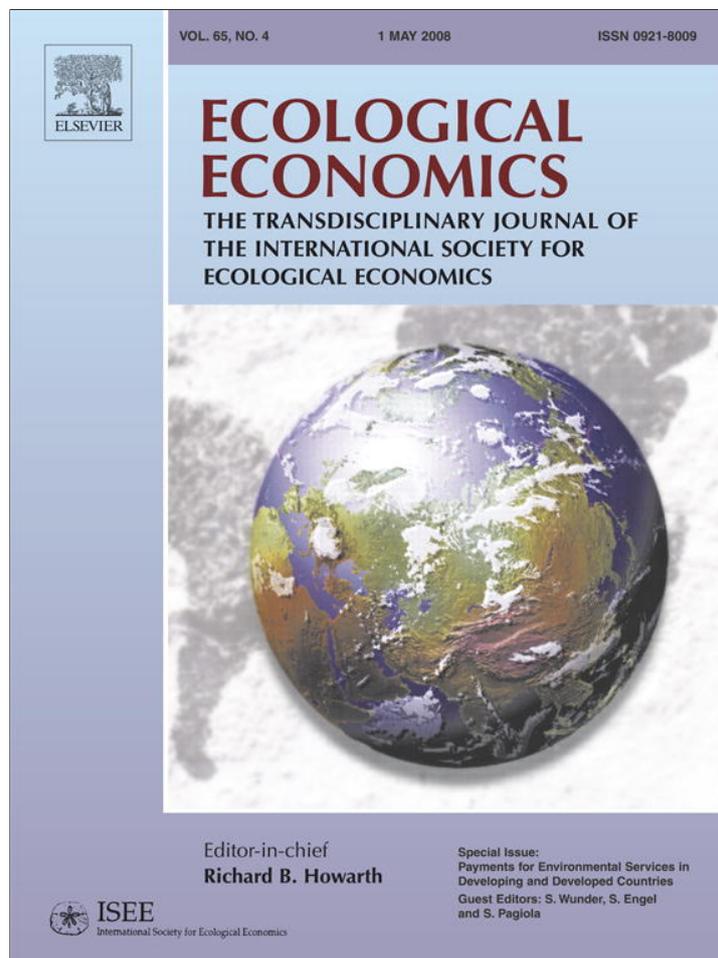


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Case study of agri-environmental payments: The United Kingdom

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ABSTRACT

The Environmentally Sensitive Areas (ESA) program, when launched in the United Kingdom (UK) in 1986, was the first agri-environmental program in the European Union (EU). This program grew to a total of 43 designated ESA schemes in the UK as a whole, 22 of which were in England. A variety of agri-environmental payments programs were created to supplement and complement the ESA schemes in years to follow. The most prominent of these in England was the Countryside Stewardship Scheme (CSS), established in 1991. The CSS was available to farmers outside the ESAs, and like the ESA program, was intended to protect valued landscapes and habitats and to improve public enjoyment of the countryside. By 2003, over 10% of England's agricultural land was enrolled in either ESA or CSS agreements. These voluntary agreements were long-term contracts (usually for 10 years) between the government and farmers to provide environmental services. Several major evaluations of the ESA program and the CSS were conducted over the years, and the results of many of those evaluations and the lessons derived are synthesized and summarized in this article. Both the ESA program and the CSS proved to be generally effective in enrolling many farmers in the entry-level contract tiers, thereby halting or slowing degradation of rural landscape and other environmental features. However, the schemes did not generally offer sufficient economic incentives to attract high levels of enrollment in the intensive farming areas. Also, the schemes were limited in their success in enrolling farmers in higher payment tiers, tiers that required more substantial changes in farming practices. The high crop and livestock-related payments received by farmers under the EU's Common Agricultural Policy (CAP) contributed to the disincentives to participate, especially in higher tiers. Following the latest (2003) reforms of the EU's CAP, England's ESA program and CSS are being replaced by a new, consolidated package of schemes that draws on lessons learned over the past 15–20 years with these two flagship programs.

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1. Introduction

The European Union's Common Agricultural Policy (CAP) objectives, as outlined in Article 39 of the Treaty of Rome,

were to increase agricultural productivity, secure European Union (EU) food supplies and stabilize prices, and ensure a 'fair standard of living' for the community's farmers. The 1992 MacSharry reforms of the CAP did not change these objectives.

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But the reforms did begin to weaken the core CAP objectives by introducing a system of direct payments to farmers and a move away from market support as a means of securing farm incomes. To qualify for these payments, farmers had to comply with a range of specific controls that were intended to restrain production; arable production was restrained by set-aside, and livestock production by quotas and headage payments. Incentives were put in place for farmers to comply with new practices, and so reduce food production. Sustainable technologies and practices represented only a very small element of these compliances.

The CAP reforms of the 1990s lightly 'greened' agricultural policy by including for the first time policy measures designed to fulfill environmental objectives. Regulation 2078/92 required member states to implement an 'agri-environmental' program. This obliged governments to offer farmers voluntary incentive schemes for adopting environmentally-friendly forms of land management. The Environmentally Sensitive Areas (ESA) scheme in the United Kingdom (UK) preceded these measures. When it was launched in 1986, this was the first agri-environmental program in the EU. The Countryside Stewardship Scheme (CSS) was established in 1991, and has been available only in England outside ESA territories. It aims to protect and enhance valued landscapes and habitats, and improve the public enjoyment of the countryside. The scheme targets chalk grasslands, waterside landscapes, lowland heaths, coastal lands, uplands and historic landscapes, and orchards and meadows. Again, farmers receive payments for entering management agreements, usually 10 years in length.

There also has been a range of other agri-environmental schemes of a more targeted nature in the UK, including some to encourage expansion of organic agriculture. Many of the UK agri-environmental programs of the past 10–20 years involved, to varying degrees, some form of 'payment for environmental services' (PES). The UK's ESA and CSS programs, in particular, were based on payments to farmers to practice particular kinds of agricultural stewardship.

2. Scope and methods

This case study of UK agri-environmental schemes is based on an extensive review of research and evaluation studies pertaining to the ESA scheme and CSS. We conducted an initial review in 2000 and 2001 (Dobbs and Pretty, 2001), which has now been updated. Recent policy developments also have been included in the concluding section of this article.

A special focus of our review of the UK experience with agri-environmental schemes was on the implications for bringing about more sustainable farming systems in 'arable crop farming' areas. Farming in arable areas of Europe has become increasingly specialized over recent decades — with fewer crops in each region accompanied by narrow rotational patterns (Pioret, 1999a, b). CAP policies that provided aid for cereals, oilseed crops, and protein crops helped lead to an increase in crops sold, while the fall in grazing livestock contributed to a decrease in permanent grassland in Europe. The growth in average farm size in Europe, together with increased mechanization, has contributed to ever more

specialized farm operations. This specialization has had adverse effects on biodiversity and rural landscapes.

