

ERDP Evidence Assessment

Final report to DEFRA

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EXECUTIVE SUMMARY

1. Introduction

The specific strategy and priorities are set out in England Rural Development Programme. The Government's overall aim for rural and countryside policy is to:

“To sustain and enhance the distinctive environment, economy and social fabric of the English countryside for the benefit of all.”

This is supplemented by five national objectives for rural and countryside policy. These form the basis for a series of key national priorities for the rural economy, notably agriculture and forestry, for rural communities, for the rural environment, and for countryside enjoyment. Two priorities are identified for the Programme:

- Priority A Creation of a productive and sustainable rural economy;
- Priority B Conservation and enhancement of the rural environment.

The general rationale for the ERDP

The rationale for the ERDP is ‘based largely on the concept of market failure’. This is relatively straightforward with regard to the provision of public goods, such as with the provision of environmental goods such as biodiversity and landscape. The public goods characteristics are well recognised. But an objective of sustainability implies the maintenance of natural capital, even where the costs may seem to exceed the benefits. Assets based on cultural heritage have similar characteristics. The application of market failure to the rural economy is less straightforward. Here a rationale might be based on preventing the ‘circular and cumulative’ decline in rural areas, supporting household incomes so as to ensure the continued occupation of the land, and maintaining social capital in rural communities. There could be parallel arguments here to those associated with the ‘total economic value’ of the natural environment. Finally there could be a rationale based on equity considerations.

Assessments have been made of each of the measures adopted under the ERDP. It is generally too soon for formal evaluations to have been made. However there is evidence based on evaluations of previous measures, from information from DEFRA and from research reported in the literature. Despite the emphasis on market failure, few formal cost benefit analyses have been attempted because of the lack of information. In practice the evaluations that are available are uncertain for a number of reasons, particularly due to a failure to establish a clearly identified counterfactual. There are often difficulties in identifying the outputs from the measures, especially with regard to the measures associated with the support of rural economies and communities. In some cases qualitative evaluations may be appropriate, but the results from these are less easily summarised and communicated.

2. Agri-environment Schemes

The rationale for agri-environment measures, Environmentally Sensitive Areas (ESAs) and Countryside Stewardship Scheme (CSS), is based on the market's failure to supply a socially desirable level of public goods. Policy institutes a quasi-market in which incentive payments are offered to farmers to enhance the supply of landscape features, biodiversity, public access and cultural heritage.

Some studies have summarised the evidence from valuation studies on the public benefits obtained from agri-environment schemes. All studies show strong public support for the schemes with the value of the benefits greatly exceeding the exchequer costs incurred. However, the authors recognise that the values should be regarded as indicative only, given uncertainty as to the reliability of the contingent valuation (CV) method. There are further concerns that the values may be overstated. Studies tend to assume the loss of environmental value under the counterfactual and the impact of the policy is over-stated. Despite these concerns, the evidence remains that policies aimed at protecting natural capital and the rural environment are highly valued by the public. On the other hand, valuation studies may fail to take account of the full range of values that would comprise 'total economic value', such as ecosystem values. It might be argued that a wider range of evidence might be considered to represent values, such as numbers of people using the countryside or joining environmental organisations.

A recurring theme in the literature is the deadweight loss arising from the particular contract mechanisms used. Efficiency can be increased by segmenting the population of farms, although in practice there is limited information about farmers' costs. Selection on the basis of benefits offered in the CSS increases efficiency. Analysis has been undertaken of alternative mechanisms such as auctions. These could raise private transactions costs although might be appropriate in some circumstances.

A full analysis should take account of both public and private transactions costs. One study estimates that public transactions costs amounted to 48% of the total compensation paid. But what is important is not their absolute level, but rather the contribution they make to scheme performance. This requires a judgement as to the appropriate balance between fine-tuning to increase efficiency and administration costs. Evidence indicates that transactions costs are falling through time. This reflects the falling numbers of new contracts being negotiated, although there may also be an element of learning with increased experience with policy measures. Further savings may be possible by means of changes to the contractual arrangements.

Evaluations have been undertaken of ESAs, often concentrating on the issue of contract renewal. There does not appear to be clear evidence of the effect of promotion in agri-environment schemes. We conclude the following in relation to participation:

- Participation in ESAs is mainly determined by income effects and the extent to which options fit with an existing farm system
- It is difficult to identify 'barriers' to participation that reflect scheme conditions.
- The characteristics of marginal entrants are likely to differ between ESA and CSS schemes with conservation interest playing a stronger role in the latter.
- There may be a case for more effective scheme promotion relating it to the cohort of marginal adopters. ESA and CSS therefore require different approaches.
- Options that demand significant changes to farm systems will prove difficult to implement

even given substantial incentives.

Our assessment of environmental impacts draws on preliminary results of a study for DEFRA and thus should be regarded as provisional only. The usefulness of environmental monitoring is limited because it has only been undertaken on agreement land. It is thus difficult to judge additionality. Maintenance of the wildlife interest is less complete but enhancement of landscape and historic features is more widespread.

No benefit valuations have been undertaken of the CSS, reflecting the complex nature of the scheme and its operation on a large number of spatially separated holdings. A recent economic evaluation concluded that the objectives were being met and that payment rates were generally acceptable. Regionally differentiated payment rates were not recommended. Value for money could probably be improved if administrative procedures could be simplified. The CSS is oversubscribed and so participation is less of an issue. Adjustment of rates was not proposed as lower rates could reduce the quality of applications. Some improvement might be possible to the scoring system used to evaluate applications. Monitoring of CSS indicates that it delivers significant environmental benefits. The additionality of the scheme is high: in over two thirds of cases CSS has led to works that would not otherwise have taken place. This reflects the emphasis given to enhancement.

Agri-environment schemes in England are more closely targeted than are those in a number of other European countries. We have not undertaken a full assessment of the options, but some observations might be made:

- That there is a need for some degree of tiering that takes account of areas with different environmental standards and public values.
- That there is potential for wider scheme coverage in the uplands and intensively farmed areas.
- That transactions costs of a more general scheme need not be especially high.
- That an agri-environment scheme may have a role in providing a lattice of habitat in the wider countryside through which species may move in the face of climate change.

Taken together these points suggest that there could be merit in the introduction of a broad and shallow scheme. This warrants further consideration.

3. Organic Farming Scheme

All Member States provide support for producers willing to adopt organic farming practices and, with the exception of the UK and France, for maintenance of organic production. Under the ERDP, the scheme opened in January 2001, with roughly £18m allocated for the organic sector in 2001/02 and further support has been pledged for organic support until 2006.

Our evidence assessment is based on three sources: (1) a comprehensive review of the literature on the benefits of organic agriculture; (2) a survey of farmers; (3) interviews with experts at the Centre for Ecology and Hydrology.

There is unanimity in the literature that organic farming offers a wide range of environmental benefits compared to conventional agriculture. Organic farming practices have characteristics that are beneficial to the diversity of fauna and flora in terms of provision of habitat and abundance of food. Organic farming provides some potential for positive impacts on landscape.

Organic farming has a positive impact on soil fertility. The evidence on soil erosion is mixed. Some factors have been identified as potentially increasing the risk of soil erosion in organic systems, but other research results suggest that there is a net gain to soil conservation. Pollution of ground and surface water from organic farming tends to be lower than that of conventional farming systems. However, with increasing water protection measures in conventional farming, these differences are becoming smaller. Most studies indicate lower CO₂ and NH₃ emissions resulting from organic farming when evaluated on a per-hectare basis, but they can be higher per unit of output.

Other areas in which organic agriculture is claimed to produce benefits to the public include animal health and welfare, food quality and safety, contributions to rural employment and contributions to supply control objectives. Not all of these are supported in the literature, and not all of these provide a sound rationale for government support of organic agriculture.

Rationale for the public assistance for organic agriculture derives from a number of arguments. Proven public-good benefits of organic agriculture provide a sound justification for government support of organic agriculture – with the possible qualification that the same benefits might perhaps be generated more cost-effectively through more targeted measures. Perceived health benefits of organically produced food do not automatically provide a justification for public assistance of organic agriculture as these benefits can be classified as private goods not involving 'market failure'.

The UK organic sector might benefit from 'increasing returns to adoption' such that greater numbers of organic farmers will lower the average costs. There is an argument here for support to be directed both to farmers and to other actors along the supply chain for creating the infrastructure needed for effective marketing of organic food. There is also an argument for some form of longer-term support in recognition of the fact that an appropriate organic infrastructure takes time to build. Information failure provides further justification for corrective action in the form of both publicly funded information provision to address short-term information needs, and investment in R&D.

Aligning the level of support offered to UK farmers with that in other Member States would remove a major impediment to the development of the organic sector in the UK and may encourage sustained, demand-led growth of the UK supply base.

Concerns over potentially adverse effects of organic aid should be accepted as a necessary cost of a policy aiming at improving the allocation of rural resource use, but policy should not be insensitive to the needs of those already operating in the industry.

4. Support to Hill Farming

Support for hill farming is provided through the Hill Farm Allowance (HFA), which is paid on an area basis to holdings in the Less Favoured Areas. It replaced the previous Hill Farm Compensatory Allowance scheme which provided headage payments. The objectives of LFA support stipulate that LFA support shall contribute to the following objectives: to ensure continued land use and thereby contribute to the maintenance of a viable rural community; to maintain countryside; and, to maintain and promote sustainable farming systems which, in particular, take account of environmental protection requirements.

The rationale for the policy rests primarily on the provision of public goods in the form of the maintenance of the existing farming system, landscape features and environmental diversity. It is important to recognise explicitly that the level of payments reflects the costs of providing a valued environment rather than simply as compensation for a natural handicap. Recent experience with Foot and Mouth has demonstrated the extent to which this in turn acts in support of the local economy generally. Support for hill farming can also act in direct support of local communities through the maintenance of incomes and demand for services, but this direct effect is of diminishing importance and varies considerably between different areas. Other measures will often be of more immediate value for local community support.

HFA payments are offered at three levels depending on land type and are limited on larger holdings. A safety net is in operation for the first three years which reduces the extent to which individual farmers can lose from the change from headage to area payments. Environmental enhancements of 10% or 20% are paid to farmers meeting certain conditions.

An evaluation was undertaken of the previous support regime, but not of the HFA. It would be premature at this stage to undertake an evaluation of the HFA. Support payments made to hill farmers considerably exceed net farm income and so must be critical in maintaining farmers on the land. But the HFA represents a relatively small proportion of the total payment and so may have less significance. The impact of agriculture on the local community is likely to be more significant in the upland areas, but will be of declining significance with a decline in the agricultural population and growth of the non-farm population.

The Countryside Survey 2000 shows evidence of declining habitat quality in some respects, but it does not indicate the causes of the changes. It is generally accepted that maintenance of agricultural use is necessary for the protection of environmental quality but overgrazing has been identified as a problem. The introduction of area payments and environmental enhancements represent moves in the right direction, but their small scale in comparison with other payments probably means that they have relatively little impact in practice. It would thus be important to explore the implications of linking all payments to land areas.

Given that the levels of HFA payments were determined with a view to minimising the degree of redistribution and that the land types used for differentiating the rates of aid were chosen on the basis that they were already mapped it seems very likely that an alternative distribution of payments might be more effective and efficient. Research into this possibility is ongoing but it is already evident that the cost of mapping any alternative land classification would be considerable.

Specific environmental outcomes at the local level depend upon a variety of local institutional factors, such as the (dis)organisation of commons. This points to a need for a higher degree of environmental management, potentially in the form of an environmental scheme designed to cover the uplands.

5. Forestry Measures

The rationale for intervention in forestry is in terms of its contribution to rural development, increasing supplies of certain forest products, and ecological and environmental benefits. In economic terms this is to correct for the undersupply of public goods and to contribute to sustainability in rural areas. A case has also been made for grant aid to forestry to correct the distorting effect of the CAP on the value of land, although this must be recognised as a second best approach reliant on the continued distortionary effects of the CAP.

The mechanisms for delivering these aims are the Woodland Grant Scheme (WGS) and the Farm Woodland Premium Scheme (FWPS). The WGS gives a range of incentives to increase the output of specific public benefits from access, recreation and environmental enhancement. The FWPS gives additional aid for planting on farmland to compensate for higher opportunity costs. Competitive bidding (challenges) and locational supplements give additional funding for specific schemes.

In recent years considerable work has been involved in obtaining better estimates of the non-market benefits produced particularly from access, recreation and the contribution to biodiversity. A collation of recreational use value estimates (mainly based on contingent valuation) from visits to UK forests indicated that the mean value of recreational use was £0.62 per person per visit, or £0.91 if the option value of future visits is included. The environmental impacts are widely supported by conservation organisations.

Benefits from accessible forests depend highly on their location. An evaluation of the Community Woodland Supplement (CWS), paid for woodlands within 5 miles of a population centre, found that the size of the incentive was reasonably well judged in relation to costs, although the costs of providing access varied widely. The valuations strongly support the development of woodlands with public access near to where people live, given that the average benefits substantially exceed exchequer costs. If poorly performing sites could be avoided, the average value of benefits would be substantially increased. Benefits would also be enhanced by providing better information on accessible woodlands to the public, better integration in wider access networks and longer-term contracts.

Research on the economic value of biodiversity in existing or new woodlands is very limited and falls far short of providing a comprehensive guide for policy. It has been argued that support for wildlife friendly-management should be assessed in terms of the contribution to meeting Biodiversity Action Plan (BAP) objectives. Woodlands may produce a wide range of private and public benefits depending on location, structure, age, condition and management. They may do this directly (timber, carbon sequestration, habitat creation, recreation) or through impacts at a large scale (local economies, water catchments). We are not aware of any recent cost-benefit studies to determine the social returns from forestry since a study completed in 1994.

The WGS and FWPS schemes were reviewed and modified after evaluations in the mid-1990s. Surveys into uptake of farm woodlands have found that farmers entering the FWPS gave a high priority to landscape and wildlife enhancement, but sport and screening were also very important. Timber production was ranked much lower. A number of factors deter some farmers from planting; an underlying dislike of, and lack of experience with, forestry can be a

formidable barrier. Legal requirements on tenants to obtain landlords' agreement can prevent them from planting trees. The loss of farm income, loss in capital value and the lack of adequate incentives are also major factors.

The WGS in England now has discretionary entry based on a scoring system. Incentives are highly targeted to deliver in spatially discrete areas with specified objectives increasing efficiency. However, it is important to recognise the difficulties involved in transferring complex policy aims into a simple and transparent scoring system. Development of the scoring system to take greater account of regional and local priorities is likely to further enhance its effectiveness in delivering public benefits.

Tendering was introduced into the WGS in 1995 whereby bidders tender stating the amount of supplement over and above the WGS and FWPS incentives that they require. An assessment concluded that the approach would be more efficient when benefits and/or costs are highly variable and where the Commission wants a rapid response.

There is good evidence that the Commission has increased the efficiency and effectiveness of WGS by refining its instruments through scoring and the introduction of challenges.

6. Processing and Marketing Grant Scheme

Processing and Marketing Grants (PMG) were available in England from 1991 until April 1996, when the scheme was withdrawn. The terms and objectives of the new PMG scheme, under the ERDP, are very similar to those of its predecessor. Processing and marketing grants enable capital investment in processing and marketing of English primary agricultural products. They also encourage farmers to become more competitive, respond to consumer demand, be more innovative and add value to their produce. £44 million Government and EU funds, will be available for the scheme from 2001 to 2006. The target set for the PMG is to assist 370 businesses and create 2,200 Full Time Equivalent jobs by 2007. By August 2000 £5 million had been offered to 80 projects.

The Group Marketing Grant (GMG) was introduced in 1992 in order to encourage the development of commercially managed marketing groups for agricultural and horticultural produce. The Marketing Development Scheme (MDS) replaced the GMG in 1994 with the intention of encouraging the involvement of a wider range of businesses. An evaluation of the GMG and the MDS found that it was very successful in meeting its objective. The rationale for the scheme was based on the view that UK producers were failing to take full advantage of the opportunities open to them. The report concluded that the scheme allowed widespread development of marketing skills and capabilities. It recommended improvements in the marketing of the agri-food sector including support for further forms of horizontal and vertical integration, better communication between links in the chain, the provision of key marketing skills, further product innovation, export assistance and the further development of traceability and quality assurance systems. The objectives for the new PMG enable projects to be supported which will meet some of the recommendations.

An evaluation of the PMG found that the Scheme had delivered significant benefits to primary producers in terms of income generated and higher quality standards. Taken together the programmes delivered 3,700 net jobs and £1,190m in net sales at the local level and attracted nearly £200m of private investment. The evaluation did note that large projects displayed lower additionality and recommended that the objectives of the programme should

be simplified, a more pro-active marketing approach should be adopted, that the criteria and scope should be adjusted to give more weight to the additionality of larger projects, decision making should be faster and monitoring and performance measurement should be improved.

The new PMG scheme has only been running since 2000 and it is too soon to evaluate it. Individual projects and the scheme as a whole should be continually monitored and evaluated two years after project/scheme completion. The following conclusions can be made:

- The original PMG and the GMG/MDS were very successful in meeting their objectives. The new PMG is based on the previous scheme and hence should also be successful in meeting its objectives but it is too soon to draw this conclusion;
- The original PMG scheme delivered value for money in cost benefit terms. The evaluation concluded that it was delivering net economic impact at reasonable cost;
- The original PMG scheme impacted on farmers' attitudes and management practices resulting in higher quality standards through better information transfer;
- There is a case for uniformity of operations between the countries within the UK which might help deliver quicker decision making and hence reduce the relative administration costs of the scheme;
- There is no evidence of the impact of the scheme on the wider public or of a profile of benefits over time.

7. Vocational Training Scheme

The Vocational Training Scheme (VTS) is a new scheme to provide funding for training that contributes to an improvement in the occupational skill and competence of farmers and others involved in farming and forestry activities and their conversion. A total of £22m has been allocated to the training scheme under the ERDP. The rationale for the measure is to provide training to help the agricultural and forestry workforce take up and make the most of the rural development opportunities provided in the ERDP.

The target set for the VTS was to provide 48,000 full cost equivalent training days for people in farming and forestry by 2007 to support successful delivery of measures under the ERDP. By the end of December 2000, 76 applications had been received but none had been approved.

We have not been able to find any evaluations or literature on the effectiveness of the VTS. An economic appraisal of proposed expenditure under the Rural Development Regulation comments that higher levels of training are associated with greater on-farm innovation and technology transfer.

There are a number of training schemes which are currently in operation to provide training for those in land based industries. It is essential that the VTS is integrated with the other schemes available. The vocational training scheme has only been running since 2000 and it is too soon to evaluate the efficiency, effectiveness and costs of the scheme.

The following conclusions can be made:

- VTS supported training is delivered by training providers who are either registered with Lantra or who can demonstrate similar competencies but it is too early to judge if the scheme is meeting its objectives;
- There is no evidence on the value for money of the VTS, the impact of the scheme on farmers' attitudes or management practice, impact of the scheme on wider rural development, the attitude of the wider public to the environment, the profile of benefits delivered over time or administrative costs of the scheme.

8. Rural Enterprise Scheme

The Rural Enterprise Scheme (RES) provides assistance for projects that help to develop more sustainable, diversified and enterprising rural economies and communities. Its primary aim is to help farmers adapt to changing markets and develop new business opportunities. RES also has a broader role in supporting the adaptation and development of the rural economy, community, heritage and environment. A total of £152 million EU and UK Government money has been allocated to the RES for the period April 2001 to the end of 2006. The majority of funding has been allocated to regional budgets. A small proportion has been reserved for national projects on the marketing of quality agricultural products.

Farm diversification can contribute towards economic benefit within the wider rural economy as well as improving farm incomes. However diversified enterprises can involve substantial capital outlay and there is often a need for grants and subsidies to help identify and develop them if they are to have a chance of success. The targets for the RES are to assist 6,000 – 7,000 projects and 200 village initiatives and create 4,000 – 6,000 full-time equivalent jobs by 2007. 123 applications had been received by the end of 2000.

The RES builds on arrangements operated under the former Objective 5b scheme. An economic appraisal of proposed expenditure under the RDR found that the programme structures were generally robust and that the majority of the projects reviewed were highly additional. There was, however, evidence to suggest that problems associated with rural development tend to be regionalised, or even localised, so that any new scheme would be most effective if carefully targeted.

The RES scheme has only been running since 2000 and it is too soon to evaluate the efficiency, effectiveness and costs of the scheme. Individual projects and the scheme as a whole should be evaluated at interim and final stages. The following conclusions can be made:

- The Objective 5b programmes were successful in meeting their objectives. The RES is to build upon the arrangements which operated under this scheme.
- There is a need for a shift in institutional and administrative levels towards the regional scale for the delivery of the RES;
- There is a need for further reform of agricultural policy to link it with rural development for schemes such as the RES to operate more effectively;
- There will be benefits to targeting schemes on the areas of greatest need;
- There is no evidence on the impact of the scheme on the public, farmers' attitudes, rural development, on administrative costs or the profile of benefits delivered over time.

9. Energy Crops

The energy crop scheme seeks to increase the area devoted to energy crops, Short Rotation Coppice and miscanthus through provision of establishment grants. The scheme also provides aid to help growers establish producer groups. A total of £29 million has been allocated to the scheme under the ERDP.

The rationale for the scheme can be viewed in the context of the Government's energy policy to ensure secure, diverse and sustainable supplies of energy at competitive prices, including a contribution towards the UK target for the reduction of greenhouse gases. The negative externalities associated with fossil fuels such as the production of CO₂ are not fully accounted for in their cost. If it is not possible to fully internalise these costs then a second best solution may be to support renewables. The infant industry character of renewables suggests that the sector might be able to benefit from 'increasing returns to adoption' such that the greater the number of adopters, the lower the average cost of supplying renewables. This may justify temporary support. There may also be a case that the UK is well placed to exploit the knowledge economy through the development of renewables.

