Barriers to raising productivity on upland farms in England

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Abstract

This study reports the resource constraints and their impacts on upland farms in England. The majority of respondents (105, 85%) reported one constraint, 65 (52%) reported two. The most frequently reported constraint was "Land- and tenure-related issues", given by 44 (42%). Other constraints included; "personal and family related issues (including succession)" by 18 (17%); "poor cash flow and low profitability" by 17 (16%); and "general uncertainty regarding Brexit" by 16 (15%). The main impacts of the primary constraints were reduced profitability, through increased costs and/or lower revenue (30 respondents) and reduced output, lower stocking rates (17), lower investment (12), and problems created for livestock management (9). 5 respondents reported that the resource constraint had directly led to the restructuring of their business. 58 respondents (48%) believed they needed external assistance to remove their constraint, principally because of low profitability (31, 53%). The majority did not support the withdrawal of direct payments, and wanted grants available for upland farming (25), additional training course (7), changes to emphasis away from environmental to traditional farming outputs (6), and alterations to taxation regulations (6), few offered innovative policies. The survey suggest that a farmer's willingness and ability to adapt to the changes in policy and support payments will be the most important determinant of which upland farms continue in business after the UK has left the European Union.

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Executive Summary

This research examines the resource constraints, the bottlenecks these constraints create and their impact on farms, and respondents preferred policies for assisting them to remove the constraint, as reported by 124 participants in a survey of upland farm businesses in England conducted in the spring and summer 2017.

The survey was a "bolt-on" to the Farm Business Survey (FBS), used the FBS's definition of an "upland farm", and was conducted by face-to-face or telephone interviews by FBS staff.

England uplands cover 2.2 million ha, 17% of its agricultural land. The farming in these areas is typically limited by altitude, climate and land type to sheep and cattle grazing. These criteria, and the distance of the farms from markets, in part explain the low profitability of many upland farm businesses.

FBS data show average Farm Corporate Income (FCI) of upland farms was negative in the 4 years between 2011/12 and 2016/17. It also shows that the majority of upland farmers lose money on their traditional farming activities, and are dependent on the Basic Support Payment scheme and agri-environmental payments to remain in business.

The majority of respondents (101 of 113 useable responses, (89%)) understood the concept of bottlenecks in the farming system being caused by a resource constraint which adversely affects their farm business. The concept was discussed and explained to those who were not familiar with it before starting to ask questions.

105 respondents (85%) reported one (their primary) constraint, and 65 (52%) reported a second (their secondary) constraint. "Land- and tenure-related issues" was the most commonly reported constraint (by 44 respondents (42%)); "personal and family related issues (including succession)" by 18 (17%); "poor cash flow and low profitability" by 17 (16%); and the "general uncertainty regarding Brexit" by 16 (15%). Other constraints included: "staff-related issues", "access to affordable capital", and "dated and obsolete farm buildings" (Table 10).

The main impacts of the reported primary constraints were: reduced profitability, either directly, through increased costs and/or lower revenue (30), or indirectly, through reduced stocking rates (17); lower investment (12); and problems with livestock management (9).

Nineteen respondents reported that their primary constraint had hindered the development of their farm business, only 5 reported that the need to address their constraint had motivated the restructuring of their business.

The majority of respondents (58) believed that they would not be able to remove their primary constraint acting alone (Table 22), low profitability was the reason given by 31 respondents for this.

Specific policy suggestions made by respondents included: making grants available (25); alterations to (but retaining) the Basic Payment Scheme (10); provision of training course (7); changes to the existing balance between food and environmental outputs (in favour of food) (6); and alterations to taxation regulations (6). These policies are largely those tried and tested by existing domestic and EU policies, only a few respondents suggested innovative policies.

The Agricultural Bill (2018) proposes a phased withdrawal of direct payments to use a proportion of the former's budget to fund Environmental Land Management Schemes (ELMS) (which had previously been called agri-environment schemes) for the provision of "public goods". However, as few respondents supported the current emphasis on environmental outputs, these changes are not likely to be popular with the majority of upland farmers.

The upland farmers in this study are, by definition, those who have survived several difficult trading years. Clearly, they have learnt how to best manage their particular farm constraint(s). But policy changes as deep-seated as those proposed in the Agricultural Bill will create winners and losers, and Defra expects it will increase the rate of structural change.

This may be two edged for the surviving farms. Whilst restructuring is likely to bring more land to the market and to lower land rents and purchase prices, which would help the successful farms to expand, ELMS are likely to impose additional environmentally-related restrictions on farming practices.

Despite the economic realities of upland farming, the majority of respondents supported policies that prioritise food production over environmental outputs. If the planned policy changes do take place then it is likely that a farmer's willingness and ability to work their land for environmental rather than more traditional farming-related outputs will be the most important factor in determining which upland farms continue in business after the UK has left the European Union.

1 Introduction

Businesses use inputs, such as labour, land and water, to create outputs, and add value in the process. The efficiency with which this transformation occurs depends on the types and combinations of inputs used. Businesses which achieve the perfect balance between inputs, so that each is fully utilised, are the most efficient. However, a shortage of one input can create a bottleneck which prevents other inputs being fully utilised. This reduces the production of the farm, which lowers its profitability.

The effects of the bottlenecks caused by the resource constraints on productivity, and barriers to their removal are of interest to policy makers because they affect the international competitiveness of the agricultural sector. Total factor productivity (TFP) measures the rate at which inputs are converted into output. TFP is measured by physical quantities and excludes prices, and therefore can be increased by raising production and holding inputs constant, or by lowering inputs while holding outputs constant, or a combination of raising outputs and lowering inputs. TFP and labour productivity (LP, which is the ratio between output and the single input, labour) of the agriculture and horticulture sector have plateaued in recent years (Defra, 2019c) and the rate of TFP growth has fallen behind comparative countries,

> "The rate of growth in TFP in the UK [agriculture and horticulture sectors] has fallen behind that of many of our major competitors, averaging 0.9 per cent per year as opposed to 3.5 per cent in the Netherlands, and 3.2 per cent in the USA" (AHDB, 2018: p 3).

Newly calculated data shows that TFP of upland LFA grazing livestock farms has

> "Decreased by 9% from 1990/91 to 2017/18. The decrease in productivity is largely driven by an increase in the volume inputs (9%), while there has been no increase in the volume of outputs over the period" (Defra, 2019b: p 12).

This fall has been despite the reduction in the volume of labour used,

> "Over this period labour productivity has increase by 54%. This has been achieved by reducing the volume of labour used while output has been stable." (Defra, 2019b: p 12).

It is in part because Defra believes that direct payments "undermine efficiency and productivity growth" (Defra, 2018b: p 3) that it supports the withdrawal of direct payments, and a switch in support towards using public money for the provision of public goods, despite the impacts it fully

expects these changes will have on increasing the rate of restructuring of farm businesses, that is, in driving existing farms out of business (Defra, 2018c).

One way this impact can be reduced is by designing and tailoring support instruments to help farmers to remove their farm's constraint, thereby releasing the bottleneck and increasing production and productivity, and the sector's competitiveness. To do this Defra needs to know the types of constraints farmers experience, the impact of these constraints on the farm, and the barriers preventing farmers from removing the constraints. This study surveys upland farmers in England to answer these questions. It asks upland farmer to identify their most limiting resources, to describe the bottlenecks these limitations create and their impacts on the farm business and to suggest policies which they believe would be most effective in removing these constraints.

The report is structured as follows. The next section explains the reasons used to justify support for upland farms, and presents recent trends regarding their profitability. Section 3 describes the survey methodology, discusses respondents' understanding of the concept of resource constraints and bottlenecks, presents details of the questionnaire and summary statistics of the respondents. Section 4 details the survey's findings by respondents' primary constraint. Section 5 summarises the impacts of each primary constraint on the farm business, and Section 6 lists the barriers farmer report which prevent them from removing their primary constraint. Section 7 summarises the policy interventions that respondents believe would be of most help in removing their bottlenecks. Section 8 discusses the research findings, and Section 9 concludes.

2 Background to upland farming systems in England

2.1 Resources typically available to upland farms

In 1975, upland areas were designated as Less Favoured Area (LFA) under Council Directive 75/268/EEC to allow targeted support to mountainous and hill farming areas. Farms are classified as LFA -farms if they have at least 50% of their total area in an LFA. In England some 2.2 million ha of land is classified as LFA, 1.8 million ha is in agricultural production (approximately 17% of the total agricultural land in England (DEFRA, 2008c). LFA land is subdivided into two areas (in accordance with Article 19 of EC Regulation 1257/1999): the more environmentally challenging area is classed

as 'Severely Disadvantaged Areas' (SDA), the remaining area is classified as 'Disadvantaged Areas' (DA): about 70% of LFA land is classified as SDA, the remainder as DA (Defra, 2008a).[1]

The moorland line is an additional upland designation. It was drawn-up in 1992 and subsequently updated in 2007. Moorland is defined in terms of the vegetation present, which must be "predominantly semi-natural upland vegetation, or predominantly made up of rock outcrops and semi-natural vegetation, used primarily for rough grazing. Moorland includes both open moors and enclosed land on the margins of uplands" (EFRA Committee, 2011). The moorland line encloses just over 40% of LFA land (800,000 ha) but does not correspond exactly with SDA or DA boundaries. It has been used to differentiate between environmental schemes and payment levels, including the Single and Basic Payment Schemes. For example, areas above the moorland line currently receive a different per hectare direct payment than land below the moorland line (Defra, 2013).