3. Environmentally Sensitive Areas scheme

The ESA scheme was first set up in 1986, following concerns about the draining and ploughing up of the Halvergate marshes in Norfolk. In the early-1980s, farmers were paid to drain marshland and convert it to cereal production. The damage caused to Halvergate led directly to the establishment of the Broads Grazing Marsh Conversion Scheme in 1985 — the forerunner of ESAs. This offered farmers a flat rate hectareage payment in return for cutting stocking rates and reducing pesticide and fertilizer use. Some 5000 ha were designated, and 90% of farmers came into the voluntary scheme. When ESAs were then mooted for sites across the country, a wide range of bodies were involved in the design process, choosing 160 sites. But these were then cut to only ten covering 738,000 ha, the management prescriptions were simplified, and the final design centrally imposed (Blunden and Curry, 1988).

More ESAs were added later. The program grew to 43 designated ESAs in the UK as a whole (Hanley et al., 1999, p. 69). ESAs covered specified areas of designated high landscape or ecological value. These ESAs encompassed about 14% of the total agricultural land in the UK (Pretty, 1998, pp.75–76). Of the 43 UK ESAs, 22 are in England (MAFF, 2000a) and 10 are in Scotland (Wynn and Skerratt, 2000). The 22 in England cover some 10% of the agricultural land area (DEFRA, 2005).

Most of the descriptive data in the sections to follow is for ESAs in England. However, there have been several valuable studies of Scotland's ESAs, so insights from studies of both English and Scottish ESAs are included in this article. Only limited reference is made to ESAs elsewhere in the UK.

3.1. Services and actors

The ESA programs were taxpayer-funded programs administered by government agencies. Funds came from the EU and the UK government, about half from each (DEFRA, 2004, p. 5; Ryan and Ogdén, 2006; Temple, 2006). Participation in England's ESAs had grown to 12,445 agreements by 2003, covering 640,000 ha (Table 1)—67% of the nearly one million eligible hectares (DEFRA, 2004, p. 9). Under the ESA system, farmers entered up to 10-year voluntary management agreements in return for annual payments. Annual payments to farmers under the England ESA schemes had grown to £53 million by fiscal year 2003 (Table 1). This consisted of £43 million for annual management of landscapes and £10 million for capital projects under 2-year conversion plans.

Environmental services that the government attempted to purchase under the ESA program included improved habitat for birds, biodiversity (such as in species rich grassland), landscape beauty, and historic preservation. In 2003, £6 million in annual management payments under England's ESA scheme was for reversion of arable land (cropland) to grassland; £22 million was for management of meadows,

Table 1 – Participation and expenditures in England for Environmentally Sensitive Areas (ESA) scheme

Year	Enrolled (ha)	Agreements (number)	Payments to farmers ^a (£1000)
1992	129,358	3265	NA
1993	266,458	4514	1641
1994	346,391	6144	16,547
1995	424,567	7834	20,100
1996	433,637	8198	28,329
1997	469,121	9201	27,951
1998	501,255	9950	32,984
1999	523,545	10,323	36,376
2000	532,000	10,915	NA
2001	528,748	11,263	NA
2002	571,520	12,027	NA
2003	640,000	12,445	53,000

NA = Data not currently available on DEFRA websites.

Sources: DEFRA, 2004, p. 12; DEFRA, 2005 (May); MAFF, 2000b, Annex V, p.30; MAFF 2000c (March).

^a Data reported by fiscal year, so 1992/93 considered 1993, etc.

pastures, and other grassland; £8 million was for managing moorland; and around £370,000 was for establishing and maintaining grass margins. Among the items eligible for capital assistance were hedge planting and restoration of stone walls and traditional farm buildings (DEFRA, 2004, p. 12).

As these items suggest, the services sought were not just those of “nature”, but rather the ecology and views of traditional and farmed British countryside. The public, as expressed through the ESA and other agri-environmental programs, generally does not want land to go out of farming and “back to nature”. What the public does want is a less chemical-intensive kind of agriculture than that which has evolved since the 1930s (Policy Commission on the Future of Farming and Food, 2002, pp. 9–11; Potter, 1998, p. 83; Pretty, 2002, pp. 148, 177–178). The environmental services associated with “traditional” agriculture were intended to satisfy a combination of use and non-use values. Although some might argue that the historic preservation services are not environmental services, there is no practical way to make such a distinction in the rural Britain context. There is widespread feeling in the UK that particular historic landscape features, rooted in the past several centuries of farming leading up to World War II, should be preserved to the extent ecologically and economically possible. Wunder (2005, p. 2) lists four major types of environmental services that currently stand out in examinations of PES schemes: (1) carbon sequestration and storage; (2) biodiversity protection; (3) watershed protection; and (4) landscape beauty. If we consider historic preservation to be one aspect of “landscape beauty”, the ESA scheme most closely resembles a combination of Wunder’s types #2 and #4. Public demand for a variety of these environmental/landscape services has been extensively evaluated in the UK (see the Hanley et al. (1999) and Stewart et al. (1997) references in the discussion of “additionality and baseline establishment” below).

The desired environmental/landscape services, for the most part, are in the nature of public goods. There is no easy way to exclude users, though there are exceptions. Public

access to the UK’s extensive system of rural footpaths, for example, could be limited, though not without considerable transactions costs. Regulations, of course, represent one possible way of providing public goods. Extensive restrictions on where new housing can be developed in rural England represent one way that some environmental services are preserved. The ESA program, on the other hand, is a voluntary, incentive-based scheme. The actors are the farmers in ESA-designated areas who decide whether or not to participate in contracts intended to result in provision of the desired services.

The ESA program involves contracts with farmers to provide landscapes and carry out management practices that are linked to the desired services. These contracts are conditional, in that farmers found not in compliance are subject to financial penalties. Minor breaches of contract may start with a warning letter, but penalties could include termination of an agreement or even recovery of all money previously paid (Ryan and Ogden, 2006). The risks of being caught in breach of contract probably are not great. In England, only 5% of contract farms receive compliance inspections each year. However, there is a feeling that most farmers are committed to complying with their ESA agreements. Many farmers see the ESA agreements as means to carry out environmental management practices that they feel are desirable but could not otherwise economically afford (Ryan and Ogden, 2006). In addition to the compliance inspections, English ESAs receive “care and maintenance” visits from a government agency that is separate from the payments and inspection agency. These visits are to monitor how the agreements are progressing and delivering on objectives (e.g., improved habitats). Although these care and maintenance visits are not compliance checks, if suspected contract breaches are noticed, they are reported to the payments agency for further investigation (Ryan and Ogden, 2006).

3.2. Implementation

Incentives offered have induced enrollment of substantial portions (40–90%) of eligible areas in England ESAs characterized by grazing and generally less intensive agriculture, but enrollment has been lower in areas characterized by more intensive arable production, such as the Essex Coast (Lobley and Potter, 1998, pp. 416–417). Only 24% of the eligible area in the Essex Coast area was enrolled by 2003 (DEFRA, 2004, p. 9). CAP income supports tied to production no doubt inhibited ESA participation by many farmers in the arable areas — especially participation in the higher tiers.

