
Total 55	Lack of experience/knowledge	3
Lack of Capital	Inadequate equipment/infrastructure	9
	Insufficient start-up capital	11
Total 22	Lack of CAP payments enabling investment in core production	2
Physical Issues	Land limitations	8
	Lack of space	6
	Weather	5
	Pests and diseases	4
	Weeds	1
Total 26	Accessing manure for fertility	2
Institutional problems	Bureaucracy	2
	Difficulties in marketing produce	4
Total 10	High environmental standards restrict productivity (eg organic)	3
Other	No need to increase productivity/Increasing efficiency is greater	4
Total 3	priority	
	Outside pressures	1

Table A 1.10. Categorisation of answers to the question 'What are the main environmental benefits generated by the way you farm?'

Environmental Practice	**Total No. Mentions**	**Category Total**
Biodiversity		
Generally increased	31	
Habitat creation	8	
Hedges	5	
Tree planting	4	
Hay meadow	1	
Wide headlands/beetle banks	2	
Beneficial insects	4	55
Water		
Rainwater harvesting	1	
Increased water holding capacity of land	5	
Less pollution	5	11
Soil		
General soil care	9	
Improved land fertility/soil structure/soil biological activity	7	
Minimum tillage	2	
Biochar and mulching	2	
Improved sward health/resilience to poaching	2	
Winter cover crops/weeds left as cover	3	25
Other Sustainable Management Practices		
Fewer inputs	8	
Diverse crops	3	
Perennial crops	2	
No pesticides/fertilisers	15	
Low stocking density	1	
Seed saving	1	
Low personal impact	1	31
Energy and Climate change		
Carbon sequestration	25	
Low energy/fossil fuel use	9	
Off-grid	5	39
Food system		
Less packaging	6	
Fewer food miles/shorter supply chain	15	
Less waste	10	
Recycling others' waste as compost	2	
Self-sufficiency	1	34

Table A1.11. Categorisation of answers to the question 'What are the main social benefits generated by the way you farm?'

Social Benefit	**Total No. Mentions**	**Category Total**
Provision of better food		
Fresh food	29	
Healthy food	23	
Good quality/nutrient dense food	3	
Better tasting food	1	
Unusual food (eg Mexican squash)	1	
Affordable	4	
Organic	15	76
Education		
Education	40	
Outreach activities	4	
Maintaining traditional skills and knowledge	1	
Open days/farm walks/open gate policy	15	60
Community		
Community building	19	
Food share with neighbours	8	
Barter (skills, produce)	2	
Farm community	3	
Social events held at farm (meals, bonfires)	2	
Local produce	8	
Fun	1	
Yurt camping	1	
Allotments for local people	2	46
Personal development		
Therapy for mentally ill people/herbal medicine	10	
Opportunity for connection with natural world	7	
Volunteering opportunities	1	
Freedom to think for myself	1	
Challenge	1	20
Local economy		
Job creation	6	
Other businesses located at farm	2	
Support local economy through our agricultural expenditure	3	11
Other		
Keeps farm small/human scale, rather than being swallowed up	3	3

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APPENDIX [F]

Examples of decisions evidencing functional need

Appendix 10: Table of planning decisions for farm and horticultural businesses on less than 10 acres

Site	Description	Farm size (ha)	Permission
Staverton Bridge	Plant nursery with 2 glasshouses, 2 polytunnels and raised beds.	0.4	PINS T/APP/C92/ K1128/618557/P6
Bee Organics	4 polytunnels and a glasshouse for propagation, 'numerous raised beds', producing organic heritage and unusual salad leaves, vegetables, herbs, top and soft fruit and nuts.	1.6	PINS APP/K1128/A/ 10/2124162
Elder Farm, Greenham Reach	Organic culinary and medicinal herb growing selling direct to customers	2.2	PINS APP/Y1138/A/12/2181808
Ourganics	Off grid Permaculture demonstration site with small amount of local food sales.	2.0	West Dorset District Council 1/W/04/000790
Kimberley Nurseries	Wholesale nursery growing 500,000 plants with 0.16ha polytunnels and 0.02 acre glass house.	2.3	South Hams District Council 44/1048/09/F
Spring Grove Market Garden	Organic field and polytunnel grown vegetables, flowers and herbs, with some eggs.	2.6	Taunton Deane Borough Council 23/03/0024
Wild Geese Acres, Greenham Reach	Organic salad bag business, sheep, pigs, orchard	2.7	PINS APP/Y1138/A/12/2181821
Tir Penrhos Isaf	Permaculture holding	2.8	Snowdonia National Park NP5/60/7B
Woodland Organics	Organic field vegetables and fruit and eggs.	2.9	PINS APP/P1133/A/00/ 1047441
Rosebarn Nursery	Nursery with focus on chilli production and mail order plants but also with small orchard, a range of soft fruit, and raised vegetable beds. Organic and off-grid.	3.2	PINS APP/J9497/C/11/ 2149857 and 2149861
Steepholding, Greenham Reach	Organic mixed holding: fruit trees; vegetable box; goats; soft & top fruit.	3.4	PINS APP/Y1138/A/12/2181807

