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A farm level assessment of the profitability of Entry Level Scheme participation in the Lincolnshire Wolds

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The paper builds on the results of previous studies investigating whether farmers profit by participation in the Entry Level Scheme (ELS). Standard payment levels (derived from points) under ELS are fixed at rates that are expected only to compensate farmers for income foregone and costs incurred. There is no profit element as such. There is therefore no reason to expect participation to be profitable. However farm level examination of the income foregone and costs incurred in previous studies based in other parts of England have shown that this can be achieved. The study is based in the Lincolnshire Wolds, an area dominated by arable farming but with topography and associated natural features that offer some variety in the mix of farming and the measures that can qualify for environmental prescriptions under the scheme. The study concluded that farmers were able to profit by ELS participation but that the extent of this varied according to the type of environmental features on the farm and whether arable land was taken out of production. These conclusions have potential implications for scheme design, farmer uptake and additionality in the use of public funds to acquire environmental benefits.

Keywords: Entry Level Scheme, agri-environmental payments, income foregone, partial budgets, profitability. JEL Code Q58.

BACKGROUND AND AIMS OF THE STUDY

The Entry Level Stewardship (ELS) is aimed at creating simple yet effective environmental management above that required through cross compliance (RDS 2005). It attracts a set payment of £30/ha as a reward for farmers carrying out beneficial management practices. Farmers must gain at least 30 points/ha from the 60 different prescriptions. Farmers are free to choose which ever prescriptions they wish and are guaranteed acceptance into the scheme.

ELS is funded through the Rural Development Programme for England (RDPE) which secures most of its funding from modulation of the Single Payment (SP) with the remainder provided under the European Agricultural Guidance and Guarantee Fund (EAGGF). The funding is subject to restrictions on payment levels under European Union (EU) Council regulations 1257/1999 and 445/2002 and article 39 of regulation 1698/2005. These stipulate that payments cannot exceed a combination of income forgone and costs incurred including as appropriate transactions costs (which can be no more than 20% of income forgone). There is also a cap on payments of €600 / hectare on annual crops and €450 / hectare on un-cropped land which, depending on the exchange rate used, means that payments for some options, such as beetle banks, are close to these absolute limits.

PAYMENTS DETERMINATION AND RESULTS OF PREVIOUS COMPARABLE STUDIES

The Department for Food, Environment and Rural Affairs (DEFRA) used a partial budgeting methodology when calculating the income forgone and costs incurred in applying the various prescriptions. This includes marginal revenue gains and losses as well as marginal cost savings and extra costs. (Turner and Taylor, 1998). The assumptions and forecasts that had to been made were founded on what was 'usual good farming practice in the area where the measure is applied' in accordance with the regulations (Council of the EU, 2002). In principle limiting the payments to no more than the income foregone and costs incurred would preclude farmers from making a profit from scheme participation. This ensures that there is no trade distortion that would otherwise endanger the green box status of the payments with the World Trade Organisation (WTO). However this presumes that the assumptions made hold good at farm level. Previous studies (Wallis and Jones 2007, and Grey and Jones 2008) indicate that this is not necessarily the case. These studies undertaken in the upland area of Teesdale and the lowland area of Gloucestershire show that farmers to varying degrees did profit from ELS participation. The extent of the profit varied considerably from farm to farm and from prescription to prescription (the detail of which are examined against the results in the present study later in the paper). Nevertheless in all cases a profit was made indicating that income foregone and costs incurred were not as expected

This highlights a potential problem that ELS, in common with other agri-environment programmes, may not be offering as much 'additionality' in compensating for changed management practices as might have been hoped. These conclusions are supported by a performance review of ELS undertaken by Boatman et al in 2007. This study found that 60% of features entered into the ELS scheme 'were already being managed along the lines required by ELS prescriptions' (Boatman et al 2007: 4). There is in a sense nothing new in this. Lack of additionality was considered to be an issue with the Environmentally Sensitive Area (ESA) schemes that preceded ELS (CRER and CJC consulting, 2002). Whether this is a problem or not

is, to an extent, a matter of perception. According to Jones et al (2006) farmers undertake environmental work worth between £215 - £411 million without compensation under agri-environment programmes. It can be argued that this work is a public good and it is an indication of market failure that this is not being compensated already (Coleman, 1994).