Scotland’s ESAs provide some especially interesting implementation insights. The Scottish Executive Rural Affairs Department (SERAD) organized delivery, but the Scottish Agricultural College (SAC) and the Farming and Wildlife Advisory Group (FWAG) had major roles in developing the individual farm plans that became part of ESA agreements. SAC both promoted the scheme and assisted farmers in preparing applications. FWAG was typically subcontracted by SAC to undertake the conservation reports (audits) that became part of the application, though in some cases FWAG assisted farmers with the entire application. The role and mix of responsibilities of SAC and FWAG varied among Scottish

ESAs (Crabtree et al., 2000, p. 19). Wynn and Skerratt (2000) examined the diversity of strategies employed in promoting ESA participation in Scotland. They concluded that “there was indirect evidence that flourishing partnerships achieved increased uptake, critical in the context of a voluntary scheme” (p. 19). They went on to note that the partnerships between these different agencies were fragile, however, and there was danger that the complementarity would be lost in delivery of Scotland’s Rural Stewardship Scheme (RSS). The RSS combined and replaced the ESA and Countryside Premium Schemes in Scotland. Delivery mechanisms under the RSS involved more competition and less mutual dependency. This illustrates the trade-off that sometimes exists between increasing competition and maintaining valuable social capital.

The Macaulay Land Use Research Institute evaluated the ten Scottish ESA schemes that comprised the revised scheme launched in 1993 (Crabtree et al., 2000). A quarter of eligible farm holdings in these areas had joined the ESA scheme by November 1997, when the evaluation began. The portion of the eligible area enrolled was considerably higher than that (statistical problems preclude knowing the exact percentage of eligible area enrolled).

Skerratt (1998) discussed the role of risk and other factors in farmers’ decisions about whether to participate in the ESA in one of Scotland’s designated areas. She noted that there were risks involved in farmers’ decisions during the process of negotiating an ESA agreement, but the fact that environmental policies could become more restrictive in the future also presented risks in not entering into an agreement at that time.

Falconer et al. (2001) presented an excellent conceptualization of transactions costs issues with agri-environmental schemes, and they carried out an empirical analysis of some of the transactions costs associated with the ESA scheme. They examined the public administrative costs of the 22 English ESAs over the 5-year period from 1992/3 to 1996/7. In 1995/6, administrative costs (including environmental monitoring) made up approximately 18% of government costs of running the ESA program in England. Data analysis suggested that there are “size economies with regard to the numbers of agreements made in any one ESA, and a significant effect of scheme experience in exerting downwards-pressure on administrative costs” (Falconer et al., 2001, p. 83). The authors were careful to point out, however, that minimizing the particular transactions costs they measured should not be the overall social objective. Agri-environmental policies need to be designed with both public and private transactions costs in mind, and these costs must be considered along with other scheme costs and expected scheme benefits.

3.3. Additionality and baseline establishment

Most of the land under ESA agreements in England was in the basic entry tiers (Lobley and Potter, 1998, p. 416; Potter, 1998, p. 88). Only 22% of enrolled land was in higher tiers as of 2003 (DEFRA, 2004, p. 10). The basic entry tiers generally halt the process of agricultural intensification, but do not require farmers to revert to a less intensive level. The regional participation patterns and the fact that most agreements are at the basic level suggest that monetary incentives were adequate to arrest intensification in more marginal areas —

where it might not have been profitable to increase the level of intensification anyway — but not adequate to slow or reverse intensification in more productive arable areas.

Overall, most of the UK ESA schemes made positive contributions to ‘greening the edges’ of farming with consequent benefits for habitats and wildlife, but the relatively low take-up of tiers above the base level and the limited impacts on arable areas indicate much less progress in ‘greening the middle’, that is, in fundamentally changing the sustainability of the crop and livestock operations. Potter put it this way (1998, p. 91): “Generally, ESAs are seen to have been most successful in maintaining the environmental capital which already exists on farms but have been much less successful in adding to or enhancing that capital.”

The ESA approach was basically a ‘wide and shallow’ approach, designed primarily to protect key environmental features over large areas of landscape. In some cases, farmers participated in higher-level tiers, contributing substantially to biodiversity objectives, particularly farmland birds (RSPB, 1996, p. 23). Even participation in the basic maintenance tiers, however, may gradually lead farmers to have more positive attitudes toward conservation (RSPB, 1996, p. 23).

Environmental benefits of the Scottish ESAs were primarily in the form of preserving environmental features already in place. Most of the Scottish ESAs were in areas already farmed rather extensively. There were some reductions in agricultural output where stock removal occurred, and fertilizer and spray levels were changed by about 12% of farmers. However, most participating farmers found ways to develop ESA agreements that did not require major changes in their farming operations. Some operators did forgo land use changes such as drainage and reclamation that would have had adverse environmental impacts, in the absence of ESA agreements (Crabtree et al., 2000, pp. 2, 49–57).

The baselines for most assessments of ESAs have been *what existed prior to implementation of the ESA contracts*. Potter (1998), in his review of ESA monitoring and evaluation studies, concluded that most monitoring studies do not go beyond measuring the extent to which participating farmers complied with the terms of their contracts. This, of course, does not necessarily imply additionality. Ideally, evaluations — as opposed to pure monitoring exercises — would be able to establish baselines that give some indication of *what would happen over time without the ESA*. Potter (1998) noted how difficult it is for evaluators to disentangle the influences of the ESA from other factors. Nevertheless, he cited cases for which environmental preservation or enhancement did appear to be attributable, at least in part, to the ESAs. He mentioned the Broads and Somerset Levels ESAs, where agreements were thought to have helped reverse the trend towards converting grassland to arable (cropland), and the South Downs ESA, where agreements helped maintain chalk grassland and induce some conversion of arable land back to grass (Potter, 1998, p. 91).

Numerous UK economic studies have gone beyond physical/biological assessment to actually estimate benefits of ESAs in monetary terms. Hanley et al. (1999) summarized a review by Stewart et al. (1997) of major cost-benefit analyses of agri-environmental schemes in the UK. Ten of the 12 schemes covered in this review were ESA schemes. The Contingent

Valuation Method (CVM) was used in most of these studies. “Primary” benefits of ESAs were wildlife conservation and landscape effects, and “secondary” benefits were water quality, recreation, and archaeological benefits. In many of the evaluations, a range of benefit estimates was presented. Benefit estimates at the upper ends of those ranges exceeded costs for each of the ESA schemes, sometimes by many times the costs. Inclusion of non-use values caused some of the benefit estimates to become very large. In both the South Downs and Somerset Levels and Moors ESAs, for example, non-use or passive benefits constituted 39% and 79% of total estimated benefits (Garrod and Willis, 1995, p. 171).

Hanley et al. (1999) discussed a number of problems associated with such evaluations, as did Whitby (2000, pp. 324–325), who noted that most evaluations of UK agri-environmental schemes had not actually been able to value benefits at the margin. In other words, even if an ESA scheme in one area has produced more social benefits than costs, how would expanding that scheme or adding new schemes elsewhere affect social benefits and costs? Among the other analytical problems that Hanley et al. (1999) discussed is that of measuring additionality. It appears that many of the cost-benefit studies were based on cause–effect relationships between ESAs and environmental outcomes that are difficult, if not impossible, to verify. Given the numerous forces affecting agricultural intensification and landscape features over time, and the time lags associated with some linkages, it is very difficult to judge whether assumed ESA linkages are always realistic.