Agricultural activity has largely shaped the upland landscape. The natural characteristics of these areas, their geology and altitude allows only a restricted range of agricultural activity. Moreover, the generally poor climate, and location away from large urban markets also reduces productivity and profitability. Historically upland farmers have managed these areas predominantly through sheep and cattle grazing (EFRA Committee, 2011) but their circumstances make it more difficult for these farmers to compete with lowland farms. Governments have cited these challenges and difficulties to justify developing specific polices for upland farms.

2.2 Specific support policies for upland farming

It is because the uplands have significant landscape, archaeological, recreational, heritage, and natural resource value, and contribute to cultural diversity, that the economics of upland farming have important implications for the economic, social and environmental sustainability in these areas (IEEP/LUC/GHK, 2004; Midmore and Moore-Colyer, 2005). The uplands are nationally and

[1] The majority of common land in England is located in the uplands, there are 1,400 designated common land sites, representing some 305,000ha of land.

internationally important for biodiversity. It is argued that without some form of agricultural activity these areas may lose the biodiversity and upland landscapes which society values. [2]

It is largely because of the resource disadvantage and external benefits of upland farming activities that national governments and the European Union have implemented successive policies to support LFA farms (Wathern *et al.*, 1986; DEFRA, 2008b). This justification for support is based on the contribution farming makes to the provision of public goods and the maintenance of social and cultural capital in the uplands (Harvey, 1994; Midmore *et al.*, 2001; IEEP/LUC/GHK, 2004; Midmore and Moore-Colyer, 2005). As such, these polices already in part at least, represent the payment of "public money for public goods", which is a principal intention of the soon to be introduced revised agri-environment scheme, Environmental Land Management System (ELMS) (Defra, 2018a; NAO, 2019).

The Hill Livestock Compensatory Allowance was introduced in 1975 as a coupled, headage based scheme. The Moorland Scheme was introduced in 1995 to reduced stocking rates on moorland. These schemes were replaced by land area payments in 2001, under Hill Farming Allowance (HFA) (DEFRA, 2006). HFA was tiered, farms up to 350 ha receiving the full per hectare payment rate, land between 350 and 700 ha received half rate per hectare payment, and all farmland above 700 ha received no payment. An additional 10% or 20% of the full payment was available if farmers observed certain environmental criteria.

All existing schemes were replaced in 2005 by the Single Payment Scheme (SPS) and Environmental Stewardship Scheme (ESS). The SPS offered three flat rate per hectare payments based on the land's geographical location. In 2005, for example, farmers were entitled to £214/ha for lowland land, and £117/ha and £29/ha for non-moorland and moorland land respectively. The payments were set in Euros, so their sterling value varied annually. In 2009 HFA was replaced by the ESS-Upland Entry Level Scheme. An important change was made to these renamed Basic Payment Scheme area payments in 2015. The non-moorland SDA regional area payment was increased to almost the same

[2] For example; "The need for the continued presence of hill farming activities to maintain the upland environment is largely recognized and accepted by both environmentalists and farmers alike", and "The main economic rationale for public support for hill farming is to ensure the provision of public goods that would otherwise be under provided. The continuation of hill farming, in one shape or another, appears critical to maintaining and enhancing the environmental quality of the uplands" (IEEP/LUC/GHK 2004).

value as the lowland area payments. In 2015, the Environmental Stewardship Scheme upland entry level stewardship (ESS-UELS) and higher level stewardship (HLS) were closed to new entrants and in 2016 replaced with Countryside Stewardship.

Upland farms were also eligible for additional schemes and payments depending on eligibility criteria. For example, the Farming and Forestry Improvement Scheme and the Countryside Productivity Scheme provides grants of up to 40% for projects that are innovative, use new technologies and the latest research (Redman 2018: p 152). Additional Funding for Rural Growth (worth £177 million) is available through Local Enterprise Partnerships or LEADER Local Action Groups – these cover three areas: business development, food processing and rural tourism infrastructure. Other measures permitted by the European Commission were not introduced in England. For example, coupled support payments for beef and sheep production, the Small Farmers Scheme (involving less stringent cross-compliance regime and not subject to greening in return for a fixed annual payment), Redistributive Payment (enhanced payments for the first 30 hectares), and Hill Support (an additional support to hill areas).

2.3 Profitability of upland farms

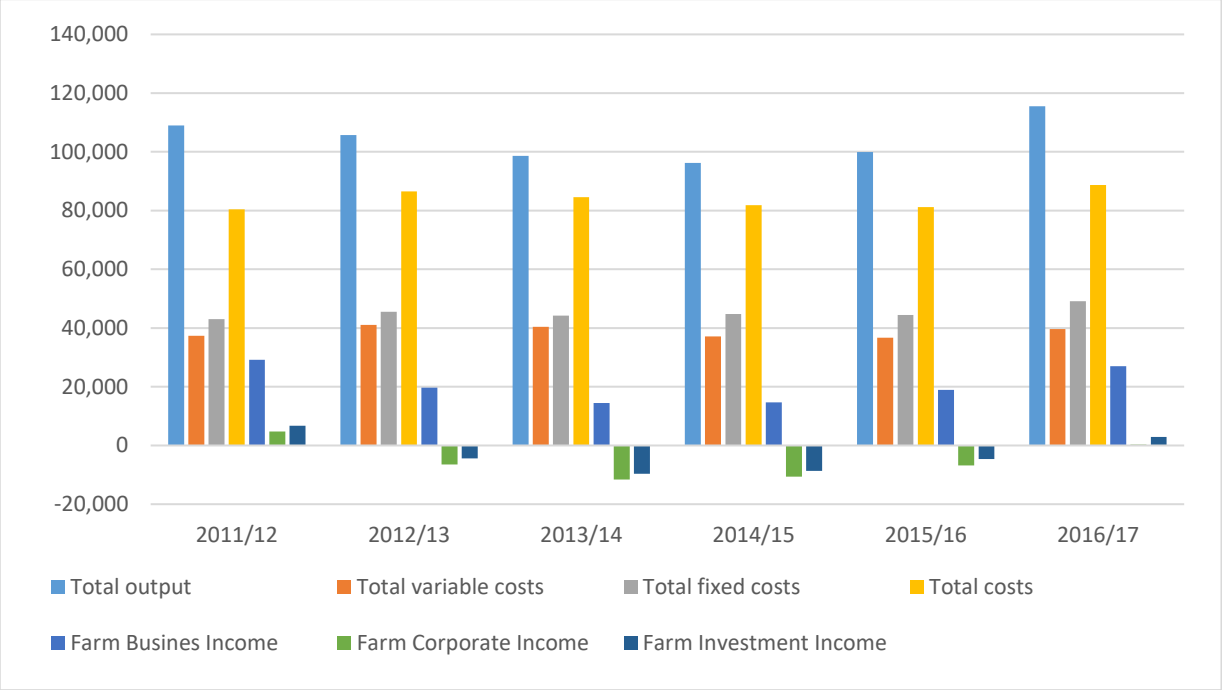
Although upland farms have benefited from a number of different types of targeted support policies for many years, business profitability tends to be low. This has been a key factor driving the structural change in the uplands (Lobley and Potter, 2004). Figure 1 shows the business output, input costs and three measures of incomes for upland farms in England between 2011/2 and 2016/7. Average Farm Business Income (FBI), which is Defra's preferred measure of farm income, decreased from £29,203/farm in 2011/12, to £14,640/farm in 2014/15, but increased in 2015/16 and reached £16,967 in 2016/17.[3] However, FBI makes no allowance for the "farmer and spouse labour and managerial input" .[4] Defra imputes a reasonable values for these labour costs and

[3] This survey excludes any contribution to the farm household income from off-farm income, although the FBS acknowledges that off-farm incomes can be used to support farming activities and household, and hence would be expected to influence the rate of farm restructuring.

[4] Farm Business Income (FBI) is defined to represent the return to all unpaid manual labour and management (farmer, spouse, farmer's family and others with an entrepreneurial interest in the farm business) and to all their capital invested in the farm business including land and farm buildings: it is Defra's preferred measure of farm income.

subtracts them from FBI to produce another farm income indicator, Farm Corporate Income (FCI), which is, therefore, a closer estimate of farm profit as a businessperson or an informed layperson would understand by the term. Figure 1 reports a negative FCI in each of the four year between 2012/3 and 2015/6, and a positive value of a mere £295/farm in 2016/17. Low and negative FCI, stretching back of many years, reduces farmers' abilities to make the investments needed to replace wearing and worn equipment (Franks, 2006).

Figure 1: Less Favoured Area Grazing Livestock Farms: Business Output, Input Costs and Income (£) (Source: derived from Harvey and Scott (various)).



The FBS reports revenues and costs by four costs centres, as shown in Table 1. The average upland farm lost £9,436 from traditional farming activities in 2016/17. Table 1 also shows the importance of agri-environment and the Basic Payment Scheme payments to FBI.

Table 1: Average farm income by cost headings for upland farms in 2015/16 and 2016/17 (FBS data: raised data).

Cost centre and Defra's measures of farm income	2015/16 (£)	2016/17 (£)
Agriculture	-10,771	-9,436
Agri-environment and other payments	9,779	11,199
Diversification out of agriculture	2,287	2,365
Single/Basic Payment	17,677	22,838
Farm Business Income	**18,972**	**26,967**
Farm Corporate Income	-6,754	295
Farm Investment Income	-4,568	2,875
Investment Income Net farm Income	9,761	16,615
Management and Investment Income	-11,681	-4,876
(Source: Harvey and Scott (2018))		

3 Survey Methodology and descriptive statics

The survey used in this research was "bolted-on" to the FBS. The FBS is an entirely voluntary survey which records financial and performance details from a randomly stratified sample of about 2,000 farms in England and Wales each year, of which 217 were upland farmers in the 2016/7 survey. The bolted-on survey was conducted in the spring and summer of 2017, it was also entirely voluntary, but limited to upland farms in England. A total of 124 useable returns were obtained from either face-to-face interviews or telephone surveys undertaken by trained FBS staff.