There are also a number of possible justifications for support specifically for energy crops: they can be grown to meet the needs of the market; they produce energy on demand and are not subject to variations due to external influences such as the weather. Energy crops have the potential to become a significant energy source over the next few years. Generation of electricity from these schemes is relatively close to commercial viability, although if the scheme could be commercially viable without the funding then additionality has not been achieved.

In addition to the issue of energy policy there may be other justifications for supporting energy crops, such as encouraging farm diversification and potential environmental advantages. At present energy crops are disadvantaged as they generally compete for land with crops that are supported through the CAP. However clearly the first best solution would be to remove the distortionary support for food crops. Finally energy crops have the potential to create employment in rural areas.

By the end of 2000 there had been relatively little take up of the scheme, reflecting the complexity of creating a fuel supply of a novel crop and then using it in a conversion plant that has not been proven commercially.

We have been unable to find any direct evaluations of the effectiveness of the energy crops scheme. Energy crops have a complex supply chain associated with getting the energy source to the energy provider. A potential gap relates to the infrastructure required to harvest, store and supply the energy crops once they have been grown. Contractual issues may also limit the take up of the energy crops scheme. In addition farmers may be concerned with the long term nature of the contract and also given the newness of the technology. The lack of biomass power stations under construction means that it is impossible for farmers to meet the requirement to have a contract for energy end use, although DEFRA will also accept letters of intent.

The energy crops scheme has only been running since 2000 and it is too soon to evaluate the efficiency, effectiveness and costs of the scheme. There should be a specific evaluation of the scheme, taking account of the recent wider energy review. Factors restricting take up also

need to be assessed, including the level of payment, contractual problems, the need to obtain planning permission and uncertainty over future agriculture policy (particularly set-aside). An evaluation will also need to take account of measures introduced to stimulate the market for renewable energy.

10. Free Advice

This scheme, announced in September 2001, entitles farmers to a day of a consultant's time, worth up to £800, for a feasibility study to help them apply for a farm diversification grant under the Rural Enterprise Scheme. The scheme is specific to the ERDP but there is also the Farm Business Advice Service (FBAS) (launched in October 2000 through the Small Business Service) offering up to three days of free business advice. It is too soon to obtain information on the uptake of the free advice to farmers scheme for ERDP projects.

Over 7,000 farmers have requested the three days of free advice from the FBAS and around 2,800 have now received the full three days of free business advice. As a response to foot-and-mouth disease (FMD) the government provided five days of free advice from the FBAS. Since September 2001 some 1,100 farmers have requested the five days of free business advice and delivery has commenced for over 300 farms. While there has been a reasonable uptake, there is a need to target the advertising of these schemes to those farmers who are most likely to benefit from business advice and participate in the ERDP schemes.

We have not been able to find any evaluations of schemes which promote business advice to farmers although there are evaluations of conservation advice programmes. These have concluded that there is an economic case for supplying free advice to promote the production of public goods. However, alternative methods of delivering the services should be considered to widen access to advice. The conservation visits both increased farmers' awareness of the benefits to wildlife from conservation measures and the parallel benefits to farming of some conservation measures.

There are a number of different schemes in operation for the delivery of advice to farmers on a range of conservation and business areas. Efforts need to be made to integrate these programmes, perhaps through a telephone call centre or Internet site. There is also a need to promote the schemes and carefully target the advice to the smaller farming enterprises who would benefit most from diversification.

It is too soon to evaluate the efficiency, effectiveness and costs of the scheme. The following conclusions can be made:

- The schemes to provide free conservation advice to farmers have delivered against their objectives, increasing farmers' awareness of environmental practices and influencing their actions. The schemes to provide free business advice to farmers are using a similar approach but it is too early to judge if they have delivered against their objectives;
- The schemes set up to provide free conservation advice have been delivered at a good value for money in terms of costs to society and benefits to farmers and society. An evaluation concluded that there was an economic case for providing the free advice. The average cost per visit of the schemes was £355;
- The provision of free conservation advice had changed farmer's awareness and management practices;
- There is no evidence on the impact of the scheme on wider rural development, the attitude of the wider public to the environment, the profile of benefits delivered over time or

administrative cost of the schemes.

11. Measures under the Rural Development Regulation not implemented in the ERDP

While most of the potential measures included in the Rural Development Regulation were included in the ERDP, a few were not. We have not undertaken any specific analysis on these issues, but consider briefly their potential.

We are not aware of any evaluations of schemes to support young farmers. It was not included in the ERDP because it was felt that the levels of aid were unlikely to be sufficient to deliver a real benefit and that enterprise was better encouraged by providing the right economic climate and more targeted measures. However, there may be three possible ways in which the measure might be introduced:

- a measure to attract those with particular skills in environmental management ;
- a measure to provide opportunities for younger people wishing to establish diversified agricultural businesses;
- a measure to support the establishment of those with experience of farming in particularly severe conditions .

There are a substantial number of farmers who face particularly low levels of income; some means of easing the movement of such farmers out of agriculture would appear to have significant merit. However, an early retirement scheme could promote a rush of applicants from farmers who could soon be expected to retire anyway. Thus the measure could be expensive and the additionality achieved low.

Three sorts of justifications for scheme might be considered:

- equity: that the individual farmers could be in sufficiently desperate circumstances ,
- restructuring: that the measure would bring about a major change in agricultural structure,
- reducing commitments to future CAP payments: leading to a net saving to the exchequer.

The early retirement measure seems not to ensure any of these justifications. It might be possible to offer capital payments to retiring landholders provided that the land is permanently removed from the CAP payment regime. There would be a problem should the scheme lead to the abandonment of agricultural land and there could be a need for a more comprehensive agri-environment scheme.

The intentions of some of the measures promoting the adaptation and development of rural areas are unclear. Depending on their scope there may be some options as means of promoting environmental objectives.

1. Introduction

1.1 The objectives of the England Rural Development Programme

The specific strategy and priorities for the England Rural Development Programme (ERDP) are set out in paragraphs 6.1.6 to 6.1.40 of the programme. The Government's overall aim for rural and countryside policy is to:

“To sustain and enhance the distinctive environment, economy and social fabric of the English countryside for the benefit of all.”

This is supplemented by five national objectives for rural and countryside policy:

1. “To facilitate the development of dynamic, competitive and sustainable communities in the countryside tackling poverty in rural areas.”
2. To maintain and stimulate communities, and secure access to services which is equitable in all the circumstances, for those who live or work in the countryside.
3. To conserve and enhance rural landscapes and the diversity and abundance of wildlife (including the habitats on which it depends).
4. To increase opportunities for people to enjoy the countryside.
5. To promote Government responsiveness to rural communities through better working together between central government departments, local government and government agencies and better co-operation with non-governmental bodies.”

These form the basis for a series of key national priorities for the rural economy, notably agriculture and forestry, for rural communities, for the rural environment, and for countryside enjoyment. Two priorities are identified for the Programme:

Priority A Creation of a productive and sustainable rural economy (key national priority NP1);

Priority B Conservation and enhancement of the rural environment (key national priority NP3)

The operational objectives and specific measures are identified under each of the these two Programme Priorities.

Priority A Creation of a productive and sustainable rural economy (key national priority NP1)

(i) Investment in agricultural holdings

Objective : to provide targeted assistance to support the development of more sustainable and competitive farming businesses with improved agricultural incomes, redeployed production and diversified farm activities.

To be implemented through: Rural Enterprise Scheme
Energy Crops Scheme

(ii) *Training*

Objective : to broaden the skills base of the agricultural and forestry workforce to enable it to meet the challenges of the re-orientation of agriculture and forestry and so contribute to the new demands of the rural economy.

To be implemented through: Vocational Training Scheme

(iii) *Improving processing and marketing of agricultural products*

Objective : to encourage innovation and investment to achieve added value for English primary products and to enhance market opportunities.

To be implemented through: Processing and marketing grants

(iv) *Forestry: Afforestation of agricultural land & Other forestry measures*

Objectives : to improve the landscape, habitats wildlife and amenity value of agricultural and non-agricultural land by planting woodland, thereby creating employment diversifying land use; to improve the ecological and social functions of existing forests; and to encourage the growth and collaborative production of short rotation coppice as a contribution to tackling climate change.

To be implemented through: The existing Woodland Grant Scheme
The existing Farm Woodland Premium Scheme
Energy Crops scheme

(v) *Adaptation and development of rural areas*

Objective : to provide targeted assistance to support the development of more sustainable, diversified enterprising rural economies and communities to assist their regeneration and adjustment of the declining importance of agriculture and to the new demands of the rural economy.

Making use of the following seven *Article 33* measures:

- Setting up farm relief and farm management services
- Marketing quality agricultural products
- Basic services for the rural economy and population
- Diversification of agricultural activities and activities close to agriculture to provide multiple activities for alternative incomes
- Agricultural water resource management
- Development and improvement of infrastructure connected with the development of agriculture
- Encouragement of tourist and craft activities.

Priority B Conservation and enhancement of the rural environment (key national priority NP3)

(i) Agri-environment

Objective : to conserve and improve the landscape, wildlife and historic heritage of the countryside, thereby also contributing directly and indirectly to economic activity and social objectives in rural areas.

To be implemented through: The existing Environmentally Sensitive Areas Scheme
The existing Countryside Stewardship Scheme
The re-opened Organic Farming Scheme

(ii) Less Favoured Areas

Objectives: to help preserve farmed upland environment by ensuring that land in Less Favoured Areas (LFAs) is managed sustainably; and to contribute to the maintenance of social fabric in upland communities, through support for continued agricultural use.

To be implemented: In year 2000, through the continuation of Hill Livestock Compensatory Allowances Scheme;
From 2001, through the Hill Farm Allowance Scheme.

(iii) Adaptation and development of rural areas

Objectives : to provide targeted assistance to support the development of more sustainable , diversified, enterprising rural economies and communities to assist their regeneration and adjust to the declining importance of agriculture and to the new demands of the rural economy.

Making use of the following two Article 33 measures:

Renovation and development of villages and protection and conservation of the rural heritage;
Protection of the environment in connection with agriculture.

1.2 The general rationale for the ERDP

The rationale for the ERDP, as explained in paragraph 6.1.22 is ‘based largely on the concept of market failure’. This is relatively straightforward with regard to the provision of public goods, such as with the provision of environmental goods such as biodiversity and landscape. The public good characteristics of these goods are well recognised and the justification for government support turns on the empirical question of whether the benefits enjoyed are greater than the costs of provision. However, the adoption of sustainable development as an objective suggests a wider set of issues than those covered by market failure. Sustainability implies the maintenance of natural capital, even where the expected costs exceed the expected benefits as measured in cost benefit terms. The rationale for this is typically based on arguments of uncertainty, irreversibility and non-substitutability. Similar arguments may be made with respect to values associated with the cultural heritage. Assets and values deriving from historic cultures have very similar qualities to natural assets in that they can

have unique characteristics and their loss would be irreversible.

The application of the market failure rationale is less straightforward with regard to the rural economy, associated with high adjustment costs and weaknesses in rural economies. A number of possible arguments might be made. Farmers may fail to adjust fully to changes in local economic conditions for a number of reasons. They may lack adequate information on the prospects of remaining in farming and on the possibilities of change. A variety of types of information have public good characteristics and thus may not be fully provided through a conventional market. Farmers may be risk averse and as a result fail to invest in alternative courses of action to the extent to which a 'risk neutral' society might prefer. There is an element of path dependency in determining the current pattern of agricultural activity, especially in its dependence on relatively intensive production methods, and some support may therefore be justified in shifting resources towards an allocation that better matches contemporary costs and benefits.

An alternative argument might be that a decline in agricultural incomes and employment would promote a 'circular and cumulative' decline in local economic conditions, through outmigration and a consequent decline in local services and communities that would reduce the quality of life more generally for the local population. This would apply where agriculture represents a significant component of the local population.

It might further be argued that agricultural diversification represents a means of supporting the occupation of the land more generally and hence of promoting environmental objectives. Decisions as to whether to continue in farming are likely to be made at the household level rather than by the farmer individually. They will thus take account of the full range of income sources available to the household, rather than of farm income alone. Thus alternative income opportunities, whether on or off farm or whether available to the farmer individually or to other members of the farm household, may be influential in encouraging continued agricultural occupation. From this perspective, it might be argued that the farm sector is dependent on the local economy, rather than the reverse of the argument that is traditionally made.

Finally, it might be argued that there are certain values associated with the maintenance of a varied pattern of balanced communities in rural areas. Social capital in rural communities may be viewed as a public good. When present, it is available to all of those living in (and perhaps visiting) the local community, i.e. it is non-excludable, and its enjoyment by one person does not reduce its value to others, i.e. it is non-rival. But there may also be efficiency gains from a 'high' level of social capital to the extent that it can reduce the general level of transactions costs and so enhance the operation of the local economy.

It could also be possible to construct arguments about rural communities that parallel those associated with the concept of 'total economic value' in natural resource economics. The maintenance of well-serviced rural communities might be seen as a source of option value. Local residents may be prepared to pay in order to maintain the option of having access to local services, such as shops or public transport. The circumstances can parallel those often associated with options values in environmental economics, uncertainty as to future values, irreversibility associated with local community decline, and a lack of close substitutes. A similar perspective might be taken by those who, while they do not presently live in rural communities, anticipate that they might wish to do so in the future. There may too be elements of existence and bequest values. Individuals living in urban areas may be willing to

pay something towards the maintenance of certain types of rural community and others may be willing to pay to ensure that such communities are available to future generations.

The strength of these arguments varies and few can be supported on the basis of results from available empirical research. Similarly, the extent to which they relate to the agricultural sector rather than applying more generally to circumstances in rural areas (and elsewhere) is unclear. Some could potentially be subject to analysis, such as in terms of the option values associated with the availability of rural services or the presence of existence values. But we are not aware that any research has been undertaken on these issues.

However, beyond the market failure, there are also concerns for equity. There is, for instance, a general presumption that everybody should have access to a certain level of services wherever they live or the ability to live in a particular place, perhaps in relation to where they have employment or where they have been brought up. This sort of view clearly informs debates about social inclusion and is the basis for goals set out in the rural white paper (DETR, 2000), such as for 'equitable access to everyday services' (p17) or 'inclusive rural communities which help young people remain in the area where they grew up (p45). These would also be legitimate objectives for government policy.

1.3 The assessment of measures adopted under the ERDP

Assessments have been made of each of the measures implemented under the ERDP. Where it is available, an assessment has been made of the nature and strength of the evidence underpinning the measures, and we have also identified gaps in the evidence base. In general it is too soon to undertake a formal evaluation of the measures. Our approach has thus been based on an assessment of the general rationale for the measures and evidence relating to schemes in operation prior to the adoption of the ERDP. We have adopted rather different approaches to the assessment of the different measures reflecting their differing age, the availability of previous evaluations and academic research. In view of these differences, we have not sought to force the individual assessments into a common format.

The following sources have been reviewed for information:

- The ERDP and other documentation on the measures;
- Previous evaluations commissioned by MAFF and other Departments;
- DEFRA reports on the uptake of particular elements within individual schemes;
- Websites (including Farm Business Advice Service, LANTRA, the Countryside Agency, ADAS, NFU) and literature on alternative options for the delivery of scheme objectives; and
- Research reports and journal articles (bibliographic searches, searches of Centre for Rural Economy at the University of Newcastle, Journal of Agricultural Economics, Journal of Rural Studies, Journal of Environmental Management, Regional Studies, Farmers Weekly).
- A visit was made to CEH, Merlewood to discuss the evidence of environmental impacts of agri-environment schemes.

1.4 The evidence from evaluations

Given the emphasis on market failure as the primary rationale for intervention, evaluations might be expected to follow the principles of cost benefit analysis. But in practice there is insufficient information for such a formal approach. In particular, evaluations rarely establish an explicit and clearly defined counterfactual. It is difficult to separate out the influence of the ERDP measure against the other potential influences; there remains uncertainty as to the circumstances that would be in place in the absence of the ERDP measures. Thus for instance, from an ex ante perspective, patterns of world commodity prices will influence agricultural impacts on the environment or the state of the national economy will influence the returns to farm diversification investments.

Any change in the policy environment would lead to a variety of subsequent changes in other policies and markets which are generally difficult to predict. One particular issue in the context of agri-environment measures concerns the status of the environment in the absence of ERDP measures. Clearly this depends on whether there would have been other changes in agricultural policy. The study by GFA-RACE (2002) on the potential impacts of CAP reform illustrates the difficulties. Their 'initial mapping' of the potential impacts assumed no adjustments in fixed or variable costs or, presumably, in world commodity prices. Difficulties in predicting environmental outcomes are reflected for instance in judging whether 'accelerated extensification' will lead to enhanced biodiversity or whether decreased stock numbers will threaten the management of key habitats. They conclude that the anticipated environmental impacts are very varied in direction and degree across different sectors and in different areas of the country.

There are also difficulties in defining the outputs arising from the policy measures. For instance, a number of measures have the general objective of the "development of more sustainable, diversified enterprising rural economies and communities". But how can this be measured? In practice attention in evaluation often focuses on conventional quantifiable outputs, such as numbers of jobs created or incomes generated, but these may not fully reflect the objectives of the policy. Attention has been given recently to the problems that this represents for evaluation, especially given the small scale of schemes relative to the other influences on a local area, the qualitative nature of some of the changes promoted, the participatory approach to scheme implementation and the demand to incorporate local priorities into the evaluation. These issues have been discussed primarily with regard to the LEADER programme (Midmore, 1998, Ray, 2000) but similar issues arise with ERDP measures.

Bristow *et al.* (2001) have piloted the 'Cardiff Methodology' approach to evaluation in Scotland. The Cardiff Methodology was developed for assessing progress towards the integration of policies for sustainable rural development objectives. It provides a pre-formed framework for the collection, collation and analysis of both primary and secondary data as well as quantitative and qualitative information on policy impacts and processes. It can be described as having four stages: Identification of the principal policy instruments within each sector, and description of the key features of design and delivery. Comparison of the negative and positive sustainability impacts and their integration with other sectors. Provision of a detailed typology or listing of the responsiveness of policy instruments to the principles and processes considered important in achieving integrated and sustainable rural development. Assessment of policies against a multidimensional framework of integrated and sustainable development tests. The CM does not seek to produce a 'simplistic, numerical

aggregative framework' to assess the overall impact of policy, rather the aim is to identify patterns and insights in the conflicts, tensions and synergies. Some collection of primary data may be included, but cross-cutting approach depends to a large extent on any formal evaluations that may have been undertaken on the individual policies being assessed within the CM framework. Generally such methodologies provide results that are less easily quantified, summarised and communicated. This has implications both for the ways in which evaluations are undertaken and for the processes of political decision-making.

2. Agri-environment Schemes

The ERDP indicates the underlying national priorities (summarised in Appendix Tables 1 and 2). The appendix tables indicate the contribution that agri-environment policy can make to specific ERDP objectives. Within the ERDP context, it is the contribution of the schemes to national rural development goals that determines their value. More specifically, it could be argued that it is the contribution of the schemes within the total portfolio of measures that determines their worth. This may be different from the basis on which agri-environment scheme evaluations have typically been undertaken in the past.

2.1 Valuation and cost-benefit

The rationale for establishing ESAs and CSS is based on the market's failure to supply a socially desirable level of public environmental goods from farmland. Policy institutes a quasi-market in which incentive payments are offered to farmers and land managers to protect and enhance the supply of landscape features, biodiversity, public access and cultural heritage. The schemes also contribute to the sustainability¹ of natural capital in the rural environment. The RDR (1257/99) expresses this rationale for the role of the agri-environmental instruments as 'to support the sustainable development of rural areas and to respond to society's increasing demand for environmental services'.

Stewart *et al.* (1997) and Hanley *et al.* (1999) have summarised the evidence from valuation studies on the public benefits obtained from agri-environment policies (Table 2.1). The cornerstone of the evidence on agri-environmental benefits in England is the original study by Willis *et al.* (1993) who valued the benefits from the South Downs and Somerset levels and Moors ESAs. All the valuation studies show strong public support for the schemes with the value of the benefits greatly exceeding the exchequer costs incurred. However, Stewart *et al.* (1997) regard the benefit values as indicative only, because of continuing uncertainty about the reliability of contingent valuation. Hanley *et al.* (1999) state that many significant problems exist for cost-benefit analysis including the issues of aggregation of non-use values, part-whole bias and benefits transfer.

¹ Defined as a non-declining capital stock.

Table 2.1 Cost-benefit analysis of agri-environmental schemes (£)

Agri-environmental scheme	Benefit estimate per person	Aggregate benefits	Scheme exchequer costs	Net value	Valuation method
Mourne Mountains and Slieve Croob ESA Moss and Chilton (1997)	Not known	13090 000	2042 823	11 047 177	CVM
South Downs ESA Willis <i>et al.</i> (1993)	1,98-27.52	263177-79835000	970 000	(-)707 000- 78 865 000	CVM
Somerset levels and Moors ESA Willis <i>et al.</i> (1993)	2.45-17.53	101 422-52637 000	1 859 000	(-)1 757 000 – 50 778 000	CVM
Stewartry ESA Gourlay (1995)	3.00-22.56	371 840-1 825 268	430 000	(-)58 160-1 395 268	CVM
Loch Lomond ESA	2.28-32.8	229 600-3 211 311	70 000	159 600 – 3 141 311	CVM
Breadalbane ESA	22.02-98	92 938-44 100 000	396 796	(-)206 796-43 703 204	CVM
Breadalbane ESA Hanley <i>et al.</i> (1996)	107.55	636050 ^a -4 363 ^b	841 396 796	239 251 – 4 444 567	CE
Machair ESA Hanley <i>et al.</i> (1996)	13.4-378	75 539-26 800 000	101 981	(-)26,442-13 298 019	CVM
Machair ESA Hanley <i>et al.</i> (1996)	23.15	256039 ^a -563 864 ^b	101 981	154 058-461 883	CE
Norfolk Broads ESA	142-150	Not known	1 821 300	Not known	CVM
NSA Hanley (1990)	16.17	13 506 311 ^c	1 500 000	12 006 311	CVM
Organic aid Foster and Mourato (1997)	127.59	17 060 000 ^d	419 000	16 640 000	CR

CVM = contingent valuation; CE = choice experiment; CR = contingent ranking

^a = Residents only. ^b = Residents plus visitors ^c = East Anglia only.