3.4. Permanence and leakage

Whitby (2000) has referred to the problem of retaining environmental capital goods built up under agri-environmental contracts, after the contracts expire, as the “end of contract problem”. Hanley et al. (1999) noted that there are virtually no constraints on farmers’ behavior in the UK after their agri-environmental contracts expire. Thus, there is no assurance that natural capital created or enhanced under ESA contracts will be maintained beyond contract lives. To the extent farmers’ attitudes towards environmental conservation change as a result of participating in ESA agreements, however, carryover of some benefits may be anticipated. Two out of five ESA-agreement holders that were surveyed in the Scotland evaluation by Crabtree et al. (2000, p. 51) indicated that their interest in wildlife conservation had increased as a result of their involvement in the ESA scheme. The greatest increased interest was in birdlife.

Regarding actual anticipated practices, slightly more than half of the surveyed farmers thought they would continue to farm in the same way even if ESA payments were to stop. However, 25% of ESA agreement-holders indicated that there would likely be some decrease in the level of their environmental management. The most frequently cited expected negative change was an increase in stocking rates and grazing of fenced-off areas. (Crabtree et al., 2000, pp. 52–53).

Given the nature of the ESA program, with its designated areas based on special environmental features and historic landscapes, it seems unlikely that there would have been much environmental “leakage” from designated ESA areas to

non-designated areas. Unlike the preservation of forested land, for example — where preservation in one area may result in more pressure on forests in other areas — it is doubtful that preserving particular working agricultural landscapes in the UK would result in more agricultural intensification pressure in other areas. That is more likely to happen in food-short developing countries.

There has been evidence of possible leakage on some individual farms, however. ESA agreements that limit stocking intensity on one part of a farm, for example, in some cases were reported to have led to greater intensity on non-agreement portions of the same farm. The extent of that kind of leakage evidently was not great (MAFF, 1997, as reported in Potter, 1998, p. 92).

3.5. Differentiation

ESA payment rates have been set to reflect costs of capital structures and income forgone in following particular management practices. Incomes (profits) foregone for various practices are first established on a typical farm basis for a wide geographic area, say all of England. Some practices are applicable only to particular ESA areas, however. Payment rates within each area are tiered, reflecting the extent of economic adjustments called for. Within each tier, individual contract payments reflect the particular capital structures and management practices agreed to in each farmer contract. Payment rates also can be adjusted somewhat across ESA regions within England and Scotland, respectively, to reflect the importance of particular options and other factors in each ESA. These adjustments may be either upward or downward, relative to the typical farm income foregone rate, but under EU rules the rates can not exceed 120% of calculated income foregone. (Crabtree et al., 2000, pp. 6–8; Hanley et al., 1999, p. 71; Ryan and Ogden, 2006; Temple, 2006).

Pretty (1998, pp. 292–93) cited evidence of shortcomings to a number of ESAs, including a lack of flexibility. At least in the early stages, many ESAs employed a more or less ‘top-down’, prescriptive approach. This may have been inevitable, given the desire to protect certain key environmental features in each designated area and, probably, a concern that requirements appear credible to non-farm groups. However, approaches that are unduly top-down create resentment (Pretty, 1998, p. 293; Pretty, 2003) and also discourage innovative solutions that may be cost-effective at the local or individual farm level.

In Scotland, the conservation management plans that were a feature of ESAs allowed flexibility to fit prescriptions to individual sites and circumstances (RSPB, 1996, p. 24). This approach was more expensive in the initial implementation phase, but it allowed farmers to ‘buy into’ the process, increasing the chances that they would stay with the general conservation strategy after the contract period.

3.6. Participation of disadvantaged groups

The ESA scheme was not intended or designed to be a program for uplifting disadvantaged groups. Nevertheless, some ESA studies have examined the extent to which operators of relatively small farms — some of whom might be “disadvantaged” according to some measures — were impacted.

One study of the Welsh Cambrian Mountains ESA found that, although the uptake at 48% was high relative to other ESAs, it was the larger farmers who were benefiting most (Wilson, 1997). The ESA, by targeting specific habitats such as semi-natural rough grazing or woodlands, tended to favor larger farmers, as they were more likely to have farms with these habitats. As a result, larger farmers got more income from the ESA scheme, and some bought smaller family farms. This brought new divisions to close-knit rural communities.

The Scottish ESA scheme raised household income of participants by an average of £3359 in 1997, according to estimates of the Macaulay Land Use Research Institute evaluation (Crabtree et al., 2000, pp. 59–63). Average ESA payments of £5837 that year were partially offset by reduced farm gross margins and increased farm fixed costs. Smaller farms benefited the least in absolute terms, but the most in proportion to income. Farms smaller than 4 ESU² that participated in the ESA experienced average household income gains in 1997 (due to their ESA agreements) that were only 40% of the average for all ESA farms. However, for these very small farms, the income gains amounted to 86% of their average estimated farm gross margins, compared to only 6% on average for all farms. (Crabtree et al., 2000, pp. 59–63)

4. Countryside Stewardship Scheme

The CSS was available throughout England outside the ESAs. It put more emphasis on enhancement of environmental features than did the ESA scheme. It was concerned with a broad set of objectives, but these became translated into environmental concerns that were specific to each 'agreement farm'. In practice, agreements usually involved only part of each farm (Baldock and Mitchell, 1998, pp. 7, 13; Crabb et al., 2000, pp. 86–100). The CSS was the first national agri-environmental scheme in the UK that sought to "buy environmental and public access 'goods' from farmers and other land managers on a targeted and discretionary basis" (Harrison-Mayfield et al., 1998, p. 157).

The CSS began with 783 agreements covering 25,404 ha in 1991. More than 1000 agreements were added (annually) most years thereafter in the 1990s. By 1998, there were 8614 agreements — most running for 10 years — covering 143,055 ha in England. Payments to farmers were totaling a little over £15 million annually by 1998 (Table 2). The first 10-year agreements began to expire in 2001 (Crabb et al., 2000, p. 39). Entering the new millennium, most of the expanded funding for agri-environmental efforts in England was expected to be concentrated on the CSS (MAFF, 1999, p. 3), and now will be focused on the new agri-environmental schemes described in the concluding section of this article.

4.1. Services and actors

UK and EU shared funding for the CSS was similar to that already described for the ESA scheme. However, payments for public access options came wholly from the UK (Ryan and

Table 2 – Participation and expenditures in England Countryside Stewardship Scheme (CSS)

Year	Enrolled (ha)	Agreements (number)	Payments to farmers ^a (£1000)
1991	25,404	783	NA
1992	53,908	2208	NA
1993	74,325	3497	5330
1994	85,987	4531	8500
1995	91,154	5027	10,510
1996	106,047	6144	11,625
1997	119,841	7339	10,926
1998 ^b	143,055	8614	15,078
1999	NA	NA	19,896
2000	NA	NA	NA
2001	315,300	10,455	NA
2002 ^c	418,100	13,319	NA
2003 ^c	530,620	16,101	52,000

NA = Data not currently available on DEFRA websites or reported in ways not strictly comparable to other data in this table.