The survey requested respondents to identify their main farm business objective over the next three years. Then to identify if their farm incurred any constraints which caused bottlenecks to their farming system preventing them delivering their business objective. If they did suffer from resource constraints, then to state what the primary and secondary constraints were, and to describe the impacts of each constraint on their business. Respondents were then asked to discuss the barriers they faced in removing the constraint, and to suggest policies and instruments they believed would help them to remove their constraints.

3.1 Farmers understanding of the concept of a constraint/bottleneck

After introducing the survey, interviewers were asked to assess the respondent's understanding of the concept of bottlenecks and their possible impacts on the farming system. When respondents were not familiar with this concept, it was discussed and explained before the survey started.

The majority of respondents (64) were reported to understand the principles, and had also recently considered the impacts of their bottleneck on their farm. A further thirty-seven understood the concepts but had not consider it recently. Twelve respondents (11%) were not familiar with the concept, eleven awareness evaluations were not completed (Table 2).

Table 2: Respondents' understanding of the concept of bottleneck/primary constraint.

Respondent had a clear knowledge of the farm's major system's constraint. (The farmer has clearly thought about prior to being asked the question).	**Understood the concept of bottleneck, but respondent had not considered this question recently. (No ready answers were available to the questions; farmer needed time to reflect and consider).**	**Respondent was not aware of binding resource constraint concept.**
64	37	12
Number of compete responses		113
Number of incomplete responses		11
Total		**124**

3.2 Descriptive analysis of respondents

Summary details of the responses received are presented in Tables 3 to 8.

Table 3: Farm types of the 124 respondents (N=124).

Specialist beef (SDA)	**Mixed grazing livestock (SDA)**	**Specialist sheep (SDA)**	**Various Grazing Livestock (DA)**
18	42	28	36

Table 4: Age distribution of farmers (N=124).

	Age of farmer
Mean age	61
Age of oldest farmer	83
Age of youngest farmer	36
Standard deviation	9.4

Table 5: Details of farm area and income of surveyed farmers (N=124).

	Total adjusted farm area (ha)	Farm Business Income (£)	Farm Corporate Income (£)	Farm Investment income (£)
Mean/farm	149	36,115	7,327	11,762
Max/farm	955	305,163	230,387	341,863
Min/farm	20	- 129,883	- 154,075	- 100,201
Standard deviation	122	49,736	47,913	50,990

Table 6: Details of the four components of income (agricultural, diversification, environmental and BPS payments) received by surveyed farmers (N=124).

	Profit from agricultural production (£)	Profit from diversification enterprises (£)	Financial surplus from AES (£)	Financial surplus from BPS payment (£)
Mean/farm	- 12,040	3,275	15,197	29,881
Max/farm	52,332	86,703	206,414	206,878
Min/farm	- 168,059	- 3,190	0	0
Standard deviation	30,101	9,802	25,045	26,170
68 farms received some form of diversification activity payment				
104 farms received some form of environmental payment				
All farms received a BPS payment				

Table 7: Details of the assets and liabilities of surveyed farmers; unraised data (N=124).

	Closing total liabilities (£)	Change in liabilities (£)	Closing value of total assets (£)	Annual change in value of total assets (£)	New worth at end of year (£)
Mean/farm	124,781	1,315	1,205,429	14,193	1,080,648
Max/farm	2,183,338	368,288	8,173,830	477,920	5,990,492
Min/farm	0	-145,844	112,378	- 154,718	112,378
Standard deviation	296,107	54,368	1,036,753	83,569	740,646

Table 8: Details of the experience of surveyed farmers (N=124).

	Number of years respondent has managed their current farm business
Mean	25.9
Maximum	50
Standard Deviation	11.3

4 Survey Findings

Respondents were ask to report their **single** main farm business objective. However, five respondents reported more than a one objective, which accounts for the 134 responses reported in Table 9.

Table 9: Main business objective over the next 3 years (N=124).

Business objective	Number
Increase revenue	27
Reduce costs	6
Improve the resilience of the business	36
Expand and grow the business	6
Reduce and downsize the business	11
To maintain existing lifestyle	18
To ensure successful hand-over to next generation	19
Leave the industry	2
Other	9

The nine "other" responses received for this question were:

- To farm at the same intensity and maintain current lifestyle.
- To diversify income streams.
- To spend more time on other projects, do this by reducing the number of sheep and the labour required for them.
- To ensure a smooth transition from a contract farming agreement – the farmer is currently looking into farming in his own right, as a tenant on the same farm and to ensure the development of alternative sources of income.
- To start a successful milking herd of northern dairy shorthorn cattle producing milk for cheese.
- To ensure that the farm remains viable post-Brexit - very concerned about future support for the agricultural industry.
- To remain profitable post-Brexit and during uncertain times (farmer dislikes the word resilience).
- To maintain the level of profit at the pre-Brexit level.
- To reduce work load but maintain income.

4.1 Primary constraint faced by respondents

The constraints reported by respondents are listed in Table 10. Nineteen farmers stated they had no limiting constraint. The most commonly reported constraint (44) was land quality and tenure, and 59 only reported a primary constraint.

Table 10: Primary and second constraints (N=124)

The primary constraint	**Primary constraint**	**Secondary constraint**	**Total**
	(N)	(N)	(N)
Land (and tenure related) issues	22+4 (=26)	16+2 (= 18)	44
Farm buildings	12	6	18
Personal and family related issues, including succession	11	7	18
Cash flow and low profitability	12	5	17
Brexit and uncertainty	9	7	16
Staff related issues	10	4	14
Access to, and affordability of capital	10	3	13
Farming production issues relating to TB controls and general animal health issues	7	4	12
Restrictions imposed on farming practices by environmental schemes	4	5	9
Commodity market (level and volatility) issues	4	1	5
Geographically related constraint	0	2	2
Others	0	3	3
No primary / secondary constraint	19	59	
Total responses.	**124**	**124**	
Others included • Only received part of my BPS payment each year • The ability to develop new incomes streams to support the development of the farm • Red tape and paperwork			
Responses to the question: what are the business' two most binding constraints/ bottlenecks which are preventing/hindering delivery of your declared business objective?			

4.2 *Land quality and availability, and tenancy-related issues*

Twenty-six respondents reported land (22) or tenancy-related (4) issues to be their primary constraint. This is perhaps not surprising given the definition of "upland farms", and the high cost of land relative to upland farming profitability – indeed it is perhaps surprising more respondents did not give land-related issues (e.g. quality and availability) as their primary constraint. Impacts on the farm business included limiting the number of stock on the farm (11) and increased costs (8).

Eight of the 22 respondents believed there was nothing they could do to address their land-related constraint: additional land was not generally available for rent and land for sale was too expensive. Eleven respondents said that the costs of overcoming the land-constraint, for example, of land improvement drainage schemes, was too high given current profitability. Most respondents (6) thought targeted land-improvement grants, for example to improve drainage, would be the best policies to help them overcome their primary constraint.

Several respondents stated that food production received too little weight compared to policies to support environmental management. One such response is reported in Table 11. However, implementing a land-improvement scheme may conflict with specific environmental objectives and so jeopardise a farm's application to participate in agri-environmental schemes, which was the second most profitable activity in 2016/17 (Table 2).

Table 11: Responses given by two farmers who reported land-related issues as their primary constraint

Constraint	Wet land, makes it difficult to finish lambs and raises fluke problems.
Impacts	Finishing lambs requires more purchased feed.
Barrier	Cash flow - business in not profitable enough to justify capital expenditure.
Suggestion	Land improvement grants or make low interest, long-term loans available.
Constraint	Lack of good in-bye grazing land.
Impact	Limits stock carrying capacity.
Barrier	Very rare land becomes available locally.
Suggestion	Change agricultural policy to promote and encourage balanced food production and wildlife habitat creation/maintenance – it's too one sided [in favour of environmental outputs] at present.

Two of the four responses giving the terms and conditions of their tenancy as the primary constraint were related to Farm Business Tenancies (FBT). The lack of rights to succession and their short-term duration reduced incentives to invest and the opportunities to make a return on any investment respectively. No respondents believed they could remove the constraint, but gave a different reason why, namely:

- the legal framework governing FBT;
- impossibility of the tenant to prevent rent increases;
- because the "landlord was in control"; and

- because the farmer was "tied to being a tenant farmer" because he/she "did not have the capital to buy land".

Three of the four respondents believed changes were needed to increase the length of FBT agreements and, generally, to grant more protection to tenant farmers.

4.3 Staff-related issues

Ten respondents cited lack of skilled and reliable labour as their primary constraint. The impacts ranged from “jobs simply not getting done” (3), to the farm carrying fewer animals than optimal (2), and various adverse impacts on the farming system. Staff-related issues prevented two farmers from changing their current farming practices, but for another, staffing difficulties were driving change.

No respondent believed they could increase the availability of casual and/or full-time reliable labour. For some this was because of higher paying alternative local employment opportunities, others believed youngsters were not interested in working on farms. Five respondents wanted policies that improved and widened college training course and apprenticeships. Other suggestions included; provision of affordable rural housing, changing taxation regulations in favour of employing labour, and the redirection of BPS to encourage young people to actively farm. A typical response from a respondent with a staff-related constraint is given in Table 12.

