Common Property Resource Management and REPS Uptake in Ireland: the case of Irish Commonage

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Abstract

This paper looks at the factors determining REPS participation among commonage farmers in the West of Ireland and on the impact REPS has had on participating farmers' income and on their environmental practices and attitudes. The study reveals that sheep farmers are less likely to join REPS than cattle farmers and that being in receipt of other sources of State income acted as a deterrent to participation. REPS had a positive impact on participants' income and was most successful in changing farmer practices in a more environmentally benign direction, when doing so imposed no additional costs on the farmer. Environmental awareness among all farmers appears to be poor although REPS farmers display more appreciation of the degraded state of commonage than do non-REPS farmers. Farmers preference for a continuation of the status quo with respect to commonage management and a lack of discontent with respect to the distribution of past commonage rights points to the potential of building on a more co-operative approach to environmental management.

Keywords: Agri-environment, common pool resource

JEL Classification: Q0

1 Introduction

The Rural Environment Protection Scheme (REPS) is the Irish Government's response to its obligations under EU Regulation 2078/92. The objectives of the latter include, inter-alia, income support for farmers in the context of de-coupling and measures to reverse environmental degradation caused by existing farm practices as well as measures to enhance the environment in its visual and amenity aspects. The principle of subsidiarity applies with respect to national policy measures required under EU Regulation 2078/92, which accounts for the diversity of policy responses across European Union countries.

The objective of this paper is to see the extent to which REPS has been successful in its stated aims. An earlier descriptive study by Emerson and Gilmore (1999) indicated potential shortcomings of REPS because of the universal and voluntary nature of the scheme plus the size limitation on REPS payments, whereby payments are made on a per hectare basis up to a maximum of 40 hectares.[1] They pointed out that such a scheme design makes it unattractive for larger, more intensive and presumably more polluting farm enterprises, thus raising doubts as to the compatibility of the two objectives of income maintenance and environmental enhancement. On the other hand, given the relatively small size of the average Irish farm, the size limitation on payments may be a deterrent to only a small minority of farms and REPS may still be capable of delivering on its objectives, provided that the farmers who join the scheme modify and change their agricultural activities in accordance with its dictates.

This paper is based on a micro study of 282 farms in the West of Ireland, all of whom are in commonage and some of whom are in REPS. The farms in the survey are the kind at whom the scheme was targeted; that is to say, relatively marginal

[1] Under REPS 3 this has been replaced a fully tiered system based on a descending scale of payments based upon farm size (see below). However a real financial incentive to join the scheme diminishes greatly for farms greater than 55 hectares.

extensive farms. They are all located in an area which has suffered soil degradation and the destruction of natural habitats as a result of past overgrazing, an inevitable by-product of earlier EU agricultural policies. The fact that all farms are in commonage adds an interesting dimension to the analysis given the public good nature of the environment and the local public good nature of holdings held in common. In particular, the attitudes and practices of farmers where commonage management is concerned could be of benefit to policy makers in their efforts to design an effective and cost efficient agri-environmental policy. Moreover, ownership of commonage is a sufficiently significant Irish phenomenon (covering approximately half a million hectares and 9% of all farms in the republic) to warrant its inclusion in a micro study.

The research questions that we attempt to answer it this study are:

(i) the structural factors that may account for non-participation in REPS by farmers;
(ii) whether farmers in REPS have gained financially as a result of membership;
(iii) whether farmers in REPS have adjusted their behaviour in an environmentally positive way;
(iv) whether REPS participation has improved farmers' awareness of and attitudes to the environment.

2 Background

The process of EU agricultural reform has significantly broadened the objectives of the Common Agricultural Policy (CAP) (Brouwer and Lowe, 2000; Buller *et al,* 2000; Lowe and Baldock, 2000). These now include measures to curb surplus production, rollback protectionist policies and a number of pro-environmental measures. The 1992 CAP reforms introduced limited price liberalisation and initiated measures to decouple EU income support to farmers from direct price

support while also modernizing the EU agricultural framework (*ibid.*). The introduction of Regulation 2078/92 provided a framework for the implementation of agricultural production methods compatible with the environment and the maintenance of the countryside. REPS 1 was first introduced by the Irish government in 1994 in accordance with the Regulation. The basic scheme comprised 11 mandatory measures, an additional mandatory measure for participants located in specific designated areas of high environmental sensitivity and a number of voluntary supplementary measures. In terms of farm management, the scheme primarily addressed waste management and nutrient control, grassland management, the protection of wildlife habitats and features of archaeological and historical significance. The scheme was universally available to all Irish farmers; participation was voluntary; it involved the design of a comprehensive farm management plan for each of its participants and the option of a funded training course on environmentally friendly farm practices. Farmers who participated in the scheme were compensated on a per hectare basis (€151 per ha) up to a maximum of 40 hectares. Those in targeted areas of high environmental sensitivity received higher payments, €242 per ha for the first 40 hectares, €24 per ha for the each additional ha up to 80 hectares and €18 per ha for each additional hectare up to 120 hectares. This extra compensation was in recognition of the fact that their compliance with higher environmental standards is compulsory. REPS participants who opted for one or more of the voluntary supplementary measures received additional payments, albeit based on just one supplementary measure. (See Emerson and Gillmor, 1999 for an analysis of REPS 1).