^d = Based on saving one bird species only; aggregated over RSPB members.

The substantial benefit valuations typical of CV studies on the agri-environment have been widely used to justify the expenditures involved. However, there is growing evidence that these valuations may be over-stated. Hodge and McNally (1998) consider there has been a failure to ‘establish a clear and realistic description of the likely outcome of the policy’. The valuation studies have assumed a loss of environmental quality under the counterfactual, and coupled this with a degree of enhancement under the policy. The assumption is that policy will be successful when evidence from monitoring is less convincing (see below). Dutch and other scientific studies (Kleijn *et al.*, 2001) have questioned whether agri-environment

schemes as currently designed are able to enhance biodiversity, although they have in turn been questioned by Stoate and Parish (2001) and Carey (2001) who argue monitoring is undertaken in the UK and that results show that biodiversity can be enhanced. In the main ESA evaluation studies of Willis *et al.* (1993) and Hanley *et al.*² (1996) the policy benefits presented to respondents now appear unrealistic. The impact of policy is over-stated. Indeed, one reason for the closure of the ESA scheme to new entrants in Scotland has been the limited evidence for environmental gain (e.g. Crabtree *et al.*, 1999).

Despite these concerns, the evidence remains that policies aimed at protecting natural capital and the rural environment are highly valued by the public.

CV studies to date have been of limited value for improving policy effectiveness (Hodge and McNally, 1998; Whitby, 2000). There is also very little information on the marginal benefits from agri-environmental policy (Stewart *et al.*, 1997). The limited evidence demonstrates diminishing marginal valuations in a Northern Ireland context (Moss and Chilton, 1997) but there is no evidence to suggest that agri-environment policy has expanded to the point where marginal costs exceed benefits.

More recent valuation work has concentrated on valuing changes in specific environmental features, their marginal utility and the scope for transferring benefit estimates between locations. Hanley (2001) combined literature estimates of the value of environmental features (hay meadows, heather moorland; rough grazing, woodland and wetland) in a benefit transfer model (ELF). The information was supplemented with new CV estimates for hedgerows and arable headlands. There was evidence for diminishing marginal benefits. For instance, the WTP to attain a 5% increase in field margins in Cambridgeshire was £11.30 per household, compared with £14.70 for a 25% increase. Hanley also found that benefit estimates were feature- and region- specific and there was evidence for distance decay in benefits as the distance from the environmental feature increased. Overall, although the model is useful in summarising existing information and combining use and non-use values in a coherent way, ELF remains to be tested. The estimates are fragile because they are based on a limited number of observations gathered in the most part from a range of studies each with their own methodology. It is not at the stage where it can reliably inform expenditure decisions.

Further work is clearly required on the valuation of individual environmental attributes before they can fully inform policy development. Benefit valuation estimates still provide an economic rationale for intervention in the agri-environment. But as yet they are not sufficiently robust to inform policy on the appropriate scale of agri-environmental expenditure or the public's valuation of specific habitats and landscape features.

The valuation studies undertaken by economists may not reflect the full range of values associated with the rural environment. In the language of 'total economic value', surveys have concentrated on the landscape and recreational values of the environment with little attention to other values, such as ecosystem functions, for instance for fish spawning, or the impacts on water catchment and flooding. Respondents may not have been aware of the full variety of ecosystem values that may be supported by agri-environment schemes. These are discussed in depth by Turner, Brouwer and Georgiou (2001). The environmental values arising from environmental conservation may vary considerably between locations although

² Presented in detail by Simpson *et al.* (1997)

there is little evidence available on this in practice. Indeed we have only a limited understanding the ecology of such systems at this scale. Further, an objective of sustainability suggests that such services should be maintained even where measured benefits may appear to be less than costs. One illustration might be in the face of climate change. Changed climatic conditions might mean that species can no longer be maintained at their existing locations. Survival in the countryside might then only be possible through their shifting location and this may only be possible where there are lattices of semi-natural habitat in corridors through which the species may move. The development and maintenance of such corridors may thus be justified in terms of the conservation of species at other locations. This suggests a potential value for a broad and shallow agri-environment scheme as insurance for the maintenance of species and habitat against future climatic change.

It might be argued that a wider range of evidence could be used in order to demonstrate the public valuation of the rural environment in more general terms, supplementing the more formal approach in economics. The Countryside Agency has demonstrated the large numbers of people who use the countryside for recreation on a regular basis. Similarly, despite the free rider incentive, very many people subscribe to non-profit organisations. In 2002, the National Trust has around 2.8 million members and the Royal Society for the Protection of Birds has 1.2 million (*Guardian* 29/1/02, p10). While membership may offer a number of advantages, besides support for the rural environment, they represent mass membership organisations, substantially larger, for instance, than the membership of the major political parties. Similarly, people also make donations for the purchase and maintenance of reserves by non-profit organisations. Perhaps too the numbers of people wishing to donate benches to be placed at familiar locations in the countryside as a memorial to relatives is a reflection of the depth of attachment held for such places.

2.2 Contract mechanisms

A recurring theme in the literature is the deadweight associated with the fixed payment incentive schemes when opportunity costs vary between farms (e.g. Hanley *et al.*, 1999). In theory, all but the marginal entrants are paid in excess of their opportunity costs and this represents itself in the increased income of the participating farmers (e.g. Hughes, 1994; Colman, 1994). Although policy may have a secondary aim of providing additional income to farmers, deadweight represents a major source of inefficiency in delivering environmental benefits. NAO (1997) noted a substantial element of over-compensation in ESA payments. This is a particular problem for the ESA scheme where relatively high rates of uptake are desirable to protect and enhance areas of national importance. It may also pose problems for increasing the payment rates to increase uptake because the marginal cost of the environmental gain achieved may be high in relation to other opportunities for expenditure. Payment rates are limited by the EC in Regulation 1257/99 to costs plus 20%, although this rarely limits the rates that are paid in practice which are generally well below the 120% limit, especially in the CSS.

Within the fixed incentive system efficiency can be increased by segmenting the population of farms either in terms of benefits, costs or both (Crabtree *et al.*, 2000). Some cost segmentation is used between ESAs because payment rates are set individually for each ESA. Within ESAs, cost segmentation is difficult because of limited information about farmers'

opportunity costs.

Segmentation by benefit is being increasingly used in schemes which are over-subscribed. Scoring systems in CSS, Tir Gofal, the Scottish CSS and Forestry Commission's Woodland Grant Scheme focus expenditure on high-benefit situations. However, this type of discretionary selection fits ill with the ESA scheme with its aim of high participation rates. Differentiated regional payments in CSS are a further route to increasing the efficiency of policy and merit further investigation, although CCRU (2000) in their evaluation of CSS fall short of recommending that the current fixed rate system be modified.

The development of alternative and more efficient contract mechanisms has been a feature of the recent literature (Latacz-Lohmann, 1998; Latacz-Lohmann and Van der Hamsvoort, 1997; Moxey *et al.*, 1999; Crabtree *et al.*, 2000; Ozanne *et al.*, 2001). Auction and bidding mechanisms should reduce deadweight and have been applied with some success in delivering woodland policy (Garforth, 2001). However, private transaction costs will be higher and there is evidence that bids are higher to allow for this and may include an element of bidding over cost. It does not necessarily follow that auctions are a more efficient mechanism in all contexts. They appear most effective where compliance costs are both variable and not sufficiently well defined to allow suitable payment setting.

2.3 Transaction costs

The full social costs of agri-environment policy should take account of both the public and private transaction cost and the economic cost of raising finance through taxation (Whitby *et al.*, 1998; Moxey *et al.*, 1999). Colman (1994) noted that the transaction costs of ESA policy were relatively high as compared with more traditional grant aid schemes. Falconer and Whitby (1999) have estimated these costs and found that they are non-trivial both for the public sector and for private participants. They estimated that in UK agri-environment schemes the public administrative costs averaged 48% of the compensation paid. Falconer (2000) estimated the private transaction costs to farmers as around 5% of the compensation although the range is likely to be substantial.

These results suggest that the transaction costs of agri-environment policy are large and raise the issue of whether such costs can be reduced. In assessing transactions costs, what is important is not their absolute level, but rather that return that they bring in terms of enhanced environmental outputs. This requires both that activity should be cost-effective and that it should be directed towards actions that have the most impact on environmental outputs. As policy mechanisms are fine-tuned to increase efficiency and effectiveness, administrative cost are likely to increase.

The available evidence does indicate quite strongly that the administrative costs of scheme implementation have fallen steadily and significantly, reflecting the high initial costs of setting up contracts relative to monitoring and enforcement and potentially some element of a learning process. For instance, while in 1992/93 administration represented over 50% of the gross costs of the ESAs, this figure fell to 15% in 1998/99. This may at least in part reflect the reduced rate of entry of farmers into the schemes, with effort being redirected from the admission of new farmers towards scheme maintenance. Statistical analysis of the administrative costs of the ESAs (Falconer, Duprez and Whitby, 2001) also suggests administrative economies of size related to scheme participation. Substantial differences in

administration costs were found between ESAs suggesting perhaps that further efficiencies may be possible, although this may reflect differences in local conditions. Whitby and Falconer (1999) suggest that transaction costs could be reduced by extending the contract period, by unifying schemes, and by investigating alternative contract mechanisms such as auctions. Short-term cost savings from scheme unification may be limited until existing contracts expire.

2.4 Evaluation of agri-environment policy

Stewart *et al.* (1997) undertook the most extensive evaluation of policy from an economic perspective. Table 2.2 gives their main recommendations and an assessment of the apparent policy response. There have been policy changes that relate to a number of these recommendations.

Table 2.2 Policy responses to Stewart *et al.* (1997)

Recommendation	Policy response
Greater targeting on habitats and species by merging the ESA and CSS schemes	Not directly implemented in the UK although ESA schemes have been closed in Scotland and Wales
Reduction in production-orientated support and introduction of cross compliance	Cross compliance and area-based HFAS payments introduced under the ERDP
Alternatives to management agreements	This has been explored within DEFRA. Efficiency in the CSS is enhanced by using a scoring system for applications
Improvement in communication and advice	Policy response uncertain
Adoption of a national performance indicator system	Bird populations used as an UK government Quality of Life Indicator and Farmland bird populations adopted by DEFRA as a Public Service Standard
The possibility of tying payment rates to environmental performance rather than management practices	This has almost certainly been investigated by DEFRA but presents major implementation problems
Allowing greater local flexibility in the interpretation of existing agri-environmental schemes	There is local objective setting in both the ESA and CSS schemes. It would require a measure of regional devolution to take this further.

2.5 Environmentally Sensitive Areas

Recent socio-economic evaluations

CEAS (1997, 1998) undertook the evaluations of Stage II, III and IV ESAs. These are not very informative for the evidence assessment because they concentrated on the impact of non-renewal of the scheme on participants' behaviour. Over 80% of participants said that they would renew their current ESA contracts at current payment levels. Higher payments would ensure a higher proportion of renewals. Discontinuation of the scheme would have minimal impact on the total crop area although there would be some reversion to arable in the South West Downs and Test Valley. The intensity of arable and livestock production would increase on many farms as farmers attempted to recoup lost income. Around 30-40% would change livestock numbers.

The results indicate that any closure of the ESA scheme would have to be managed carefully if loss of environmental capital were to be prevented. Whitby (2000) has also raised this

issue of how to maintain benefits from ESA investment in an evolving policy framework.

Participation

The level of participation achieved in voluntary incentive schemes is central to the achievement of policy aims (Falconer, 2000). It is particularly so with the ESA scheme where high uptake is required to protect and enhance the natural capital of the ESA areas. At the outset of the ESA scheme, NAO (1997) state that uptake targets were set at 75% of eligible land. Uptake (to 1999) is understood to have averaged 59.0% of the eligible area with uptakes below the original 75% target in 14 ESAs (including Breckland at 13% and the Essex Coast at 18%). New uptake targets have now been set for each option in each ESA (MAFF, 2000b).

Recent studies on the determinants of participation include those by Morris and Potter, 1995, Wilson (1996, 1997), Crabtree *et al.* (1999), Wilson and Hart (2000), Falconer (2000), Wynn *et al.* (2001) and Morris *et al.* (2000). Different authors have used different approaches, some concentrating on 'economic' explanations for behaviour based on compliance costs. Others have focussed on the behavioural response of farmers, examining the role of contextual factors and the process of adoption of new policy measures.

The overriding conclusion of this recent work is summarised by Wilson and Hart (2000) when they state that 'most farmers in the EU are driven in their participation decisions by financial imperatives and, to a lesser extent, by the goodness of fit of schemes'. Farmers are much less inclined to join when scheme conditions do not fit with existing farm management and major changes to land use are required (Wynn *et al.*, 2001). In a quantitative modelling of entry into Scottish ESAs, Wynn *et al.* showed that the probability of entry was higher where an option could be incorporated without major changes to farm operations. Similarly Morris *et al.* (2000) found that arable farmers were mainly reluctant to join CSS because 'it did not suit the overall commercial purpose of their business'.

Farmers with a strong conservation interest tend to join a scheme earlier (Wynn *et al.*, 2001). It is possible that conservation-interested farmers are much more important to the competitive CSS scheme (and more important in explaining the current uptake) than amongst marginal entrants to the ESA scheme. Wilson and Hart (2001) showed that 66% of CSS entrants in Devon entered because they wished to promote environmental conservation compared with 23% in the Cambrian ESA. Where conservation interest may be important in ESAs is in the uptake of habitat creation options or those requiring major adaptation of land management. Those with a conservation interest might be more prepared to undertake this.

'Scheme' factors can play an important role in determining who enters some ESA schemes. Wilson (1997) found that farm size and the amount of remnant semi-natural wildlife habitat emerged as the strongest variable influencing participation in the Cambrian Mountains ESA. This appeared to reflect the promotion activities of ADAS who had specifically targeted larger farms with large semi-natural habitats.

Morris *et al.* (2000) and Morris and Potter (1995) advocate a more actor-orientated approach to participation through an understanding of stages of change in the adoption process. They suggest a better matching of promotional methods to a farmer's stage of adoption as a route for increasing participation. Others have sought to emphasise the role of networks and leader-follower relationships in influencing farmers' decisions (Falconer, 2000) (although evidence for the effect of such networks is not always present, Wilson, 1997).

There does not appear to be clear evidence on the effectiveness of promotion in agri-environment schemes. Stewart *et al.* (1997) thought that it could be improved. It is one area where there may be potential for improved delivery either directly by government or through the use of agents.

We conclude the following in relation to participation:

- Participation in ESAs at the margin is mainly determined by income effects and the extent to which options fit with an existing farm system, but scheme factors and promotion can also be important.
- It is difficult to identify ‘barriers’ to participation that reflect scheme conditions. The most obvious barrier is the reluctance of many farmers to change the basis of their land management (and business).
- The characteristics of marginal entrants is likely to differ between ESA and CSS schemes with conservation interest playing a stronger role in the latter.
- There may be a case for more effective scheme promotion. Promotion needs to be related to the cohort of marginal adopters and ESA and CSS therefore require different approaches to promotion.
- Options that demand significant changes to farm systems will prove difficult to implement even if substantial incentives are offered. This is often the case on arable or intensive grassland farms. Large-scale uptake of such options is likely to be unrealistic.

Environmental performance

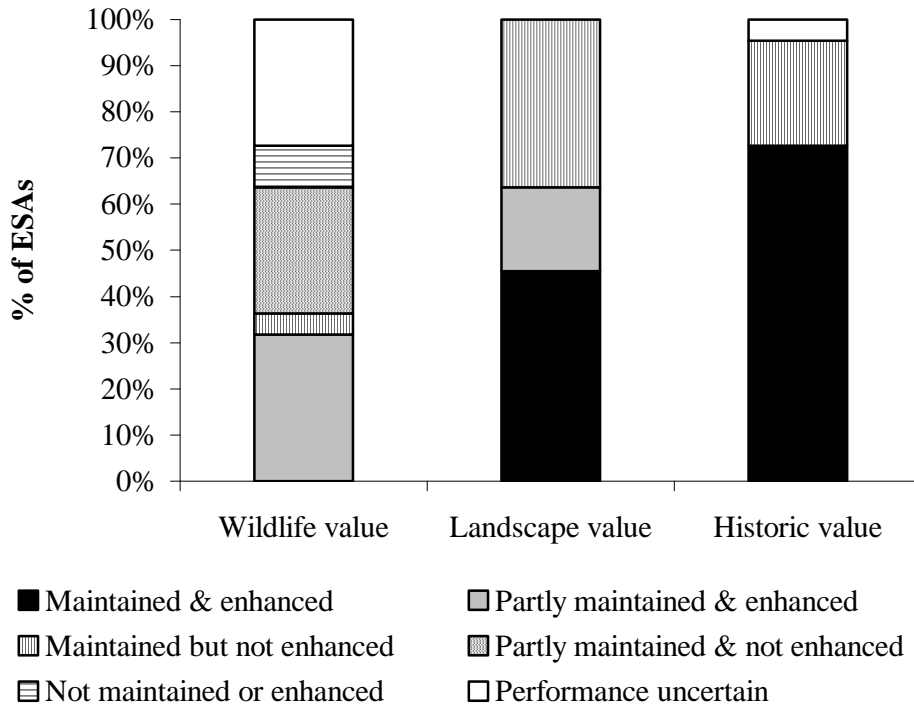
This section draws on preliminary results from the Ecoscope study for DEFRA ‘Review of Agri-Environment Schemes – Monitoring Information and R and D Results’³. Limitations in the scope and precision of monitoring limit the extent to which performance can be assessed. Because of technical difficulties, monitoring has only been undertaken on agreement land – there is therefore no counterfactual and additionality cannot easily be determined.

When assessed against the total of 388 performance indicators set up for the 22 ESAs, 38% of PIs were achieved, on average, in Stage I-III ESAs and 16% in Stage IV. When assessed against the objective of protecting and enhancing the wildlife, landscape and historical interest, performance varies depending on the environmental interest (Figure 2.1). Discounting the uncertain element (this relates mainly to Stage IV ESAs), landscape and historic features are maintained in almost all ESAs. Maintenance of the wildlife interest is less complete but most ESAs were at least partially successful in maintaining wildlife values. There is limited evidence for enhancement of wildlife⁴ but enhancement of landscape and historic features is more widespread. ESAs seem less effective than CSS (see below) in achieving wildlife enhancement.

³ It should be emphasised that these results remain provisional at this stage.

⁴ In part this reflects the long time periods that may be required to enhance habitats. However it also reflects the generally small uptake of higher tier options and the concentration of ESA expenditure on protection.

Figure 2.1 Average performance with respect to maintaining or enhancing wildlife, landscape and historic interest across all ESAs



2.6 Countryside Stewardship Scheme

Benefits and Value for Money

The six objectives of the CSS scheme are to:

- sustain the beauty and diversity of the landscape;
- improve and extend wildlife habitats;
- conserve archaeological sites and historic features;
- improve opportunities for countryside enjoyment;
- restore neglected and or features; and
- create new habitats and landscapes.

No benefit valuations have been made for CSS. It is therefore not possible to draw conclusions about the value for money of the overall scheme. However, there is no reason to believe that the conclusions would differ substantially from those already discussed for ESAs. Indeed the more specific targeting of benefits should imply that their value can be expected to be greater.

Recent Evaluation

CCRU (2000) undertook the recent evaluation of CSS and concluded that the objectives of the scheme are being met. This was based on the link between objectives, prescriptions and participation – rather than on performance indicators of the scheme outputs. This process-based approach to monitoring and evaluation in CSS differs markedly from the performance

indicators used to monitor the ESAs. CCRU (2000) propose a series of quantitative performance indicators for CSS, which parallel the recent formulation of environmental objectives and targets for ESAs (MAFF, 2000a). This is necessary if CSS is to be properly evaluated (Stewart *et al.*, 1997).

The CCRU (2000) evaluation concentrated on determining whether VFM could be improved by more efficient mechanisms, and whether the comparison of different delivery mechanisms suggests any conclusion about the relative performance of the ESA and CSS schemes. They also investigated whether performance indicators could be defined to provide a basis for stating quantitative targets against which performance could be assessed.

Specific contract details

CCRU (2000) examined the CSS payment rates in some detail and concluded that they were generally acceptable. Arable margin payments were generous and could be reduced; walling payments were low. Regionally differentiated payments were not recommended although there was a case for local supplements in some cases where payment rates were inadequate.

Administrative costs and efficiency

CCRU (2000) note a failure to take into account the transaction costs of different types of agreement. Value for money could be improved if greater account were taken of the transaction costs of achieving environmental gain associated with individual contracts. In particular, they conclude that the administrative procedures for handling agreements, amendments and payments need to be simplified to reduce costs. The evaluation makes recommendations on a number of specific aspects of the administration of CSS.

Participation and discretionary selection of entrants

The CSS is oversubscribed and participation is therefore less of an issue than with the ESA scheme. It is also likely that the marginal participants in CSS have greater conservation interest than marginal ESA entrants (as discussed above). If true, it suggests that promotion methods may need to differ between the schemes.

The excess demand for entry into CSS raises the question of payment rates and whether current rates are optimal. CCRU (2000) do not argue for any adjustment of rates – this would have to be traded off against the loss of some higher quality applications. Competition for entry into some options of CSS is greater than others and CCRU recommend a re-direction of promotion towards types of farms that do not apply and landscapes under threat.