Table 12: Responses given by an individual farmer who reported staff-related issues as their primary constraint

Constraint	Lack of available, skilled labour.
Impacts	Lack of maintenance of dry stone walls.
	I am thinking of reducing numbers of own sheep on the farm and maybe agisting [take in and feed for payment] other farmers’ sheep due to lack of labour at times such as lambing.
Barrier	Skilled workers can earn more money in other sectors than agriculture.
Suggestion	Reform the subsidy system to encourage young people and those who want to actively farm the land. More young farmers in an area would increase the active workforce and they would be available to help out at busy times.

4.4 Building-related issues

Twelve respondents cited building-related issues as their primary constrain. Seven lacked livestock buildings, and four were using obsolete buildings. The shortage and unsuitability of buildings raised farm costs (5) and resulted in three respondents having to out-winter stock they would rather have housed. The barriers to removing the constraint was the high costs of new or refurbishing existing buildings, exacerbated by low profitability (8).

Seven respondents supported the introduction of farm building grants, one wanted enhanced tax benefits on farm buildings, and one a guarantee that borrowing costs would remained low. Typical responses from farmers citing building-related constraints are given in Table 13.

Table 13: Responses given by two farmers who reported building-related issues as their primary constraint

Constraint	Lack of buildings for winter housing.
Impacts	Have to out-winter nearly all our stock.
Barriers	Lack of cash to make necessary changes.
	Limited ability and willingness to borrow.
Suggestions	Farm buildings grants.
	Low cost loans.
Constraint	Poor quality housing for cattle.
Impacts	Keep cattle in unsuitable conditions.
	Very labour intensive to feed cattle.
Barriers	The cost of replacement building, access to funds.
	No suitable casual labour.
Suggestion	Capital grant scheme for livestock housing.

4.5 Animal health and bovine TB-related issues

Seven farmers gave animal genetics and managing animal health and fertility as their primary constraint. Three respondents under bovine TB restrictions faced higher costs and reduced flexibility, but believed they were powerless to alleviate this problem. Three farmers could not improve herd genetics because of the high cost related to the farm's profitability, one had herd fertility problems. Farmers would like more financial assistance to compensate them for costs dealing with TB-related restrictions. One would like to see free-at-point-of-use advisory service,

akin to the ADAS services, reintroduced. Two did not offer any policy suggestions. A typical set of responses from a farmer with bovine-TB and animal health-related constraints is given in Table 14.

Table 14: Responses given by two farmers who reported bovine TB and animal health related issues as their primary constraint

Constraint	Bovine TB.
Impacts	Recurring problems with TB has meant more stock to house, poor facilities has led to animal health issues.
	Farm usually sells suckled calves in autumn markets, has been unable to do so.
Barriers	Cashflow is tight-again as a result of TB/Health issues.
Suggestions	Funding to help improve badger preventative measures to help farm go clear of TB.
Constraint	Fertility and health issues in breeding cows.
Impacts	Demoralising.
	Increase in vet costs.
Barriers	Cost of blood sampling and working with vet.
	Difficult to find someone to look at feeding regime.
Suggestion	Free vet and nutrition advice like old ADAS provided.

4.6 Low market prices and market volatility

Four respondents gave low market prices or market volatility as their primary constraint. It made accurate budgeting impossible, lowered incomes, adversely impacted on the farming system, and made it impossible to diversity business activities. Two said farm location and climate were responsible, which could not be changed, and one believed that the option to improve market prices by improving livestock genetics took too long to show a return. Policies that would help address this constraint included: education of the public, improved lamb marketing, and using grazing solely for habitat management forsaking food production. One farmer's response, who would consider becoming a specialist conservation manager, is set out in Table 15.

Table 15: Detailed response given by a farmer's who reported "market prices or volatility-related issues" as their primary constraint

Constraint	The price we receive for our produce has not changed over the last 15 years, yet the costs of inputs have all increased.
Impacts	Currently the opportunities to create and sell a different product are not there.
	Store cattle and the store lamb production work well for the farm, but the returns have not increased, the market is squeezed - someone somewhere is making some money?
	Question: if the same price for a store lamb today as it was in 2002 what does this imply for changes to the business? Are we producing a product that is not wanted? Sometimes it is not about following fashion of diversification, but making what you do work.
	Are there alternative marketing opportunities that we are not considering?
Barriers	The farm is a traditional edge-of-moor farm, costs of pasture improvement and fencing do prevent some improvement to the pasture, although this is being done with capital introduced.
	To remove the sheep would not improve the overall use of the farm, but is there an opportunity to reach outside of the comfort zone and seek new marketing opportunities? A shortage of my time stops this from happening.
	Time and money. Seeking new markets, finding a unique selling point for the product, direct sales, but to more than just a few locals. Increasing the desire for the product overall, lamb marketing?
Suggestions	Lamb marketing for meat.
	Consider grazing livestock as purely habitat management tools and do not breed for meat, but bread for vegetation management only and get paid for such.

4.7 Brexit and policy related issues

Uncertainty caused by the decision to withdraw from the European Union was the primary concern of nine respondents. Uncertainty regarding the future UK agriculture policy prevented investment, specifically in building, intensification of production, and, more generally, in "sheep-related projects". It has caused some farmers to redouble checks to ensure all expenditures are cost-effective (including livestock purchases). All respondents recognised this was a problem beyond their individual control. Five respondents wanted direct support payments to continue, two wanted a "good" trade deal. Typical responses of two farmers in this category are set out in Table 16.

Table 16: Detailed response given by two farmers who reported Brexit-related issues as their primary constraint

Constraint	Uncertainty over Brexit.
Impact	Has no impact on the day to day running of the farm at all, but has prevented me from carrying out big projects especially for the sheep.
Barrier	There is nothing I can do about Brexit.
Suggestions	Ensure appropriate trade deals.
	Poor domestic use and consumption of lamb, so increase this market and improve overseas sales.
Constraint	Concern over support following Brexit to farms in marginal areas.
Impact	Uncertainty over Brexit.
Barrier	Nothing - unknown at present.
Suggestion	Continue support for farmers in marginal areas in post Brexit world.

4.8 Personal or family-related issues

Eleven respondents gave personal or family-related issues as their primary constraint. Five respondents gave succession issues and five health issues, one said they lacked the necessary financial management skills to fully understand the financial side of their business. The majority of farm businesses in England are family businesses which often involve two or more generations of the same family, which means many need to consider succession planning in addition to other business considerations. The mean age of respondents was 61, which suggests some will be facing age-related health issues. Impacts included the need to carefully management their workload (6), disagreements about the future strategy for the business (2), delays in making decisions (1), and the need to make substantial changes to the farm business (1). Seven respondents said they were unable to do more than they were already doing, one lacked the time needed to improve their personal business skills. Suggestions to help farmers address this constraint included: tax breaks to encourage and facilitate farmers to retire; and more conveniently located and timed training courses (2). Two responses are set out in Table 17.

Table 17: Detailed response given by two farmers who reported personal heath or succession-related issues as their primary constraint

Constraint	Elderly parents.
Impact	Father's opinions and influence on the business is restricting son [the respondent] from moving the business forward and adapt. Father will not allow change - what has historically been done must continue.
Barrier	Farmer's son would like to try some different farming methods, however father will not allow it.
Suggestion	None given.
Constraint	Farmer's own health.
Impact	Farmer has to employ staff to help with manual livestock and machinery tasks.
Barrier	Cannot do much about the farmer's health issues.
Suggestion	Nothing.

4.9 Cash flow and profitability-related issues

Twelve respondents gave financial-related issues, namely poor cash flow (5), low profitability (5) and high costs (2) as their primary constraints. Poor cash flow and profitability resulted in reduced investment (3) and forced farmers into prioritising short-term management decisions. Two respondents needed to cross-subsidise their farm business from other income, and one intended to increase off-farm income. Four respondents believed there was nothing they could do to improve their financial situation, because there was no other viable use for their farm's resources (1) and for market-related issues (2). Two requested more timely payment of their Direct Payments from the Rural Payments Agency, and two wanted Defra to prioritise traditional farming activities. An organic-registered respondent wanted changes to some organic rules and regulations to help reduce production costs. Typical responses from farmers with cash flow or profitability-related constraints are given in Table 18.

Table 18: Responses given by two farmers who reported cash flow-related issues as their primary constraint

Constraint	Cashflow at certain times of the year.
Impacts	Need to time income to coincide with committed expenditure, e.g. mortgage repayments, so we have to transfer money from other businesses.
	We rely on use of suppliers who are flexible with payment terms but they expect our loyalty in return so we may not always get the best deal or price.
	It reduces our options for buying and selling so potentially makes us less competitive.
Barrier	Unwilling to increase borrowings any further at the moment.
Suggestion	Pay the BPS on time - we should receive it in December but it currently comes in April - this does not help matters!
Constraint	Cashflow.
Impact	Lack of income at certain times of year leads to shortage of cash to pay bills, so livestock tends to be sold for cashflow management rather than when at market price or optimum value.
Barrier	Farmer is nervous of borrowing too much money as feels current overdraft is already as high as he would like.
Suggestion	Do more work off-farm to bring in alternative regular income.

4.10 Access to capital or cost of borrowing

Ten respondents cited difficulties accessing capital or the cost of borrowing as their primary constraint. Six of these were unable to borrow additional capital, three were already in sufficient debt or and one thought borrowing costs (which included bank charges) were too high. The impacts included: reduced competitiveness (3); less stock on the farm (2); reduced investment (1); and having to continually prioritise short-term actions (1).