The aim of the present study was to gather further evidence at farm level to explore the extent to which farmers can profit from ELS participation and in doing so to add to the debate about additionality within agri-environment funding.

THE CASE STUDY AREA AND FARM SELECTION

The Lincolnshire Wolds is in an area where arable farming predominates but nevertheless offers physical features that lend themselves to the application of agri-environment prescriptions and some mixed farming. In some ways this offers similar circumstances to parts of the Cotswolds that were included in the study based in Gloucestershire undertaken by Grey and Jones (2008).

In order to establish the profitability of ELS in the Wolds detailed case studies were used with information being obtained through interviews with the farmers. These were all predominately arable, as is typical of the area, with enterprises of varying sizes, structures, and operating over different landscapes. Information from Natural England together with local knowledge was used to recruit the eight case study farmers. In total ten farmers were approached with one declining and another being left out after struggling to arrange an interview.

METHODOLOGY

The partial budgets were drawn up for each individual prescription and then summarised for the farm along the lines of previous studies (Wallis and Jones, 2007 and Grey and Jones 2008). There are a number of specific methodological issues and these were dealt with based on evolving principles emerging from the earlier studies.

Budgeting issues and the principles employed

Year of study

When assessing each case study the same year must be used for all to ensure constancy of results. It was felt that the year chosen should be as current as possible to ensure up to date results. However this year should not be out of the norm. The volatility in the commodities market in the two previous years (2007 and 2008 harvest) and the exceptional yields seen in the Wolds in 2009 therefore posed a problem in using a single year's results. It was decided to take results from all the previous three years (2006, 2007, and 2008 harvests) and average them.

Direct (or 'variable') cost estimation

Direct costs were calculated from figures obtained during the interviews or failing that using figures sourced from the Farm Management Handbook which corresponded with the year concerned (Nix, J 2006, 2007 & 2008).

Estimation of specific crop loss

Average crop yields were obtained from the farmer, adjusted by a percentage of this figure to

take into account for yield suppression on the headlands and poor land. These reductions were based on evidence in a study by Wilcox, A *et al* (2000) which established that the yield in the first 6m from the boundary of a field is on average 80% of the average of the whole field, the first 4m is 77%, and the first 2m is 75%.

Marginal machinery running costs

The machinery fuel and repair costs were generally calculated based on assumptions made by the ABC (2007a) based on the actual machinery in use on the case study farms taking account of their age and approximate usage. This cost was divided by the total hectares farmed (i.e. not just what was in the ELS agreement) to give a per hectare figure.

Working capital estimation

Nearly all crops are winter cereals and the average working capital was approximated by taking 60% of the variable costs (as used by Jones, 2009) and then applying an interest rate of 5% (taken to be a reasonable medium term borrowing rate).

Averaging set up costs over the life of the agreement

A number of direct costs were one-off establishment e.g. agent fees for completing the application and the initial drilling of buffer strips. These costs were split proportionally across the five years of the agreement.

Enhanced baseline costs

The costs of complying with cross compliance regulations were treated as base line and were not be included in the study. However if other existing requirements, such as combinable crop assurance, existed then despite the overlap the costs of keeping within these requirements was accounted for but noted separately. The costs for mainly managerial costs undertaken by the farmer were accounted for at an hourly rate of £20.46 was used based on a assumptions for estimation used by Jones (2006). If farmers were voluntarily undertaking management practices covered by ELS already without any requirement to do so these costs were excluded because, it was argued, this was the usual farming practice in the area, i.e. cutting hedges only every two years for instance.

Manual farm labour costs

Any changes to the fixed manual labour, either unpaid family labour or paid labour, were be included at the Agricultural Wage Board minimum wage for the given year taken from Nix, J (2006, 2007, & 2008). The labour requirement for each crop was based on Nix, J (2007) at premium work rates (which are appropriate for large scale arable farms in the Wolds).