CCRU (2000) examined the discretionary entry system use in CSS in detail. They conclude that the scoring system could be changed by linking it more directly to the aims of the scheme. They conclude that it should be based solely on the four outputs that the scheme aims to procure – historical features, access, wildlife and landscape. Greater weight should be given to the quantity of environmental outputs procured. Selecting applicants on a VFM basis (cost per unit of score) is a further step towards attempting to increase the economic efficiency of the procurement mechanism.

Environmental performance (1997-2000)

This section draws on preliminary results from the Ecoscope study for DEFRA 'Review of Agri-Environment Schemes – Monitoring Information and R and D Results'. The monitoring arrangements for CSS are different from those for ESAs. There are no specific objectives or PIs for CSS landscape types. Instead, performance is assessed by subjective appraisal of the

process of achieving environmental gains (e.g. agreement negotiation, appropriateness, compliance). It is not possible to evaluate CSS in terms of achievement of objectives or the quantity or quality of environmental benefits. Care must therefore be taken in comparing the CSS results with those from ESAs

Figure 2.2 The average % of agreements judged to be effective in maintaining and enhancing values.

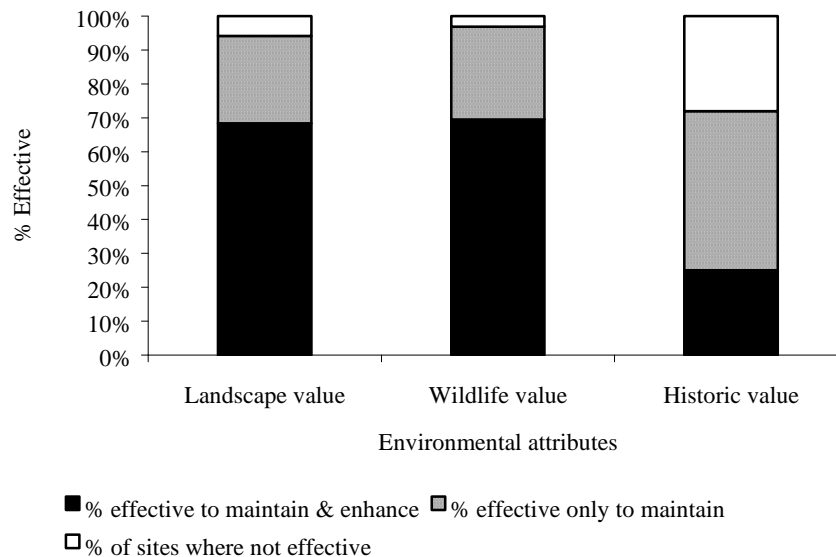


Figure 2.2 gives the results from this process monitoring. The great majority of contracts are considered effective for maintaining wildlife and landscape values and nearly 70% of sites are considered effective for enhancement. Performance in relation to historic features is more patchy and with no maintenance or enhancement occurring on 47% of sites. Overall, CSS appears to be capable of delivering significant environmental benefits. In over two thirds of cases CSS has led to works that would not otherwise have taken place. The additionality of the scheme is high. This reflects, in part, the emphasis given in CSS to environmental enhancement; this is more likely to ensure additionality and measurable gain.

2.7 Approaches towards the development of agri-environment schemes

England has adopted a more closely targeted approach towards agri-environment policy that has been the case in a number of other EU countries. This raises the question as to whether a ‘broad and shallow’ scheme might offer value for money. This raises a number of questions, such as the types and levels of environmental responses that might be generated, the values of the benefits that might be provided and the transactions costs of implementing a scheme including a large proportion of commercial farmers. We have not however undertaken a full assessment of the various options.

Schemes may operate so as to protect an already high environmental standard or so as to enhance a lower one. Clearly the former will cover the landscapes and habitats of highest value and where they are under threat this would appear likely to generate the highest value for money (the exception would be where the opportunity cost of protection is particularly high). Where the objective is the enhancement of environmental quality, it is suggested that

higher responses to agri-environment schemes will occur in locations that have experienced lower levels of environmental damage from intensive agriculture. These areas still retain the seed banks and wildlife populations as a basis for environmental enhancement. If it is assumed that the most critical wildlife sites are already under some sort of protection, such as in SSSIs, cSACs existing agri-environment schemes, this suggests that schemes expansion should take place further into the areas where the highest potential exists, such as in buffer zones surrounding critical areas or county wildlife sites.

However there may be differences in judgements as to what constitutes 'high value' in environmental terms. The scientific community place a priority on the conservation of rare species and habitats, such as reflected in Biodiversity Action Plans, while the general public might have a greater preference for greater numbers of more common species, especially in locations nearby centres of population. Even so, the review of set-aside noted a general recognition of the environmental value arising from a scheme that could cover extensive areas of land in the more intensively farmed areas (CRER, 2001) and the Hills Task Force (2001) pointed towards the potential for a scheme covering the Less favoured Areas. There is some valuation evidence of the relatively high value placed on access and environmental enhancement around urban areas in the context of forestry and similar arguments would apply to other environmental enhancements, but there is no direct way in which professional judgements may be compared with public willingness to pay in that they adopt a different philosophical approach towards the question of value (Edwards-Jones, *et al.* 1995).

We are not aware of any economic assessment of marginal values relative to the overall size of scheme. We noted above some evidence of diminishing marginal benefits associated with wider field margins, but this may not be equivalent to extending scheme coverage to a wider area. One factor might arise from the evidence, noted in both ESAs and the Organic Farming Scheme, that the farmers with stronger conservationist attitudes tend to join schemes earlier. These farmers may have maintained a high quality of environment anyway so that we may expect the additionality of schemes to increase through time. Indeed, there is some evidence from the evaluation of the Countryside Stewardship Scheme that additionality of agreements did increase over the period 1996-1998 studied (Carey, *et al.* 2001).

The transactions costs of targeted schemes will generally be higher than those for simpler general schemes. However, it may be noted that the proportion of total costs represented by scheme administration cost has been falling steadily over the years in which agri-environment policies have been in operation. The approach to the Hill Farm Allowance, where eligibility for environmental enhancement payments is determined from information provided on IACS forms also suggests that the administration costs of a broad and shallow scheme could be quite modest.

These points may suggest the following conclusions:

- That there is a need for some degree of tiering in agri-environmental policy that takes account of areas that already have high environmental standards, areas of lower standards but with greater potential for enhancement and areas of lower conservation interest but where public values are higher.
- That there is potential for a wider coverage within agri-environment policy that includes the uplands more generally and penetrates into the most intensively farmed areas.

- That the transactions costs of targeted schemes have been reduced from the levels when schemes were first introduced and that there the potential to introduce more general schemes with relatively low transactions costs.
- That an agri-environment scheme may have a role in providing a lattice of habitat in the wider countryside through which species may move in the face of climate change.

Taken together, these points suggest that there could be merit in the introduction of a broad and shallow scheme. This warrants further consideration.

3. Organic Farming Scheme

3.1 Introduction

Financial support for organic agriculture may be granted by the governments of EU Member States under European Union's Agri-Environmental Regulation (EC regulation 2078/92). All Member States have taken advantage of this regulation to provide support for producers willing to adopt organic farming practices and, with the exception of the UK and France, for maintenance of organic production. Within the UK, support has been offered since 1994 - first under the Organic Aid Scheme (OAS) and later under the Organic Farming Scheme (OFS). The OAS offered the lowest rates available in any of the Member States, and between 1994 and 1999 only 400 farmers entered the scheme in England. With numbers of organic producers remaining low amidst rising consumer demand for organic food throughout the mid-1990s, MAFF responded with the launch of the Organic Conversion Information System (OCIS) in 1996 and, in April 1998, announced substantially increased payment rates under the OFS, which replaced the OAS in 1999. The response of farmers to both schemes clearly exceeded MAFF's projections, and the funding of £16m allocated to the OFS for two years had been exhausted within six months. The Scheme reopened in January 2001, with roughly £18m allocated for the organic sector in 2001/02 under the England Rural Development Programme (ERDP), and more money (on average £21m per year) has been pledged for organic support until 2006 (Table 3.1).

Table 3.1. OAS and OFS funding (£'000)

	Organic Aid Scheme	Organic Farming Scheme
1995-96	261	
1996-97	374	
1997-98	571	
1998-99	1,026	
1999-2000		12,037
2000*		13,400
2001		20,600
2002		19,000
2003		19,900
2004		22,300
2005		22,900
2006		22,600

* year 2000 onwards years from 16 October to 15 October

Source: House of Commons (2001)

The take-up rates so far are clear evidence that the largest ever wave of conversion to organic farming methods in the UK is underway. By the end of 2000, the area of farmland under organic management or in conversion had increased to nearly 530,000 hectares, a tenfold

increase over the figure for April 1997 (DEFRA, 2002). This figure represents 2.5% of the total agricultural land area and is well in line with the figure of 2.2% for the EU average.

In spite of the Scheme's success and popularity with the farming community, the increased incentives were criticised for: not providing financial support beyond a five-year extended conversion period and therefore maintaining a policy of high consumer prices for organic food; not recognising the environmental benefits that organic management practices deliver; and limiting the area eligible for support to 300 hectares thus failing to reach some significant upland areas where overgrazing is a serious environmental problem (Soil Association, 1998). Most of those arguing for further government assistance do so on the basis that organic farming provides public-good type benefits beyond the immediate effect on the farmer. Many claims have been made for organically produced foods, ranging from food quality, food safety, animal welfare, support for rural communities and fair trade, and benefits for the environment. The House of Commons Select Committee on Agriculture Second Report points out that many of these claims are disputed, emphasising that

“we have seen no evidence to enable us to state unequivocally that any of the many claims made for organics are always and invariably true. All claims need to be properly evaluated in order to help consumers make their own judgements on the benefits of organic produce” (House of Commons, 2001, p.67).

The objective of this section is to assess the nature and strength of the evidence underpinning the OFS. While the immediate purpose of this evidence assessment is to inform the rationale of government policy towards organic agriculture, we feel that the organic sector itself would benefit from an evaluation of the scientific basis for the demands they are making of their producers in setting standards and the promises they are offering to consumers.

Our evidence assessment is based on three sources: (1) a comprehensive review of the literature on the wider benefits of organic agriculture; (2) a survey of 179 organic and 129 non-organic farmers carried out in 2001/02 by the Centre of Rural Economics Research, Cambridge, as part of the Economic Evaluation of the Organic Farming Scheme (CRER, 2002); (3) interviews with experts at the Centre for Ecology and Hydrology, Merlewood.

The remainder of this section is organised into two sections. The first reviews the evidence on the wider, public-good type, benefits of organic agriculture. This is followed by a wider-ranging assessment of the rationale for government support of organic agriculture – beyond the public goods argument.

3.2 Evidence of the wider public benefits of organic agriculture

Summary

There is unanimity in the literature that organic farming offers a wide range of environmental benefits compared to conventional agriculture.

Organic farming practices have characteristics that are beneficial to the **diversity of fauna and flora** in terms of provision of habitat and abundance of food. The abundance and diversity of species found in organic systems, specifically the higher levels of endangered or declining species, suggests that by converting more land to organic management their decline may be to some extent reverted.

Organic farming provides some potential for positive **impacts on landscape**, e.g. perspectives for further development of high-quality landscapes, the possibility of cautious utilisation of sensitive areas, and in terms of re-qualifying the identity of rural areas.

Organic farming has a positive impact on **soil fertility**. Organically managed soils usually have higher total contents of soil organic matter and significantly higher biological activity than those farmed conventionally. There are no distinct differences in soil structure between the farming systems.

The evidence on **soil erosion** is mixed. Frequent soil disturbances by mechanical tillage, wider row distances in cereals, slower juvenile development of the crops, and premature breakdown of crops have been identified as potentially increasing the risk of soil erosion in organic systems. Other research results suggest that in total, these factors seem to contribute less to the erosion potential than the soil conserving factors.

It is recognised that while incorrect organic management practices could bear some potential risk of **polluting ground and surface water**, the negative effects from organic farming tend to be generally lower than those of conventional farming systems. However, with increasing implementation of water protection measures in conventional farming, these differences are becoming smaller.

Most studies indicate lower **CO₂ and NH₃ emissions** resulting from organic farming when evaluated on a per-hectare basis, but research results are varying when related to the output and tend to be higher than in conventional systems.

Other areas in which organic agriculture is claimed to produce benefits to the public include animal health and welfare, food quality and safety, contributions to rural employment and contributions to supply control objectives. Not all of these are supported in the literature, and not all of these provide a sound rationale for government support of organic agriculture.

3.3 Environmental effects of organic agriculture

Environmental management practices

The farm survey carried out as part of the Economic Evaluation of the Organic Farming Scheme (CRER, 2002) found significant differences in the extent to which organic and non-organic farmers apply environmental management practices beyond the direct requirements of organic agriculture. Organic farmers performed better on six of the nine management practices listed in Table 3.2, and particularly so on the timing of grass mowing to protect breeding birds. Conventional farmers did better on tree planting and, not surprisingly perhaps, nutrient budgeting. Some of these differences reflect directly the requirements of organic production, but a higher general concern for the environment on the part of organic farmers may also have some influence.

Table 3.2: Environmental management practices on organic and non-organic farms

Management practices	Organic farmers	Non-organic farmers
Headland management	61 (34%)	32 (27%)
Restored hedges	110 (61%)	57 (49%)
Planted more hedges	92 (51%)	40 (34%)
Impr. field boundaries for wildlife	103 (58%)	47 (40%)
Provided wildlife food or cover	64 (36%)	45 (38%)
Timing of grass mowing	95 (53%)	31 (26%)
Nutrient budgeting	38 (21%)	30 (26%)
Impr. manure handling and storage	104 (58%)	32 (27%)
Planted more trees	96 (54%)	71 (61%)
Other		

Source: CRER (2002)

Biodiversity

Numerous studies have been undertaken to compare the differences in biodiversity between organic and conventional farming systems. At least 23 such studies have been undertaken in Europe since 1987 (Soil Association, 2000). Evidence from these studies substantiates the generally held view that organic farming supports greater levels of wildlife, in terms of both quantities and varieties. Furthermore, rare species, including some that appear in the Biodiversity Action Plan, are found more commonly on organically farmed land. This does not necessarily mean that other environmentally sensitive farming practices do not also benefit wildlife and the landscape of the countryside, indeed other farming practices have been found to have positive impacts. In most studies, adjacent or nearby organic and conventional fields were paired for comparison. Studies that monitor the change in biodiversity throughout the conversion period and during full organic certification have not been identified.

Birds

Bird populations are seen as useful indicators of the well-being of the environment and have been selected by the UK government as an official 'Quality of Life' indicator. Thus, comparative studies of bird populations on organic and conventional farmland provide valuable information on respective biodiversity levels. Evidence indicates that bird populations perform better on organic farms. In a study of the territory distribution and breeding success of skylarks on organic and intensively managed farms in southern England undertaken by Wilson *et al.* (1997), it was found that populations were twice as high and the nest survival rate was higher on organic. There were 2.2 times as many skylark territories on organic farms. In another study organically managed farmland was found to support an average of 20 per cent more yellowhammer territories than on conventional farmland. Breeding success was also slightly higher (Bradbury *et al.*, 2000). Field boundaries on organic farms were found to support greater numbers of most bird species (Chamberlain *et al.*, 1999).

Organic farms are generally considered to be more valuable sources of suitable bird food. In a Danish study (Hald *et al.*, 1990), organic cereal fields were found to support a greater abundance and diversity of invertebrate and plant food for birds. Significantly, the greatest difference between the two systems was found in the in-field areas. The diversity of crops grown, mixed farming practices, and the prevalence of non-crop habitats such as hedgerows and grass strips have been identified as the major reasons for the comparatively higher populations of birds (Chamberlain *et al.*, 1999; Wilson *et al.*, 1997; Bradbury *et al.*, 2000). Hedgerows are considered particularly important for both nesting habitat and as sources of food (Chamberlain *et al.*, 1999; Stopes, 1996; Bradbury, 2000). Chamberlain *et al.* (1999) observed that hedges on organic farms tended to be higher and wider and had more trees than on conventional farms. In a survey of hedgerows at Elm Farm Research Centre carried out over eleven years, during which time the farm was converted to organic status, bird species diversity increased by 10 per cent (Stopes, 1996).

Invertebrates

The conversion of land to organic status may be expected to cause an increase in the prevalence of pest species. However, in study of butterfly populations on organic and conventional farms, (Feber *et al.*, 1997) found this not to be the case. The populations of non-pest butterflies were, in contrast, significantly higher on the organic farms. As was found in the comparative studies of birds, the vegetation structure had an important influence on the abundance and diversity of species of spiders in cereal fields (Feber *et al.*, 1998). Spiders are predators of certain arable pests. Thus, their abundance and diversity may be an important economic feature of organic systems. Investigations by numerous continental European authors found a higher diversity and/or a higher frequency of many types of invertebrates.

On the whole, the amount and frequency of all relevant faunal groups on organically cultivated land was reported to be generally higher than, or at least similar to, that on conventional land.

Floral diversity

There is evidence that organic farms have a higher diversity of crops in their rotation (Hausheer *et al.* (1998), Freyer, 1997; and Piorr *et al.*, 1998). Organic farming relies on long and elaborate crop rotations as a means of disease and pest prevention, and to maintain soil fertility by cultivating N-fixing legumes. Furthermore, organic farming standards recommend cultivating site-adapted crop varieties. The preservation of old varieties and breeds is an important initiative within the organic farming movement, but it does depend mainly on the individual activities of the farmer (Stolze *et al.*, 2000).

Many once common wildflower species associated with arable crops have been declining in and some are now amongst Britain's most seriously endangered plants. In a study by The Northmoor Trust to compare the diversity and abundance of rare arable flora on neighbouring organic and conventional farms (Kay and Gregory, 1998-9), the organic farms were shown to support significantly higher populations and a greater diversity of rare or declining arable species. Continental European studies confirm that the diversity and number of wildlife species are higher on organic than on conventional fields (e.g. Frieben, 1997; Mela, 1988; Rasmussen and Haas, 1984). Hald and Redderson (1990) found that several rare species of wild plants were only found in organic cereal crops. Finnish research (Aalto, 1998; Holme, 1996) supported the view that organic farming systems positively affect floral diversity in

neighbouring field edge strips and hedgerows.

On the whole, the diversity of floral species is closely connected to local site conditions. In regions with a high potential for biodiversity, organic farming promotes numerous and highly varied flora. However, in regions with low potential for biodiversity, the positive impact of organic farming on wild herb or grassland diversity is less distinct (Baars *et al.*, 1983; Smeding, 1992).

Conclusions on biodiversity

The overall conclusions from these comparative studies of organic and conventional systems are that organic farming practices have characteristics that are beneficial to fauna and flora in terms of provision of habitat and abundance of food. The abundance and diversity of species found in organic systems compared to conventional, specifically the higher levels of endangered or declining species, suggests that by converting more land to organic management their decline, which has been attributed to modern intensive farming practices, may be to some extent reversed.

In the House of Commons Select Committee on Agriculture Report (2001), it was surmised that biodiversity studies might underestimate the benefits of organic farms for three main reasons:

- there would have been a tendency to match organic farms, which have tended to be relatively small, with similar sized conventional farms. Consequently, the larger intensively managed farms, which usually support the lowest populations of wildlife, may not have been represented in the studies,
- in some studies, recently converted farms were selected due to the shortage of organic farms. As it is possible that wildlife populations build up over the years from the time a farm begins conversion, the results may not be representative of a fully established organic farm,
- wildlife populations are likely to increase on organic farms when organic systems become more established as part of the landscape, as opposed to the current situation whereby most exist in isolation, surrounded by conventional farms.

Landscape

As landscapes are not only influenced by farming systems but also by individual activities, traditional reasons and spatial factors, it is difficult to measure the impact of the farming system (Stolze *et al.*, 2000). Organic certification standards do stipulate conservation measures to be taken. Smaller fields and diverse crop rotations tend to be a typical feature of organic farms as are the active planting of hedges and the creation of habitats, thus supporting the shaping of the landscape (van Elsen, 1997). In a study commissioned by the Countryside Commission, organic farms were found to have a more traditional landscape with more large, bushy hedges, recently established trees, woodland, and smaller fields (Entec, 1995). There was however some debate as to whether this more visually diverse landscape was a direct result of organic management or due to the more conservation minded attitudes of organic farmers (House of Commons, 2001). In the more extensively farmed upland regions and on small horticulture farms no visible differences between the farming systems were observed (Entec, 1995). According to Langer (1997), effects of organic farming on the landscape depend on the type of production system adopted under organic management, the extent of conversion, the spatial aggregation of converting farms, and the farm type dominating the local landscape before conversion (Stolze *et al.*, 2000).

On the whole, it appears that organic farming provides some potential for positive impacts on landscape, e.g. perspectives for further development of high-quality landscapes, the possibility of cautious utilisation of sensitive areas, and in terms of re-qualifying the identity of rural areas (Stolze *et al.*, 2000).

