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Agriculture and the Environment

This paper discusses some environmental concerns for modern farming in the UK. Many people in the UK believe that support for agriculture should be re-organised so that the money is directed towards benefit of the environment, but traditionally environmental concerns have played a very small part in the Common Agricultural Policy (CAP) and there is little sign of an early change. This paper considers some possibilities that have been put forward to improve the position.

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I Environmental Problems in Agriculture

A. Introduction

For many years it was assumed that agriculture was beneficial to the environment, but more recently concern has increased about possible harmful environmental effects of modern intensive agriculture. This concern is often equivalent to a general distaste for modern intensive agriculture, but modern farming clearly does face some specific environmental problems.

The most important is probably the need to avoid polluting the water supply. There are obvious risks with leaks of slurry or excessive use of pesticides. The problem of nitrates in drinking water is much more complex. A second range of problems relates to wildlife. Intensive farming is often blamed for its destruction, again mainly through excessive use of pesticides, but also through removal of habitat.

B. Pollution of the Water Supply

1. The problem

Water pollution has become an increasingly serious problem, partly because intensive farming often creates more potential hazards, and partly because stricter rules on water quality, especially for drinking, are having an impact on agricultural practices. Intensive dairy farming is the most important case in which the slurry becomes a serious problem, rather than being the source of useful manure in traditional farming.

2. Drinking water

The EC drinking water directive[1] was developed because of concerns over the re-use of waste water for drinking water supplies and the increasing numbers of new organic substances entering supplies. It laid down mandatory quality standards for drinking water throughout the Community for the first time, setting quality standards and guidelines for over 50 parameters of drinking water. In most cases a maximum allowed concentration or value (MAC) is set for each parameter. These include parameters that affect public safety such as faecal coliforms, and also aesthetic parameters such as colour, odour, and taste. The drinking water directive is

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[1] 80/778/EEC *OJ L229* 30 August 1980

implemented by Regulations. In England and Wales these are the *Water Supply (Water Quality) Regulations 1989*[2] (as amended).

3. Groundwater

The EC Directive (80/68/EEC) on groundwater protection includes two lists of dangerous substances. List I contains substances that must not be introduced into groundwater. List II contains substances that must be 'limited' with their introduction and their discharges controlled by authorisations. Amongst other effects of the Directive, some statutory groundwater protection schemes have been introduced in the UK to control diffuse pollution of groundwaters by nitrate from agricultural land via the designation of Nitrate Vulnerable Zones and Nitrate Sensitive Areas.

New groundwater regulations are due soon, and a consultation paper on the draft regulations was issued in January 1998.[3] Paragraph 18 explains how they will work:

> Under the new Regulations, the Agencies will have power to serve Notices where activities on or in the ground…might lead to an indirect discharge of a list I substance to groundwater, or where pollution of groundwater, or where pollution of groundwater might result from an indirect discharge of a list II substance. The Agencies will have a duty to serve a Notice to prevent an indirect discharge of a List I substance to groundwater or pollution of groundwater by an indirect discharge of a List II substance. Alternatively a Notice may grant authorisation for activities subject to conditions. This could involve activities on land such as the process of sheepdipping, or the storage and use of List I and list II chemicals in unsatisfactory containment facilities, which might lead to pollution of groundwater. It will be an offence to carry on an activity prohibited by a Notice, or to carry on an activity in contravention of the conditions of a Notice.

A recent report by the National Consumer Council mentioned that, despite severe restrictions, many older chemicals such as the insecticides lindane and dieldrin are still found in relatively high concentrations in groundwater.[4] It also points out that although there are rigorous tests before approval of any new active substances, many old pesticides are still in use, although they were released on the market without similar investigation standards. Systematic re-evaluation of old active substances, which in some cases have been on the market for the last 40 years, is only just being introduced at EU level.