Coppergon	Fresh and dried flowers, stabling of horses, eggs, pullets, slaughter cockerels, rare breed fowl, sale of weaners, honey.		3.5	PINS T/APP/C/93/Q0830 /629612 & 3 and T/APP/Q0830 /A/93/226397/P6
Vallis Veg	Organic vegetable box scheme with vegetables cultivated on just 2 acres of the site.	(0.8)	7.2	PINS APP/Q3305/A/13/2196614

APPENDIX [G]

Illustrative functional need of an ecological, off-grid smallholding.

Ecological Land Co-operative

ILLUSTRATIVE SMALLHOLDER FUNCTIONAL NEED

FEBRUARY 2017

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For a Living, Working Countryside

This document has been prepared by the Ecological Land Co-operative Ltd. It is written to be read in conjunction with the planning application, plans and other documents accompanying the application.

ILLUSTRATIVE SMALLHOLDER FUNCTIONAL NEED

1. We have not submitted business plans for the three proposed smallholding businesses with this application. Only after a consent is granted can we responsibly advertise smallholdings and invite applicants to submit their business plans. By involving prospective smallholders before a consent has been secured we are effectively asking individuals and families to put their lives on hold for an unknown period while we work our way through the planning process with an unknown outcome.

2. At Greenham Reach, the Ecological Land Co-operative's (ELC) first project, we recruited prospective smallholders at the local planning authority's (LPA) request in May and June in 2011 and the LPA refused our applications a year later. The appeal was allowed in April 2013, two years later. By then, all of the original applicants for our smallholdings had taken up farm business opportunities elsewhere.

3. The documentation evidencing functional need submitted with our Greenham Reach applications included an agricultural appraisal by Rebecca Laughton MSc, an appraiser specialising in small-scale and ecological food production. Her appraisals can be downloaded from here: http://ecologicalland.coop/planning-documentation

4. What follows to support this application is an example smallholder functional need, using the functional needs as set out for one of the three smallholder businesses proposed for Greenham Reach, Plot C. As above, the original applicants for Plot C - Mr and Mrs Guskov - did not purchase the smallholding, due to being offered a plant nursery before planning consent was granted for Greenham Reach. The smallholding was bought by Ruth O'Brien and Alex Wilson.

5. The proposed business for Plot C was as follows:

    a. A market garden (1ha), plus two medium size polytunnels

b. Vegetable and herb nursery, to propagate seedlings for market garden and to sell to other growers.
c. An agroforestry enterprise (1ha), to provide top and soft fruit, mushrooms on logs, herbs and perennial vegetables and provide firewood for space heating (dwelling, polytunnels, poultry brooder shed).
d. Processed Food (jams, chutneys, pickles etc) made from surplus and non-marketable produce
e. A poultry enterprise (300 birds on about 0.3 hectares) to supply pure bread point of lay hens for sale.

6. Ruth and Alex's business is not dissimilar to that of the business proposed by the Guskovs, the principal difference being that in place of a chicken hatchery, Ruth and Alex have developed a micro-dairy with Golden Guernsey goats.

7. Ruth and Alex's business can be viewed on-line here: https://steepholding.wordpress.com/

8. The following table sets of the functional needs of the Guskovs' proposed business. References to other planning decision within the table below are to decisions referenced in **Appendix** Table of Planning Decisions for Farm/Horticultural Businesses on less than 10 acres.