Soil quality

Research into the impact of organic farming on soil properties has been reviewed by Stolze *et al.* (2000). Organic farming relies strongly on farm-internal nutrient supply (except P, K, Ca), and fertilisation is mainly based on farmyard manure, compost, green manure, and plant residues. As a consequence, an extensive supply of organic matter is passing through aerobic decomposition processes. According to Stolze *et al.* (2000), **organically managed soils usually have higher total contents of soil organic matter.**

The main indicator for the biological activity of soils is the abundance and biomass of earthworms. Studies summarised by Stolze *et al.* (2000) showed that organically managed soils are significantly richer in earthworm abundance, biomass and diversity of populations. Mechanical weed control and intensive soil tillage in organic farming can however have negative effects on other key species, e.g. *Collembola* (Krogh, 1994). A favourably structured soil offers better resistance to physical soil damage, such as compaction or erosion, and is therefore of environmental relevance. **Research reviewed by Stolze *et al.* (2000) showed no distinct differences in soil structure between the farming systems.**

Hausheer *et al.* (1998) developed a 'soil protection index' of erosion risk. In comparison with conventional farms they found a higher index on organic and integrated farms in around 80 per cent the cases. A larger number of organic than integrated farms had a very high soil protection index. Studies link the soil erosion controlling potential of organic farming to a variety of factors (Stolze *et al.*, 2000), although other factors, such as mechanical tillage may increase the risk of soil erosion (Auerswald, 1997; O'Riordan and Cobb, 2001; Stolze *et al.*, 2000). However, overall there is a positive net impact on soil conservation.

Ground and surface water quality

Organic farming systems are considered to contribute significantly lower levels of nitrates to watercourses. In recognition of this, Wessex Water offer a subsidy of £40 per hectare per year for two years to farmers willing to convert to organic farming in areas where nitrate levels are rising (House of Commons, 2000). Based on an extensive review of the relevant European literature, Stolze *et al.* (2000) concluded that organic farming results in lower or similar nitrate leaching rates than integrated or conventional agriculture. On a per hectare basis, nitrate leaching rates are significantly lower, although when related to production units (tonnes of crop or milk), the nitrate leaching rate is similar or higher (Stolze *et al.*, 2000).

Ploughing legumes or grass leys at the wrong time or the selection of unfavourable crops planted afterwards, as well as composting farmyard manure can lead to critical levels of nitrate leaching (Stolze *et al.*, 2000). However, growing awareness of these problems is recently resulting in improved organic farming practices.

Stolze *et al.* conclude that while incorrect organic farm management practices could indeed bear some potential risk of polluting ground and surface water, the negative effects from organic farming tend to be generally lower than those of conventional farming systems. However, with increasing implementation of water protection measures in conventional farming, these differences are becoming smaller (Dabbert and

Piorr, 1999).

Pesticides

Since the use of synthetic pesticides is banned, organic farming does not pose any risk of ground and surface water pollution from synthetic pesticides (Stolze *et al.*, 2000, Köpke and Haas, 1997). In a comparison of environmental burdens of organic and conventional systems, the social costs associated with green house gases, nitrate leaching and pesticide residues, O'Riordan and Cobb (2001) estimated the total cost for each system to range from £10 to £15 per hectare for organic systems and from £25 to £40 per hectare for the conventional systems. A significant part of the costs of the conventional systems were for the removal of pesticide residuals from drinking water in order to meet European standards, whereas no such charge was attached to the calculations for organic systems. Little research has been undertaken on the effects on the environment of those pesticides which are permitted in organic farming

Climate and air quality

Stolze *et al.* (2000) analysed a number of German, Dutch and British studies regarding NH₃ emissions in conventional and organic farming systems and concluded that organic farming tends to bear a lower NH₃ emission potential than conventional farming systems, especially if housing systems and manure treatment are optimised towards further reduction. Modern agriculture has been recognised as adding to climate change through the emission of greenhouse gases, contributing 15%, while also acting as a sink for greenhouse gases due to CO₂ fixation. On a per hectare basis, most studies analysed by Stolze *et al.* (2000) indicate lower CO₂ emissions from organic farming (40-60%), but results relating to the volume of output fail to show a clear difference. One of the arguments for buying organically produced food has been that it contributes to a reduction of greenhouse gas emissions because of a reduction in the distance that food travels (food miles) (Safe Alliance, 1994). This argument needs further investigation taking into account that at least in Britain the bulk of organic products is imported and is marketed through supermarkets.

Food quality and safety

Countless scientific studies have been conducted in an attempt to establish differences with regard to pesticide residues, desirable and non-desirable substances, taste, etc. Alföldi *et al.* (2001) analysed 33 studies published between 1993 and 1998 concluding that while a number of authors found organic food to be superior to conventionally produced food in some areas, noticeably many found no differences between food produced organically or conventionally, and only very few reported unfavourable results for organic food. However, most of the studies did not withstand scientific scrutiny in terms of research methods and technology. A major Dutch study (Mansvelt, 2001) investigating the effects of organic food on health, looked at a total of 2000 publications. The evidence presented was found to be inconclusive; the authors were very critical of the methodologies adopted, and suggested extensive and systematic further research.

Perceived health risks of conventionally grown food can be difficult to substantiate scientifically. Nevertheless, consumers are often concerned about food safety and they may be more confident in the safety of organically certified food which is for instance assured to be free of GMOs. BSE has been cited as a major food safety concern of consumers (Makatouni, 2001) and as a reason for converting to organic food (Soil Association, 2000). No cases of BSE have been identified in animals born and reared on organic farms. Organic standards do not permit the feeding of animal by-products to livestock.

More research needs to be done on possible effects of those substances permitted as pesticides in organic farming. Recent studies of Neem (*Azadirachta indica*) extracts have shown to be highly toxic in animal trials (Stolze *et al.*, 2000). Copper, a substance that occurs naturally but is potentially toxic to humans, is permitted for use in organic systems. However, the use of chemical substances is strictly controlled by the organic certification authorities and generally kept to a minimum. The contamination of food by manure is also a concern, this may even be a problem when manure is spread on a field adjacent to one where harvesting is taking place and drift or runoff may occur (FAO, 2000).

The absence of pesticide residues is one of the most important reasons given for the superiority of organic food products. Pesticide residues can be found on organic produce (possibly due to their use on the land prior to conversion or wind drift), but levels are usually negligible. Many studies show higher levels of residues on conventionally produced food (Stolze *et al.*, 2000), some show no difference. According to a MAFF report, around half of all fresh fruit and vegetables contain some pesticide residues (MAFF, 2000). However, they are usually below government maximum residue levels. European studies on pesticide residues in total diets have shown that intake is often below one per cent of the Acceptable Daily Intake (FAO, 2000). The Soil Association (2001) argues that 'there may be harmful effects that are currently unknown', also there is growing concern about the effects of cocktails of pesticides that are sometimes used.

Of far greater concern is the risk to pesticide users. Over a twelve-month period, five per cent of pesticide users in the UK holding certificates of competence consulted a doctor with symptoms thought to be pesticide related. Of even more concern are the possible long-term pesticide-related health problems (HSE, 1998).

Nitrates in the diet are known to convert into substances that are potentially carcinogenic, they can also impair the ability of the blood to transport oxygen (FAO, 2000). Nitrate levels in organically grown products can be assumed to be lower than in conventional crops (Alföldi *et al.*, 2001), particularly in nitrophilic leaf, root, tuber crops and potatoes (Woese *et al.*, 1997; Stolze *et al.*, 2000).

It has been argued that the ban of synthetic fungicides leads to a higher incidence of mould on organically produced crops and therefore to higher risk of contamination with mycotoxins. The literature reviewed by Stolze *et al.* (2000) did not confirm this, with a number of studies showing no difference in mycotoxin contents between organic and conventional produce. Some studies even found lower fungi infestation rates and mycotoxin contents on organically grown cereals. Woese *et al.* (1997) cite two studies which found lower concentrations of Aflatoxin M1, the most toxic mycotoxin which can cause liver cancer, in organic milk than in conventional milk.

While the application of antibiotics in organic systems is not banned, they cannot be used routinely as growth-promoters or as prophylactics, and growth-promoting hormones are strictly forbidden (Stolze *et al.*, 2000). Regular controls ensure compliance with these regulations and so a strong argument exists for the superiority of animal products from organic production.

Possible nutritional benefits of organic food as compared to conventionally produced food have been difficult to substantiate (Woese *et al.*, 1997). Stolze *et al.* (2000) and Alföldi *et al.*

(2001) showed either no significant differences in contents of micro- and macronutrients, vitamins, organic acids and aromatic compounds, or contradictory results. An exception is Vitamin C which several studies have found to be present in higher concentrations in organically grown vegetables.

In a study by Makatouni (2001), taste was also cited amongst regular organic food consumers as a main reason for buying it. Many comparative sensory analysis studies of conventionally and organically grown products have been inconclusive. However, certain comparative studies on specific products have shown a difference (FAO, 2000). Organic apples have been found to be less tart and sweeter than conventional apples (Nature, 2001). There is a generally held view that organic produce has more visual defects than conventional food and that consumers who buy organic products are willing to trade visual quality for perceived benefits (Conklin and Thompson, 1993).

Impacts on Animal Health and Welfare

A high standard of animal welfare is one of the principles of organic farming and the aim is to achieve a high level of vigour and vitality in order to enhance the animal's resistance to infection, parasitic attack and metabolic disorder, and ability to recover from illness (Younie, 2001). Concern has been raised that organic livestock production systems are not welfare friendly due to the restrictions placed upon the use of drugs. The House of Commons Select Committee (1999) suggested that there may be a temptation to delay using non-organic treatments in the hope that the animal may recover without it, thereby avoiding delays in marketing due to the drug withdrawal period, or losing the organic status of the animal, and consequently the price premium.

The Veterinary Epidemiology and Economics Research Unit concluded that the animal health status within organic systems is similar and occasionally better than that of conventional farms (House of Commons, 2000). However, health status depends highly on specific farm conditions and management practices, which seem not to be related to the different farming systems (Stolze *et al.*, 2000). Thus organic systems cannot necessarily be assumed to deliver higher animal welfare standards.

Impacts on rural employment

Organic farms tend to have higher labour requirements. Padel and Lampkin (1994) estimated that increases in labour normally range between 10 and 25 per cent. Hird (1997) has suggested a similar range of between 10 and 30 per cent. Labour requirements depend very much on the type of enterprises and the enterprise mix. In general, the more diverse the enterprise mix the higher the labour requirements, as the benefits of specialisation and economies of scale are lost. The conversion of more land to organic status could provide more employment opportunities in rural areas. The proposed Organic Food and Farming Targets Bill aims to bring about a substantial increase in organic farming by 2010, ensuring that 30 per cent of land is organic by that time. Taking a conservative estimate of extra labour requirements for organic farming of 10 per cent, Sustain (2000) has estimated that if this target is achieved, as many as 16,600 new jobs may be created in the UK. However, more organic farming does not necessarily create sustainable full-time jobs; extra labour requirements may be covered by family members or by seasonal labour as the results of our survey of 179 organic farmers show (Table 3.3). Full-time labour input has fallen slightly, and it is not clear whether this is due to conversion to organic status or simply reflects the general trend of declining farm labour. And the extent to which this employment offers wider benefits to the local economy will depend on the state of the local labour market.

Table 3.3. Changes in on-farm employment after conversion to organic farming

Full-time family labour	-2.1%
Part-time family labour	+11%
Employed full-time labour	-1.9%
Employed part-time labour	+40%
Casual labour	+6.3%

Source: CRER (2002)

It should not necessarily be construed that an expanding organic farming sector will cause linear rises in labour requirements. As organic farms become established and possibly larger, so they may become more efficient and labour-saving technologies may be adopted (Offermann and Nieberg, 1999). It may prove difficult to satisfy seasonal labour requirements using local labour, and there is a growing awareness that both skilled and unskilled labour shortages may serve as a constraint to the further expansion of organic farming (Howard-Borjas and Jansen, 2000)

3.4 Reflections on the rationale for public assistance of organic agriculture

Summary

Proven public-good benefits of organic agriculture provide a sound justification for government support of organic agriculture – with the qualification that the same benefits cannot be generated more cost-effectively through alternative, more targeted agri-environmental measures. We have found no evidence of the latter.

Perceived health benefits of organically produced food do not automatically provide a justification for public assistance of organic agriculture as these benefits can be classified as private goods not involving 'market failure'.

The **infant industry character** of the UK organic sector suggests that the sector might benefit from 'increasing returns to adoption' such that the greater the number of organic farmers the lower the average cost along the entire organic supply chain. There is an argument here for support to be directed both to farmers and to other actors along the supply chain for creating the infrastructure needed for effective marketing of organic food. There is also an argument for some form of longer-term support in recognition of the fact that an appropriate organic infrastructure takes time to build – more time than to convert an individual farm to organic production.

Information failure provides further justification for corrective action in the form of both publicly funded information provision to address short-term information needs, and investment in R&D to develop the productive and conservation potential of organic agriculture over the longer term.

Aligning the level of support offered to UK farmers with that in other Member States would remove a major impediment to the development of the organic sector in the UK and may encourage sustained, demand-led growth of the UK supply base.

Concerns over **potentially adverse effects of organic aid** should be accepted as a necessary cost of a policy aiming at improving the allocation of rural resource use.

Introduction

Having reviewed the evidence underpinning the claims made for organic farming in the preceding section, we next consider the extent to which proven public-good benefits provide a sound rationale for government support of organic agriculture. This is followed by a wider-ranging assessment of other arguments – beyond the public goods argument – in favour of organic support policies.

Public goods market failure

It is widely held that the public-good type benefits of organic agriculture provide a sound justification for government support of organic agriculture. A few commentators, however, have argued that support of organic farming is a relatively crude means for providing public goods, particularly environmental benefits. Rewarding a particular farming system, defined in terms of an inflexible system of rules, may not be the most effective way of addressing environmental problems that are heterogeneous in nature. It has been argued that policy will make a more positive impact if it identifies and rewards the specific outcomes it seeks through more targeted agri-environmental measures (House of Commons, 2000; v. Alvensleben, 1998). However, these commentators ignore the trade-off between targeting and administration costs. More targeted policy measures are usually more costly to implement and administer than organic support schemes, and these additional transaction costs may offset any potential efficiency gains from targeting. It has also been argued that the very nature of the environmental benefits of organic agriculture, i.e. broad spectrum improvements across the full range of environmental indicators (which critics may call diffuse or untargeted) should be taken to favour organic agriculture to other agri-environmental measures. Another distinct advantage of organic farming over other measures is that it is not, by default, necessarily reliant on continuing government support. Rather, the market creates a more positive incentive towards environmental management. This means that, unlike targeted agri-environmental measures, organic farming will be more likely to deliver public goods after contracts expire.

We would like to emphasise that perceived health benefits of organically produced food do not automatically provide a justification for public assistance of organic agriculture.

Health benefits are a private good in as much as they accrue in their entirety to the people who buy and consume organic food products. There are no spill-over effects as is the case with environmental benefits. One would therefore expect consumers to be prepared to pay fully for any perceived health benefits attached to organic food. There may be a secondary argument, however, in favour of public support in this context: if health benefits can be provided more cost-effectively through organic farming methods than through alternative means (such as Integrated Farming systems or food technology), then there is a case for encouraging organic production methods through public funds. However, the lack of clear evidence of health benefits of organic food makes this argument redundant.

Infant industry arguments

Lack of critical mass and organic infrastructure

Organic agriculture as a sector faces high initial set-up costs in terms of developing an appropriate infrastructure for the provision of information and advice and the marketing of organic products (Latacz-Lohmann and Foster, 1997). Lack of critical mass of organic

producers increases per-unit marketing costs and/or the risk of having to market organic produce through conventional marketing channels. Low throughput raises per-unit costs for wholesalers, processors and retailers increasing the cost to the consumer and reducing demand. This reduces incentives to actors along the supply chain to market organic products.

The lack of processing and marketing infrastructure within the organic sector is indeed considered a major obstacle to the further development of organic farming (Michelsen *et al.*, 2001). This is a particular problem in certain geographical areas, where producers are too remote from suitable processors, and for certain products. Notably, the organic livestock sector has experienced significant problems in locating abattoirs willing to process organic stock (Rigby *et al.*, 2000; CRER, 2002).

The average cost associated with such infrastructure investments falls with the number of farmers adopting organic practices, giving rise to 'increasing returns to adoption'. It means that the greater the number of organic producers, the lower the average costs and potentially the higher the profitability of organic food initiatives at all points along the supply chain. This would stimulate demand, further increasing throughput and again reducing average costs. This is likely to generate incentives for new producers to enter the organic industry. In this way, 'increasing returns to adoption' can set in motion a spiral of expansions of the organic supply base. There is a potential role for policy here in trying to spark off such a spiral. **There is an argument here for support to be directed both to farmers (in order to create a critical mass of organic producers to sustain a supply chain) and to other actors along the supply chain (for creating the technical and logistical infrastructure needed for effective marketing of organic food). More importantly perhaps, there is an argument for some form of longer-term support in recognition of the fact that an appropriate organic infrastructure takes time to build – more time than to convert an individual farm to organic production. Hence, it may not be sufficient to support farms through their individual conversion periods (of two to five years), but to support them throughout a sectoral conversion period – an interval during which a large enough number of farmers have converted to bring to bear the critical mass effects that give rise to 'increasing returns'.**

Network and coordination effects may act as another source of increasing returns to adoption through improved exchange of information between organic farmers (through informal networks), technological interrelatedness of production (e.g. reduced spray drift from conventional fields, reduced risk of cross-pollination with GM crops) and scale economies in the supply industry (Latacz-Lohmann *et al.*, 2001). Several studies have highlighted the importance of organic farmer networks. Informal networks of organic producers are considered to be valuable and trusted sources of information by farmers who are either undergoing conversion or considering doing so (CRER, 2002; Rigby *et al.*, 2000; Padel, 2001). It has been reported that farmers are more inclined to convert if they receive most of their information about organic farming from other farmers rather from other sources. Geographical isolation is an impediment to the networking process and has been identified as a problem that needs to be addressed (Rigby *et al.*, 2000).

Two arguments may question the existence of increasing returns. First, it is conceivable that organic farmers benefit from pest and weed management on adjacent conventional farms. This beneficial externality will diminish as organic farming covers a larger area. Second, increasing returns on the cost side may be offset by declining prices as more and more farmers compete for a share in the organic market.

On balance, these arguments reinforce the above policy conclusions – with the qualification that there may be a case for spatial targeting of limited funds to some sort of organic priority areas. Such a strategy would aim at enticing a disproportionately high number of producers into organic agriculture in certain regions as a means of maximising regional network and coordination effects. However, concerns about adverse impacts on prices call for some caution.

Information failure

There is no universally accepted definition of information failure. At face value, the term seems to suggest that lack of information prevents producers from switching to a potentially superior technology. Another interpretation of the term is that individual farmers have little incentive to generate information about new technologies by, for example, running their own field trials, as indeed many of the pioneers of organic farming did. The reason for this is not necessarily the inability to enforce private property rights in the knowledge generated. Rather, the lack of incentives to innovate stems from the lack of profitability of organic farming due to low numbers of organic farmers – see the 'increasing returns to adoption' argument above. Yet another interpretation is that the government has failed to direct sufficient resources into research for organic agriculture. This has a perfectly plausible explanation in the 'induced innovation hypothesis' which states that innovation effort is proportional to the relative importance of the technology in the market – the critical mass argument from a different perspective. This leads on to yet another, even stronger, interpretation of 'information failure': had organic agriculture received the same attention in research, education and extension over the past 50 years as has conventional agriculture, it might today be the more profitable farming system.

All of the above interpretations involve some form of market or government failure argument and thus provide, in principle, a rationale for corrective action. This should take the form of publicly funded information provision – along the lines of the proven OCIS help line, but potentially beyond that – to satisfy the short-term information needs of organic farmers and those willing to convert, as well as investment in R&D as a means of developing the productive (and conservation) potential of organic agriculture over the longer term.

Path dependence and technological lock-in

The arguments presented so far form the individual building blocks of the assertion that agricultural technologies may be path dependent and that conventional agriculture may be technologically locked-in at the expense of competing, potentially superior farming systems – including organic agriculture. In a nutshell, the path dependence argument goes as follows: Once one among several competing technologies has been chosen by a sufficiently large number of producers, increasing returns to adoption will set in, implying that any further adoptions will make that technology even more profitable to existing users and new entrants. In this way the technology becomes entrenched over time, and the costs of switching to competing technologies (i.e. the costs of leaving the entrenched path) increases. Lock-in occurs because users of the entrenched technology continue to enjoy increasing returns from each new user adopting a networked technology. This process is reinforced by R&D efforts being directed to the dominant technology – at the expense of competing farming systems. However, had the same number of initial producers adopted one of the competing technologies, say, organic agriculture, increasing returns would have made that technology the dominant one. That is to say that if technologies benefit from increasing returns to

adoption, there are multiple possible equilibrium outcomes, and that we cannot predict ex ante which technology will eventually become the dominant one. We cannot thus rest assured that the dominant technology will necessarily be the optimal one. This has been interpreted by emulators of the path dependence concept as an instance of market failure: decentralised, individual decision-making does not necessarily lead to the best technology being adopted.

A superior technology would only generate similar returns after considerable numbers of users switched to that technology. Moreover, because increasing returns are caused by network and co-ordination effects, the difficulty of co-ordinating the switch to the superior technology means that it would always be more rational for the individual user to retain the inferior technology than to shift, unless any individual knew that (many) others were shifting at the same time.

The arguments presented above suggest that organic agriculture displays many of the technological features that can give rise to increasing returns – such as networking, coordination and critical mass effects, implying that a massive switch to organic agriculture would enhance its relative profitability. There is also some evidence that organic agriculture yields 'increasing environmental returns to adoption', meaning that the environmental benefits of organic agriculture increase more than proportionately with the density of land under organic production. This is generally attributed to the creation of environmental networks providing wide-ranging habitat for wildlife (Firbank, 2002).

Technological 'lock-in' of 'inferior' technologies can, at least in principle, justify government intervention. Before taking action, policy makers will want to rest assured, however, that the locked-in technology is indeed inferior to the alternative under consideration. This will require some careful judgement as to the relative merits of alternative technologies if adopted in sufficient numbers.

It is widely recognised in the technology adoption literature that breaking the dominance of a locked-in technology requires a concerted policy effort. In the case of agricultural technologies, this could mean a combination of conversion and maintenance support for organic farmers, substantial investments for the development of an organic marketing and information infrastructure, concerted R&D efforts for the organic sector, etc.