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2 SI 1989/1147

3 Proposed Groundwater Regulations: Consultation Paper and Compliance Cost Assessment, Library Deposited Paper 3/5818

4 National Consumer Council, Farm Policies and Our Food: the Need for Change, 1998, p.53

4. Bathing Water

Attention has recently centred on whether run-off from agricultural land is the cause of the poor standard of British bathing waters that often fail to comply with EU standards. Water companies have invested heavily is sewage treatment and have sometimes been surprised to find that they often still failed to comply. OFWAT cited factors beyond their control, including run-off from agricultural land, as causes.[5] However, North West Water has now revised its earlier view that agricultural run-off was a major cause of the poor environmental standard of Blackpool beach. The Environment Agency is now confident that factors beyond the control of North West Water, including agricultural run-off, account for no more than 10% of the problem.[6]

5. Nitrates

EC rules limiting the acceptable level of nitrates in drinking water pose problems for farming. Many people suppose that the excess run-off of nitrates comes from farmers heaping on too much nitrate fertiliser which is then washed off by the rain. In fact the process is much more complex. Researchers on the experimental site at Rothamsted have been studying the nitrate leached from plots of land, some of which have been left bare and have not been fertilised since 1843, yet continue to leach nitrates in the water. The New Scientist summed up some of the research:[7]

> On unfertilised crops the researchers found that soils still leach 20 kilograms of nitrate nitrogen per hectare of land every year. Even under spring barley, which leaves the soil bare and more prone to nitrate leaching during the subsequent wet winter months, they found than only 7% of the 80 or 120 kilograms of nitrogen they had applied was leached. They conclude that if a nitrogen fertiliser is given in the correct dosage for a given crop it does not cause nitrate pollution. So where does the nitrate, found in increasing quantities in drinking water, come from? British researchers traced what happens to the nitrogen in the fertiliser by labelling it with the isotope nitrogen-15. They found that most nitrogen in water comes from vast reserves of nitrogen that were held naturally in the soil before and while farmers introduced intensive practices. Researchers in Sweden have confirmed the British results. They found that whether or not they applied spring fertilised to their experimental plots, the soil still released nitrogen.

That does not mean that nothing can be done about the rate of nitrate leaching. There are ways of reducing the rate of leaching, but it is not simply a matter of cutting down on the level of fertiliser use. The Draft Code of Good Agricultural Practice for the Protection of Water produced by MAFF in 1997 (paragraphs 277 – 302) contains advice to farmers in this respect. Farmers are advised to avoid ploughing up permanent grassland for arable farming wherever possible; to take particular case when using organic wastes such as sewage sludge

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5 OFWAT 1996-97 Report on levels of service for the water industry in England and Wales, p.38

6 *ENDS Report* 277 February 1998 p.3

7 Inside Science, *New Scientist*, 15 September 1990

and manure; to limit the total of inorganic fertiliser applied; to avoid applying fertiliser when the soil is waterlogged, flooded, frozen hard or covered by snow. Farmers are also warned that leaving soil bare increases the risk of losing nitrates, so that sowing crops by early September will help to reduce nitrate leaching.

There are two approaches to the problem of excess runoff of nitrates in areas where it is particularly high. The British approach, with Nitrate Sensitive Areas organised by MAFF on the same principles as Environmentally Sensitive Areas, has been to offer farmers an incentive to adopt certain farming practices that reduce nitrate leaching. The EU approach, coming from the Environment Directorate of the Commission (DG XIII), has Nitrate Vulnerable Zones that are organised in the UK partly by DETR. The *Nitrates Directive (91/676)* requires that an action programme of appropriate measures should be drawn up and made compulsory in nitrate vulnerable zones. Farmers are not compensated for complying with the plan.

The zones and action programme were finalised after considerable consultation, with the action programme laid down in a schedule to a statutory instrument.[8] Nitrogen fertiliser shall not be applied in excess of the crop requirement. Chemical fertiliser shall not be applied to land between 1 September (15 September for grassland) and 1 February unless absolutely necessary. Nitrogen fertiliser shall be applied as accurately and uniformly as possible. It shall not be applied to steeply sloping fields, nor if the soil is waterlogged, flooded, covered with snow or has recently been frozen. There is also a general requirement: "Chemical fertiliser shall not be applied to any land in a location or manner which makes it likely that the chemical fertiliser will directly enter the water".