Four respondents did not believe there was anything they could do to address this situation. Three aimed to increase farm profitability, one was uncertain what to do. One respondent said this was not yet a problem but was likely to become one in the near future. Suggestions that might help respondents to overcome these constraints included: grants for capital items (2); a lending scheme targeted at farmers (1); maintaining low interest rates (1); and guaranteeing "decent lamb and beef prices" (1). Typical responses from farmers with access to capital or the cost of borrowing-related constraints are given in Table 19.

Table 19: Responses given by three farmers who reported access to capital or cost of borrowing-related issues as their primary constraint

Constraint	Access to capital.
Impacts	Cattle kept in an inefficient way - high labour requirement and straw bedding requirement as cannot afford a slurry based system.
	Cannot increase stock numbers as this requires more building space.
Barrier	Farmer age and small asset base are limiting access to capital.
Suggestion	Possible government lending schemes for agriculture.
Constraint	Access to capital funds.
Impact	Limits acquisition of labour saving machinery/technology.
Barrier	Heavily borrowed and no access to further loans.
Suggestion	Grant funds for technology/machinery.
Constraint	Very big overdraft, can't borrow any additional money.
Impact	Can't invest in anything new.
Barrier	Can't make enough money to service the loans.
Suggestion	None given.

4.11 Environmental designation-related issues

Four respondents offered environmentally-related land designations (ESS-HLS, SSSI were named) as their primary constraint. The need to observe rules and regulations reduced forage production by restricting fertilizer and farm yard manure applications (2), imposing higher costs (1), and creating problems for stock-management (1). None of the respondents believed they could reduce this constraint. Three said this was because they were scheme rules (two of these three respondents said withdrawal from the agri-environment scheme would simply lead to farming restrictions imposed by some other, presumably more demanding, environmental designation. One respondent asked for an "improved understanding of the balance between agriculture and the environment by those who enforce and manage the design of schemes and their regulations". Typical responses from two farmers with environmental land-designation-related constraints are presented in Table 20.

Table 20: Responses given by two farmers who reported environmental land-designation-related issues as their primary constraint

Constraint	Schemes - HLS and land management - including SSSIs, Natural England and Peak Park and ESA land.
Impacts	Restricts muck spreading and fertiliser usage and restricts spraying which places limitations on stocking numbers: all of which reduce and limit productivity and efficiency.
	ESA has enforced livestock stocking rates which have led to land being ruined.
Barrier	Even if farmer came out of HLS, the SSSI and other authoritative bodies would still be in place.
Suggestions	Introduce scheme flexibility depending on weather and growing conditions.
	Improve understanding of balance between agriculture and the environment by those who enforce and manage the design of schemes and their regulations.
Constraint	Environmental scheme restrictions.
Impacts	Fertiliser and muck restrictions reduce forage yield - impact has increased year on year.
	Not allowed to plough up land combined with reseeding and spray: restricts impacts on quantity and quality of forage and consequently increases the need to buy in forage which increases costs.
Barrier	Strict/inflexible regulations and rules.
Suggestions	Allow more farmyard manure to be used to replace nutrients removed.
	Allow targeted spraying of certain plants which are reducing yields.

5 Summary of key impacts of farmer's primary constraint

Farmers were asked to indicate the impacts of their key constraint on their farming system. A summary of their responses is presented in Table 21 classified under two headings: adverse economic impacts, and adverse effects on business development.

Table 21: Impact of the primary constraint (N=105)

Impact	(N)
Adverse economic impacts	
Low profitability (increases cost, lowers revenue)	30
Reduces the number of stock on the farm	17
Reduces investment in the farm business	12
Creates stock management problems	9
Adverse business development impacts	
Hinders the development of the farm business	19
Stimulated changes to the farm business	5
Others	
Farmers need to carefully manage their workloads	6
Other	8
Others include • Jobs not getting done (3) • Impact not yet seen but expected shortly (2) • Cannot benchmark performance (1) • Demoralising for the farmer (1) • Impossible to budget accurately (1)	

The most frequently mentioned impact of the farm's primary constraint was the reduction in profitability (30), either because the constraint increased costs or reduced revenues. Seventeen said their primary constraint reduced the number of livestock farmed, which would also be expected to reduce profitability. Twelve respondents said their constraint reduced investment, and nine said it created problems for managing livestock – both impacts are likely to either increase costs or reduce revenues, or both. These constrains are therefore likely to contribute towards the low and negative return from agriculture activities reported in Table 2 for 2015/6 and 2016/7.

Nineteen respondents said the constraint hindered the development of their farm business. However, five said that the constraint had forced the business to change and evolve (but none specified the changes undertaken). The inability to address a problem which has technical solutions must be particularly frustrating.

6 Farmer action to remove their primary constraint

Farmers were asked why they were unable to reduce or remove their business constraints, Table 22 summaries their responses.

Table 22: Reasons why farmers were prevented from removing their primary constraint (N=95)

Barriers to removal of primary constraint	(N)
There is nothing an individual farmer can do	58
Low farm profitability – making costs of addressing the problem unaffordable	31
Others	6
Total responses	95
Others include: • Lack of farmer time to address the issue (2) • Limited by over farm resources (2) • Difficulty finding reliable advice (1) • It takes a long time to deliver genetic improvement (1)	

Table 22 shows that 58 respondents (61%) believe they are not able to remove their primary constraint acting alone and that 31 (33%) blamed low farm profitability for preventing them from reducing the impacts of their primary constraint. The lack of cash and, in some cases, inability to access capital prevented investments, was thus holding back productivity. The responses from those who were not able to remove their constraint acting alone are presented in Table 23. For example, seven respondents with land-based constraints believed they were unable to influence the type and location of farmland coming to market. Many were constrained by regulations of one type or another, some imposed upon them, such as TB-related restrictions, the legal framework underpinning Farm Business Tenancies, and local planning regulations. Others were constrained by agreements voluntarily entered into, such as organic regulations and agri-environment schemes – respondents believed these regulations were too inflexible.

Table 23: Reasons given for why respondents believed it was not possible for them to remove their primary constraint

Land is primary constraint		(Nos.)
	No land is available to rent in the local area	7
	Dependent on organic registration organisation's rules and regulations	1
Staff as principle constraint		
	Lack of suitable local labour	9
	High house prices	1
	Alternative industries can pay labour more than farming can offer	1
Buildings as primary constraint		
	Landlord-related issue	1
	Local planning regulations	1
Animal health and productivity as primary constraint		
	Regulations regarding TB	2
	Inadequate cash flow to take action to address TB-related problems	2
Market price and volatility as primary constraint		
	Lack of sales outlets	1
Brexit and policy uncertainty as primary constraints		
	This is out of farmers' hands	4
	Uncertainty with respect to future agriculture and environment policy	3
	Too few local livestock markets	1
Personal and family-related issues given as primary constraint.		
	Personal health-related issues	3
	Inter-generational issues/disputes	4
Cash flow management and profitability given as primary constraint.		
	Market-related issues	2
	Organic rules and regulations constrain options	1
	No viable alternative farm-system options	1
Access and cost of capital given a primary constraint.		
	Poor asset base	1
	Current high level of debt	2
	Current policy uncertainty makes action too risky	1
Tenure-related issues given as the primary constraint		
	Legal framework of the FBT	1
	Cannot prevent rent increases	1
	The landlord is in control	1
	Farmer is tied to being a tenant as he does not have the capital to buy land	1
Environmental designations given a primary constraint		
	AES rules and regulations to too inflexible	1
	There are so many environmental land regulations here that whatever I do I would be caught by at least one of them	2
	Has to move winter stock away	1
	Has to grow kale as winter feed	1
	Total	**58**

7 Policy related insights into how to help alleviate constraint

The suggestions respondents offered for policy initiatives that would help to remove their primary constraint are presented in Table 24.

Table 24: Policy suggestions respondents believed would help them alleviate their primary constraint (respondents were allowed to suggest more than one policy) (N=111)

Policy instrument	(N)
Make grants available (including help with TB related costs and subsidies rural housing)	25
Suggestions related to Basic Payment Scheme payments	10
Provide training courses in practical livestock husbandry skills	7
Adjust the existing balance between food and environmental outputs	6
Change taxation regulations	6
Tenancy reform	4
Subsidised loans	3
Increase output prices (including improved lamb marketing)	3
Do not know	4
Others	8
No suggestions offered (including do not know)	35
Others include • Want a good trade deal (2) • Change to planning regulations (1) • Need to earn more off-farm income (1) • Support share farming initiative (1) • Support farmer retirement scheme (1) • Provision of ADAS-type advice service (1) • Reduce imports (1)	

Although a wide range of suggestions was offered, by and large they were traditional forms of intervention support, for example, grant aid, changes in taxation regulations, subsidised loans and tenancy reforms. Ten suggestions involved changes to the Basic Payment Scheme payment – including more prompt payment, altering its terms and conditions, none suggested they should be discontinued. Only a very few offered more innovative solutions, examples of which included support for share farming and for farmer retirement schemes, the need to increase off-farm income, a reduction in market price variability, and refashioning the farm away from meat production to prioritise conservation activities through specialist conservation grazing management.

8. Discussion

The majority of surveyed farmers understood the concept of resource constraints creating bottlenecks which reduce the efficiency with which inputs are used, lowering production, productivity and profitability. Many respondents had recently considered these issues. 105 (85%) respondents reported at least one constraint, and 58 (55%) believed they were of a type that an individual farmer could not overcome without external assistance, in part because of the type of constraint and in part because of low profitability.