International competitiveness of the organic sector

It has been argued that when organic support schemes in other Member States are more generous, including ongoing support to established organic producers, UK farmers are disadvantaged in terms of the cost of production and hence the price of their produce. A similar argument applies where schemes differ within the United Kingdom. For example, more financial assistance is available in Wales. This disparity of funding between the territories of the UK inevitably has implications for competitiveness (House of Commons, 2000).

There have been frequent complaints from organic farmers in the UK over 'cheap imports' of organic food products, and the fact that roughly 70% of organic food sold in this country is imported is often attributed to disparities of funding between EU Member States. On the one hand, this may be regarded as distorting competitiveness and trade flows. On the other hand, disparate levels of support may be seen to reflect differences in the intensity and strength of preferences for the public-good benefits of organic agriculture. The first argument calls for a harmonisation of organic support policies across the EU – and potentially beyond. The second argument suggests that disparate levels of support are economically efficient and that the resulting 'trade distortion' should be accepted as a necessary cost of that policy.

These theoretical considerations are not particularly useful for informing practical policy. On a more practical note, one might argue that if the UK wishes its organic sector to expand because of the public goods it delivers, then higher levels of support in other Member States are an impediment on the way. Foreign producers who receive higher conversion payments and ongoing support will have a cost advantage over UK producers which will put them in a favourable position in winning contracts with UK supermarkets or processors. This will impede the development of the UK supply base, implying that that the organic farming sector in the UK will not be able to reap fully the potential benefits from 'increasing returns to adoption'. This will put UK producers at an even greater disadvantage in relation to foreign competitors, and in this way a downward spiral may be sparked off which may eventually displace UK producers from the supply chain.

This process may be broken, or indeed prevented, by offering domestic producers support commensurate with that offered in other Member States. The (potentially frustrating) implication of this policy is that organic farmers will not benefit fully from the higher payments. Rather, the payments create leeway for producers to lower their prices in competing for market shares with foreign producers, implying that a part of the gains from increased support will be passed on to processors and retailers and, ultimately, to consumers. Lower consumer prices, however, stimulate demand which in turn invokes a supply response.

In conclusion, it appears that offering organic support commensurate with that in other Member States would remove a major impediment to the development of the organic sector in the UK and may encourage sustained growth of the UK supply base.

Is there a case against public assistance for organic agriculture?

There is also a perfectly reasonable case against aid for organic agriculture. If the market really is expanding, if retailers are anxious to provide more organic products and if organic produce commands a premium, why should the state intervene? (House of Commons, 2000). The pioneers of organic agriculture converted without public assistance in an adverse environment, and the early development of the organic sector was entirely market-driven (Latacz-Lohmann and Foster, 1997). Critics have argued that that support could lead to a distortion of the market, falling producer prices and thus might be harmful to those who are already operating in the industry. There is also evidence that in the prevailing economic circumstances, organic aid attracts farmers who may not be able to follow through the conversion of their land to organic production and who are motivated by the hope of finding a way out of existing problems rather than by a well thought out vision of sustainable organic production (CRER, 2002; House of Commons, 2000). There are also fears that the growth in organic supply stimulated by conversion grants is leading to a loss of control by the industry over its traditional values and principles, as larger and more commercially-oriented farmers and the supermarkets become ever more dominant in the market (House of Commons, 2000).

However, these concerns have little weight against the arguments of market failure arising from public goods, the infant industry character of the UK organic sector and trade distortion. The yawning gap between demand and UK supply, even in products capable of being grown in the UK (currently covered by imports), indicates clearly that the organic sector has not been capable of adequately addressing market opportunities that exist – because of its mere size in relation to the level of demand. Also, an organic sector left to its own devices would be too small relative to its efficient size when public goods are properly accounted for.

Hence, the above concerns over the adverse effects of public assistance should be accepted as a necessary cost of a policy aiming at improving the allocation of rural resources.

4. Support to Hill Farming (Hill Farming Allowance)

4.1 The Hill Farm Allowance

Farming in the Less Favoured Areas has been supported under various regimes for many years. From 1976 up to 2000 this was implemented by means of Hill Livestock Compensatory Allowances, payments to farmers based on the numbers of livestock kept. Under the ERDP, from 2001, these have been replaced by the Hill Farm Allowance (HFA).

The objectives of policy

The objectives of LFA support set out in Article 13(a) of Regulation 1257/1999 stipulate that LFA support shall contribute to the following objectives:

- to ensure continued land use and thereby contribute to the maintenance of a viable rural community;
- to maintain countryside;
- to maintain and promote sustainable farming systems which, in particular, take account of environmental protection requirements.

There is a high degree of complementarity amongst the three objectives. They require that land be maintained in agricultural land use under sustainable farming systems in such a way as to maintain the countryside, which presumably refers to the maintenance of a relatively high quality rural environment in terms of landscape and biodiversity. The wording of the first objective seems to assume that continued land use, under these terms, will contribute to the maintenance of a viable rural community.

4.2 The rationale for policy

Drew Associates (1997) see the rationale as resting essentially on market failure. Public goods take the form of maintenance of the existing farming system, landscape features and environmental diversity. Notwithstanding the language used in the ERDP, in terms of WTO proofing it is important to be precise with regard to the rationale for LFA payments; that the level of payments represent the costs of producing highly valued landscapes rather than that payments are made to farmers simply to compensate for the higher costs of production associated with a natural handicap. Midmore *et al.* (2001) suggest that the areas should be referred to as 'Favoured Environmental Areas' rather than 'Less Favoured Areas', which would emphasise this aspect. Recent experience with Foot and Mouth has demonstrated the extent to which the conservation of the environment acts in turn to support the local economy generally. Support for hill farming can also act in direct support of local communities through the maintenance of income and the demand for services. But this direct effect is of diminishing importance and varies considerably between different areas. Other measures will often be of more immediate value for local community support.

4.3 The implementation of the policy

The introduction of the HFA in 2001 changed the basis of support from the numbers of livestock to the area of land. Payments are offered at three levels relating the different areas: Severely Disadvantaged Areas, Disadvantaged Areas and above the Moorland Line. Rates

are payable for holdings in excess of 10 ha on the first 350 ha, at half these rates between 350 to 700 ha, with no payments on areas in excess of 700 ha. A safety net is in operation for the first three years which reduces the extent to which individual farmers can lose from the redistributive effects of the change.

Environmental enhancements are paid within the HFA to farmers meeting certain criteria. Increased payments are increased by 10% for meeting one of the following criteria and by 20% for meeting two:

- (i) 1 ha or 5% under woodland or arable cover (but not if in receipt of other financial support and not if converted from permanent grassland after 1998);
- (ii) registered as organic (but not if in receipt of organic support);
- (iii) at least 15% of livestock units (LU) are suckler cows;
- (iv) stocking rate below 1.2 LU/ha;
- (v) stocking rate below 1LU/ha (this entitles full 20%).

The impacts of the changes on the payments received by farmers in different circumstances have been assessed by MAFF (2001). Despite the fact that the levels of payments were set so as to minimise the degree of redistribution associated with the switch to HFAs, there will, nevertheless be considerable changes. However, it will be difficult in practice for farmers to distinguish between the effects of the redistribution and the generally lower levels of payments arising from the ending of additional payments made in the late 1990s in respect of BSE.

4.4 The assessment of policy

Reviews have been undertaken of HLCAs (Drew Associates and the Agricultural Economics Unit, University of Exeter, 1997) but not of the HFA, and it would be somewhat premature to do so at this stage. A literature search failed to find any further articles reporting evaluations of HLCAs or HFAs.

The objectives might be considered in two stages: whether the policy promotes continued land use, and whether this land use is effective in the maintenance of the countryside and takes account of environmental protection.

Ensuring continued land use

Subsidy payments generally are very likely to have been critical in maintaining the numbers of farmers in the LFAs. In recent years, income levels have been particularly low and the total direct livestock payments have represented between three to four times the level of net farm income (and between 130 – 150% of cash incomes). In their study of the potential environmental impacts of CAP reform, GFA-RACE (2002) find that, across a number of farm types, subsidy removal has the greatest impact on hill farms. However, as shown in Table 4.1, the specific hill payments represent only between one quarter to one third of the total level of support payment received. It is thus harder to judge the particular impacts of the HFA payments that are restricted solely to hill farms.

Table 4.1. Support payments on hill farms

£ million	1997	1998	1999
HLCA payments	27	27	27
Supplement to HLCA:			
i) BSE top-ups	8		
ii) Additional HLCA		15	16
iii) Agrimonetary compensation	13	8	10
Sheep Annual premium (including LFA supplement)	55	70	63
Suckler Cow Premium	39	39	42
Beef Special Premium	15	15	15
Total	155	175	170
<i>Of which specific hill subsidies</i>	<i>28%</i>	<i>34%</i>	<i>33%</i>

Source: Task Force for the Hills (2001)

Farming and a viable rural community

The impact of agricultural activity on the level of the local economy will vary considerably from place to place. Drew Associates (2001) estimate that farming accounted for about 12% of total employment in the Severely Disadvantaged Areas. This would be considerably higher than in many other parts of England. With a general growth of population against a continuing decline in agricultural employment, the relative significance of agricultural employment will continue to fall. But against this, the experience of the consequences of Foot and Mouth Disease demonstrates an alternative and much greater impact on economic activity through the tourism sector. This demonstrates that the most significant local economic impacts are also associated with the quality of the local environment.

Farming and the environment

Evidence of the state of upland habitats is available from the Countryside Survey 2000 (Haines-Young *et al.*, 2000). This shows a mixed pattern of change, with some indications of declining environmental quality. For example, there was a loss of acid grassland in England and Wales of 17% between 1990-1998. This may be associated with agricultural intensification, although the specific causes of change cannot be identified. There is a specific module of work on a survey of uplands in England and Wales. This has involved a higher intensity of sampling in the 2000 survey that can act as a baseline for monitoring change in the future. It will be necessary to link CS2000 to other data, especially socio-economic data relating to agricultural land uses, in order to identify the particular causes of environmental change and hence to identify potential implications of hill farming payments.

It is generally accepted amongst conservationists that the maintenance of the environment requires that the land should be maintained in agricultural use (Midmore *et al.*, 2001), although some have occasionally questioned whether this should apply to the whole of the area or whether some might be permitted to develop different types of habitat with more 'wildness' (Adams, 1996). However, the impact of the present level and pattern of payments at the margin under current circumstances is much harder to discern. There is widespread belief that subsidy payments have been associated with overgrazing and environmental

damage in a number of areas. But the position is complex and it is difficult to ascribe specific causes to current stocking levels (Midmore *et al.*, 2001).

The change in the basis of payment from one based on the numbers of livestock to one based on land area will have reduced the level of payment that farmers receive at the margin and hence in principle will have reduced the incentive to overstocking. Further, the introduction of a linkage between the HFA payment and environmental objectives through the environmental enhancements will make a more direct connection between HFA payment levels and the ERDP objectives. The HLCA was criticised by Drew Associates and Exeter University for the lack of such a linkage. However Drew Associates also argue that because of their relatively low overall importance it seems unlikely that HCLAs had any substantial effect on the environment. And, given that the environmental enhancement payments can only represent up to 20% of the total, the linkage may still not be very strong. This may be expected to continue while other payments on sheep and beef cattle remain based on livestock numbers. Nevertheless, it is possible that the explicit link made between payments and environmental performance may have some psychological impact on farmers.

It should be recognised too that some farmers in the LFAs also receive payments under other agri-environment schemes. ESAs cover just over 20% of the LFA area and Countryside Stewardship 2.5%. Sites of Special Scientific Interest cover a further 17%. These schemes thus offer further support to farmers in the LFAs, although where the level of payment is set on the basis of the net agricultural income foregone, then logically that will add little to the net income received by farmers. In practice, these schemes are critical to the survival of some farmers. At the same time the coverage of schemes within the LFAs is uneven so that some farmers have limited opportunities to take advantage of agri-environment schemes. Similarly, the opportunities for generating extra income from diversification varies between areas and between farmers, depending on individual assets and skills and the specific location of their holdings. Thus the role of the HFA payment in keeping farmers in occupation of the land will vary between areas and between farmers.

4.5 Evidence gaps

Many of the ESAs are located in the LFAs so that much of the evidence of environmental value in the ESAs reflects on the LFAs. But it is very difficult to identify a specific impact of the HFA given its relatively low level in relation to other support payments, either in terms of its effects in ensuring a continuation of land use or in terms of environmental impact.

While the bulk of subsidy received is tied to the numbers of livestock, it must be anticipated that the influence of the HFA must be relatively limited. It would thus be important to explore the implications of linking all payments to land areas.

Given that the levels of HFA payments were determined in order to minimise the degree of redistribution and that the areas in which the payments were set were based on the areas that were defined at that time, not specifically for this purpose, it would seem very likely that an alternative distribution of payments could achieve the given outcomes at lower cost. Research being initiated by DEFRA should contribute towards the definition of more suitable areas in which payment levels may be defined with regard to the costs of promoting a desired environmental outcome.

Specific environmental outcomes at the local level depend upon a variety of factors. There

can be under and over grazing with a particular area simultaneously and often other local institutional factors, such as the (dis)organisation of commons, can be of considerable significance. This points to a need for a higher degree of environmental management. Several authors (Drew Associates, 1997; Midmore *et al.* 2001) conclude that an agri-environmental scheme for the uplands would be desirable.

5. Forestry Measures

(Woodland Grant Scheme, Farm Woodland Premium Scheme)

5.1 The ERDP

Policy objectives

The ERDP gives a national priority under Priority A to ‘ the sustainable management of England’s existing woods and forests, and, where appropriate, a steady and landscape sensitive expansion of tree cover’. The aim is to increase the benefits that forest provides in terms of the rural economy, economic regeneration, better opportunities for recreation and conserving and enhancing the environment. Forestry contributes to elements of Priority B with its objectives for nature conservation, biodiversity and landscapes.

Rationale

The rationale for intervention in forestry as indicated in the RDR (1257/99) is in terms of its contribution to rural development, increasing supplies of certain forest products, and ecological and environmental benefits. In economic terms the argument appears to be the same as that for the agri-environment - that is to correct for market failure, including the undersupply of public goods and to contribute to sustainability in rural areas.

Public benefits apart, a case has been made for grant aid to forestry to correct the distorting effect of the CAP on the value of land (Harvey, 1994; Pearce, 1994). This is recognised as a ‘second best’ argument dependent on the continued failure to implement more fundamental reforms of the CAP. That apart, the justification for grant aid is to procure additional public benefits in a cost-effective way. The rates of return from commercial forestry are currently too low to stimulate much new investment even with WGS planting grants. While this reflects current market conditions and does not per se provide a case for additional support, it does suggest that it may require higher levels of support in order to achieve a given set of objectives.

Mechanisms

The mechanisms for delivering these aims are the Woodland Grant Scheme (WGS) and the Farm Woodland Premium Scheme (FWPS). They use a mixture of fixed and variable rate incentives, and competitive bidding (challenges). The WGS gives a range of incentives to increase the output of specific public benefits from access, recreation and environmental enhancement. The FWPS gives additional aid for planting on farmland to compensate for higher opportunity costs. Competitive bidding (challenges) and locational supplements give additional funding for specific schemes.

5.2 Benefit valuation and cost-benefit

Forestry has a long history of being subjected to cost-benefit analysis. In recent years considerable work has been involved in obtaining better estimates of the non-market benefits produced particularly from access, recreation and the contribution to biodiversity (see Willis *et al.*, 2000). Although usually derived from existing forests these (average) benefit valuations are typically used to assess the benefits from new planting. What is ideally required is an assessment of the marginal benefits from new planting. At some point, theory would indicate that benefits decline and may become negative. In addition, a proportion of

the population may prefer less woodland and more open space. These negative preferences are often omitted in CV studies (e.g. Clinch and Murphy, 1998; Hutchinson and Chilton; 1999; Macmillan and Duff, 1998).

Incentives are also used to procure public benefits from the management and improvement of existing woodlands. Economic research to value the benefits produced has been too limited to provide much guidance for policy. The CV estimates of the value of wildlife-friendly management of existing forests at £20-£30 per household per year suggest strong support for WGS management grants for environmentally beneficial activity (ERM, 1996).

Amenity/Recreational value and the Community Woodland Supplement

Bateman *et al.* (1999) collated all the recreational use value estimates (mainly based on contingent valuation) from visits to UK forests. The mean value of recreational use was £0.62 per person per visit, or £0.91 if the option value of future visits is included. Discrete choice methods give estimates that are £0.75 higher. Benefits from accessible forests depend highly on their location, which is a determinant of the number of users. Bateman demonstrates that the pattern of demand for additional recreational woodlands is closely related to population density. The conclusion is that recreational woodlands policy should be focussed on providing benefits close to where people live. Benson and Willis (1992) in their valuation of recreational benefits on the Forestry Commission estate came to the same conclusion and this provides a clear steer for policy.

The Community Woodland Supplement (CWS) procures access to new woodlands for local communities. It gives a single additional payment of £950 per ha for a 10-year contract with owners who provide public access to woodlands planted under the WGS. To be eligible, woodlands must generally be within 5 miles of a population centre and in an area where opportunities for woodland access are limited.

Crabtree *et al.* (2001a) evaluated the CWS and found that the size of the incentive was reasonably well judged in relation to costs, although the costs of providing access varied widely. Benefits from the access procured were measured by asking a sample of residents for their willingness to pay for continued access to their local community woodland beyond the year CWS agreement. WTP values per household showed marked distance decay beyond 3 miles from a woodland. The aggregate WTP⁵ per ha varied from £25 to £32,890 per ha, an average of £3,580 per ha. Aggregate value depended on the size of the local population, the characteristics of the woodland and the number of local substitute woodlands.

These valuations strongly support the development of woodlands with public access near to where people live, given that the average benefits substantially exceed exchequer costs. Bateman *et al.* (1996) came to the same conclusion from their study of community woodlands development around Wantage, Oxfordshire. Even so, around 20-30% of CWS schemes were unsatisfactory through lack of information to the public or poor recreational experiences (Crabtree *et al.*, 2001a). If future applications could be better assessed so as to avoid such poorly performing sites the average value of the benefits would be substantially increased. Benefits would also be enhanced by providing better information on accessible woodlands to the public, better integration in wider access networks and longer-term contracts.

⁵ This was a lower bound estimate ignoring all non-respondents and protest bids. It may substantially underestimate the true benefit.

It was clear that a sizeable proportion of the benefit was from non-visitors to the woodland who were not bidding specifically for access but for the landscape and amenity benefits of additional woodland in their locality. This provides a strong justification for providing incentives for new community woodland with good amenity qualities close to population centres (under three miles). Higher benefits might be obtained by paying woodland owners to convert existing mature woodlands into accessible community woodlands. Woodland Improvement Grants under WGS are available for this purpose but there is no information on the benefits procured or whether the public are adequately informed of these new opportunities.

Landscape and Biodiversity

Research on the economic value of biodiversity in existing or new woodlands is very limited and falls far short of providing a comprehensive guide for policy (Willis *et al.*, 2000). The ERM (1996) willingness to pay estimates (see above) suggest that the aggregate willingness to pay for enhanced forestry biodiversity may be substantial. RSPB (2000) argue that support for wildlife friendly-management should be assessed in terms of the contribution to meeting BAP objectives. The specific targeting of challenge funds to achieve well defined environmental gains (such as the Jigsaw challenge to support habitat connectivity) are well judged to deliver identified benefits.

Total value

Woodlands may produce a wide range of private and public benefits depending on location, structure, age, condition and management. They may do this directly (timber, carbon sequestration, habitat creation, recreation) or through impacts at a large scale (local economies, water catchments). We are not aware of any recent cost-benefit studies to determine the social returns from forestry since the work of Pearce (1994). RSPB (2001) argue that the Forestry Commission should link incentives to clearer evidence on the nature and magnitude of benefits from particular types of woodland within a total economic value framework. However evidence on the size of specific benefits and impacts remains very fragmented. We may note however that the environmental benefits of forests are widely supported by conservation organisations.

5.3 Economic Impacts

PACEC (2000) investigated the impact of forestry on the English economy, concentrating particularly on the estimation of forestry multipliers. They categorised forestry into productive high forest, traditional estate, small farm woodlands and community forests. The total gross output of forestry and associated processing was estimated as £2,939 million of which 37% was directly attributed to forestry and processing and the remainder indirect or induced. The gross output multiplier (total output/direct output) was 2.71. There were 18,500 direct jobs in the forestry and processing sectors with an employment multiplier of 1.84. This gives a total forestry-related employment of 34,100 jobs. Not all of this employment was in rural areas – the rural and local employment multiplier (total rural and local employment/direct employment) was 1.43, giving 26,450 rural and local jobs in total.

Incentives that promote new planting and enhanced forest management will contribute to incomes and employment. The planting of small scale woods on farms generates a relatively high level of total employment as compared with large scale coniferous plantations (MLURI, 1999; Crabtree *et al.*, 2001b). But it is timber harvesting that over the long term is the most

significant generator of jobs. Planting undertaken solely for amenity or environmental gain will contribute less to local employment than woodlands with marketable output. Net employment creation is location-specific and depends very much on the previous land use and its associated employment.

5.4 Scheme evaluations

The WGS and FWPS schemes were reviewed and modified after evaluations in the mid-1990s (SOED, 1994; ENTEC, 1996). Whilst the schemes were achieving their objectives the review made changes to increase the efficiency and effectiveness of the schemes in delivering public benefits. Consultants are at present undertaking evaluations of the revised schemes and these will be followed by a policy review which is to start shortly. Until these evaluations are completed we are not aware of any other information on the performance of FWPS. Aspects of the WGS have been reviewed and the Community Woodland Supplement of the WGS has been evaluated (see Section above).