There are specific requirements relating to organic manure, including a formula for determining the maximum amount to be spread on land per hectare. In addition, organic manure shall not be applied to any land less than 10 metres from surface water, or between 1 August (1 September for grassland) and 1 November. The capacity of storage vessels for livestock manure is specified, and records of fertiliser application must be kept.

6. Sheep Dip

There are possible environmental problems caused from dipping sheep in pyrethroids. This is not the same as the possible health problems from organophosphates, which have received so much publicity. Indeed, paradoxically organophosphates were considered relatively harmless to the environment. That is why they were introduced, when sheep scab reappeared in British flocks in 1973, after concern over the persistence in wildlife of the organochlorines (in the same family as DDT) that used to be used had resulted in a ban.

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[8] The Action Programme for Nitrate Vulnerable Zones (England and Wales) Regulations 1998 (SI 1202)

Unfortunately, the pyrethroids that are now increasingly replacing organophosphates, as a result of health concerns, are also potentially dangerous to the environment. The environmental journal ENDS reported concern about the toxicity to aquatic life of synthetic pyrethroids:[9]

> The Environment Agency and the Scottish Environment Protection Agency (SEPA) are now reporting an increase in sheep dip pollution. The reason appears to be the shift away from traditional organophosphate dips towards formulations based on pyrethroids, particularly cypermethrin...A SEPA spokesman told ENDS that pyrethroids were "two or three orders of magnitude more toxic" and had a "much, much greater impact on river life". One official Scottish source estimated that the incidence of sheep dip pollution has increased ten-fold in the last year due to pyrethroids. The Environment Agency's North West region has also reported a marked increase in sheep dip pollution over the last two years, but cautions that in many cases it has not been possible to prove which kinds of dip were responsible.

The *New Scientist* quoted Ray Prigg, a senior ecologist at the Environment Agency's north west region as saying that pyrethroids are so toxic that "if dipped sheep drip while grazing near streams, that can provide the few nanograms of pesticide per litre of water required to kill freshwater shrimps".[10]

The MAFF guidelines on disposal of unwanted pesticide have been tightened up. Farmers used to be told to seek advice from the Regional Water Authority and the local official agricultural adviser on construction and siting of soakaways.[11] In 1991 a Code of Good Agricultural Practice for Water was introduced, which is a statutory code under section 116 of the *Water Act 1989*. This means that, if you do not keep to the Code, it will not be an offence but it could be taken into account in any legal action. Following the Code is not a defence against a charge of causing pollution. The Code is more doubtful of the usefulness of soakaways, without ruling them out.

> 210 Dispose of used dip wash as soon as possible after dipping. **Never** empty it into a watercourse. Soakaways are not suitable in most places as they could pollute groundwater. Ask the NRA if there is any doubt about the risk of polluting groundwater by using an existing soakaway. Do not build new soakaways for sheep dip.

The National Rivers Authority (now the Environment Agency) investigated the issue in 1994 and considered that waste from sheep dip remained a problem.[12] It recommended stricter controls, including the following:

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9 *ENDS Report 263* December 1996 p.4

10 *New Scientist*, 11 January 1997

11 Guidelines for the disposal of unwanted pesticides and containers on farms and holdings, *Library Deposited Paper 4847*

12 NRA, The Disposal of Sheep Dip Waste, 1994

> 1 The disposal of sheep dip waste needs to be under the legislative control of the Regulatory Water Organisations including the NRA. At present it must be proven that pollution has occurred before a farmer can be compelled to change established practice.
>
> 4 Disposal of sheep dip waste to soakaway or at high loading rates to land should be banned, including the existing sites where these practises are currently used safely.
>
> 6 The siting of new dips and the associated plans for dip disposal should be subject to planning controls, with the Regulatory Water Organisations as statutory consultees. In the longer term, consideration should also be given to the need to register sheep dippers.