Agenda 2000 sets out the new direction for European Agriculture. It created the second pillar of the CAP (the first pillar being market support) and is based around the Regulation 1257/99. It consists of 22 measures to promote rural development and amalgamates the accompanying measures of the 1992 reform (agri-environment scheme, afforestation and early retirement) plus the Less

Favoured Areas scheme. It also includes measures to support structural adjustment. The broad objective of such reform was the continued integration of environmental goals into agricultural policy. (See Lowe and Brouwer, 2000; Matthews, 2002 for more analysis). More specifically its fundamental principles included, "recognising the multifunctional role of agriculture, improving competitiveness, ensuring environmental aims were upheld, diversifying economic activity and conserving rural heritage." (EUROPA: see references).

The original REPS scheme has been amended and evolved into REPS 2 and currently REPS 3. REPS 2 introduced additional restrictions on waste management and the use of chemical fertilisers. Training was now mandatory and the supplementary measure relating to public access and leisure activities was discontinued. Payments were increased by 10 percent for farmers with holdings of less than 20 hectares. REPS 2 was characterised by unexpectedly poor participation rates. Reasons cited were inadequate compensation, stocking restrictions, the complexity of the scheme and its attached penalties for breaches and high planning costs (Irish Famers Journal, 2002).

REPS 3 was introduced during the summer of 2004, partly in response to poor participation rates in REPS 2 (see Rath, 2002; Regan, 2002; Afcon Report, 2003; Carty, 2003; Rice, 2003). REPS 3 aimed to simplify the application and farm plan process, increase the REPS premia and enhance the positive environmental dimensions of the scheme. Payments were increased to €200 per ha for the first 20 hectares, €175 per ha for the next 20 hectares, €70 per ha for the next 15 hectares and €10 on all land above 55 hectares. A Farm management waste grant was introduced to assist with the costs of compliance but farms with less than 20 livestock units are ineligible for the grant. A new feature of the scheme was the introduction of the inappropriately named Biodiversity Options, which consisted of a list of measures from which the farmer must select two to implement. This aspect of the scheme is mandatory and the measures are all designed to enhance

the environment as opposed to desisting from damaging it. (See Appendix 1 for a list of these measures). Those in targeted areas of high environmental sensitivity, specifically, National Heritage Areas (NHAs), Special Areas of Conservation (SACs), Special Protection Areas (SPAs), and Commonage receive the same payment as under REPS 1 but with an additional payment of €5 an hectare for land in REPS over 120 hectares. The number of voluntary supplementary measures was expanded to include the preservation of special wildlife and birds habitats.

2.1 REPS and Commonage

An important feature which distinguishes Ireland from other EU countries is the high amount of commonage land in Ireland compared to other EU member states. There are approximately 4,500 commons in Ireland with approximately 9% of all farms in commonage. In the west of Ireland commonage represents 19% of total farm area. This makes commonage a unique Irish phenomenon. Commonage is land held in common ownership. In the particular study area in the west of Ireland, farmers use commonage for grazing, mainly of sheep. Farmers are the legal right-holders of commonage and its use for other purposes technically requires their approval. Farms in the survey range in size but they are predominantly extensive sheep or cattle/sheep farms, relatively low-income farmers and are living on marginal land. It is precisely these farmers that the REPS scheme is designed to target (Flynn ,1998b; Emerson and Gillmor, 1999).

The management of Commonage is particularly significant for the process of CAP reform in Ireland because upland commonages were identified as among the worst affected by overgrazing. Recent evidence indicates that a significant contributory factor in the degradation of commonages is the intense grazing by domestic livestock. (Bleasdale, 1995; Douglas, 1995). In the period 1980-1992, sheep numbers in Ireland rose from 3.2 million to 8.9 million. (CSO, 1992). It has been estimated that in Co. Galway and Co. Mayo there were 2 million sheep in 1994-5,

a quarter of the Irish sheep population (Bleasdale, 1995). The effects of high grazing intensities include disappearance of heath and calcareous grasslands, reduced habitat for rare species (e.g. red Grouse), decline in grassland productivity due to replacement by less productive grasses and the loss of peat which has increased water pollution and lead to the decline in salmonid species (Bleasdale, 1995; Lee, 1996; Carrol, 1998).

Commonage is an example of a common pool resource and consequently may display characteristics of rivalry and non-excludability. There is a substantive literature which indicates that for such resources one can expect that the lack of rules regarding authorized use will lead to misuse and over-consumption (Ostrom, 2000). An important concern of this study is the impact of property right arrangements on grazing practices by commonage farmers who are part of REPS. This factor is not at issue on private land and, in the absence of local institutions governing grazing regimes, one might expect a different pattern of farmer behaviour on commonage land compared to private land.