Sources: DEFRA, 2004, pp. 12–13; DEFRA, 2005 (May); MAFF, 2000a; MAFF, 2000b; Annex V, p. 30; MAFF, 2000c (March).

^a Data reported by fiscal year, so 1992/93 considered 1993, etc.

^b 1998 figures do not include 78 Agreements under the Arable Stewardship pilot scheme, involving 2472 ha.

^c The Arable Stewardship scheme now incorporated as option within the CSS.

Ogden, 2006). There were more than 16,000 CSS agreements in England by fiscal year 2003, covering more than a half million hectares of land. Annual payments had reached £52 million, nearly the same as ESA payments. These payments consisted of £38 million in annual management payments and £14 million for capital works (DEFRA, 2004).

Environmental/landscape services that the government sought to obtain through the CSS were similar to those of the ESA scheme. The CSS was intended to sustain the beauty and diversity of the rural landscape, preserve wildlife, conserve historic features, restore neglected land or features, and create new habitats (Carey et al., 2003, p. 73). In 2003, annual management payments went for arable reversion, establishing and maintaining grass margins, managing lowland pasture and hay meadows, managing upland pasture, and managing heather moorland. Payments also went for management and maintenance of footpaths, bridleways, and cycle paths, as well as for provision of educational access for school children and other groups. Capital works payments were for such items as planting and restoring hedgerows, fencing, restoring dry stone walls, and special projects such as restoration of traditional farm buildings. Other expenditures were for such capital items as stiles, gates, ponds, and scrapes for wildlife (DEFRA, 2004, pp. 13–14).

Like the ESA, CSS agreements are conditioned upon farmers carrying through with environmental management practices agreed to in individual contracts. Compliance monitoring and sanctions are similar to those described previously for the ESA scheme (Ryan and Ogden, 2006). In early years of the CSS, there were attempts in some regions to inspect 10% of the agreements each year, though time constraints did not always permit that. Where project staff were able to build trust with farmers, minor contract violations often could be dealt with informally, thereby reducing transactions costs and enhancing future cooperation (Hall, 2006).

² ESU=European Size Unit.

4.2. Implementation

A variety of public and private agencies and organizations partnered in some way with the government in shaping or promoting the CSS. Among these agencies and organizations were local authorities, the Farm and Wildlife Advisory Group (FWAG), English Nature, the Countryside Agency, the Environment Agency, the Wildlife Trusts, the National Farmers Union, and the Royal Society for Protection of Birds. The primary functions of most of the partner organizations consisted of consultation on targets, promotion, and advice to applicants. The FWAG was an especially important partner in promoting the CSS and helping farmers understand how to use it (Hall, 2000).

A fully participatory process involving various organizations has the potential to build horizontal and vertical social capital, thereby laying a foundation for continuing and dynamic agri-environmental programs. One evaluation found that partner organizations appreciated their involvement in the consultation phase, though there were some problems with tight deadlines (Crabb et al., 2000). According to the same study, some organizations felt that their involvement was weak beyond the consultation phase, and wanted more feedback on decisions made by the government. Consultation without adequate feedback on decisions made, and the reasons for those decisions, can lead to the feeling that participation is 'for show' rather than 'for real'.

A major economic evaluation of the CSS was conducted for MAFF by Cheltenham and Gloucester College and the Agricultural Development and Advisory Service (ADAS) (Crabb et al., 2000). This evaluation — which we refer to as the CG/ADAS evaluation — entailed surveys, case studies of selected areas, and personal interviews. CSS agreements included a disproportionately high number of cattle and sheep farms and a disproportionately low number of crop and dairy farms, compared with the overall population of England's farms. The evaluators indicated that this was not surprising, given that CSS landscape targets and prescriptions often were associated with less intensive grassland. However, there had been enough land area targeted where dairying is important to warrant a higher number of dairy farm CSS agreements. Dairy farming was relatively profitable, compared with some other types of farming, during the period covered by the evaluation. This may have caused CSS payment rates to be insufficiently attractive to many dairy farmers.

Payment rates for the CSS are set in a similar way to that described earlier for the ESA scheme. Rates are based on capital costs and incomes forgone, but rates can be adjusted, within limits, to accomplish scheme objectives (Ryan and Ogden, 2006; Temple, 2006). Changes in EU CAP policies during the CSS's 1991–1996 pilot phase decreased the attractiveness of CSS participation; therefore, payment rates were increased during the pilot phase (Countryside Commission, 1998). Some 64% of respondents in the CG/ADAS evaluation said they definitely would re-apply for a CSS agreement (if allowed) when their current agreements run out. Only 3% said they would not re-apply, and 33% were undecided. This implied that payment levels were adequate for nearly two-thirds of then current agreement holders. Of those who were undecided about re-applying and who gave reasons, nearly half ranked

'too expensive/payments insufficient' as their major reason. Within that group, two out of five wanted a 20% increase in payment levels and nearly the same proportion wanted more than a 20% increase. The CG/ADAS survey of non-applicants and face-to-face interviews with some non-applicants also revealed a widespread willingness to participate in many aspects of the CSS at payment rates existing at the time. Interviews with Project Officers indicated that payments might need to be higher for some items in some areas — such as stone walling in the Lake District (Crabb et al., 2000, pp. 50–52).

Of course, decisions about participation in the CSS and other agri-environmental schemes are based upon a complex set of factors. Lobley and Potter's survey of farmers in Southeast England shed light on participation decisions in the early stages of the CSS. They found that farmers who were enrolled in the CSS emphasized conservation motivations more than did ESA enrollees. At that time, the CSS was a relatively new program, and the ESA program was not. Lobley and Potter grouped participants in CSS and ESA programs into 'Steward' and 'Complier' categories, and found 41% of CSS farmers to be in the Steward category. Both Stewards and Compliers were concerned with how well the agri-environmental scheme (either CSS or ESA) provisions fit their existing farming systems, but Compliers were more likely to be very concerned with the level of stewardship payments than were Stewards (Lobley and Potter, 1998, pp. 425–26).

The general conclusion of the CG/ADAS evaluation was that CSS annual payment rates were generous for many practices, in relation to farmers' opportunity costs. However, like the ESA, targeting and economic incentives were not particularly strong for arable areas, except for measures like field margins and strips (Crabb et al., 2000, p. 58; Hall, 2006).

4.3. Additionality and baseline establishment

Carey et al. (2003) used a nationwide sample of 500 CSS agreements in effect in 1998 to evaluate the environmental additionality attributable to England's CSS. Their evaluation consisted of 'desk evaluations' of the agreements, face-to-face interviews with agreement holders, and ecological field surveys. The baseline was *what would have been undertaken without the agreement*, established through the interviews with agreement holders. The multidisciplinary evaluation team concluded that 36% of the agreements had "high" additionality, meaning "...it was clear that none of the work under the CSS would have been undertaken without the agreement. Also, these agreement sites were predicted to provide a high positive environmental improvement or enhancement and were likely to be both visible and accessible to the public" (Carey et al., 2003, pp. 79–80). The team assigned "medium" additionality scores to 38% of the agreements. These were agreements for which the team felt that "some work consistent with the agreement would have taken place anyway, but not to the same scale or standard" (Carey et al., 2003, p. 80). The remaining agreements — approximately a quarter of the total — were considered to provide "low" environmental additionality.