8.1. Land quality

Perhaps unsurprisingly, the most frequently reported constraint involved land quality, particularly its underlying poor quality. However, although it may be technically possible to improve, for example, poorly drained land, it may not always make commercial sense to do so given the expense involved, without external funding. Whilst such improvements would increase land productivity, they may also mean that the farm could not participate in agri-environment schemes, excluding them from an important income stream. Where this is the case, farmers have no option but to accept the productivity limitations imposed by the constraint. It is natural handicaps such as poor land quality that have been used to justify targeted support policies for upland farming

8.2. Future support payments, and the balance between food and environmental outputs.

The Agriculture Bill (2018) proposes to phase-out direct payments by 2028 and use some part of the freed-up funding to support a new Environmental Land Management Scheme which will be available to all farms in England from 2025 (NAO, 2019). However, the majority of farms are financially reliant of the existing Basic Payment Scheme, so the withdrawal of direct payments represents an immediate threat to their survival. Most of the respondents who commented on direct payments wanted them to continue, to be paid on time and have less environmental additionality attached.

ELMS is currently being trialled and tested. However, agri-environment payments are determined by World Trade Organisation not European Commission rules and are based on

"profit foregone". With profitability of upland farm low, it is difficult to see how the loss of direct payments can be made-up through ELMS payments without there being a significant increase in the environmental outputs expected from upland farmland. In effect, continuing the trend in the dependence of upland farm businesses on environment rather than food outputs. The findings of this survey suggest such changes will not meet with universal approval, respondents were unhappy about the extent and influence of existing environmental rules and regulations. Only one respondent reflected on the possibility that the farm may have to cease producing traditional agricultural goods and focus primarily on delivering environmental outputs as a specialist conservation grazier.

Defra accepts the proposed policy changes will accelerate structural change and will increase the rate at which farms cease trading:

> "the link between Direct Payments and land … removes the need to farm the land so it may encourage those who chose to leave [farming] to accelerate this decision" (Defra, 2018c: p 45).

Therefore, the details of ELMS, and specifically what farmers will be required to do to secure their environment payment will be critical to the economic survival of many upland farms.

8.3. Grants aided support for upland farming.

The survey was conducted in the spring and summer of 2017. This was before the launch of the Rural Development Programme for England (RDPE) Countryside Productivity Scheme (CPS) which was designed to improve farm productivity. CPS had two arms. Its Large Grant Scheme offered grants of up to 40% with a minimum grant of £35,000 but no maximum, for a range of projects selected to improve farm productivity. For example, capital grants could be used to purchase robotic equipment - designed to aid crop and livestock production, to increase the use of renewable energy produced on the farm, to purchase LED wavelength controlled lighting to aid crop production, and to increase the efficient use of livestock slurries, manures and digestates. Clearly, many of these technologies would be of little use to upland farmers, and the scheme requires applicants to co-fund to the value of at least £52,500, which is likely to be out of the reach for the majority of upland farmers.

The second arm of CPS was the Small Grants Scheme. This provided grants of up to 40% of eligible costs (increased to 50% for farmers in Cornwall or the Isles of Scilly) (Defra, 2018d), with a minimum award of £3,000 and a maximum of £12,000. Applicants would need to find a more modest sum of between £5,250 and £18,000 in order to apply. Moreover, these grants could be used to purchase cattle handling systems, cattle crush and electronic weighing systems, and equipment designed to improve resource efficiency and nutrient management, items generally of more relevance to typical upland farmers.[5] Provisional data shows that more than 3,500 such grants, worth a total of £23.5 million have been made (Defra, 2018d). There is currently no breakdown of awards by geographical region. Neither arm of the scheme provided grants for the modernisation and improvement of farm buildings.

8. 4. Tenancy reform

Should the policy changes following Brexit be introduced, Defra fully expect more land to come to market, either for purchase or to rent (Defra, 2018c). Given current trends, new rental agreements would exclusively be under FBT. So, the concerns raised by respondents about the legal framework governing FBT, and their view that it was unbalanced in favour of the land owner are likely to become more important in the future.

Some of these concerns were raised by the Tenancy Reform Industry Group report in October 2017 which recommended reforms to agricultural landlord and tenant law in a post-Brexit society. However, these concerns were not included in the Agriculture Bill, Defra (2019a) launched a consultation exercise to seek views on options for reform of agricultural tenancy law in England. A key aim of the consultation was to identify how reforms could any existing remove barriers so as to:

[5] Examples of items of livestock equipment eligible for funding include; handling systems, crushes, calving detectors, weighing equipment, calf feeders, EID devices, pasture plate meters and electric scraper systems. Examples of arable equipment eligible for funding include, precision-farming equipment, including GPS units, yield-mapping devices, variable rate controllers and direct or strip till drills.

- deliver productivity improvements and facilitate structural change in the tenant farming sector;
- support new entrants and the next generation of farms; and
- enabling environmental improvements and sustainable farming practices.

However, most of the items under consultation refer to Agriculture Holding Act tenancies rather than possible changes to FBT.

8.5. Examples of innovative policies

The policies respondents suggested to help remove their primary constraints included capital grant schemes (25); beneficial changes to and retention of the Basic Payment Scheme (10), adjusting the existing balance between food and environmental production back to food production (6); the provision of training courses (7); changes in taxation regulations (6); reforms to tenancy law (4); provision of subsidised loans (3); and increasing output prices (3). These suggestions are almost entirely taken from tried and tested, conventional CAP Pillar 1 and 2 interventions and support programmes.

Besides the changes discussed above, the Agriculture Bill makes support available for measures that increase productivity, and for investment in research and development. For example, it currently includes

> "provisions which allows the Secretary of State to give financial assistance for, or in connection with, the purpose of starting, or improving the productivity of an agricultural, horticultural or forestry activity" (Coe and Downing, 2018P: 28).

How these measures are drafted and how they target support to benefit upland farmers will be critical to the rate at which upland farm businesses close. This is shown by the Economic Resilience Scheme currently under consideration by The Welsh National Assembly (2018). As currently proposed, economic resilience measures would provide "targeted, wide-ranging economic support" across the food chain to increase market potential; improve productivity; support farm enterprise diversification; assist with effective risk management; and to improve knowledge exchange, skills and stimulate innovation. However, it intends assistance to be

> "conditional on a credible business strategy, assessment of viability, and potential for a return on investment",

so that only farms

> "with the potential to be viable" (para 4.13)

would be able to apply for support though this scheme. Elements of a similar scheme may well be of value to upland farmers in England, but the criteria used to assess the credibility of applicant's farm business strategy will be important. The Welsh Assembly readily admits that not every farm will meet these criteria, and for this reason it intends to create "a new and valuable income stream through the Public Goods scheme" (para 5.18) to support "the delivery of outcomes for which there is no functioning market" (para 6.4).

Therefore, the criteria used to assess a credible business strategy will effectively separate farms into those with a future producing food and those whose future predominately lies in the provision of public goods.

8.6. The Brexit dividend

Whilst the removal of direct payments and the increased emphasis on "public money for public goods" has captured much attention, the Agriculture Bill also addresses other aspects of food production and the food chain. For example, it enables data to be collected from and shared with those involved with/having an impact on matters linked to certain activities in the agri-food supply chain (excluding consumer-based information) to help ensure "fairness" in the supply chain; to intervene in the market "in exceptional circumstances"; and to allow Producer Organisation to continue. These additional measures may help to address some of the assistance the respondents thought would help their businesses.

However, Baker (2018) argues that the UK is at risk of missing the opportunities provided by leaving the European Union to introduce innovative policies, such as those listed in Table 25. Some of these, for example, providing pensions for farmers, dealing with succession related-issues, and involving farmers in the design of environmental schemes were suggested by a small number of respondents to this survey, so they may find favour with at least a proportion of upland farmers.

Table 25: Policy measures identify as being innovative to the European CAP (Baker, (2018)

Country	Policy measure
South Korea	Provides an agricultural pensions, which are often contingent on part-time farmers ceasing farming. Has created a successful high end horticultural sector by identifying areas with potential – in terms of soil, weather and access to markets – which are supported with focused interventions schemes.
Norway	Has a legislative limits to farm size (see also Forbord *et al.*, 2014)
New Zealand	In 2009 it established Land and Water Forum (LAWF) stakeholder group which consisting of farming representatives, NGOs, regional councils and indigenous right groups. Government set the 'what' - such as percentage reductions in e. coli in the water and a percentage of rivers that had to be swimmable by 2040 – and members of LAWF were asked to reach a consensus on how this could be achieved (Land and Water Forum, 2011).
Japan	"Hometown dues" tax policy allows urban workers to pass some of their income tax back to underfunded rural areas. National-Regional-Local structured Environmentally Friendly Farming subsidy scheme, in which each tier has clear and complementary roles related to land use.
(Source: Baker (2018))	

9 Conclusions

The economic performance of upland farm businesses in England is characterised by low profitability, with losses related to traditional agricultural activities. The majority of such businesses are dependent on direct payments and agri-environment payments to remain in business. Under these circumstances it is perhaps not surprising that the majority of respondents were able to identify at least one resource constraint as having an adverse impact on the farm's production and its profitability. These factors may account for their preferences for policies that incentivise food production and which reduce restrictions imposed by environment schemes.

The majority of respondents believed there was nothing they could do to remove their constraint and so release their farm's bottleneck. For example, many respondents identified the quality and amount of farmland as their primary constraint. Land improvement schemes are expensive and are typically undertaken only with grant funding. Where no business case can be made to remove the constraints, farmers have little choice but to adapt their farming system as best they can to minimise the impacts.