A number of studies assert that the pattern of overgrazing on commonages is an agricultural trend to which agri-environmental policy in Ireland should afford high priority (Emerson and Gillmor, 1999; Flynn, 1998a; DAFF, 1999). This paper aims to explore the effectiveness of REPS at achieving its objectives in commonage areas – i.e. which involve the management of a local public good, whilst also analysing the schemes compatibility with EU regulations.

As already indicated, farmers in Commonage who join REPS get higher payments then those not in designated areas, in recognition of the higher environmental standards to which they must conform. The extra conditions that attach to such farms are contained in Measure A which was developed in 1998 and integrated earlier distinct supplementary measures. Measure A also required that an ecologist accompany the REPS planner in preparing REPS plans on commonage areas. For

example it required farmers to discontinue the practice of outwintering of livestock. The objective of this new measure was "to provide a comprehensive approach to conservation and/or regeneration of designated target areas" (DAFF, 1999). Commonage farmers who are not in REPS also receive a payment of €242 per hectare, but in their case it is limited to a maximum of 10 hectares. The payment is conditional upon compliance to the Code of Good Farming Practice. This is a lower environmental standard than REPS.[2]

Towards the end of the original REPS in 1998-1999 it was noted that REPS due to its voluntary nature was not in itself a sufficiently adequate policy in tackling over-grazing on Irish commonages. Such was the concern with the soil degradation caused by overgrazing, that the EU threatened to stop all REPS payments to commonage farmers in the West of Ireland. Subsequently, targeted EU legislation was introduced which required all commonage farms, irrespective of whether they were in REPS or not, to farm according to a Commonage Framework Plan (CFP). Allied to this was a recommendation of specific training schemes for commonage farmers who were in REPS (DAFF, 1999). These location specific commonage framework plans were to be drawn up jointly by an ecologist and an agronomist dictating stocking levels, grazing regime and the exclusion of certain agricultural practices. Also, baseline ecological data were to be collected on all commonages to facilitate long term monitoring and evaluation of the programme. All REPS plans operating in commonage now had to comply with the over-arching compulsory CFP. Since the task of preparing a CFP for every site in Ireland would take some time (it was only finished in 2005) a 30% de-stocking on all commonages was introduced until an individual CFP for every commonage had been prepared. Since the nationwide implementation of the CFP, a new agricultural scheme 'The National Parks and Wildlife Service Farm Plan Scheme for Designated Areas and Commonage' has been introduced. Aimed at farmers in designated areas who do not wish to join REPS it offers compensation for income forgone due to stocking

[2] This payment also applies to farmers in NHAs, SACs and SPAs who decide not to join REPS.

restrictions. Unlike REPS, payments do not include an incentive element. (O'Keefe, 2005)

Clearly REPS on its own has not addressed many of the environmental problems identified by policy makers in areas of high uptake, where livestock systems which involve commonage are the norm. REPS has developed under property regimes which frequently imply rivalry and non-excludability. It has co-evolved with a combination of voluntary agri-environment schemes, national targeted legislation, increased involvement of non-agricultural expertise, specialist training and the execution of a comprehensive monitoring and evaluation system. Consequently, the commonages of Ireland are now managed and governed differently to other farming systems in the livestock sector. This makes the study of commonage extremely relevant to the future of Irish agri-environment policy.

3 Data and study sites

This study is located in Connenmara, County Galway and Co. Mayo. The population of what is essentially a rural community numbers approximately 30,000 with a density of one person per 6.5 ha (Scannell, 1984). Connemara's and Mayo's Atlantic climate gives rise to high levels of precipitation particularly in mountainous regions where 2,500 mm of rainfall per annum is typical (Webb and Scannell, 1983). The landscape of southern Connemara is low-lying and composed of large expanses of western blanket bog. The soils of the upland grazing areas are generally of low productivity and are best suited to extensive cattle and sheep production and very little arable farming occurs in the study areas.

In the spring and summer of 2004 a sample of 283 farms were identified as operating management regimes considered typical of commonage farmland but which also involved some REPS adopters. Personal interviews were undertaken with the owner-operator at the owner's property. Each interview lasted

approximately 45 minutes and followed a standard format. The questionnaire was piloted for one month during February 2004 and this aided in the design of the survey.

Each survey provided detailed data on revenue and cost summaries, farm premia, use of technology, labour and costs of farm operations, particularly grazing and livestock activities. The survey focused principally on market costs and benefits. Information on shareholder activities and on current and past land management practices were also documented. The range of enterprises on these farms included sheep, beef and suckler cow production. On most of the farms livestock are moved from lowland areas surrounding farmsteads to upland commonage areas. Consequently, additional information on shareholder/grazing rights, number of active shareholders and the movement of livestock was obtained where, for example, livestock are relocated between different seasonal pastures such as between upland commonages and lowland areas.

Property rights and the non-excludable nature of commonage is known to affect land management (Ostrom 2000). Consequently information on the number of active shareholders, farmer attitudes to commonage and the nature of decision making – whether joint or cooperative management by shareholders was also sought. Farmers were also questioned about commonage management, its degradation and their attitudes to its future use. Finally all respondents were asked a series of questions on sources of household income and household characteristics in order to determine which socio-economic variables affect decisions to adopt REPS.