Managerial labour costs

Managerial labour costs were accounted for (at £20.46/hour) regardless of whether this was an actual cost incurred by a salaried manager or a notional cost incurred by one of the owners of the business

Aggregating the results for each prescription

It is likely that farmers will generate more points than the 30 points per hectare that is the

minimum required in order to have a ‘safety margin’. Hence if the result for each prescription is calculated account must be taken of the extent to which the target number of points is exceeded. Thus the proportion of points that prescription attracts is used, for example if a farm obtained 15% of its points from field corner management, then 15% of the total payment would be attributable to this prescription. The income forgone was then deducted from the adjusted payment each prescription attracted to find the profit and the addition of all these gave an overall figure of the profit obtained from entering the ELS scheme. Once this was done for each of the three years studied an average could be made.

RESULTS

Case studies and prescriptions employed

Table 1- Case Studies Characteristics

	<i>Landscape</i>	<i>Size of agreement (ha)</i>	<i>% Owned</i>	<i>Organisation Structure</i>	<i>Enterprises</i>	<i>Previous AES</i>	<i>Reasons for Joining</i>
A	Large fields, few features	492	33%	Family Run	Cereals	None	Reclaim Modulation
B	Open, few features except pasture	165	86%	Stubble to Stubble Contracted/ Family Run	Cereals/ Sugar Beet/ Suckler Herd	None	Reclaim Modulation
C	Large fields more features	433	100%	Consultant/ Labourer	Cereals/ Let Grazing	CSS	Reclaim Modulation
D	Smaller fields more features	141	0%	Family Run/ Contract elsewhere	Cereals/ Sugar Beet/ Let Grazing	None	Make Grassland Profitable
E	Smaller fields some features	65	100%	Family Run/ Contracted	Cereals/ Let Grazing	CSS	Interest/ Profit
F	Average fields more features	255	9%	Stubble to Stubble Contracted	Cereals/ Let Grazing/ Free Range Eggs	CSS	Reclaim Modulation
G	Smaller fields more features	166	0%	Stubble to Stubble Contracted	Cereals/Potatoes/ Miscanthus/ Let Grazing	CSS	Reclaim Modulation
H	Large fields, few features	311	100%	Manager/ Labourers	Cereals	None	Reclaim Modulation
<i>Mean</i>		<i>254</i>	<i>54%</i>				

Table 1 summarises the characteristics of the case study farms chosen and shows that the predominately enterprise on all of the farms was cereal production and that the only livestock enterprises were a suckler herd on one farm and free-range laying hens on another. Four of the farms had grazing let to other farmers.

Interestingly although ELS is meant to be a whole farm basis farms C, E, F, and G had left their grassland out of the agreement because it was already in CSS and A and H farmed more than one holding and had separate agreements on each. Farm H actually farmed 1750ha in total.

The average size of agreement was well above the average of 151ha in the census statistics (DEFRA 2007) but was very close to the average size of ELS agreement in the Lincolnshire Wolds (NE 2008). Whilst the farms were all fairly typical of those found in the Wolds the variables of different organisational structures and landscape types allowed for interesting differentiation in the analysis of the results.

Income forgone per prescription

All farms earned points from the compulsory FER but most also gained points from the management plans (which are no longer available to new applicants). Only Farm D had no points for management plans and that was because they had joined ELS when these were no longer an option. The income forgone for the FER and management plans were similar with the costs being that of an adviser, for all except farm E, and for the farmers managerial time. The average income foregone was 14% for the FER and only 6% for management plans. Variations between case studies were due to either the number of features which meant the FER took longer or the size of agreement with the larger agreements being able to spread the cost over a larger area.

Table 2- Income forgone (as a % of the attributable payment) for different prescriptions categories

Prescription	Case Study Farms								Av.
	A	B	C	D	E	F	G	H	
Farm Environmental Record	6%	6%	30%	34%	18%	12%	2%	7%	14%
Boundary Features	-6%	-	4%	0%	-4%	-6%	0%	0%	-1%
Trees and Woodland	-	-	-	0%	0%	-	0%	113%	24%
Historic and Landscape Features	-	-	-	0%	-	-	-	-	0%
Buffer Strips & Arable Land	76%	-	16%	2%	50%	-	13%	121%	82%
Lowland Grassland	-	6%	-	0%	-	-	-	0%	2%
Management Plans	4%	1%	9%	-	13%	6%	1%	3%	6%
Total Agreement	37%	5%	7%	4%	21%	-2%	3%	65%	21.8%

As a percentage the most points were gained from boundary features. Farms C, F, and G were able to achieve over 60% of their points from these prescriptions. In all cases the changes in costs of labour, fuel, and repairs were only small in comparison to the payments. Farms A, E, and F had a negative income forgone because they had actually saved costs. Farms D, G, and H had not needed to change their management practices and therefore had no income forgone. Farm C had changed from cutting every two years to cutting every three which was more costly and extra costs did occur.