Of special concern in our review of UK agri-environmental schemes were the impacts on *arable areas*. Like the ESA program, the CSS appeared to have had limited impacts on

arable farming practices. CSS-funded management practices for arable land were limited to 'arable reversion, field margins, and some special projects for selected species' (e.g., support for the increasingly rare farmland birds, curlew and lapwing) (Crabb et al., 2000, p. 96). There was little focus on crop rotations and other measures for the purpose of building soil health. In fairness, improved soil health was never a primary goal of the CSS (Hall, 2000). UK agri-environmental schemes generally, including the CSS, were not financially attractive to the highly productive, intensive arable farms (Potter, 1998, p. 103; Baldock and Mitchell, 1998, p. 25). Only around 15% of the land under CSS agreements in 2003 was in either 'arable' or 'arable reversion' categories (DEFRA, 2005).

At least partly in response to concerns about the CSS's limited impact in arable areas, a pilot Arable Stewardship Scheme — under the CSS — was introduced in 1998 in parts of England's East Anglia and West Midlands regions. Under this scheme, arable farmers were paid to manage their land in ways intended to encourage wildlife (Baldock and Mitchell, 1998, p. 11; MAFF, 2000c). By 2002, the most beneficial options of this pilot effort were incorporated nationwide into the CSS (DEFRA, 2004).

Another area of weakness in the current CSS, identified by the CG/ADAS evaluators, concerned whole watersheds. To deal effectively with watershed problems, it is necessary for groups of farmers along a waterway to act collectively, and so jointly sign up for agri-environmental programs (Pretty, 2003). Grouping of farmers along waterways was attempted in many areas — sometimes successfully (Hall, 2000). However, because of the fertility and, hence, profitability of land along some waterways, it can be difficult to induce adequate numbers of farmers in a watershed to participate (Crabb et al., 2000, p. 57). One approach is more aggressive targeting, and higher payment levels may be needed in some such instances. Another is to focus on building social capital among farmers as a prerequisite for improvements to natural capital over whole watersheds. The new Water Framework Directive will encourage further efforts at such collective land management.

4.4. Permanence and leakage

Most CSS agreement holders in the CG/ADAS evaluation indicated that there would be little or no change in cropping and stocking intensities on their farms in the absence of agreements (Crabb et al., 2000, pp. 32–33). Some 26% and 32%, respectively, did indicate that there would be moderate to major increases in intensity of cropping and stocking. However, much larger percentages of CSS agreement holders said that there would be moderate to major decreases in levels of stewardship in the following areas, in the absence of a continued CSS agreement: conservation land management (53%); provision of public access (45%); maintenance of hedgerows, walls, and field boundaries (59%); management of specific environmental features, such as traditional buildings (43%); and field margins (70%) (Crabb et al., 2000, pp. 32–33). Of course, there is always a strong possibility of bias in questions asked to people about what they will or will not do in the absence of financial compensation. One might expect the bias to be in the direction of overstating the extent of reversion (decrease in environmental management), in order to create a

perception that policy makers need to continue agri-environmental payments.

We do not have evidence of "leakage" with the CSS to cite. However, our comments earlier in this article about possible within-farm leakage in the ESA scheme could also apply to the CSS.

4.5. Differentiation

Although CSS payment rates were established in a way similar to that described for the ESA scheme, the CSS had more of a competitive element in the application process. Procedures were put in place that were intended to result in a high 'value for money' portfolio of CSS agreements. The CSS used a two-stage scoring system. The first stage involved assignment of tentative scores to determine which applications warranted site visits. Only those receiving site visits were considered for approval, and they were then assigned numerical scores. Points were assigned based on the following criteria: historic features, landscape, public access, wildlife, target area, and 'other priorities'. The first four in this list, which corresponded to the major objectives of the CSS, each had roughly the same potential weight in the scoring system.

The CG/ADAS evaluation identified some shortcomings in this scoring scheme and its application in the decision making process. One shortcoming was the awarding of points for application features, such as being within a 'target area', that were means, not ends, of the CSS. A second shortcoming was that the system did not explicitly account for conflicts between objectives. This shortcoming could be obviated by allowing negative scores for some features, when positive effects in one area (e.g., wildlife) simultaneously resulted in negative effects in another (e.g., public access). A third shortcoming was that the potential weights attached to each criterion appeared to be *de facto* assignments of relative value, rather than the result of some explicit recognition of priorities. Another shortcoming in the scoring system was that it conflated quantity and quality, rather than explicitly assessing them separately (Crabb et al., 2000, pp. 71–76).

Finally, it appeared that little attention was given to relating priority scores to agreement costs when the government considered CSS applications. Although the list of 'Other Factors' used for scoring included 'exceptional value', this was not a very systematic way to compare overall benefits and costs of applicants' proposed activities (Crabb et al., 2000, p. 74). This is not to suggest that it generally would be feasible to assign monetary values to the expected outcomes of each proposed agreement. It is simply to say that some explicit comparison of the costs of each proposed agreement and the expected quantity and quality of benefits could have increased the 'value for money'.

4.6. Participation of disadvantaged groups

Like the ESA scheme, the CSS was not designed to target disadvantaged groups. However, there is some evidence available on participation by farm size. The CG/ADAS evaluation found CSS farms to be larger, on average, than the population of farms in England. Some 20% of CSS farms were over 300 ha in size, compared to only 3% of all farms. At the

other end of the size scale, only 36% of CSS farms were less than 50 ha, compared to 65% of all farms. However, authors of the CG/ADAS study noted that definitional problems could have distorted these findings.

Crabb et al. (2000, p. 19) found little land tenure difference between CSS farms and other farms. Roughly a third of CSS agreement holders' land was rented, as was that of unsuccessful CSS applicants, non-applicants, and the population of England's farmers.

5. Conclusions and discussion

We summarize here some of the major lessons derived from our review of UK agri-environmental schemes that set the scene for the 2003 CAP reforms. Then, we discuss recent policy developments in the EU and the UK.

5.1. Lessons learned³

By 2003, near the end of the time when new enrollments were allowed in the CSS and the ESA scheme, there were nearly 1.2 million ha — over 10% — of England's agricultural land enrolled in one or the other of these schemes. Although the ESA and CSS schemes had somewhat different purposes and design, their overall effects in the UK were similar. The stewardship payments offered under these schemes were generally attractive to farmers in the more 'marginal' agricultural areas; the payments tended to raise and stabilize overall farm incomes for farmers in hill areas and lower-yielding arable areas. However, in the more productive arable areas, such as East Anglia, it was difficult for the stewardship payments offered under the ESA and CSS programs to compete with the income support and risk-reducing CAP policies available to specialized, conventional farmers. It is difficult to draw farmers away from systems that involve only a few crops, relatively routine operations, and substantial government subsidies. The fossil fuel and agrochemical-based technologies and large-scale agricultural structure that have evolved over the last 50 years also inhibit a return to more diverse and management-intensive farming systems (Pretty, 2002). There also is too little social capital adequately to support movement to more complex, integrated farming systems, though necessary networks, marketing institutions, and support groups are beginning to take shape.