Uptake

Adequate participation in the WGS and FWPS is a necessary but not sufficient condition for their success. Without an appropriate level of participation planting targets and scheme outputs cannot be achieved; the relaxation of area limits last year should have the effect of stimulating delivery. The focus of recent research into uptake has been in the context of farm woodlands. Numerous surveys of farmer entrants and non-entrants to the FWS and FWPS have been conducted (e.g. Watkins *et al.*, 1996; Crabtree *et al.*, 2001b). ENTEC (1996) found that farmers entering the FWPS gave a high priority to landscape and wildlife enhancement, but sport and screening were also very important. Timber production was ranked third as a priority but well below landscape and wildlife. The literature identifies a number of factors that deter some farmers from planting. In many cases there is an underlying dislike of, and lack of experience with, forestry that can be a formidable barrier. Legal requirements on tenants to obtain landlords' agreement can prevent them from planting trees. The loss of farm income, loss in capital value and the lack of adequate incentives are major factors in many situations.

5.5 WGS Mechanisms

Discretionary entry

The WGS in England now has discretionary entry based on a scoring system (Forestry Commission, 2001). This will increase the efficiency with which the objectives given in the ERDP and England Forestry Strategy are delivered through WGS grant aid. Incentives are now highly targeted to deliver in spatially discrete areas with specified rural development, economic regeneration or recreational objectives. Incentives to procure environmental benefits are targeted to deliver on the UK and local BAPs. Scoring also increases efficiency by reducing administrative costs because 'applicants' with low-scoring schemes do not apply. This is made possible by the relatively transparent and simple scoring system.

Aspects of the scoring will inevitably be questioned, although it is important to recognise the difficulties involved in transferring complex policy aims into a simple and transparent scoring system. It seems likely that small amenity woodlands on farms will not score highly unless they provide other public benefits (e.g. from access). But this is appropriate given the aim of concentrating expenditure on delivering the Forestry Strategy. There may be a case for such

woodlands where they make a particular contribution to landscape and the present scoring system does not allow for this.

Development of the scoring system so that it takes greater account of regional and local priorities is likely to further enhance its effectiveness in delivering public benefits.

Challenge funding

In 1995, tendering was introduced into the WGS for special expansion and management initiatives. The theoretical efficiency gains from bidding mechanisms as compared with fixed incentive systems have been outlined by Latacz-Lohmann and Van der Hamsvoort (1997). Under the system of challenge funding, bidders tender a proposal stating the amount of supplement over and above the WGS and FWPS incentives that they require. The economic role of challenge funding is to provide an efficient funding mechanism in situations where costs and/or benefits are highly variable, or to deliver incentives where there is insufficient information on which to base fixed incentive rates.

Garforth (2001) calculated whether fixed incentives set at a rate higher than the WGS rates would have been more efficient (lower cost) than challenge funding, assuming applicants 'overbid' by 20%. He concluded that a challenge would be more efficient when benefits and/or costs are highly variable and where the Forestry Commission wants a rapid response. It is also to be expected that challenge funding will provide efficiency gains when the funds available to the Forestry Commission are too limited for setting supplementary rates.

There is good evidence that the Forestry Commission has increased the efficiency and effectiveness of WGS by refining its instruments through WGS scoring and the introduction of challenges.

5.6 FWPS Mechanisms

FWPS provides additional payments to farmers over and above those available through WGS. It aims to encourage planting on agricultural land in order to improve the landscape provide new habitats, increase biodiversity, and provide farmers with ongoing income. The FWPS increase the incentive rate for planting but is not targeted either locationally or to achieve specific environmental objectives.

In order to apply for FWPS, applications must enter and be approved for WGS. Changes to WGS eligibility impact on uptake of the FWPS. It is thus the targeting and conditions of the WGS that are a prime determinant of what public benefits FWPS payments deliver. Small farm woodlands outside rural priority areas may find difficulty in obtaining grant aid. This reflects its limited contribution to the England Forestry Strategy.

6. Processing and Marketing Grant Scheme

6.1 Summary of scheme

Processing and Marketing Grants (PMG) were available in England from 1991 until April 1996, when the scheme was withdrawn in England. The scheme remained open to applications elsewhere in the UK until the end of 1999. The terms and objectives of the new PMG scheme, under the ERDP, are very similar to those which governed its predecessor. Processing and marketing grants enable capital investment in processing and marketing of English primary agricultural products. They also encourage farmers to become more competitive, respond to consumer demand, be more innovative and add value to their produce. £44 million Government and EU funds, will be available for the scheme from 2001 to 2006.

- To be eligible for consideration under the new PMG, projects must have one or more of the following objectives;
- To guide production in line with foreseeable market trends or encourage the development of new outlets for agricultural products;
- To improve or rationalise marketing channels or processing procedures;
- To improve the presentation and preparation of products or achieve the better use or elimination of by-products or waste;
- To apply new technologies and/or innovation;
- To improve and monitor quality;
- To improve and monitor health conditions;
- To protect the environment.

6.2 Information on the uptake of schemes

The target set for the new PMG is to assist 370 businesses and create 2,200 Full Time Equivalent jobs by 2007. By August 2000 £5 million had been offered to 80 projects ranging from a project to revolutionise beef quality and consistency through new breeding programmes to an initiative led by English Apples and Pears to determine the best time to harvest apples and pears to improve storing and eating quality (MAFF, 2001 Action Plan for Farming, 2001).

6.3 Effectiveness of Schemes

The Group Marketing Grant was introduced in 1992 in order to encourage the development of commercially managed marketing groups for agricultural and horticultural produce. The Marketing Development Scheme (MDS) replaced the GMG in 1994 with the intention of encouraging the involvement of a wider range of businesses. These schemes have similarities with the PMG and evaluations of them have been carried out for MAFF by the Scottish Agricultural College and of the original PMG Scheme for the Scottish Office by SQW. The economic appraisal of proposed expenditure under the RDR report reviews both of these evaluations and concludes that there is good evidence on the effectiveness of processing and marketing grants. These evaluations are reviewed below and comparisons are made with the objectives of the new PMG.

Scottish Agricultural College evaluation of the Group Marketing Grant (GMG) and Marketing Development Scheme (MDS)

The GMG/MDS was very successful in meeting its objective of helping the agricultural and horticultural industry develop efficient marketing structure and encouraging good practice. The rationale for the scheme was based on an analysis of the agri-food marketing system which tended to support the view that in a number of cases UK producers, particularly primary producers, were failing to take full advantage of the market opportunities open to them. The report concluded that the scheme allowed widespread development of marketing skills and capabilities. It recommended that future improvements were needed in the marketing of the agri-food sector including support for further forms of horizontal and vertical integration, better communication between links in the chain, the provision of key marketing skills, further product innovation, export assistance and the further development of traceability and quality assurance systems.

The objectives for the new PMG (outlined above) enable projects to be supported which will meet some of the recommendations. The new PMG is, however, principally a capital support measure to contribute to the costs of new buildings, the refurbishment of old buildings and the purchase of new equipment and hence will not result in the provision of key marketing skills. Non-capital grant aid for marketing of agricultural produce is being provided under the RES (Article 33) which is discussed below.

SQW evaluation of the 1991-1993 and 1994-1999 PMG.

The evaluation of the PMG undertaken for the Scottish Office found that the Scheme had succeeded in delivering its objectives of promoting improvements in product quality and the production of high quality products. Both programmes (1991-3 and 1994-9) led to significant benefits to primary producers in terms of income generated (£275m over both programmes) and in terms of the higher quality standards passed on, through better information transfer from processors to primary producers on the requirements of the market.

Taken together both programmes delivered 3,700 net jobs and £1,190 m in net sales at the local level and attracted nearly £200m of private investment. The costs per net job created were £33,000 for the 1991-3 programmes and £26,000 for the 1994-9 programme. The conclusion reached by the researchers was that this value for money was comparable with the performance of the Regional Selective Assistance programme and that the programme was delivering net economic impact at reasonable cost.

The evaluation did note that programme additionality was higher in the 1994-9 programme since the large projects which tended to predominate in the earlier programme displayed lower additionality. The evaluation recommended that the objectives of the programme should be simplified, a more pro-active marketing approach should be adopted, that the criteria and scope should be adjusted to give more weight to the additionality of larger projects, decision making should be faster and monitoring and performance measurement should be improved.

The terms and conditions of the new PMG are very similar to those which governed its predecessor. It seems likely that the new scheme will also deliver against its objectives, will deliver value for money and will have a positive impact on farmers' incomes and the rural economy more generally. It is clear from previous evaluation evidence that smaller projects are likely to display higher additionality. We might note in this context the concern raised by the Hills Task Force (2001) that the £70,000 minimum threshold might deter applications from smaller producers. It also appears that there is a case for uniformity of operation

between the countries within the UK which might help deliver quicker decision-making and hence reduce the relative administration costs of the schemes. There is no evidence of the impact of the scheme on the wider public or of a profile of benefits over time. These are areas which future evaluations of the PMG could consider.

6.4 Evidence of impact on the wider public

There is evidence that the public are willing to buy specifically from local or regional producers. The Countryside Agency has set up an 'Eat the View' Initiative as a response to this growth in green consumerism and the need to assist consumers in understanding the connections between the food they buy and the countryside they value. Initiatives, such as this, are needed alongside the PMG scheme in order to provide direct market opportunities for farmers.

6.5 Gaps in evidence base

The PMG scheme has only been running since 2000 and it is too soon to evaluate the efficiency, effectiveness and costs of this scheme. Individual projects and the scheme as a whole should be continually monitored and evaluated two years after project/scheme completion. As recommended in the SQW evaluation, continuous monitoring reports should be requested from the applicant on turnover, employment created and safeguarded, changes in labour productivity and impact on suppliers who are primary producers. The scheme evaluation should address questions on value for money, the impact of the scheme on attitudes of farmers and wider rural development, the evidence of the impact of the scheme on the wider public, the profile of benefits over time and information on the administrative costs of the scheme. Also, as recommended in the Scottish Agricultural College evaluation, the holding of seminars so that recipients can share experiences and problems together will help add to the evidence base on the effectiveness of the scheme.

6.6 Conclusion

This section has been able to review the information available on the new PMG scheme and the evaluations of the previous PMG scheme and the GMG/MDS. The following conclusions can be made:

- The original PMG and the GMG/MDS were very successful in meeting their objectives. The new PMG is based on the previous scheme and hence should also be successful in meeting its objectives but it is too soon to draw this conclusion;
- The original PMG scheme delivered value for money in cost benefit terms. The evaluation concluded that it was delivering net economic impact at reasonable cost;
- The original PMG scheme impacted on farmers' attitudes and management practices resulting in higher quality standards through better information transfer;
- There is a case for uniformity of operations between the countries within the UK which might help deliver quicker decision making and hence reduce the relative administration costs of the scheme;
- There is no evidence of the impact of the scheme on the wider public or of a profile of benefits over time.

7. Vocational Training Scheme

7.1 Summary of scheme and rationale

The VTS is a new scheme to provide funding for training that contributes to an improvement in the occupational skill and competence of farmers and others involved in farming and forestry activities and their conversion. A total of £22m has been allocated to the training scheme under the ERDP over the 7 year period to March 2007, with £1 million available in the year 2000/2001.

The rationale for this measures (England Rural Development Programme, p.76) is to provide training to help the agricultural and forestry workforce take up and make the most of the rural development opportunities provided in the ERDP. It is acknowledged that other training courses exist but that they may not be geared to the specific needs of rural development nor sufficiently accessible to encourage participation.

Information on the uptake of schemes

The target set for the VTS was to provide 48,000 full cost equivalent training days for people in farming and forestry by 2007 to support successful delivery of measures under the ERDP. By the end of December 2000 76 applications had been received but none had been approved. In January 2001 three Yorkshire-based training groups had bids approved for the provision of 1,350 training places. By mid 2001 over 3,600 days of training had been approved (DEFRA, 2001).

Effectiveness of Schemes

We have not been able to find any evaluations or literature on the effectiveness of the VTS. The DEFRA economic appraisal of proposed expenditure under the rural development regulation comments that higher levels of training are associated with greater on-farm innovation and technology transfer (Gasson and Hill, 1996).

A previous evaluation commissioned by MAFF considered whether there continued to be a valid economic rationale for core funding Lantra, the National Training Organisation (NTO) for the whole land-based sector. The evaluation commented that Lantra has made reasonable progress in achieving its education and training objectives. The evaluation considered the value for money of the core funding of Lantra and concluded that it was needed for the provision of corporate services, development services and communications. The evaluation concluded that the funding should continue as it was essential for the agriculture and horticulture sector to have a strong NTO to represent its interests and co-ordinate its training infrastructure.

7.2 Alternative approaches for the delivery of scheme objectives

There are a number of training courses/schemes which are currently in operation to provide training for those in land based industries. For example, Lantra have recently successfully bid to deliver the University for Industry's on-line Learndirect courses to the land-based sector. It is essential that this scheme, specifically targeted at promoting programmes under the ERDP, is integrated with the other schemes available.

Gaps in evidence base

The vocational training scheme has only been running since 2000 and it is too soon to evaluate the efficiency, effectiveness and costs of the scheme. There should be specific evaluation of training courses or workshops provided by VTS funding and also the consideration of the impact of training within the context of the overall ERDP evaluation. We are not aware of any evidence on the impact of training provision on business performance.

7.3 Conclusion

This section has been able to review the information available on the VTS scheme and the recent evaluation of Lantra. The following conclusions can be made:

- VTS supported training is delivered by training providers who are either registered with Lantra or can demonstrate similar competencies but it is too early judge if the scheme is meeting its objectives;
- There is no evidence on the value for money of the VTS, the impact of the scheme on farmers' attitudes or management practice, impact of the scheme on wider rural development, the attitude of the wider public to the environment, the profile of benefits delivered over time or administrative costs of the scheme.

8. Rural Enterprise Scheme

8.1 Summary of scheme and rationale

The Rural Enterprise Scheme (RES) provides assistance for projects that help to develop more sustainable, diversified and enterprising rural economies and communities. Its primary aim is to help farmers adapt to changing markets and develop new business opportunities. RES also has a broader role in supporting the adaptation and development of the rural economy, community, heritage and environment. The areas covered by the scheme include:

- Setting up of farm relief and farm management services;
- Marketing of quality agricultural products;
- Basic services for the rural economy and population;
- Renovation and development of villages and protection and conservation of the rural heritage;
- Diversification of agricultural activities and activities close to agriculture to provide multiple activities or alternative incomes;
- Agricultural water resources management;
- Development and improvement of infrastructure connected with the development of agriculture;
- Encouragement for tourist and craft activities;
- Protection of the environment in connection with agriculture, forestry and landscape conservation as well as with the improvement of animal welfare.

A total of £152 million EU and Government money has been allocated to the RES for the period April 2001 to the end of 2006. The majority of funding has been allocated to regional budgets. A small proportion has been reserved for national projects on the marketing of quality agricultural products.

Farm diversification can contribute towards economic benefit within the wider rural economy as well as improving farm incomes. These improvements help address some of the deprivation problems now being experienced in rural areas and the difficulties currently confronting the agricultural sector. However the setting up of the sort of enterprises envisaged can also involve substantial capital outlay. Since there is no assured market for the goods produced there is often a need for grants and subsidies to help identify and develop the diversified enterprises if they are to have any chance of success.

8.2 Information on the uptake of schemes

The targets for the RES are to assist 6,000 – 7,000 projects and 200 village initiatives and create 4,000 – 6,000 full Time Equivalent jobs by 2007. Applications received by the end of 2000 are shown in Table 8.1.

Table 8.1. Applications to the Rural Enterprise Scheme received by 31 December 2000

Scheme	Number of applications
Setting up of farm relief and farm management services	1
Marketing of quality agricultural products	12
Basic services for the rural economy and population	9
Renovation and development of villages and protection and conservation of the rural heritage	8
Agricultural diversification	10
Diversification into non-agricultural activities	46
Agricultural water resources management	0
Development and improvement of infrastructure connected with the development of agriculture	3
Encouragement for tourist and craft activities	25
Protection of the environment in connection with agriculture, forestry and landscape conservation as well as with the improvement of animal welfare	9

Source: DEFRA (2001) *England Rural Development programme 2000-2006: Annual Report 2000*. DEFRA, London.

8.3 Effectiveness of Schemes

The aim of the RES is to build on arrangements which operated under the former Objective 5b scheme. The DEFRA economic appraisal of proposed expenditure under the RDR report reviews the interim economic evaluations of the six English Objective 5b Programmes. The researchers found that the programme structures were generally robust in continuing to reflect the needs of the programme area and that the majority of the projects reviewed were found to be highly additional.

There was, however, evidence to suggest that problems associated with rural development tend to be regionalised, or even localised, so that any new scheme would be most effective if carefully targeted. The RES is available throughout England, except designated Objective 1 area where separate funding schemes apply, and with a particular target for aid which will benefit designated EU Objective 2 rural areas. The projects will be assessed and implemented on a regional basis and hence should address the specific regional or local problems associated with rural development. This issue of the institutional arrangements surrounding rural development has been discussed more widely in the academic literature and this is briefly reviewed below. There is also a growing literature on the links being made between farming and the rural economy which is also briefly explored below.

8.4 Institutional arrangements

Ward and McNicholas (1998) review the Objective 5b programme in the Northern Uplands and look at the regional administration and institutional arrangements for the management of it. They conclude that a shift in institutional and administrative arrangements towards the regional scale is needed as well as changes in rural development policy. The arrangements for programming and implementing the RES have been modelled on the Objective 5b programme with the drawing up of Rural Development Plans at the most appropriate

geographical level. Crucial elements of national discretion were incorporated into Agenda 2000 which allows the adaptation of CAP and through this the ERDP to regional circumstances (Lowe *et al.*, 2002).

8.5 Links between farming and the rural economy

There is a growing literature on the links between agriculture and rural life. The measures in the RES clearly seek to promote schemes to help farmers adapt to new markets and schemes to develop the rural economy although the RES does not make specific links between these two objectives. Some commentators (the Council for British Archaeology in their comments, July 2000, on the RES, Lowe *et al.*, 2001) argue that the measure should specifically encourage schemes which promote both of these objectives and holistically consider the links between them. Lowe *et al.* (2001) comment on the narrow basis of the economy of some rural areas that has been revealed by the foot-and-mouth crisis.

There are, however, other commentators (Thomson, 2001) who argue that agriculture and rural development do not readily link together and should be considered as two separate objectives. Thomson argues that a clearer separation is needed between rural development and agriculture in terms of food production. The author accepts that diversified rural systems do contribute to rural development but thinks that policies relating to the needs for people living in rural areas should be separated from policies relating to the production of food.

It appears that while there are still production subsidies agriculture cannot be linked with rural development. The Agenda 2000 outcome (there was not a reform of the system to free up funds from production subsidies to be available to promote integrated rural development) was a missed opportunity to reform the CAP (Lowe *et al.*, 2002). However, if there is a more radical overhaul of the system in favour of providing grants for agri-environment schemes and the wider management of the countryside then it is essential that schemes are promoted that make this link. The foot-and-mouth crisis has focused attention on the need for further reform of CAP so that robust rural economies can be promoted (Lowe *et al.* 2002).

8.6 Gaps in evidence base

The RES scheme has only been running since 2000 and it is too soon to evaluate the efficiency, effectiveness and costs of the scheme. Individual projects and the scheme as a whole should be evaluated at interim and final stages.

8.7 Conclusion

This section has been able to review the literature available on the RES and the DEFRA evaluations of the Objective 5b programmes. The following conclusions can be made:

- The Objective 5b programmes were successful in meeting their objectives. The RES is to build upon the arrangements which operated under this scheme.
- There is a need for a shift in institutional and administrative levels towards the regional scale for the delivery of the RES;
- There is a need for further reform of agricultural policy to link it with rural development for schemes such as the RES to operate more effectively;
- There will be benefits to targeting schemes on the areas of greatest need;

- There is no evidence on the impact of the scheme on the public, farmers' attitudes, rural development, on administrative costs or the profile of benefits delivered over time.

9. Energy Crops Scheme

9.1 Description of Scheme

The Energy Crops Scheme (ECS) is a new scheme that seeks to increase the area devoted to energy crops in England through provision of establishment grants. The crops eligible for these grants are Short Rotation Coppice (SRC) (either willow or poplar) and miscanthus. The scheme also provides aid to help SRC growers establish producer groups (DEFRA, 2001). A total of £29 million has been allocated to the scheme under the ERDP over the 7 year period to March 2007 (Table 9.1).

Table 9.1. Proposed Expenditure on Energy Crops Scheme under ERDP (£ million)

2000/01	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07
0	4	5	5	5	5	5

9.2 Rationale

The rationale for the scheme can be viewed in the context of the Government's energy policy. This is to ensure secure, diverse and sustainable supplies of energy at competitive prices (DTI, 2000)

Energy crops fall within the wider category of renewable energy.⁶ There are a number of distinct policy reasons given for supporting the development of renewable energy (DTI, 2000).

1. Potential contribution to diversity and security in energy supply
2. Recognition of the environmental benefits of renewables, and in particular the contribution they can make in meeting current and longer term climate change targets for the reduction in emissions of greenhouse gases
3. Long term economic viability. Support provided now may help address economic and other barriers which need to be overcome to enable renewables to gain a foothold in the market after which they should become increasingly competitive with a reduced need for support.

As noted above a key argument for the support of renewable energy sources is the environment. Internationally the UK has accepted a target of reducing emissions of a basket of greenhouse gases by 12.5 per cent below 1990 levels by 2008-2012 as its contribution of an overall EU reduction of 8 per cent. In addition, the UK has also set itself a goal of 20 per cent reduction in carbon dioxide emissions by 2010. As part of the process of achieving these goals the Government has set a target of 10 per cent of electricity to come from renewable sources by 2010. Given that fossil fuels are a major contributor to greenhouse gas emissions their replacement with non-fossil fuel sources is seen as a key part in the reduction of greenhouse gas emissions. Though this is to be linked with improved energy efficiency and further use of combined heat and power systems.