The Groundwater Regulations, discussed in sub-section 3 will probably require that a farmer obtains a Notice from the Environment Agency before sheepdipping, to prevent leakage of the sheep dip into the groundwater. Pyrethroids are almost certain to be in List I, which will mean that the Agencies can impose a blanket ban on soakaways.[13]

C. Wildlife

1. The effects of Pesticides

MAFF scientists undertook a major study of the medium-term effects of pesticide application on the environment.[14] This careful scientific study was naturally hedged with cautions, but the results show very little sign of environmental damage, except for the effect on invertebrates. The following extracts from the conclusions compare the effects of the Full Insurance regime (where pesticides were applied to cope with all problem pests) with control fields. Two control regimes were included in the study. One, called supervised, involved a lower pesticide use. The other, caller integrated, incorporated as many modifications to cropping and pest control as possible.

> Monitoring of bird populations by regular mapping of their territories revealed no obvious overall change in the density of the common farmland songbirds...The only species which did show a change in density that is consistent with effects of a Full Insurance regime on prey populations was the starling. (p.203)...Wood mouse populations vary greatly from year to year, but the results revealed no evidence for overall population changes that could be attributed to the Full Insurance regime. (p.204)...Although herbicides affected plant populations in the fields, more changes, both of seed in the soil and plants above ground, were attributable to physical disturbance such as ploughing than to the use of herbicides.(p.205)...Effects of the Full Insurance regime (on invertebrates in the soil) were mixed, resulting in reduced catches of some species but others were apparently favoured by the high pesticide inputs, presumably through a reduction in competition or predator-prey interactions.(p.205)...Overall, the density of all herbivorous invertebrates in the Full Insurance area declined by about 50% relative to that in the Supervised + Integrated Area.(p.207)...Monitoring of spray drift revealed some effects of summer aphicide applications on

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[13] ENDS Report 276, January 1998 p.43, and discussion with a DETR official

[14] Pesticides, Cereal Farming and the Environment, *The Boxworth Project*, HMSO 1992

> hedgerow arthropods although there was rapid recolonisation. The lack of major changes in field boundary floras suggests that drift was not substantial. Residues of pesticides in drainage water from fields where they were applied were absent or present only at low levels.(p.208)

The conclusion of the study noted that heavy use of pesticides did limited environmental damage but brought no economic benefit (p.214):

> The results have provided new information about the risks to the cereal-field environment arising from high levels of pesticide use as an insurance against crop damage. For some forms of wildlife, there was little evidence that the high inputs changed the density or performance of populations, whereas others were seriously affected…Economic appraisal of the three pesticide programmes suggested that although there was an advantage to the Full Insurance approach in terms of yield, it was fully balanced by the extra costs entailed. Crop protection was achieved as efficiently by a moderate, supervised approach based on use of pesticides only when shown to be necessary.

On the other hand, some concern has been expressed about the effects of combinations of pesticides. A study deposited in the House of Lords Library contains an article on the topic,[15] containing the following summary:

> Reviews of pesticide usage survey data and vertebrate wildlife and honeybee poisoning incident schemes in the UK show that there is considerable potential for wildlife to be exposed to combinations of agricultural pesticides. According to the published literature the toxicity of many pesticide combinations is at least additive. In some cases pesticide mixtures, particularly those involving insecticides, have been shown to be synergistic, with reported increases in toxicity of up to 100-fold. However, these effects are species, time and dose dependent and are therefore difficult to predict routinely. It is suggested that risk assessments should routinely take additive toxicity into account and those based on synergism should be targeted at those mixtures for which a further defined increase in toxicity would result in a high-risk classification. In order to support this risk assessment approach there is a need to develop and validate a standard *in vitro* test in order to confirm the interaction in those cases where additive or synergistic toxicity results in a high-risk classification.