The EU's CAP continued to inhibit the effectiveness of the ESA scheme and CSS at the time of our review in 2000 and 2001. The CAP had numerous distorting effects, including discouragement of biologically diverse and ecologically sound crop and livestock systems. Especially in arable areas like England's East Anglia, farmers generally had been too well protected by the CAP to find it economically attractive to make the major farming system changes that would be called for to participate in the higher tiers of agri-environment payment schemes. We expected that the EU would find it necessary to continue on the 'decoupling' path because of World Trade

Organization (WTO) agreements. We concluded that success in obtaining high farmer participation rates in agri-environmental schemes or tiers that 'green the middle' in major arable areas would require such high payment rates that they would be deemed politically unacceptable. What we were advocating was a major shift away from production-oriented policies and toward policies that directly support stewardship and social concerns (Dobbs and Pretty, 2001).

5.2. Subsequent policy developments and next steps

Agenda 2000 reforms of the CAP officially added rural development (including enhancement of the environment) as a major policy objective. These reforms were followed by the comprehensive mid-term review of the CAP in 2003, with payments to farmers in principle being decoupled from production in the Pillar I (production) category and more funds being shifted to the Pillar II (rural development and environmental) category. Individual countries then devised their own systems of implementation of environmental schemes. In the United Kingdom (UK), the creation of a broad-based agri-environmental scheme was proposed in the 2002 Curry report (Policy Commission on the Future of Farming and Food, 2002), and adopted in the government's later Strategy for Sustainable Farming and Food (DEFRA, 2002).

Starting in 2005, most CAP Pillar I subsidies were being moved to a new single payment, though member states have some latitude to only partially decouple — allowing some subsidies to continue being paid on a headage or acreage basis. The new single farm payments are being determined largely on historical payment bases. Although EU farmers are gaining more flexibility to respond to market signals under this more decoupled payment approach, they will be subject to more comprehensive environmental cross-compliance provisions than in the past (Davis, 2003; DEFRA, 2005).

The greater decoupling under Pillar I should help mitigate some of the disincentives for farmers to enroll in the higher tiers of PES programs. Overall, one would expect UK agriculture to become more extensive, with lower applications of chemical inputs, and some reductions in overall levels of commodity production. However, as always, adjustments will involve a complex set of interactions, and impacts on the crops sectors could turn out to be more modest than some expect, and some impacts on the environment could actually turn out to be negative. For example, decoupling could lead to greater specialization in the cereals sector, leading to even less biodiversity (GFA-RACE with IEEP, 2003; Moss et al., 2003). Nevertheless, our view is that greater decoupling offers real opportunities for PES programs to contribute more effectively to environmental enhancement and sustainability.

Concurrent with the consolidation of payments under Pillar I of the CAP, major changes are being made in England's agri-environmental schemes under Pillar II.⁴ The 2003 mid-term review of the CAP has been implemented in England with

³ Much more complete treatments of lessons and issues derived from our review of UK PES schemes are found in Dobbs and Pretty, 2001, 2004).

⁴ Under the devolution of powers that has been underway for some time in the UK, agri-environmental policies (as with various other policies) often differ among the governmental units of England, Scotland, Wales, and Northern Ireland. Here, reference is only to England.

the establishment of three new stewardship schemes as of 2005 — Entry Level Stewardship, Organic Entry Level Stewardship, and Higher Level Stewardship. With the introduction of these schemes, the Countryside Stewardship Scheme and Environmentally Sensitive Areas scheme — for the past 15–20 years the core programs, along with support for organic agriculture, of agri-environmental policy in England — have been closed to new applicants (DEFRA, 2005).

The aim of the Entry Level Stewardship (ELS) scheme, which is open to all who farm their land 'conventionally', is to encourage farmers to deliver simple environmental management in addition to cross-compliance requirements. This management focuses on improved water quality and reduced soil erosion, improved conditions for farm wildlife, maintenance and enhancement of landscape character, and protection of historic features. Farmers have to complete a plan of the farm showing the main environmental features, called the Farm Environmental Record (FER), and select options from a menu of measures that are rated with points. At least 30 points per hectare are required over the whole farm to qualify for the £30 per hectare payments. The application is for a 5-year term.

There remain complex relationships with the CSS and ESAs. Where a CSS measure covers the whole of the field, it has to be excluded from the ELS. Land in ESAs is excluded from the ELS, and land cannot count towards the ELS if it is part of an English Nature management agreement.

The compulsory construction of a FER includes nine elements: field boundaries, trees and woodland protection, historic landscape features, buffer strips, arable land wild bird measures, encouragement of a range of crop types, soil protection, lowland grassland management, and nutrient management plans. This 'whole-farm' approach is consistent with one of the recommendations we made based on our review of UK agri-environmental schemes (Dobbs and Pretty, 2001, pp. 67–68).

The Organic Entry Level Stewardship (OELS) scheme is similar to the ELS, though the applicants must have at least part of their land registered with an organic inspection body as organic or in conversion before application. The objectives and basic measures under the ELS apply equally to the OELS, with only the detailed management guidance and points awarded that differ.

The Higher Level Stewardship (HLS) scheme has been designed to be the most demanding scheme. Applicants must have entered one of the ELS schemes, and so all the basic requirements of those apply. The HLS is for 10 years, though occasionally it could be extended to 20 years. The aims are wildlife conservation, maintenance and enhancement of landscape quality and character, natural resource protection, historic environment protection, and promotion of public access to and understanding of the countryside. Unlike the entry-level schemes, the HLS is competitive and is judged on environmental benefit per unit of expenditure. The HLS is closely tied into the targets set in each of the 150 Joint Character Areas of England.

The new combination of agri-environmental schemes in England appears to offer good prospects for further enhancing agriculture's multifunctionality (Dobbs and Pretty, 2004) in a coordinated way that builds on experiences gained with the CSS, the ESA scheme, and other schemes.