Those constrained by farm size could not expand because of a shortage of land on the market and its high cost. For these farmers, the proposed policy changes may be two-edged, because whilst Defra expects them to accelerate the rate of structural change (that is, to increase the rate at which farms cease trading) - which will bring more land to the market and lower its price – the proposed ELMS is likely to place greater restrictions on farming practices as it seeks to raise environmental standards and outputs.

The evidence from this survey is that the changes outlined in the Agriculture Bill will not be universally popular with upland farmers. Much will depend on the detail of the schemes and programmes which are introduced, and there remain opportunities to bend support instruments in ways that benefit upland farm businesses, such as training schemes, access to affordable capital, and reforms to FBTs. More far-reaching initiatives might include an Upland Economic Resilience Scheme, small and large grant schemes targeted at the needs of upland farmers, for example to help refurbish, expand and build new agricultural buildings, and the introduction of new environmental markets in which compensation payments are not constrained by World Trade Organisation rules.

It is because of the current economic realities of upland farming that the majority of the respondents support direct payments and policies that would prioritise traditional agricultural activities at the expense of environmental outputs. If the planned policy changes do take place and specific upland farm support schemes are not introduced then it is likely that a farmer's willingness and ability to work their land for environmental rather than the more traditional farming-related outputs will be the most significant determinants of which farms survive after the UK has ceased to be a member of the European Union.

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Appendix

Table A1: Summary of responses by key constraint

Key constraint: land-related issues (N=22)							
Detail of primary constraint	Nos	Impacts of key constraint on farm business	Nos	What can I do to remove my farm's primary constraint	Nos	Suggested policy to help remove constraint	Nos
Farm size	12	Limits number of stock on farm	11	Low farm profitability (making costs of improvements unaffordable)	11	Grant scheme	6
Land is wet	5	Raises costs	8	Nothing	8	BPS terms & conditions	2
Poor quality forage	4	Prevents diversification opportunities	1	No comment received	3	Adjust food/env. Balance	1
Fragmented holding	1	Adverse impact of future integrity of the business	2			Support share farming initiative	1
						Support retirment scheme	1
						Change tax to reduce tax benefits for land purchase	1
						Don't know	2
						No suggestion offered	8
Key constraint: staff-related issues (N=10)							
Detail of primary constraint	Nos	Impacts of key constraint on farm business	Nos	What can I do to remove my farm's primary constraint	Nos	Suggested policy to help remove constraint	Nos
Lack of labour	10	Reduces stock numbers on farm	2	Not much individual farmer can do	11	Provide additional training in livestock husbandry skills	5
		Jobs simply not done	3			Change BPS subsidies	1
		Prevents change to farming system	2			Change tax in favour of employing staff	1
		Forced change to farming system	1			Provide affordable rural housing	1
		Future related changes most likely needed	2			Don't know	1
						No suggestion offered	1
Key constraint: building-related issues (N=12)							
Detail of primary constraint	Nos	Impacts of key constraint on farm business	Nos	What can I do to remove my farm's primary constraint	Nos	Suggested policy to help remove constraint	Nos
Lack of space for livestock	7	Increases costs	5	Low farm profits and high costs	8	Provide building-related grants	7
Obsolete livestock buildings	4	Need to outwinter stock	3	Nothing	2	Change planning regulations	1
Lack of staff housing	1	Reduces profitability	3	High risk on investment	1	Decide a post-Brexit farming and environment policy	1
		Reduces stock that farm can carry	1	No answer	1	Improve tax advantages for investing in farm buildings	1
		No answer	1			Provide low cost loans	1
						No suggestion offered	3

Key constraint: animal health and TB related issues (N=8)

Detail of primary constraint	Nos	Impacts of key constraint on farm business	Nos	What can I do to remove my farm's primary constraint	Nos	Suggested policy to help remove constraint	Nos
TB	4	TB related constraints	4	Nothing	4	Help wrt TB related costs	3
Poor cow fertility	1	Reduced revenues	1	Low farm profitability and high cost of taking action	3	Provide ADAS-type advice service	1
Poor genetics	3	Increased costs	1	Need to find reliable advise	1	Policy to support hill farm profitability - raise output prices	1
		Demoralising to farmer	1			Do not know	1
		Reduces number of stock on farm	1			No suggestion offered	1

Key constraint: commodity market (levels and volatility) related issues (N=4)

Detail of primary constraint	Nos	Impacts of key constraint on farm business	Nos	What can I do to remove my farm's primary constraint	Nos	Suggested policy to help remove constraint	Nos
Low market price for produce	3	Impossible to budget accurately	1	Limited by farm resources	2	Educate the public about UK foods	1
Volatile markets	1	Imposes farming system on farm which is less than optimal	1	Nothing	1	Use grazing solely for habitat management - forsake food production	1
		Lowers income	1	Genetic improvement takes time to achieve	1	Reduce imports	1
		Makes it impossible to diversity business activities	1			Improve lamb marketing	1
						No suggestion offered	2

Key constraint: Brexit related issues and uncertainty (N=9)

Detail of primary constraint	Nos	Impacts of key constraint on farm business	Nos	What can I do to remove my farm's primary constraint	Nos	Suggested policy to help remove constraint	Nos
Brexit - uncertainty	5	Handicaped the development of the farm	9	Nothing an individual farmer could do about this situation.	8	Needed support payments to continue	5
Brexit - future of support payments	4			No suggestion offered	1	Wanted a "good" trade deal	2
						No suggestion offered	3

Key constraint: Personal and family related issues, including succession (N=11)

Detail of primary constraint	Nos	Impacts of key constraint on farm business	Nos	What can I do to remove my farm's primary constraint	Nos	Suggested policy to help remove constraint	Nos
Succession issues	5	Requires farmer's to manage their personal workload	6	Nothing more can be done	7	Enhanced tax breaks for retiring farmers	3
Health issues	5	Disagreement on future strategy of the business.	2	Lack of time to train/relax more	2	Additional (more convenient) training courses	2
lack of financial management skills	1	Succession management has requried substantial changes to the existing farming businesses.	1	No need to do anything (no successor to "work" for)	1	No suggest offered	6
		Delays decision making	1	No suggestion offered	1	0	0
		Unable to benchmark performance	1				
		No impact yet	1				

Key constraint: cash flow and low profitability (N=12)

Detail of primary constraint	Nos	Impacts of key constraint on farm business	Nos	What can I do to remove my farm's primary constraint	Nos	Suggested policy to help remove constraint	Nos
Poor cash flow	5	Need to cross-subsidise their farm business from other income sources	2	Nothing (for various reasons)	4	More timely payment of support payments by RPA	2
Poor profitabiilty	5	Increase farm costs reduces competitiveness	3	Low farm profitability	4	Prioritise farm business (Defra)	2
High costs	2	Forced to prioritise management for short-term goals	3	Current level of debt too high	2	Reduce market price volatility (Defra)	1
		Reduces investment in the farm business	3			Relax organic rules and regulations	1
		Forced to change farming system	1			Have to earn more off-farm income	1
		Unable to change farming system	1			No suggestion given	5

Key constraint: access to and cost of capital (N=10)

Detail of primary constraint	Nos	Impacts of key constraint on farm business	Nos	What can I do to remove my farm's primary constraint	Nos	Suggested policy to help remove constraint	Nos
Access to capital	6	Reduces business competitiveness	3	Nothing - for various reasons	4	Grants for capital items	2
Current level of debt	3	At overdraft limit	2	Low current profitability	3	Lending scheme for farm businesses	1
Cost of borrowing	1	Reduced number of livestock on farm	2	Not certain of what to do	1	Keep interest rates low	1
		Reduced investment	1	This is of accute future concern	1	Guarantee a "decent price for lamb and beef"	1
		Forces farmer into prioritising short-term mangement	1	No suggestions given	1	No suggestions given	5
		A clear issues for the near future	1				
		No impacts stated	1				

Key constraint: tenure related issues (N=4)

Detail of primary constraint	Nos	Impacts of key constraint on farm business	Nos	What can I do to remove my farm's primary constraint	Nos	Suggested policy to help remove constraint	Nos
Terms of the tenancy	3	Reduces investment in the farm and land	4	Nothing	4	Reform of FBT	2
Rent charged	1					Change law to protect tenants from "rogue landlords"	1
						No suggestions offered	1

Key constraint: restrictions imposed on farming practices by environment schemes (N=4)

Detail of primary constraint	Nos	Impacts of key constraint on farm business	Nos	What can I do to remove my farm's primary constraint	Nos	Suggested policy to help remove constraint	Nos
Rules and regulations (restictions) applied to environmental schemes and land designations	4	Reduces forage production	2	Nothing	4	Increase "common sense" flexibility into AES rules and regulations	2
		Increases farm costs	1			Relax rules governing application of farm yard manure.	1
		Creates stock management problems	2			Tenancy reform	1
						Improve the balance in land management between food and environment	1

Table A2: Summary of the impacts of primary constraint on the farm business: by key constraint.