Buffer strips and arable options made up on average 23.3% of the points and were the least profitable as they resulted in land being taken out of production. The arable prescriptions were limited to mainly field corner management and some pollen and nectar mix. Due to the lack of spring cropping in the study area none of the case studies had chosen over-wintered stubbles. The income forgone was the loss of gross margin and the cost of establishment less the savings in labour, fuel, repairs, and interest on capital. On average the income forgone was 82% of the payment and between case studies this varied between just 2% and 121%. Farm D had a low income forgone only because the land was already out of production whereas the other variations were due to either the level of the gross margin performance or the level of cost savings. Farms C and G had relatively low yields and price and had relatively high savings in fixed costs. The cost savings were particularly significant when the farm was largely run by contractors as was the case with Farm G. By way of contrast Farm H had high yields and prices resulting in high gross margins and due to large size of the total farming business had relatively low costs and less scope for fixed costs savings.

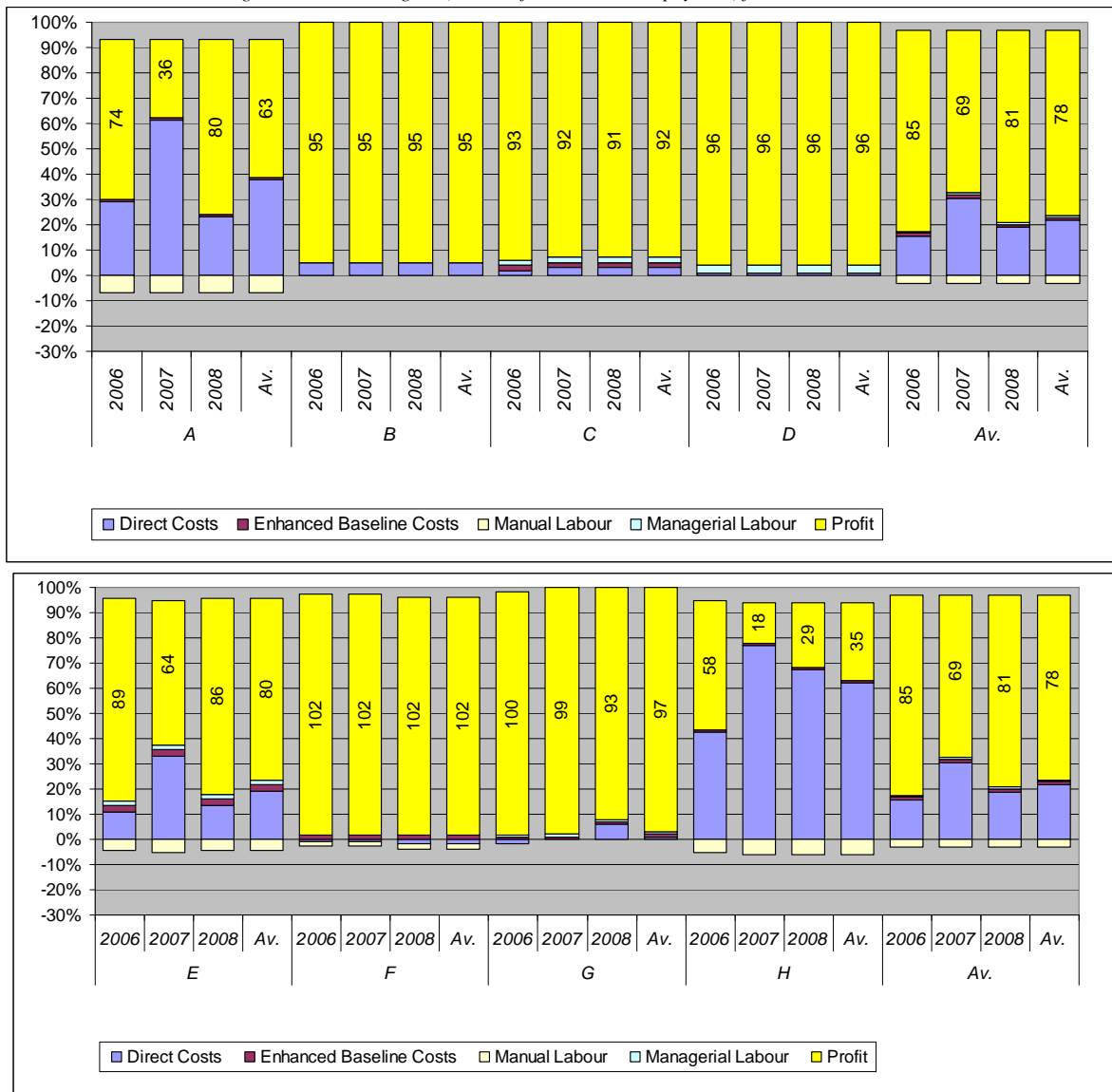
The options that cause land to be taken out of production also saw variations between the