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REFERENCES

- Baldock, D., Mitchell, K., 1998. Farming with Wildlife. A WWW-UK Report. Institute for European Environmental Policy, London.
- Blunden, J., Curry, N., 1988. A Future for Our Countryside. Basil Blackwell, Oxford.
- Carey, P.D., Short, C., Morris, C., Hunt, J., Priscott, A., Davis, M., Finch, C., Curry, N., Little, W., Winter, M., Parkin, A., Firbank, L.G., 2003. The multi-disciplinary evaluation of a national agri-environment scheme. *Journal of Environmental Management* 69, 71–91.
- Countryside Commission, 1998. Countryside Stewardship: monitoring and evaluation of the pilot scheme. Research Note 3. Countryside Commission.
- Crabb, J., Short, C., Temple, M., Winter, M., Augustin, B., Dauven, A., 2000. Economic Evaluation of the Countryside Stewardship Scheme. Prepared for Ministry of Agriculture, Fisheries and Food (MAFF), Economics (Resource Use) Division. Cheltenham and Gloucester College of Higher Education and ADAS.
- Crabtree, B., Thorburn, A., Chalmers, N., Roberts, D., Wynn, G., Barron, N., Macmillan, D., Barraclough, F., 2000. Socio-economic and Agricultural Impacts of the Environmentally Sensitive Areas (ESA) Scheme in Scotland. A Report for the Scottish Executive Rural Affairs Department. Macaulay Land Use Research Institute, with Bell-Ingram Rural and University of Aberdeen, Craigiebuckler, Aberdeen.
- Davis, J., 2003. Managing Editor's column. *EuroChoices* 2 (2), 4–5.
- Department for Environment, Food and Rural Affairs (DEFRA), 2002. The Strategy for Sustainable Farming and Food. UK Government, London.
- Department for Environment, Food and Rural Affairs (DEFRA), 2004. Countryside Stewardship and Environmentally Sensitive Areas Schemes. Annual Report 2002–03. UK Government, London.
- Department for Environment, Food and Rural Affairs (DEFRA). 2005. DEFRA Environmental and Rural Development Website (<http://www.defra.gov.uk/erdp>) and Farming Website (<http://www.defra.gov.uk/farm>).
- Dobbs, T., Pretty, J., 2001. Future Directions for Joint Agricultural-Environmental Policies: Implications of the United Kingdom Experience for Europe and the United States. South Dakota State University Economics Research Report 2001–1 and University of Essex Centre for Environment and Society Occasional Paper 2001–5. Brookings, SD, USA. (available at <http://agecon.lib.umn.edu/cgi-bin/detailview.pl?paperid=3794>).
- Dobbs, T.L., Pretty, J.N., 2004. Agri-environmental stewardship schemes and "multifunctionality". *Review of Agricultural Economics* 26 (2), 220–237.
- Falconer, K., Dupraz, P., Whitby, M., 2001. An investigation of policy administration costs using panel data for the English

- Environmental Sensitive Areas. *Journal of Agricultural Economics* 52 (1), 83–103.
- Garrod, G.D., Willis, K.G., 1995. Valuing the benefits of the South Downs Environmentally Sensitive Area. *Journal of Agricultural Economics* 46 (2), 160–173.
- GFA-RACE Partners Limited in association with IEEP (GFA-RACE with IEEP), 2003. The Potential Environmental Impacts of the CAP Reform Agreement. Prepared for Department for Environment, Food and Rural Affairs. UK Government.
- Hall, J., 2000. Personal communication. The Countryside Agency, Cambridge, UK.
- Hall, J., 2006. Personal communication. The Countryside Agency, Cambridge, UK.
- Hanley, N., Whitby, M., Simpson, I., 1999. Assessing the success of agri-environmental policy in the UK. *Land Use Policy* 16, 67–80.
- Harrison-Mayfield, L., Dwyer, J., Brooks, G., 1998. The socio-economic effects of the Countryside Stewardship Scheme. *Journal of Agricultural Economics* 49 (2), 157–170.
- Lobley, M., Potter, C., 1998. Environmental stewardship in UK agriculture: a comparison of the Environmentally Sensitive Area programme and the Countryside Stewardship Scheme in South East England. *Geoforum* 29 (4), 413–432.
- Ministry of Agriculture, Fisheries and Food (MAFF), 1997. Evidence of House Select Committee on Agriculture: Environmentally Sensitive Areas and Other Schemes under the Environmental Regulation. Minutes of Evidence, Vol. II. UK Government, London.
- Ministry of Agriculture, Fisheries and Food (MAFF), 1999. A New Direction for Agriculture: Agenda 2000 CAP Reform. UK Government, London.
- Ministry of Agriculture, Fisheries and Food (MAFF), Economics and Statistics Group, 2000a. Economic Appraisal of Rural Development Options. Working Paper. UK Government, London.
- Ministry of Agriculture, Fisheries and Food (MAFF), 2000b. England Rural Development Plan: 2000–2006. UK Government, London.
- Ministry of Agriculture, Fisheries and Food (MAFF). 2000c. MAFF Environmental Website (<http://www.maff.gov.uk/environ>).
- Moss, J., McErlean, S., Patton, M., Kostov, P., Westoff, P., Binfield, J., 2003. The impacts of decoupling on UK agriculture. *EuroChoices* 2 (2), 24–25.
- Pioret, M., 1999a. Crop trends and environmental impacts. Agriculture, Environment, Rural Development: Facts and Figures—A Challenge for Agriculture. The European Commission, Agriculture and Environment (<http://europa.eu.int/comm/dg06/envir/report/en/index.htm>).
- Pioret, M., 1999b. Specialized holdings and more intensive practices. Agriculture, Environment, Rural Development: Facts and Figures—A Challenge for Agriculture. The European Commission, Agriculture and Environment (<http://europa.eu.int/comm/dg06/envir/report/en/index.htm>).
- Policy Commission on the Future of Farming and Food, 2002. Farming and Food: A Sustainable Future. UK Government, London.
- Potter C. 1998. Against the Grain: Agri-Environmental Reform in the United States and the European Union. Wallingford, Oxen, UK and New York, NY, US: CAB International.
- Pretty, J., 1998. The Living Land: Agriculture, Food and Community Regeneration in Europe. Earthscan Publications, London.
- Pretty, J., 2002. Agri-Culture. Earthscan Publications, London.
- Pretty, J., 2003. Social capital and the collective management of resources. *Science* 302, 1912–1915.
- Royal Society for Protection of Birds (RSPB), 1996. ESAs and Other Schemes under the Agri-environment Regulation. (Comments submitted to the House of Commons Agriculture Committee).
- Ryan, M., Ogden, P., 2006. Personal communications. Department for Environment, Food and Rural Affairs, UK Government, London.
- Skerratt, S., 1998. Socio-economic evaluation of UK agri-environmental policy: imperatives for change. *Études et Recherches sur les Systèmes Agraires et le Développement* 31, 317–331.
- Stewart, L., Hanley, N., Simpson, I., 1997. Economic Valuation of the Agri-environment Schemes in the United Kingdom. Report to HM Treasury and the Ministry of Agriculture, Fisheries and Food, Environmental Economics Research Group. University of Sterling.
- Temple, M., 2006. Personal communication. Agricultural Development and Advisory Service, Wolverhampton, UK.
- Whitby, M., 2000. Challenges and options for the agri-environment: presidential address. *Journal of Agricultural Economics* 51 (3), 317–332.
- Wilson, G., 1997. Assessing the environmental impact of the Environmentally Sensitive Areas scheme: a case for using farmers' environmental knowledge? *Landscape Research* 22 (3), 303–326.
- Wunder, S., 2005. Payments for Environmental Services: Some Nuts and Bolts. Occasional Paper, No. 4. Center for Environmental Forestry Research, Jakarta, Indonesia.
- Wynn, G., Skerratt, S., 2000. Delivery of the Environmentally Sensitive Area Scheme, Scotland, UK: local partnerships in policy delivery. Paper for Agricultural Economics Society Annual Conference, Manchester, UK.