Key constraint: land-related issues (N=22)		**Key constraint: staff-related issues (N=10)**		**Key constraint: building-related issues (N=12)**	
Impacts of key constraint on farm business	Nos	Impacts of key constraint on farm business	Nos	Impacts of key constraint on farm business	Nos
Limits number of stock on farm	11	Reduces stock numbers on farm	2	Increases costs	5
Raises costs	8	Jobs simply not done	3	Need to outwinter stock	3
Prevents diversification opportunities	1	Prevents change to farming system	2	Reduces profitability	3
Adverse impact of future integrity of the business	2	Forced change to farming system	1	Reduces stock that farm can carry	1
		Future related changes most likely needed	2	No answer	1
Key constraint: animal health and TB related issues (N=8)		**Key constraint: commodity market (levels and volatility) related issues (N=4)**		**Key constraint: Brexit related issues and uncertainty (N=9)**	
Impacts of key constraint on farm business	Nos	Impacts of key constraint on farm business	Nos	Impacts of key constraint on farm business	Nos
TB related constraints	4	Impossible to budget accurately	1	Handicaped the development of the farm	9
Reduced revenues	1	Imposes farming system on farm which is less than optimal	1		
Increased costs	1	Lowers income	1		
Demoralising to farmer	1	Makes it impossible to diversity business activities	1		
Reduces number of stock on farm	1				
Key constraint: Personal and family related issues, including succession (N=11)		**Key constraint: cash flow and low profitability (N=12)**		**Key constraint: access to and cost of capital (N=10)**	
Impacts of key constraint on farm business	Nos	Impacts of key constraint on farm business	Nos	Impacts of key constraint on farm business	Nos
Requires farmer's to manage their personal workload	6	Need to cross-subsidise their farm business from other income sources	2	Reduces business competitiveness	3
Disagreement on future strategy of the business.	2	Increase farm costs reduces competitiveness	3	At overdraft limit	2
Succession management has requried substantial changes to the existing farming businesses.	1	Forced to prioritise management for short-term goals	3	Reduced number of livestock on farm	2
Delays decision making	1	Reduces investment in the farm business	3	Reduced investment	1
Unable to benchmark performance	1	Forced to change farming system	1	Forces farmer into prioritising short-term mangement	1
No impact yet	1	Unable to change farming system	1	A clear issues for the near future	1
				No impacts stated	1
Key constraint: tenure related issues (N=4)		**Key constraint: restrictions imposed on farming practices by environment schemes (N=4)**			
Impacts of key constraint on farm business	Nos	Impacts of key constraint on farm business	Nos		
Reduces investment in the farm and land	4	Reduces forage production	2		
		Increases farm costs	1		
		Creates stock management problems	2		

Table A3: Summary of what farmers believe they can do themselves to remove their primary constraint.

Key constraint: land-related issues (N=22)		**Key constraint: staff-related issues (N=10)**		**Key constraint: building-related issues (N=12)**	
What can I do to remove my farm's primary constraint	Nos	What can I do to remove my farm's primary constraint	Nos	What can I do to remove my farm's primary constraint	Nos
Low farm profitability (making costs of improvements unaffordable)	11	Not much individual farmer can do	11	Low farm profits and high costs	8
Nothing	8			Nothing	2
No comment received	3			High risk on investment	1
				No answer	1
Key constraint: animal health and TB related issues (N=8)		**Key constraint: commodity market (levels and volatility) related issues (N=4)**		**Key constraint: Brexit related issues and uncertainty (N=9)**	
What can I do to remove my farm's primary constraint	Nos	What can I do to remove my farm's primary constraint	Nos	What can I do to remove my farm's primary constraint	Nos
Nothing	4	Limited by farm resources	2	Nothing an individual farmer could do about this situation.	8
Low farm profitability and high cost of taking action	3	Nothing	1	No suggestion offered	1
Need to find reliable advise	1	Genetic improvement takes time to achieve	1		
Key constraint: Personal and family related issues, including succession (N=11)		**Key constraint: cash flow and low profitability (N=12)**		**Key constraint: access to and cost of capital (N=10)**	
What can I do to remove my farm's primary constraint	Nos	What can I do to remove my farm's primary constraint	Nos	What can I do to remove my farm's primary constraint	Nos
Nothing more can be done	7	Nothing (for various reasons)	4	Nothing - for various reasons	4
Lack of time to train/relax more	2	Low farm profitability	4	Low current profitability	3
No need to do anything (no successor to "work" for)	1	Current level of debt too high	2	Not certain of what to do	1
No suggestion offered	1			This is of accute future concern	1
				No suggestions given	1
Key constraint: tenure related issues (N=4)		**Key constraint: restrictions imposed on farming practices by environment schemes (N=4)**			
What can I do to remove my farm's primary constraint	Nos	What can I do to remove my farm's primary constraint	Nos		
Nothing	4	Nothing	4		

Table A4: Selected quotations from respondents do not believe they can remove their primary constraint.

Land is primary constraint	
	Very rare land becomes available locally
	No land available that is close to the main farmstead/adjoins existing land areas
Staff as primary constraint	
	There just are not the people locally that want to come and work with livestock and get their hands dirty.
	Low supply of skilled labour, especially in this area & farm cannot afford the time or money to train people - would need competent and skilled labour that can go straight to work
	Skilled workers can earn more money in other sectors than agriculture
Buildings as primary constraint	
	Tenanted land with no investment from landlord
	Council/local planning authority refusal to grant planning permission for a farmworkers dwelling
Animal health and productivity as primary constraint	
	Animal health enforces when I am able to buy under their agreed term.
	Cash flow is so tight that we can't even afford to put in badger proofing.
	Difficult to find someone to look at feeding regime.
Market price and volatility as primary constraint	
	Too few sales outlets.
Brexit and policy uncertainty as primary constraints	
	There is nothing I can do about Brexit
	Unknown level of support for British agriculture post Brexit.
Personal and family-related issues given as primary constraint.	
	Cannot get rid of a bad back
	Cannot remove this constraint, the business is a family partnership which has become bigger (3x generations) over time so not that straightforward to sort out.
Cash flow management and profitability given as primary constraint.	
	We could sell more store lambs earlier, or feed lambs to fatten them faster but then would suffer a reduced income/increased costs so would wipe out any potential gain
	Shortage of local based feed suppliers, all purchased feeds incur lengthy travel distances, increasing haulage costs

	Organic registration rules and regulations
Access and cost of capital given a primary constraint.	
	Currently am heavily borrowed and have no access to further loans.
	It is too risky in the current climate.
Tenure-related issues given as the primary constraint	
	I cannot do anything to prevent it [landlord increasing my rent]
	We are tied to being tenant farmers so cannot change this as we do not have the capital to buy land
Environmental designations given a primary constraint	
	Strict / inflexible regulations and rules
	Even if left HLS - Natural England and SSSI restrictions are still in place and thus does not make sense to stop getting paid for HLS and still be governed by rules and regulations.
	Even if farmer came out of HLS, the SSSI and other authoritative bodies would still be in place.

Table A5: Summary of policies respondents suggested for helping them to remove the primary constraint: by primary constraint

Key constraint: land-related issues (N=22)		**Key constraint: staff-related issues (N=10)**		**Key constraint: building-related issues (N=12)**	
Suggested policy to help remove constraint	Nos	Suggested policy to help remove constraint	Nos	Suggested policy to help remove constraint	Nos
Grant scheme	6	Provide additional training in livestock husbandry skills	5	Provide building-related grants	7
BPS terms & conditions	2	Change BPS subsidies	1	Change planning regulations	1
Adjust food/env. Balance	1	Change tax in favour of employing staff	1	Decide a post-Brexit farming and environment policy	1
Support share farming initiative	1	Provide affordable rural housing	1	Improve tax advantages for investing in farm buildings	1
Support retirment scheme	1	Don't know	1	Provide low cost loans	1
Change tax to reduce tax benefits for land purchase	1	No suggestion offered	1	No suggestion offered	3
Don't know	2				
No suggestion offered	8				
Key constraint: animal health and TB related issues (N=8)		**Key constraint: commodity market (levels and volatility) related issues (N=4)**		**Key constraint: Brexit related issues and uncertainty (N=9)**	
Suggested policy to help remove constraint	Nos	Suggested policy to help remove constraint	Nos	Suggested policy to help remove constraint	Nos
Help wrt TB related costs	3	Educate the public about UK foods	1	Needed support payments to continue	5
Provide ADAS-type advice service	1	Use grazing solely for habitat management - forsake food production	1	Wanted a "good" trade deal	2
Policy to support hill farm profitability - raise output prices	1	Reduce imports	1	No suggestion offered	3
Do not know	1	Improve lamb marketing	1		
No suggestion offered	1	No suggestion offered	2		
Key constraint: Personal and family related issues, including succession (N=11)		**Key constraint: cash flow and low profitability (N=12)**		**Key constraint: access to and cost of capital (N=10)**	
Suggested policy to help remove constraint	Nos	Suggested policy to help remove constraint	Nos	Suggested policy to help remove constraint	Nos
Enhanced tax breaks for retiring farmers	3	More timely payment of support payments by RPA	2	Grants for capital items	2
Additional (more convenient) training courses	2	Prioritise farm business (Defra)	2	Lending scheme for farm businesses	1
No suggest offered	6	Reduce market price volatility (Defra)	1	Keep interest rates low	1
		Relax organic rules and regulations	1	Guarantee a "decent price for lamb and beef"	1
		Have to earn more off-farm income	1	No suggestions given	5
		No suggestion given	5		
Key constraint: tenure related issues (N=4)		**Key constraint: restrictions imposed on farming practices by environment schemes (N=4)**			
Suggested policy to help remove constraint	Nos	Suggested policy to help remove constraint	Nos		
Reform of FBT	2	Increase "common sense" flexibility into AES rules and regulations	2		
Change law to protect tenants from "rogue landlords".	1	Relax rules governing application of farm yard manure.	1		
No suggestions offered	1	Tenancy reform	1		
		Improve the balance in land management between food and environment	1		