Functional need	Reasoning[1]	Where this has been accepted (other than Greenham Reach appeals)
Polytunnel ventilation and temperature control	Constant monitoring is required of the polytunnels to ensure they do not get too hot or cold and this can only be carried out by visiting the site and manually adjusting vents or the proposed wood burning stoves. The Guskovs' proposed plug plants are particularly susceptible to extremes in temperature but the proposed greenhouse vegetables (tomatoes, etc.) must be also protected from low temperatures. In the case of tomatoes and cucumbers, which are sown in January, replacement of the plants would be a lengthy procedure resulting in financial losses since the start of the cropping season would be delayed by a month or two. Heating will be provided by wood burning stoves, combined with a thermal mass system using water tanks. It is sometimes necessary to make a decision fairly late at night about whether or not to use heating, in order to conserve resources.	Deciding on Rosebarn Nursery the Inspector noted that polytunnels could be required to be opened at around 5 a.m., "as crops have been lost in the past due to the tunnels not being opened until 7 or 8 a.m.". In the case of Sydling Brook the inspector found that: "automatic sensors could remotely warn of actual low temperatures but would still require action on site late at night or early in the morning".
Protection of seedlings (in polytunnels and glasshouses)	The early season production of sensitive seedlings such as tomato, peppers, aubergines and cucumbers, is an intensive process requiring frequent attention. In January, when the seeds are sown they must be kept at a constant temperature of 18°C to ensure germination. Most growers propagating their own seedlings operate an alarm system connected to their house, to alert them to a sudden drop in temperature during the night. By living on site the Guskovs can respond immediately to the problem, thus avoiding significant losses. In addition, the seedlings will require regular watering, and it will be necessary to attend to polytunnel ventilation according to weather conditions. It will be particularly important that seedlings are raised successfully if they are being sold on to other local growers. It would be hard for those growers to find an alternative supplier of the right plant varieties at the scale they need at short notice, thus causing financial losses due to delays in cropping.	Inspectors have found that a) although environmental controls may break down infrequently, when they do, losses would be critical to the business (Bee Organics); and b) that both seedlings and environmental controls require regular, including night-time and early morning checks (Sydling Brook and Trevalon Organics).

[1] Largely taken from the accompanying Agricultural Appraisal

Functional need	Reasoning	Where this has been accepted (other than Greenham Reach appeals)
Irrigating polytunnels	The polytunnel crops must receive enough water through the summer months. Watering before sunrise and after sunset is the best way of avoiding water loss through evapotranspiration and leaf damage from 'burning'.	From Sydling Brook: "irrigation in polytunnels is best done at night or first thing in the morning … automated systems are prone to failure" Inspector.
Early harvesting of fragile crops	During the summer leafy crops, such as salads, are best harvested early in the morning before they wilt in the heat, to prolong shelf-life. Good shelf-life is significant to the success of this element of the business as leaf quality and consistency are key to retaining customers, particularly restaurants.	From Sydling Brook "summer crops such as lettuce have to be harvested at cool times (early in the morning or late in the evening)" and "box packing... Is usually done in the evenings when it is cool" Inspector.
Pest control	From Sydling Brook "Slugs are one of the most destructive pests in polytunnels. The conditions needed for the young plants are also ideal for the breeding and feeding of slugs. One slug bite can destroy a newly germinated seed and one slug can kill many young plants in a single night. Damage can be caused to larger plants like lettuce, tomatoes and cucumbers. Clearly an organic grower cannot use normal pesticides for control. There is a raft of other measures against slugs, including biological controls, but one of the most effective is waiting until it is dark and picking the slugs off the plants by hand, using a head light, and destroying them. This is a time consuming manual job which has to be done regularly during hours of darkness… large pests can also be a serious problem. One such large pest on the loose undetected can devastate the crops overnight. Deer might be controllable by mechanical scarers but such noises are disruptive to other residents and are not always effective. Rooks and pheasants become scarer resistant, and badgers can get through rabbit and other types of fences. The best method of control is the appellants walking their dog around the property late at night and /or early in the morning. The presence of the dog frightens-off any larger pests encountered and its residual scent provides additional longer-term deterrence"	Inspectors found that controlling pests creates a functional need to be on site in the cases of Woodland Organics, Strong Orchard and Sydling Brook".