different years studied. On average the income foregone was 54% in 2006, 121% in 2007, and 66% in 2008. The significant uplift in output prices in 2007 had driven up the income foregone to the point that the prescriptions were unprofitable.

The grassland prescriptions had provided the focus of agreements on Farms B and D and had only been excluded from Farms C, E, F, and G because their grassland was already in CSS. In all cases the choice of this option had caused no change in management and only Farm B had any income foregone, which was the cost pulling out some hawthorn after an inspection.

The remaining options formed only a small part of any agreement and in general gave rise to no income foregone. Woodland edge management was the exception as it took land out of production, hence the large income foregone for case study H in the trees and woodland options.

Figure 1- Income Foregone (as a % of the attributable payment) for the Whole Farm

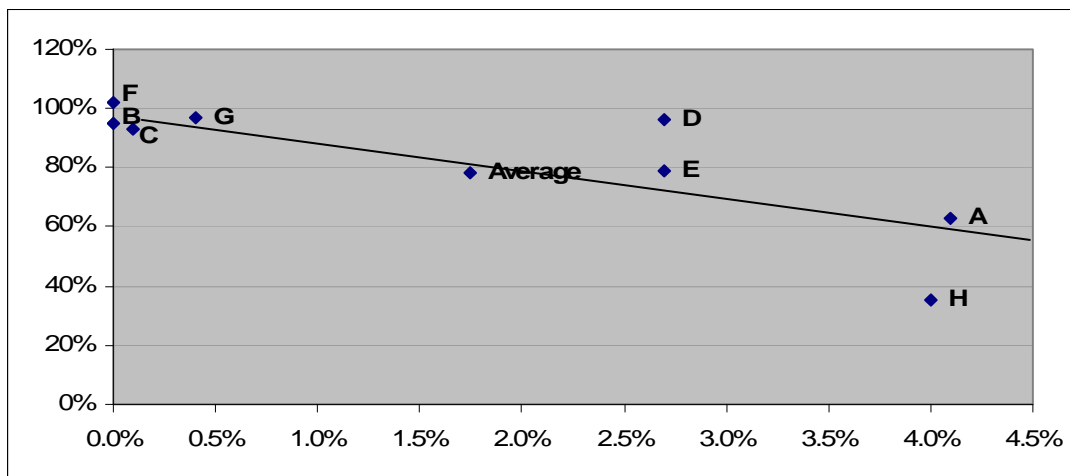


Whole farm profitability

All the case studies made an overall profit from ELS on all the years studied with the average profit being 78.2% of the payment. The average whole farm profit was above 90% of the payment for five of the case studies and varied between 35% and 79% for the remaining three (see Figure 1). The difference between Farms B, C, D, F, and G with their consistently high profits on one hand and A, E, and H with their lower and more volatile profits on the other, was that the latter had taken significant land out of production. Case Study D did have land out of production but as this was already left uncropped there was no income forgone. In general (as Figure 2 shows) there appears to be a relationship between profit and the level of land out of production but the significance of this cannot be judged from the small number of observations.