The following conventions were used in data gathering and in performing the analysis:

(i) Family labour was valued at the same cost as hired labour

(ii) All inputs even though subsidised were valued at their market price

(iii) Production was valued at farm gate prices

(iv) The cost of land rent was included for all of the farms

(v) All prices are expressed in Euros

In general the statistical tests performed are of a relatively simple statistical nature, comparing the structural characteristics, activities, economic position and attitudes of REPS and non-REPS farmers. Most of these tests are parametric z tests (for means and proportions) comparing the aforementioned variables for REPS and non-REPS farms. Non-parametric tests were conducted when the data involved was of an ordinal nature. In addition, various logit regressions were undertaken to see whether the structural and social characteristics of both classes of farm and farmer impacted on their probability of joining REPS.

4 Results

4.1 Factors accounting for non-participation

The variables compared are: (i) the size of farms; (ii) the type of farms; (iii) the age of the farmer; (iv) the farmer's level of educational attainment; (v) whether the farmer is in receipt of State payments (other than REPS); (vi), membership of the Irish farmers Association (IFA); (vii) whether the farmer is engaged in off farm employment and; (viii) whether the farmer is full time or part time. The criterion governing the selection of these variables was exogeneity; that is to say, those variables were selected on the basis that they would be unaffected by REPS membership. With the exception of age and size of farm , the other variables are represented by dummy variables. The State payment variable does not refer to the amount of income that a farmer gets from the State but is a status variable. This is because for any State transfer, a certain minimum amount is disregarded for means testing purposes. Hence the status variable is exogenous. Farm type is also represented as a binary variable, those farms with some sheep and those with none. Education is represented as an ordinal variable to capture primary,

secondary and tertiary levels of education. All other variables are binary dummies since the farmer either has the status that the variable describes or he doesn't have it.

Bivariate comparisons of REPS and non-REPS farms and farmers reveal statistically significant differences between the two groups in terms of age, farm type, whether the farm household is engaged in off-farm employment, and status as a recipient of state transfers. While the average age of both sets of farmers is elderly, REPS farmers are marginally younger. A much greater proportion of non-REPS farmers are in receipt of state transfers compared to REPS farmers. These state transfers consist of farmers dole (unemployment assistance), disability allowance, pre-retirement allowance, old age pension and farm assistance. Farm assistance is the principal state transfer in our study. [3] While most farms in the study contain some sheep, our results indicate that this percentage is higher for non-REPS farms. What the logit regressions reveal is that farm type and farmer status (as a state transfer recipient) are the only variables that affect the probability of joining REPS (see table 2a). Farms with some sheep (as opposed to no sheep) are less likely to join REPS and being in receipt of State transfers also reduces the likelihood of membership. Reducing the number of variables in the regression to three doesn't have a huge adverse effect on the overall significance of the equation and the values of the coefficients are broadly the same (see table 2b). Age would appear to be correlated with the farmer's likelihood to be in receipt of state transfers as can be seen from the fact that when the latter is excluded the age variable becomes significant at the 90 percent level. However the significance of the equation reduces quite substantially when state transfer status is excluded (see table 2c). Excluding the age variable and retaining the state transfer variable reduces the significance of the equation but not as dramatically as when the latter variable is excluded. This would indicate that while being older increases the

[3] The Citizens Advice Bureau informed us that most common form of state transfer in the area of our study is State Assistance.

likelihood of being in receipt of state assistance, the latter encompasses more than just older farmers.

State transfers are means tested. Presently, farmers do not lose benefits if their income from other sources (REPS or off farm) is less than €4590. Above this level, the effective marginal tax rate in terms of loss of benefits is 50 percent. This clearly acts as a financial disincentive to join the scheme for this class of persons. It also acts as a disincentive for a member of the farm household to engage in off farm employment, which is something that the second pillar of the CAP (of which REPS is part) is designed to promote. Thus, this would explain the statistically significant difference between the two categories of farms in relation to off-farm employment. We performed a simple correlation for the whole sample between the off farm employment variable and the state transfer dummy variable. The correlation coefficient is negative (-0.4) although not very high, which is what one would expect performing a correlation with two sets of dummy variables and assuming that there is a lot of variation in the level of assistance received by individual farm households from the State. Our results also indicate that REPS is more attractive to farmers who have no sheep than to those who have some. There is also a greater likelihood that sheep will be grazed on commonage land than cattle. This appears to be indicating that REPS is more attractive to those farmers who use commonage less. One reason for this may be that at the time the survey was conducted, there was some uncertainty about future state plans for the management of commonage. One would therefore expect more caution to be exhibited by those most dependent on commonage; that is to say sheep farmers, which could explain their conservatism regarding REPS membership.