Functional need	Reasoning	Where this has been accepted (other than Greenham Reach appeals)
Weather related emergencies	The Guskovs will need to be on-hand to close vents and doors in case of rain and in the event of high winds, cut the plastic to save the polytunnel frame from being bent. Such a decision can only be made by someone present on-site. Alternatively, a wind-break barrier made from bales, can sometimes protect the tunnel and save the plastic. The delay caused by having to travel to the site in the middle of a windy night to check for damage might mean that remedial action was taken too late. Also from Rosebarn Nursery "snow could also hinder or prevent the operation of the solar panels which provide energy to heat the propagators …. There is also a greater risk in the winter of the solar and wind powered batteries running low at night, requiring use of the emergency generator. The loss of plants and produce would be likely to result without someone on site at most times to deal with such emergencies." Inspector	This issue was recognised by inspectors in four cases. Rosebarn Nursery is particularly appropriate as it is also off-grid: "it is clear that judgements are required on site at short notice as to what action should be taken in the light of weather conditions at the site itself … It would be very difficult if not impossible for appropriate and timely action to protect crops to be taken without someone being present on the site at most times, and without such action serious loss of crops could occur. Given the limited availability of power on the site, automatic warning systems would not provide a solution...Any snow damage to the polytunnels could lead to loss of growing plants if not addressed quickly" Inspector.
Watering an open field area	The Guskovs will be watering their field crops manually and this is best done either very late or early in the morning.	From Sydling Brook: "[watering] should also be done either very late or early in the morning" Inspector
Preventing frost damage	In winter plants must be covered at sunset to protect them from frost and at sunrise this must be removed to allow daylight and moisture to get to the plants.	For Woodland Organics "the appellant loses a significant amount of his produce to .... unexpected night frosts. The appellant considers that his virtually continuous presence on site is required to … take the necessary action to limit the harm caused by unexpected frosts". Also of relevance is that the predecessor to Annex 1 of PPS7, Annex 1 of PPG7 specifically identified frost damage as part of functional need.

Functional need	Reasoning	Where this has been accepted (other than Greenham Reach appeals)
Egg incubation and chick rearing	Egg incubation is a delicate process, requiring frequent monitoring of the temperature and humidity of the eggs, followed by the heating of the newly-hatched chicks. There is a risk that the chicks will overheat, as much as die of cold, if the heating system does not act as predicted. Due to the site being off-grid, the electricity to power the heat lamps will come from renewable energy sources, and the incubation will require more diligent monitoring than a mains system. The wood burning stove that will keep the chicks warm from three weeks old will also need regular refuelling. A back-up bio-diesel generator is also available if the renewable options fail. In total 340 chicks will be raised each year (divided into 3 batches), and this would be too large a number to keep in a domestic (probably rental) situation were Mr. and Mrs. Guskov unable to live on site.	From Venn Copse: "To my mind, the essential need for a worker to be readily available to deal with emergencies particularly arises because of the susceptibility of the chickens to changes in temperature during the first three weeks of their lives and the need for a worker to be able to respond promptly to changes in temperature which are most likely to occur during the night" Inspector. From Beech Ridge Farm: “There are automated systems that regulate temperature and water supply, but these require regular monitoring and rapid response in the event of failure, to prevent significant loss of stock numbers .. " Officer's report.
Chicken protection	The chickens require a least twice daily attention for letting out, feeding and watering, egg collection and putting in again at dusk. In the summer they will stay out until 9 or 10pm, meaning that were the family not resident on site it would be necessary for someone to return to the farm to shut up the chickens. It is during this dusk period that they are at greatest risk from fox attack. Due to the focus being on raising pure-bred point of lay pullets, the value of each bird and the investment which has gone into it, means that protection from foxes is a particular concern.	The protection of poultry, and other stock is acknowledged by the Inspectors deciding Woodland Organics, Strong Orchard and Beech Ridge Farm.

Functional need	Reasoning	Where this has been accepted (other than Greenham Reach appeals)
Overnight presence during lambing	The sheep will need daily checking and an overnight presence at lambing time.	At Blackthorn Farm, lambing was accepted as a functional need in the West Dorset District Council commissioned appraisal by Reading Agricultural Consultants, contributing to the planning committee decision to give temporary permission in September 2010.
Range and quantity of activities	The proposed farm business is labour intensive, including a wide range of crops and animals, and of items produced, most of which will require the attention of the Guskovs on most evenings and most mornings. The Guskovs will be living off-grid and the infrastructure (solar PV, compost toilet, W.E.T. system, etc.) will need maintaining. The Guskovs will also be contributing to the ELC's programme of education and hosting an annual school visit and open day. All of these taken together makes a strong case for there being a functional need for an agricultural workers dwelling.	This has been accepted for Bee Organics, Coppergon, Sydling Brook, Trevalon Organics, and Five Penny Farm. In deciding Five Penny the Inspector wrote "one of main features of this enterprise is the diversity of the crops grown, the animals on site, and the variety of items produced … [this] makes the enterprise very labour intensive and give rise to the need for the physical presence of one or more of the appellants on the site throughout a long working day, frequently during the evenings, and sometimes at night".
Security	While this alone is not a reason for on-site accommodation, for the business proposed the agricultural assessors believes that security is a legitimate concern. There are instances of animal theft or abuse when a site is not attended, as well as petty theft of equipment such as tractors, electric fence batteries and posts and metal for scrap.	This was given as one of the grounds that established a functional need at Rosebarn Nursery.