Significant variation between years only occurred in the farms where gross margins were part of the income forgone and for the remaining farms the income forgone was unresponsive to changing economic conditions. As stated in the methodology the income forgone was split into four categories, out of which only the direct costs were significant totalling on average 23.2% of the payment. Enhanced baseline costs and managerial labour costs were both negligible. Manual labour cost was typically a cost saving and taking account of this produced negative income forgone in farms that had land taken out of production or had saved time by cutting hedges less often. In the case of farm F this had led to an overall profit equivalent to 102% of the ELS payment. However the manual labour savings for farmers using family labour, such as case study A, would have in reality been only notional.

Figure 2- Relationship between Whole Farm Profit (y-axis) and Land out-of Production (x-axis)



Comparison of the results with those of earlier studies

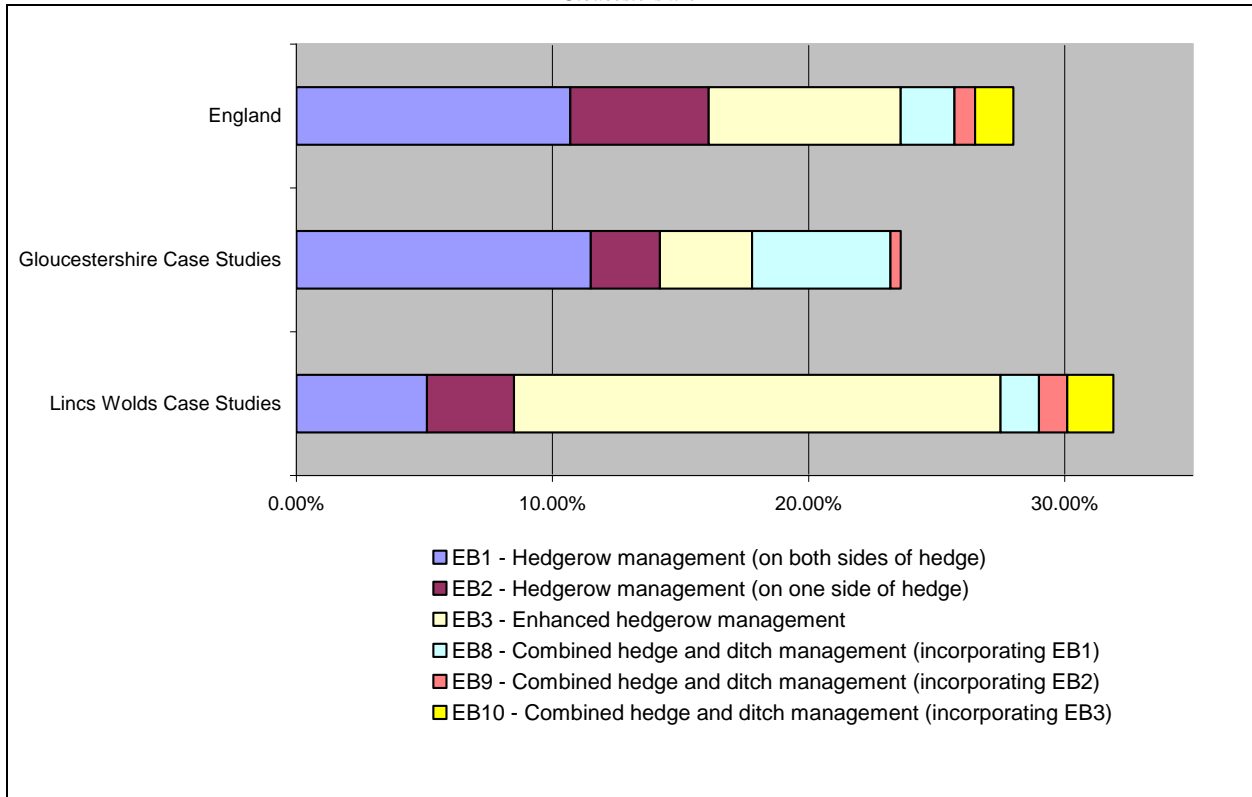
This study has found that arable farmers profit from ELS and have been successful in achieving their financial objectives for entering the scheme. The study adds weight to the results from previous studies by Wallis and Jones (2007), and Grey and Jones (2008) that farms in general are able to profit by ELS participation.