Table 1: Structural and Social Characteristics of Farms and Farmers

	Farms in REPS	Farms not in REPS	Z test for difference
Mean values			
Farm Size	76.1	77.9	0.15
Age	55	59	2.36**
Percentage			
In receipt of state transfers	43	71	3.6***
Farm type (with some sheep)	69	85	2.8***
Membership of IFA	38	37	0.25
In off farm employment	47	34	1.91*
Full time			
Mean Rank			
Educational attainment	143.4	129	1.58

*** significant at 99 percent level, ** significant at 95 percent level, *significant at 90 percent level.

4.2 Financial impact of REPS

There are no objective data on household income and farm income. What our survey shows are self-selected broad income categories, which farmers report as their household income situation. What table 3 reveals is that a significantly higher percentage of non-REPS farm households declare themselves in the lower income categories than do REPS households. Looking at the breakdown of sources of household income, what is immediately clear is the relative importance of State assistance to non-REPS farm households and how off farm employment income is a more significant contributor to REPS household income than to that of non-REPS farm households. In order to see whether signing up to REPS had a positive impact on the income of farmers, we construct an estimate of the absolute amount of income that farm households derive from farm activities, off farm employment

and state transfers. These estimates are quite tentative as they are based on the mid-point of each income category for total farm household income that each farmer declared, multiplied by the percentage of income that the farmer claimed derived from the various sources. The sources of variation in our final estimates come from the different income classifications and the differences among farmers of income derived from different sources. It doesn't capture the variation in income among farmers in a given declared income category. This will bias downwards the standard deviation of the results for each income category. Table 5 shows the final estimates and the resulting z test for differences between the means of REPS and non-REPS farms. The results show that the income differences between REPS and non-REPS farm households are significant as are income differences from the various sources. Interestingly, when we estimate the difference in mean income from farm activities deducting the REPS payment that each REPS farmer received, we see that non-REPS farmers have a higher estimated mean income from farm activities than do REPS and that this difference is statistically significant at a 95 percent confidence level. So we can tentatively conclude that joining REPS has had a positive impact on the farm incomes of the schemes' participants.

Table 2a: Logit Regression of REPS membership on Structural and Social Characteristics of Farms and Farmers

		B	S.E.	Wald	Sig.	Exp(B)
Step 1(a)	Age	-.015	.013	1.440	.230	.985
	IFA	.112	.301	.138	.710	1.118
	Educ	.740	.677	1.195	.274	2.096
	Partic	.270	.343	.619	.431	1.310
	Size	-.001	.002	.123	.726	.999
	Type	-1.052	.387	7.382	.007***	.349
	Off	.048	.388	.015	.901	1.049
	State	-.780	.344	5.156	.023**	.458
	Constant	2.802	.909	9.501	.002***	16.470

Nagelkerke $R^2 = 0.122$

Table 2b: Logit Regression of REPS membership on Structural and Social Characteristics of Farms and Farmers

		B	S.E.	Wald	Sig.	Exp(B)
Step 1(a)	Age	-.015	.012	1.709	.191	.985
	Type	-1.025	.370	7.683	.006***	.359
	State	-.775	.320	5.865	.015**	.461
	Constant	2.993	.729	16.835	.000***	19.939

Nagelkerke $R^2 = 0.113$

Table 2c: Logit Regression of REPS membership on Structural and Social Characteristics of Farms and Farmers

		B	S.E.	Wald	Sig.	Exp(B)
Step 1(a)	Age	-.027	.011	6.570	.010*	.973
	Type	-1.067	.366	8.502	.004***	.344
	Constant	3.260	.724	20.294	.000***	26.038

Nagelkerke $R^2 = 0.083$

Table 2d: Logit Regression of REPS membership on Structural and Social Characteristics of Farms and Farmers

		B	S.E.	Wald	Sig.	Exp(B)
Step 1(a)	Type	-.989	.368	7.242	.007***	.372
	State	-.948	.292	10.552	.001***	.387
	Constant	2.195	.385	32.446	.000***	8.979

Nagelkerke $R^2 = 0.104$

*** significant at 99 percent level, ** significant at 95 percent level, *significant at 90 percent level

Table 3: Farmers' perception of Income Status

Total Household Gross Income (euros) Percentage of farm households in each income category						
Income categories	<15,000	15,000-30,000	30,000-45,000	45,000-60000	> 60,000	Cumulative percent
Non-REPS farms	65.5	25.2	8	0	1.3	100
REPS farms	23.1	42.6	15.3	6.3	3.7	100

Table 4: Farmer's perception as to sources of Farm Household Income

Mean percentage contribution of different activities to farm household income				
	Farm activities	Off farm employment	State transfer	Cumulative percent
Non-REPS	42.2	18.3	39	100
REPS	49.6	27.8	18.8	100

Table 5: Estimated mean values of income from different sources

	Farm activities	Off farm employment	State transfer	Total household income	Farm income less REPS payment
Non-REPS	5895	4239	4166	13966	5894
REPS	9974	8941	2972	21688	3883
Z test for difference	4.4***	3.4***	2.1**	5.5***	2.52**