⁶ Other renewable energy sources include offshore and onshore wind, hydro, wave, PV, landfill gas.

The negative externalities associated with fossil fuels such as the production of CO₂ are not fully accounted for in their cost. This leads to an overuse of fossil fuels in relation to possible alternatives. As the PIU (2002) argue the first best solution would be to ensure the internalisation of the full external costs in the price of fossil fuels. If it is not possible to alter the price of fossil fuels to fully internalise these costs then a second best solution may be seen as offering support to more environmentally friendly alternatives such as renewables.

The infant industry character of renewables suggests that the sector might be able to benefit from 'increasing returns to adoption' such that the greater the number of adopters the lower the average cost of supplying renewables. This may justify temporary support for the sector until a critical mass is reached allowing it to take advantage of these increasing returns to scale. It can be seen that through innovation and the development of new technologies, the cost of electricity through renewable generation (in particular from sources such as landfill gas, waste and onshore wind) fell dramatically under the Non Fossil Fuel Order (NFFO) rounds of the 1990s (DTI, 2000).

The PIU (2001), recommending allocations from the £100m fund for renewable energy announced in March 2001, notes that there may be wider reasons for developing renewable sources of energy in the UK in terms of taking advantage of the knowledge economy. They estimate that the global market for environmental goods and services is expected to rise to £440 billion by 2010. A case is made that the UK is well placed to exploit this opportunity and export goods and services relating to renewables.

These justifications for support apply to most types of renewable energy, there are however a number of possible reasons why within this broader group the energy crop sector should be supported. First, there is some merit in supporting a range of renewables as with new technologies there is always some doubt and risk as to which will become the 'best' technology. In addition, energy crops do have some distinct advantages over other renewables. In particular they are seen as an important renewable energy source because they can be grown to meet the needs of the market. This sets them apart from other renewable energy sources that must be harnessed where they appear. They produce energy on demand and are not subject to variations due to external influences such as the weather (ETSU, 2000). However, as noted by the PIU (2002) in their wider energy review there is some dispute as to the degree of the problem for other renewable sources.

The PIU (2001) argued that energy crops have the potential to become a significant energy source over the next few years. In particular they see it alongside offshore wind as an area where the greatest gains can be made (in terms of Kwh deployed per £ spent). This is largely due to the fact that the generation of electricity from these schemes is relatively close to commercial viability. Though it has been pointed out that the best policy may not necessarily be to support those technologies which are closest to commercial viability as other technologies may prove to be more beneficial in the long run (Jackson and Löfstedt, 1998). There is also some danger with this approach in that if the scheme could be commercially viable without the funding then additionality has not been achieved.

In addition to the issue of energy policy there may be other justifications for supporting energy crops. Energy crops are a possible alternative that will enable farmers to diversify away from the production of foodstuffs that are in surplus (House of Lords, 1998). This has a number of possible advantages for the sector. First it may lead to a reduction in the supply of surplus products thus reducing the exchequer cost. Second it would link with the

Government's aim of developing a diversified and sustainable agricultural sector. In addition there may be some environmental benefits to energy crops when compared with conventional arable crops (House of Lords, 1999). This includes providing habitats for a diverse array of bird species. Although there may be less diversity than in permanent woodlands it is reported that SRC supports the highest number of invertebrates of all types of woodland (Royal Commission, 2000) Generally inputs of fertiliser and pesticides will be reduced. However, it has been argued that there is potential for energy crop production to be just as intensive as some arable or forage crops in terms of sludge/slurry uses, soil compaction and soil erosion and pest control (National Trust, 1999)

However in order for farms to diversify into energy crops it is clear that they have to provide similar returns to conventional crops. In fact Walsh and Brown (1998) argue that, given the newness of the crop and the increased risk, a premium may be required. At present energy crops are disadvantaged as they generally compete for land with crops that are supported through the CAP. Although some energy crops do have the advantage that they are a permitted non-food crop on set-aside land. A second best justification for support for energy crops would be to redress the balance. However clearly the first best solution would be to remove the distortionary support for food crops (House of Lords, 1999)

A final possible justification for supporting energy crops may be seen in the potential for energy generation from these crops to create employment in rural areas. It is suggested that each MW of power generated creates 5 jobs.⁷

9.3 Information on the Uptake of Scheme

Table 9.2. Take up of the Energy Crops Scheme

Scheme	Number of applications received by 31st December 2000
Energy Crops (Miscanthus)	0
Energy Crops (Short Rotation Coppice)	15

Source: DEFRA (2001)

Table 9.2 shows that by the end of 2000 there had been relatively little take up of the scheme, reflecting the complexity of creating a fuel supply of a novel crop and then using it in conversion plant that has not been proven commercially.

9.4 Effectiveness of Scheme

We have been unable to find any direct evaluations of the effectiveness of the energy crops scheme. As noted above, the PIU (2001) concluded that energy crops have the potential to become a significant energy source over the next few years. However, the PIU (2001) recognised that energy crops have a complex supply chain associated with getting the energy source to the energy provider. They note that DEFRA has taken this into account with the available funding for planting grants but argue that a potential gap relates to the infrastructure

⁷ For example, the ARBRE plant at Eggborough in North Yorkshire has the capacity to generate 8 MW and employs 40 people.

required to harvest, store and supply the energy crops once they have been grown.⁸ This may be deterring growers from participating in the scheme and will limit its effectiveness. Although it may be argued that the ECS partially addresses the issue of infrastructure through the allocation of funding for the establishment of producer groups.

Contractual issues may also limit the take up of the energy crops scheme. In addition farmers may be concerned with the long term nature of the contract and also given the newness of the technology whether the contracts will actually be fulfilled.

The success of the energy crops scheme is clearly related to the economics of providing energy from these crops. This at present is largely determined by policies designed to meet the Government's target of 10 per cent of electricity from renewable energy by 2010. Therefore the effectiveness of the scheme depends on the success of other policy instruments such as the New Opportunities Fund in encouraging the establishment of schemes to utilise this source. The CLA (2002) notes that as a requirement to have a contract for energy end use is a condition of entry in to the scheme, the lack of biomass power stations under construction has meant that it is impossible for farmers to meet this requirement although DEFRA will also accept letters of intent.

9.5 Gaps in evidence base

The energy crops scheme has only been running since 2000 and it is perhaps too soon to evaluate the efficiency, effectiveness and costs of the scheme. There should be a specific evaluation of the scheme. However, it is clear that an evaluation should not concentrate upon just the establishment grant for energy crops but the whole supply chain for energy from these crops. An evaluation will also need to take account of measures introduced to stimulate the market for renewable energy. In addition the scheme needs to be evaluated in relation to the recently completed wider energy review conducted by the PIU (2002). In particular a major issue is the cost effectiveness of energy crops when compared with other renewables.

Other factors that require evaluation are those that may be preventing take up. These include the level of payment, contractual problems, the need to obtain planning permission and uncertainty over future agriculture policy (particularly set-aside). The location of the end user also requires consideration. For example it has been noted that the siting of the power schemes in areas of lower rainfall may not be considered ideal given the water requirements of the crops (House of Lords, 1998). The effectiveness of the grants to establish producer groups should be evaluated with particular reference to whether they help overcome some of the problems with infrastructure highlighted by the PIU.

⁸ The identification of these problems has led to the allocation of extra money to be allocated to fund market or physical infrastructure.

10. Free Business Advice to Farmers

10.1 Summary of scheme

This scheme, announced in September 2001, entitles farmers to a day of a planning consultant's time, worth up to £800, for a planning feasibility study to help them apply for a farm diversification grant under the Rural Enterprise Scheme.

The free advice to farmers scheme is specific to the ERDP. It is also worth mentioning the Farm Business Advice Service (FBAS) (launched in October 2000 through the Small Business Service) which farmers can contact for up to three days of free business advice.

10.2 Information on the uptake of schemes

It is too soon to obtain information on the uptake of the free advice to farmers scheme for ERDP projects.

Over 7,000 farmers have requested the three days of free advice from the FBAS and around 2,800 have now received the full three days of free business advice. As a response to the problems which farm businesses have suffered as a result of the foot-and-mouth disease (FMD) the government put in place a package of short term measures which included five days of free advice from the FBAS. Since September 2001 some 1,100 farmers have requested the five days of free business advice and delivery has commenced for over 300 farms (DEFRA, 2001, p.29). More should be done to encourage businesses to make the most of the measures which have been put in place (DEFRA, 2001, p.17). The areas in which improvements have been made include:

- The Small Business Service who have embarked on a £2.5m national advertising campaign designed to improve awareness of Business Links;
- Farmers whose animals have been culled as a result of FMD are targeted directly for the five days of free advice from FBAS.

There has been a reasonable uptake from farmers in obtaining free business advice. There is a need for targeting the advertising of these schemes to those farmers who are most likely to benefit from business advice and participating in the ERDP schemes.

10.3 Effectiveness of Schemes

We have not been able to find any evaluations of schemes which promote business advice to farmers. There are evaluations of Conservation advice programmes (Ecotec, 2000, and Cheltenham & Gloucester College of Higher Education, 1995) which are being run by ADAS, FWAG and the Elm Farm Research Centre.

The number of recipients who benefited from these programmes in 1999/2000 was 7,356. Ecotec (2000) concluded that there is an economic case for supplying free advice to promote the production of public goods that benefit society at large rather than the private farmer and that programmes which offer free advice to farmers should be continued. Ecotec did, however, recommend that alternative methods of delivering the services should be considered to widen access to free advice.

In the evaluation farmers were asked about how much the programmes had changed their attitudes and what actions they had subsequently taken. The conservation visits by both

FWAG and ADAS both increased farmers' awareness of the benefits to wildlife from conservation measures and the parallel benefits to farming of some conservation measures. In general, changes in management practice and record keeping were undertaken more readily than changes in buildings and equipment.

In 1998/99 the direct cost of the 70 person-years of advice given by all the programmes was £2.26 million. This is an effective (including promotional activity cost) average cost per visit of £355. The evaluation considers the costs of the individual programmes and commented that the cost per visit varied considerably between the different programmes – the FWAG conservation visits were only a quarter the cost of ADAS visits. This variation in cost can be partly attributed to the difficulties in knowing exactly what the costs to the different organisations are. The evaluation comments that it appeared that more could be done to reduce the costs of provision of advice from ADAS.

McNally (2001) in an assessment of the farm business survey concludes that there is a need for careful targeting of government advice and assistance if it is going to make an impact on the survival of household traditionally dependent on the farm business. For example, the only substantial increase in farm diversification over the last 10 years has been in the renting out of farm buildings and diversification has only made a small contribution to the average business income.

10.4 Alternative approaches for the delivery of scheme objectives

There are a number of alternative initiatives/schemes which are delivering free advice to businesses:

- Mentioned above, farmers can call in the services of the Farm Business Advice Service (launched in October 2000) through the Small Business Service;
- ADAS/IGER/University of Bristol are currently carrying out a project to identify the most pressing technical issues currently facing smaller farm businesses and the preferred methods of knowledge transfer to address them. The project will involve implementing and monitoring the programme;
- The NFU has set up a recent £20,000 fund to offer half a day of free advice from a qualified legal adviser to tenant farmers who want a rent reduction.

There are a number of different schemes in operation for the delivery of advice to farmers on a range of conservation and business areas. We would endorse the Ecotec (2000) suggestion that efforts needed to be made to integrate the different free information programmes perhaps through a telephone call centre or Internet site. There is also a need to promote the schemes and carefully target the advice to the smaller farming enterprises who would benefit most from diversification to help their business survive.

10.5 Gaps in evidence base

The free advice to farmers scheme was announced in September 2001. It is too soon to evaluate the efficiency, effectiveness and costs of the scheme. Evaluation will need to be undertaken of the uptake of this specific scheme and more generally through an assessment of the role of advice in farmers' adoption of the measures under the ERDP. Monitoring should be carried out to record the amount and type of training given. Evaluation should include interviews with advice recipients, stakeholders and advisors. We are not aware of any evidence on the relationship between the provision of advice and business performance.

10.6 Conclusion

This section has been able to review the information available on schemes which provide business advice and evaluations which have been carried out on previous schemes which have provided environmental advice. The following conclusions can be made:

- The schemes set up to provide free conservation advice to farmers have delivered against their objectives – increasing farmers’ awareness of environmental practices and influencing their actions. The schemes to provide free business advice to farmers are using a similar approach to market their schemes and provide the advice but it is too early to judge if they have delivered against their objectives;
- The schemes set up to provide free conservation advice have been delivered at a good value for money in terms of costs to society and benefits to farmers and society. The Ecotec evaluation concluded that there was an economic case for providing the free advice. The average cost per visit of the schemes was £355;
- The provision of free conservation advice had changed farmer’s awareness and management practices;
- There is no evidence on the impact of the scheme on wider rural development, the attitude of the wider public to the environment, the profile of benefits delivered over time or administrative costs of the schemes.

11. Measures under the Rural Development Regulation not implemented in the ERDP

11.1 Measures not adopted

While most of the potential measures included in the Rural Development Regulation were included in the ERDP, a few were not. These were for:

- Setting up young farmers
- Early Retirement
- Promoting the adaptation and development of rural areas (*Article 33*)
 - land improvement
 - reparation
 - restoring agricultural production potential damaged by natural disasters and introducing appropriate prevention instruments
 - financial engineering

These measures are outlined in Council Regulation (EC) No 1257/1999, with some further detail provided in No 1750/1999. However, we have not been able to identify the full implications of some of the measures available under *Article 33*. We are also not aware of evaluations of any potential schemes falling within these areas and here offer a few general remarks on their apparent potential.

11.2 Setting up young farmers

The RDR includes a measure for setting-up aid to facilitate the establishment of young farmers under certain conditions. We are not aware of any evaluations of a potential scheme of this sort. In principle, there may be merit in encouraging younger farmers into a sector of the economy in which the average age is relatively high. However the recorded average age of farmers is remarkably stable. There is little evidence of any change in the average age of farmers in the Farm Business Survey either on LFA farms or on all farms through the 1990s. In all cases the average was between 49 and 54. The recorded average age may appear relatively high to the extent that in a family business, the member of the older generation may continue to be defined as the 'farmer', even when active decision-making is shared or even passed on to the next generation.

Two possible arguments might be made for such a scheme: that it provides a way into farming for new blood from outside the industry, or that it offers a means for members of farming families to set themselves up on their own holding, ensuring that skills and accumulated experience are retained. These arguments clearly pull in opposite directions. The simple argument that the maintenance of efficient agricultural production relies on a constant infusion of individuals from non-farm backgrounds might seem hard to sustain; it is rarely expressed with regard to other sectors. The explanation for the non-implementation of this measure in the ERDP (p74 6.1.21) is explained in the following terms "Levels of aid available for young farmers are unlikely to be sufficient in themselves to deliver real benefit. The intention is to reflect the need to encourage young enterprise in the industry by providing the right economic climate and, where appropriate, targeting measures, e.g. the Vocational

Training Scheme or the Rural Enterprise Scheme, towards young new entrants.”

However, the position might be different where an altered approach to land management might benefit from non-traditional attitudes and skills, such as in the adoption of new approaches to environmental management. We don't know whether or not there is evidence of a scarcity of such skills amongst those wishing to take up agricultural management opportunities.

On the other hand there are some hints from econometric analysis (McNally, unpublished) that in the case of hill farming, farmers with an agricultural upbringing may be more successful than others. This would conform with a commonly expressed view within agriculture that those from a farming background have an advantage over those with a non-farm background. It may be that it will be difficult to maintain the supply of farmers in the most remote and unfavourable locations who are willing to continue production where it is necessary for such production to maintain environmental goals for the area.

The measure requires that economic viability can be demonstrated within three years. The language of the RDR seems to imply, but does not state that viability should be in terms of income from agricultural production. If this is the case it would seem to be unreasonably narrow, and difficult to ensure given the pressures on agricultural incomes.

This might lead towards three possible ways in which the measure might be introduced:

- a measure to attract those with particular skills in environmental management to take on the management of sites of particular conservation significance or potential, such as a Site of Special Scientific Interest;
- a measure to provide opportunities for younger people wishing to establish diversified agricultural businesses that could support the restructuring of the local economy (there could be some overlap here with other ERDP schemes);
- a measure to support the establishment of those with experience of farming in particularly severe conditions in order to ensure the supply of suitably skilled and experienced farmers to retain land in production in the least favourable locations.

11.3 Early Retirement

While there may be uncertainty as to the appropriate interpretation of data on the average ages of farmers, there is, without doubt, a substantial number of farmers who face particularly low levels of income and who can see little opportunity for enhancing it either through agricultural expansion or diversification. The current emphasis on diversification as a solution to farm income problems rather distracts attention away from those for whom this is not a serious option. Some means of easing the movement of such farmers out of agriculture would appear to have significant merit.

However, there is an inevitable concern that any offer of an early retirement scheme would promote a rush of applicants from amongst farmers who could soon be expected to retire anyway. The ERDP (p74 6.1.21) comments that : “An economic appraisal showed that while it would contribute to restructuring, the cost of running a scheme would outweigh the benefit, mainly because it would not be possible to exclude from the scheme those who would have retired without the assistance. It would have been very difficult to target only those most in

need.” Thus the measure could be expensive and the additionality achieved low. An effective policy would need to be targeted on more specific objectives and thus restrictive in the circumstances under which early retirement would be permitted.

The conditions of the scheme set out in the RDR seem to promise little return in terms of making the farm sector more independent of state support or of reducing commitment of the exchequer to CAP payments.

Three sorts of justifications might be considered:

- equity: that the individual farmers could be in sufficiently desperate circumstances such that there would be clear equity arguments for providing some relief,
- restructuring: that the measure would bring about a major change in agricultural structure so as to improve the general condition of those remaining in farming, or
- reducing commitments to future CAP payments: that there could be some means of taking resources out of the CAP subsidy regime with the possibility that the measure could lead, in time, to a net saving to the exchequer.

The early retirement measure seems not to ensure any of these justifications. It is not apparently necessarily targeted at farmers or holdings with low (potential) incomes and the conditions are only required to hold for the duration while the transferor receives early retirement support. But similarly, none of the three suggested possible justifications would necessarily equate directly with an early retirement scheme. The first could apply to farmers of any age who hold high levels of debt or who hold limited agricultural resources and have no prospects for diversification. The second is related to the structure of land holding rather than the age of the farmer. The third could apply to land currently in profitable agricultural use.

There may be an analogy here with proposals for a bond scheme (e.g. Swinbank and Tangermann, 2001). An increasing proportion of CAP payments are now directly linked to specific parcels of land. It might then be possible to offer capital payments to retiring landholders provided that the land is permanently removed from the CAP payment regime. This may be less attractive to landowners than might appear at first sight to the extent that the reduced subsidy entitlement will reduce the value of the land. However, it seems unlikely that the full amount is capitalised into land values and there may be some scope for mutual gain arising from the difference between individual and state discount rates. This would clearly be most attractive to those wishing to put the land into income generating non-agricultural uses.

There would be a problem should the scheme lead to the abandonment of agricultural land and there would be a need for a more comprehensive agri-environment scheme that protected environmentally sensitive areas to which landholders would continue to be entitled. This would need to be considered in determining appropriate levels of payment within particular areas.

11.4 Measures promoting the adaptation and development of rural areas (*Article 33*)

The precise intentions of some of these measures are unclear, such as in terms of the extent to which they have to pursue agricultural objectives. Thus, for instance, can land improvement or re-parcelling be for environmental rather than agricultural production objectives? If so, such a measure might offer a means of assembling larger areas of land for habitat re-creation. Appropriate instruments for the prevention of natural disasters might include flood protection measures, perhaps the creation of sacrifice areas available to take flood waters, equivalent to the washes in the Fens, that could generate significant environmental values. Financial engineering might offer a means of implementing a bond scheme targeted at individual parcels of land along the lines considered above rather than through an early retirement scheme.

Appendix Table 1 Contribution of the agri-environment schemes to Priority A of the ERDP

Priority A To encourage:		Role of agri-environment schemes⁹
an agriculture sector which is:	Competitive diverse and flexible	None
	Responsive to consumer wishes	None
	Environmentally responsible agriculture contributing to biodiversity, cultural and landscape targets	Indirect impacts through changes in conservation interests of farmers. Participants must observe good farming practice
	Managed as an integral part of the rural economy	None
The sustainable management of England's woods and forests, and an expansion of tree cover.		Very minor
Tourism and recreation		Minor – access provision
An improvement in the skills base		Very limited contribution to environmental skills
An improvement in the infrastructure of rural areas		None
An improvement in the provision of advice and support for diversification		None
The use of environmental and heritage assets in rural regeneration		Very limited

⁹ This refers only to the schemes considered in this report; it excludes the Organic Farming Scheme.

Appendix Table 2. Contribution of the agri-environment schemes to Priority B of the ERDP

Priority B To encourage		Role of agri- environmental schemes
Nature Conservation and Biodiversity	In the wider countryside, protection, re-establishment and favourable management of priority habitats and species including wild birds, BAP and HAP	Very important
	Protection and favourable management of international sites	Significant
	Protection and favourable management of national sites	Significant
	Protection and re-establishment of a matrix of wildlife habitats in the wider countryside	Very important
	Protection and favourable management of the ecological value of ancient and semi-natural woodlands	None
Landscape and historic environment	Safeguarding and enhancing the landscape character and local distinctiveness of the wider countryside to attain target and solve problems identified in the Countryside Charter descriptions	Very important
	Protection and enhancement of historic and archaeological features of international, national and local importance	Significant
	Conservation and enhancement of nationally important landscapes	Very important
	Securing favourable collaborative management of commons	
Protection of air, soil and water		Some but limited

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