Grey and Jones found the apparent link between profitability and farm type was mainly because of the associated landscape features. The study reinforces this finding because even with just the

one farm type there has still been variation, demonstrating that landscape is a more important factor than farm type and just small changes in landscape features can result in large differences in profit. It was the abundance of features in the landscape that allowed farmers to choose, intentionally or sub-consciously, options with limited income forgone. Only case studies with more open and featureless landscapes were not able to focus their agreements on the options that cause little change to management, such as boundary and grassland options, and instead had to resort to the less profitable arable and buffer strips options.

The high level of adoption of boundary prescriptions is shown in Figure 3. This shows that farmers in the Wolds were more inclined to choose enhanced hedgerow management (pale yellow and yellow) compared to farmers in England and those in the study by Grey and Jones (2008). An explanation could be that when boundary features are scarce, as they were on a number of the farmers in this study, the farmers would choose enhanced management to maximise points. A similar relationship was found in grassland options with farms in the Wolds being more inclined to use very low inputs rather than low inputs.

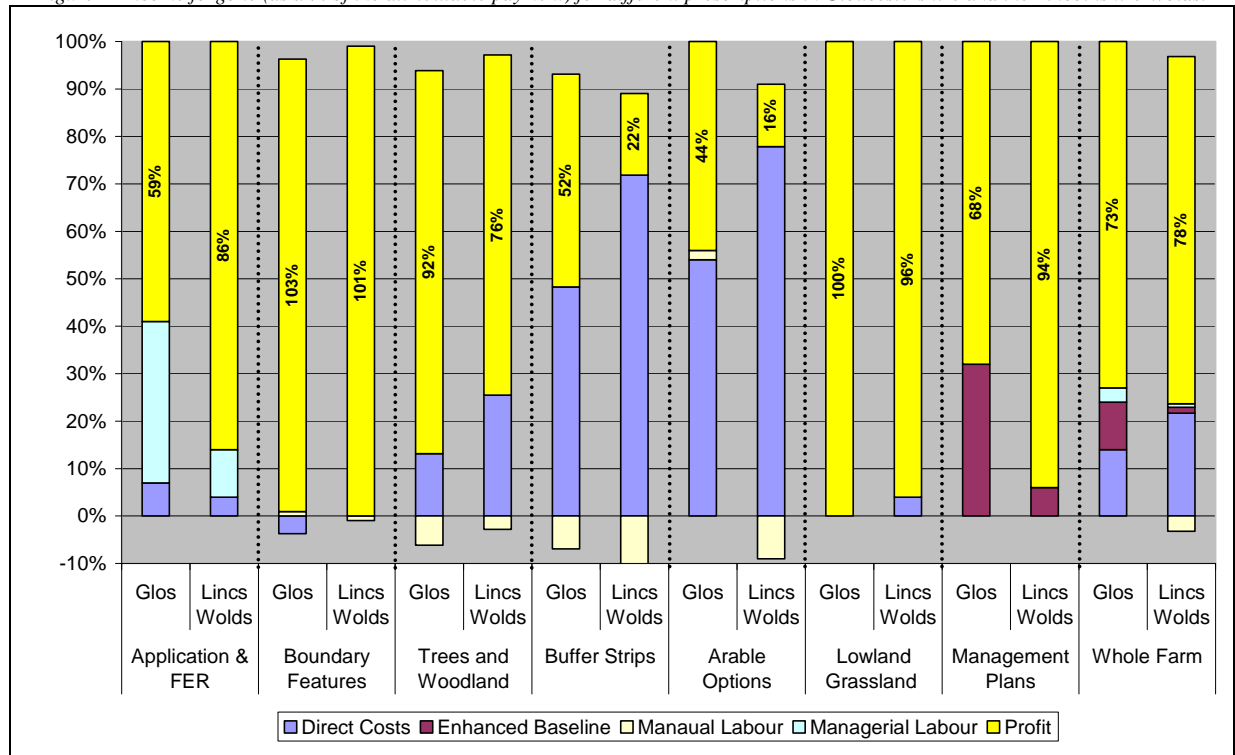
Figure 3- Percentage of points scored from boundary prescriptions in comparison with all ELS participants in England and case study farms in Gloucestershire