*** significant at 99 percent level, ** significant at 95 percent level, *significant at 90 percent level

In contrast to farm income, data was collected on total farm costs. (See Appendix 2). Of note is the fact that although mean total costs were considerably higher for non-REPS farms compared to REPS farms (20 percent higher), the difference is not significant due to the considerable standard deviation in costs, especially for non-REPS farms. This is obviously indicative of, among other things, substantial

heterogeneity in the level of farm activity on the non-REPS farms. If perceived farm income is higher for REPS farms but we can make no statement as to costs, then a related conclusion is that the financial benefits from REPS derive from the REPS payments as opposed to savings on costs. Furthermore, we cannot even conclude from the results of our sample, that compliance with the conditions of the REPS scheme imposed any higher costs on REPS farmers. This does raise broader issues about the design of the REPS scheme and whether it is more a system of income transfer as opposed to a scheme designed to change farmer practices in an environmentally friendly fashion. Emerson and Gilmore (1999) suggested that REPS, as it was originally designed, was likely to appeal to those farmers for whom little change in farm behaviour was necessary in order to be scheme compliant.

4.3 REPS participation and farm behaviour

Appendix 2 shows a detailed breakdown of costs for REPS and non-REPS farms. The only cost where there was a statistically significant difference between both types of farms is that related to artificial fertiliser. REPS farms spent on average 43 percent less on fertiliser than non-REPS farms. This is probably due to the Nutrient Management Plan, which is part of REPS, and designed to encourage farmers in a more cost effective use of fertiliser. It is an example of a measure than benefits farmers financially and benefits the environment. This fact was also noted in the Evaluation of REPS 1 "The scheme has brought about a beneficial move away from the excessive application of chemical fertiliser to better utilisation of organic fertiliser" (DAFF**,** 1999)

Other costs with environmental implications are buildings maintenance and fencing costs. An evaluation survey on REPS found that overall investment in waste management and storage facilities was greater on REPS farms than on non-REPS farms (AEU, 1999). Our data may fail to pick this up because it refers to maintenance and not original investment. However a study by Curtin and Whelan

(1998) indicated that many farmers who joined REPS already had adequate waste facilities. If the latter were the case, then it again raises the issue of the extent to which REPS resulted in changed farmer behaviour in instances where such change involved increased costs for farmers. The same argument could be applied to fencing, although this is a measure than has more to do with environmental enhancement rather than avoiding environmental damage.

While farmers are encouraged under REPS to switch from chemical fertilises use to organic fertiliser use, the latter is not environmentally neutral, especially if not adequately stored. Organic use is determined by stocking densities. A condition of REPS was a stocking level of less than 2 livestock units per hectare. Table 6 shows the breakdown of stocking rates for farms in our survey. What is initially striking is that mean stocking rates for all farms in the survey are considerably less than those necessary for REPS eligibility. This fact notwithstanding, mean stocking rates on REPS farms are less than on non-REPS farms and the difference is statistically significant. These results need to be interpreted in the light of the Commonage Framework Plan (CFP) which would have affected all farms in our survey. The latter is a targeted response to problems of overgrazing on environmentally sensitive commonage land. A higher percentage of non-REPS farms were obliged to de-stock under the CFP than were REPS farms. Notwithstanding this fact, over 50 percent of REPS farms were still obliged to de-stock, indicating that while REPS appears to have been effective in reducing stocking rates, it was not effective enough given environmental requirements.

Table 6: Stocking Rates on Farms (Livestock Units per hectare)

	Non-REPS	REPS	Z test for difference
Stocking rates on farm	0.54	0.43	1.84*
Stocking rates on commonage share	0.49	0.32	2.02**

Table 7: Percentage of Farms obliged to de-stock under the Commonage Framework Plan

Non-REPS	REPS	Z test for difference
81.1	56.4	3.16

*** significant at 99 percent level, ** significant at 95 percent level, *significant at 90 percent level

However it must be acknowledged that REPS had some effect in reducing stocking rates, given the lower percentage of farms that were forced to de-stock under CFP and given that even after the CFP took effect, REPS farms still have a lower stocking rate on both commonage land and on their overall farm. This may also be partly due to the fact that a greater proportion of REPS farms have no sheep (31 percent) than have non-REPS farms (15 percent) and sheep are more likely to be grazed on commonage.

We can conclude that the environmental provisions of REPS were most effective when their implementation also delivered financial benefits to the farmer (reduction in use of chemical fertiliser). This is an unsurprising result. However, there is some consolation in the fact that REPS farms had lower stocking rates than non-REPS farms and were less likely to be forced to reduce stocking levels as a result of the introduction of the CFPs than were non-REPS farmers. This indicates a degree of compliance with REPS conditions even when it has some direct negative financial implications.

4.4 Awareness of and attitudes to the environment

An important dimension of REPS is education. If environmental sustainability is to be achieved it is necessary that agri-environment schemes as a policy instrument are able to foster attitudinal change. According to Morris and Potter (1995), the ability of agri-environment schemes to 'green' the farming community is most crucial in making farmers not merely "passive adopters" of the schemes for economic benefits but "active adopters" who will want engage with

environment, agriculture and future policy decision-making, rather than just receiving policy in a top-down manner. Therefore, attitudes are a very important indicator for the future direction of policy. REPS includes a compulsory educational measure where farmers must undertake a course in environmentally friendly farming methods.

In the survey farmers were asked to evaluate the effect of commonage on the environment. What table 7 reveals is a very low level of acknowledgement among all farmers that commonage has resulted in severe environmental damage or worse and a high percentage who believe that no adverse environmental consequences have occurred as a result of commonage. Moreover only 10 percent of non-REPS farmers believe that overgrazing has occurred compared to 20 percent of REPS farmers (see table 8). If we accept the general scientific consensus that overgrazing has been a major pressure on the environmental integrity and stability of the study area (and bearing in mind the necessity of introducing the Commonage Framework Plan (CFP) to deal with the problem of overgrazing), the overall lack of environmental sensibilities of the part of the majority of REPS and non-REPS farmers is worrying. REPS farmers do however appear to have a higher level of environmental awareness compared to non-REPS farmers, albeit starting from a very low base. When we rank the state of the environment from 1 to 4 and perform a non-parametric test on the attitudes of both categories of farmers, the difference between them is statistically significant. This would appear to indicate that REPS may have had a positive (albeit marginal) educational effect in terms of raising the environmental awareness of its participants. Alternatively farmers who joined REPS may have been those with a higher environmental awareness in the first place. Or, given that more of the REPS farmers in our study do not have any sheep in their farm enterprise (31 percent compared to 15 percent for non-REPS) and given that most commonage is grazed by sheep, there was less of a potential cost to them from recognising the environmental degradation that has occurred on commonage land.

Most farmers, regardless of whether they are participating in REPS or not, do not perceive that commonage has been unfair in its distribution of grazing benefits (see table 9). This high level of satisfaction with the status quo is further reflected when farmers are asked to rank possible options regarding future management of commonage (see table 10). The majority favour maintenance of the status quo, although this figure is considerably higher for non-REPS (61 percent) compared to REPS (39 percent) farmers. A minority have selected REPS as the first best management option (less than 6 percent of non-REPS farmers and approximately 19 percent of REPS). However when we look at the second most favoured option, REPS performs much better, with 38 percent of non-REPS farmers selecting it as their second best option while 61 percent of REPS farmers do. Given that many farmers only returned their first preferences, these statistics are quite revealing and appear to indicate that REPS is high in the preference ranking of many farmers but comes a distinct second to the current arrangement. The Pearson correlation coefficient between the different options was also estimated. It was insignificant for all pairings except Status Quo and Privatisation. This had a correlation of -0.694 for the whole sample, -0.64 for non-REPS farmers and -0.71 for REPS farmers. This indicates that those farmers most favourable to privatisation are those least favourable to maintenance of the status quo and vice versa. When replying to this question about the future management of commonage, farmers are presumably taking into account the financial and environmental implications of the different proposed regimes.

These attitudinal responses contain mixed messages. On the one hand there is a low level of awareness that overgrazing has occurred on commonage land and that the environment has been compromised as a result. The fact that the majority of farmers indicate contentment with past distribution of grazing rights on commonage would appear to give sustenance to the view that it was genuine ignorance on the part of the farmer as opposed to some covert pecuniary motive

that inspired them to deny the extent of the environmental damage. In addition, the structure of past agricultural policies, whereby over 90 percent of the value of a sheep derived from a subsidy, positively dis-encouraged environmental awareness since low stocking rates would have been economic folly. Farmers' preference for a continuance of the status quo with respect to future commonage management points to the potential for building on a co-operative approach to managing the environment. The environment is a public good and commonage is a local public good. Privatisation, which is the preferred option of a minority of farmers, reinforces a behaviour based on a calculus of private costs and benefits. It would be fiscally less expensive and ultimately more effective if environmental compliance was ensured through acceptance of the environmental objectives of the scheme (as a result of education) and local monitoring of individual farmer behaviour. The potential is there to build on farmers' co-operative experience with regard to commonage management and to develop an environmental policy with more emphasis on the shared public good nature of the environment and on the importance of environmental sustainability to the long run economic future of the farming community.

Table 7: Farmers' perception of the effect of commonage on the environment

(percentage of farmers who selected a given environmental category)

	Complete destruction	Severe damage	Some damage	Perfect maintenance	
Non-REPS	0	4.9	30.5	64.6	100
REPS	0.55	10.4	40.6	48.35	100

Table 8: Farmers' perception of state of environment and degree of overgrazing

	State of Environment	Z (Mann-Whitney) test for difference	Has overgrazing occurred	Z test for difference
	Mean Rank		Percentage who said yes	
Non-REPS	148.6	2.58***	10.3	2.03**
REPS	125.3		20.2	

Table 9: Does Commonage fairly distribute grazing benefits
(percentage who answered yes)

Non REPS	REPS	Z test for difference
71.3	68.4	0.48

Table 10: Future management of commonage (percentage first preference)