The overall average level of profit made out of ELS participation was quite similar in the Lincolnshire Wolds to that found by Grey and Jones in Gloucestershire (as can be seen in Figure 4). It can also be seen that profit margins tend to be much higher for prescriptions involving boundary features, extensive use of grassland and management plans. In Gloucestershire a greater proportion of management plan costs come from the pre-existing enhanced baseline for compliance. However the main difference between the two areas is in the extent of profit from

prescriptions that involve taking up land for buffer strips or other arable options. The income foregone was higher for this in Lincolnshire than was the case in Gloucestershire. This might be attributable to the higher level of arable farming profitability and yield potential in Lincolnshire. However comparisons between arable prescriptions in the two studies are made difficult because the results in Gloucestershire were based on over-wintered stubble whereas in Lincolnshire none of the case studies had chosen this option.

Figure 4- Income foregone (as a % of the attributable payment) for different prescriptions in Gloucestershire and the Lincolnshire Wolds.



The significant element of profit in the Lincolnshire results, echoing those of the earlier studies, shows that the actual income foregone did not match that forecast in DEFRA budgets. This is largely for two main reasons. First farmers did not need to alter their practices either because they were already carrying out work above the baseline required or because it was not necessary or relevant under their circumstances. Secondly projected income foregone for the whole of England over five years could not be expected to replicate that on individual farms in a particular year. In fact the study showed that the variation in income foregone was considerable between the three years for the same prescription on the same farm. It is almost inherent in simple, basic, self-select schemes that farmers will tend to select prescriptions that involve little or no change. This has been raised as an issue for ELS (Boatman, 2007) but was also inherent to the ESA schemes as highlighted by CRER and CJC consulting (2002). The problem of a lack of ‘additionality’ can clearly be seen from all three farm level studies with respect to ELS.

The question these findings raise is therefore whether DEFRA is right to pay for work where there is no ‘additionality’ and whether their assumptions should be based on a ‘typical’ baseline or the ‘minimum’ baseline. The study by Jones *et al* (2006) found that on average farmers were

carrying out £23-44/ha of uncompensated work. Obviously if DEFRA took this into account as a baseline for their £30/hectare payment the additional amount could be very small.

IMPLICATIONS FOR THE FUTURE

The early adopters of ELS in 2005 are now considering whether to renew their five-year ELS agreements. The findings of this study suggest that it would be financially beneficial to their business to do so. They can use it to ensure they are being rewarded for the public goods they already provide. Farmers on farms without many landscape features on which to base their points will be conscious that management plans can no longer provide a convenient means to earn points in a way which does not require land to be taken out of production. This may influence their desire to remain in ELS. Farm H, for example, will now need to take an extra 5ha of land out of production and this will limit their profitability to just 2% of the payment compared with 35% with the inclusion of management plans and if prices improved they might make a loss.

Policy makers on the other hand are considering how to improve the benefits of ELS by encouraging wider uptake of prescriptions and improving additionality whilst continuing to increase the overall uptake of ELS. The problems are that capping or reducing payments for prescriptions with limited additionality could discourage overall uptake and allow market failure to continue. Whereas increasing payments for prescriptions with additionality by using the 20% transaction cost element (as a form of 'incentive') could improve uptake of these options but at current exchange rates the EU's limits of €600/hectare on annual crops and €450/hectare on uncropped land will soon be breached by increases in some of the highest payments.

Other options, is to regionalise payments to improve targeting. This could help the uptake of certain prescriptions in some areas but will distance ELS from its principals of simplicity and ease of administration. A more radical method of creating a market, such as those seen for carbon credits, would require scarcity and this is inappropriate for a scheme where high uptake is required. Another alternative the re-introduction of set-a-side for environmental purposes using the compulsion of cross compliance conditions to receipt of the Single Payment has, for the time being, been shelved in favour of a voluntary approach but its success is crucially affected by the uptake of land take options under ELS. The study demonstrates clearly why farmers are reluctant to select these options.

EU rules mean policy makers cannot or should not intentionally make ELS profitable but studies that have examined the true profitability have found that it is. Other studies have found that most farmers are strongly motivated to enter ELS for financial reasons and because DEFRA has set targets to achieve high uptake the profitability of ELS participation might be regarded as essential rather than accidental or incidental.

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