		Maintain the status quo	Privatise	REPS participation by all	Shareholder committee	Other
Non-REPS	First preference	61	28.7	5.74	0	3.45
	Second preference	10.3	5.7	38	18.4	1.1
REPS	First preference	39	33.67	18.62	4	3.63
	Second preference	18.1	4.7	63.2	9.8	0
Z stat for the difference between first prefer-ences		3.346***	-.0821	-2.835***	-2.05**	-.007

*** significant at 99 percent level, ** significant at 95 percent level, *significant at 90 percent level

5 Conclusions

Our results lend weight to the notion that REPS effectiveness as an environmental measure has been subsumed by a priority to provide income support and thus doesn't secure "a more genuine integration the environment and agriculture." (Flynn, 1998b). Our study suggests that whilst REPS ability to provide a better income to farmers is irrefutable its environmental benefits have been more ambiguous. We have some evidence to indicate that REPS farmers employ less input intensive practices such as reduced fertiliser use and that it has served as a catalyst to decreasing stocking rates. Our results correspond to Ryan's (1998) study on a sample of participating Wexford farms that found that "extra income" was the main benefit of participation for farmers while "improving pollution control" and providing a "better environment for wildlife" were the least beneficial in farmer's views.

We also note that REPS farmers are more inclined to acknowledge environmental damage caused by farming and that REPS farmers are more predisposed than non-REPS farmers in the management of an environmental public good such as commonage. The establishment of local forums as recommended by the Afcon-Report (2003) may provide a means of galvanizing farmer support for REPS. Policy could avoid focusing on individual farm management plans (whose drawbacks have been highlighted elsewhere, See: Flynn 1998b) and use forums to extend the range of actors involved in agri-environment scheme design and control (which will thereby reduce environmental risk, See: Short 2000). This could promote farmer involvement in agri-environment schemes which involve commonage and empower farmers and make use of local knowledge in the management of a "common pool" resource as Feehan et al (2005) and Short (2000) recommend. Pro-active farmer involvement and co-operation could also serve to reduce the fiscal costs of inspections required under REPS and CFP schemes. Indeed the Mid-Term Evaluation actually cites commonage as the prime example where agri-environment policy could be most effective in achieving "greater

reductions in soil erosion, or to enhance habitats" leading to enhanced positive externalities as a result of united action by farmers.

REPS also appears to have been successful in accommodating social and rural community aspects of Rural Development Regulation (1257/99) through supporting increased diversification of farm households by enhancing reliance on off-farm employment. This has been an indirect consequence of participation as this is not a stated aim of REPS. However, as REPS forms part of the Irish government's "National Development Plan" which aims at promoting Regulation 1257/99, REPS could lay claim to being a vehicle for change in this regard in the absence of other initiatives on the Irish governments part in promoting off-farm diversification (Afcon Report; 2003).

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Appendix 1

The table below show the Biodiversity Options under REPS 3. All participating farmers must choose two Biodiversity Options with at least one from the first category.

Category 1 Options	Category 2 Options
4A Creation of a New Habitat	2A Traditional Hay Meadows
5A. Hedgerow Rejuvenation	2B. Species Rich Grassland
5B. New hedgerow establishment	3A Increased Watercourse margin
5C Additional Stonewall Maintenance	3B Exclude all Bovine Access to Watercourses
9A Green Cover Establishment	4B Broadleaved Tree Planting.
9B Environmental Management of Set-aside	4C Nature Corridors
9C Increased Arable Margins	7A Increase in Archaeological Buffer Zones
	7B Management of Publicly Accessible Archaeological Sites
	8A Provide Landscaping around the Farmyard

DAFF (2004), 'Terms and conditions of the RURAL ENVIRONMENT PROTECTION SCHEME (REPS)'

Appendix 2 **Breakdown of Farm Costs**

	REPS Participation	Mean	Std. Deviation	Z test
Artificial Fertiliser, Manure, Compost	Non-REPS Farmer	983.3962	1458.59646	2.36**
	REPS Farmer	496.7259	559.13593	
Contractors	Non-REPS Farmer	820.7692	639.91201	0.42
	REPS Farmer	886.0714	777.44001	
Purchased Hay, Silage, Straw	Non-REPS Farmer	1039.6667	963.45467	0.94
	REPS Farmer	892.0078	1039.71350	
Petrol, Diesel and Oil	Non-REPS Farmer	887.3684	1008.53417	1.98
	REPS Farmer	599.8056	670.87103	
Herbicide, Fungicide, Insecticide (Spraying Costs)	Non-REPS Farmer	432.8571	1088.83533	1.13
	REPS Farmer	240.8788	300.88944	
Machinery Maintenance and supplies	Non-REPS Farmer	513.1034	525.56163	0.67
	REPS Farmer	596.7072	554.39542	
Building Maintenance and Supplies	Non-REPS Farmer	1134.3750	2207.91899	0.1
	REPS Farmer	1194.1176	1968.12619	
Fencing Costs	Non-REPS Farmer	781.4035	780.73269	0.61
	REPS Farmer	721.3043	737.20874	
Total Farm Costs	Non-REPS Farmer	6379.9756	6380.23990	1.42
	REPS Farmer	5284.5813	4403.50981	