2. The effects of changing husbandry practices

Birds and other forms of wildlife have often found it harder to survive in the modern farming environment of intensive cultivation than in that of the past. Even in Wales, where grazing remains the almost universal predominant use of land, there has been a sharp decline in the number of birds. A report by the Royal Society for the Protection of Birds report concluded that agricultural changes in Wales had created widespread losses of habitat diversity.[16] The main elements were: the loss of tillage due to the demise of the traditional mixed farm; the

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[15] Helen M.Thompson, Interactions between pesticides; a review of reported effects and their implications for wildlife risk assessment, *Ecotoxicology* **5**, 59-81 (1996) (House of Lords Deposited Paper 97/406)

[16] RSPB, Silent Fields, (1995)p.13

loss of semi-natural grassland to agricultural improvement; the loss of traditional shepherding techniques in the hills and the expansion of sheep-walks at the expense of heather moor; the loss of plant diversity with the widespread re-seeding of old pastures; the loss of damp grassland with drainage; and the loss of structural diversity in grass swards with increased stocking densities of sheep.

Since the early 1990s, a proportion of arable land has been set aside, under the rules of the Common Agricultural Policy. That has benefited populations of birds:[17]

> 22 The analysis of historical data showed no overall change in the local populations since the introduction of set-aside. Perhaps the field-scale benefits of set-aside did not translate into general population increases, but this explanation is unlikely given the results of the field scale analyses. Perhaps movements of birds from farm to farm made local population changes difficult to detect; perhaps also set-aside acted to slow down local rates of population decline. It turns out to be extremely difficult to inter-relate field, farm scale and national changes in bird populations.
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> 23 Set-aside is an important habitat for both breeding and wintering birds on farmland. The nature of set-aside management appears to be benign, and can result in an increased level of food resources for breeding birds compared with cereal crops. Published studies show that skylarks can produce more young on set-aside than on crops; more needs to be known for other species. While it cannot be shown for certain that set-aside has affected national bird populations, it can be inferred that the loss of set-aside would be a major setback in the attempt to conserve the birds of arable farmland.

The report ends optimistically, in paragraph 25:

> The effects of set-aside, as it has been managed in England between 1995-1997, are remarkably easy to summarise. The farmer is happy with it; it causes no particular agronomic problems, and it's great for birds.

A less upbeat conclusion came from research involving asking farmers how they were managing their set-aside land. Researchers at University of Liverpool found that only 1% of the land was managed specifically to promote conservation.[18]

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[17] Institute of Terrestrial Ecology and other bodies, Agranomic and Environmental Evaluation of Set-Aside, (May 1998) p.vi

[18] New Scientist 3 January 1998

II EC Agri-Environmental Policy

A. The Common Agricultural Policy (CAP) and the Environment

It has often been suggested that the traditional CAP was inevitably hostile to the environment because it was based on assistance via high support prices. Therefore the more farmers produced, the more benefit they derived from the policy. The policy was not intended to have that effect. One of the main aims was to improve the position of small farmers – who were often extremely poor and scarcely part of the modern economy in those days. Support prices were set high enough for them to be able to make a living from farming, but that left larger farmers able to make large profits, which could then be re-invested to increase production further and add a further boost to profits.

For many people on the Continent, an environmental policy in agriculture means preserving small farms with their traditional methods. The newcomers to the EU, such as Austria, also see agricultural policy very much in this way. The problem of small farms has not entirely been solved. With urban workers becoming steadily better off, the drift from the land has continued.

That is a different perspective from that in the UK where much of the drift from the land took place in the nineteenth century. Thus there is more British interest in considering how to impose environmental conditions upon large farmers, whose high incomes are widely resented.

It is unlikely that a policy based upon price support can really be environmentally friendly since farmers are always encouraged to produce as much as possible. The gradual move towards income support, however, does open up new options. In principle, income support can be paid according to any criterion. Indeed, there are positive advantages in changing agricultural support into support for the meeting of environmental objectives, in that such a policy conforms more easily with the demands of the World Trade Organisation. Subsidies can be paid if they do not affect the level of production or, in WTO jargon they are "in the green box".

What we have seen, and will continue to see, are modest measures offering more support to the environment. It is probably unrealistic to imagine replacing production subsidies by environmental subsidies, so as to leave farmers equally well off, the environment improved, and international trading partners satisfied. An agricultural economist recently argued that

the agri-environmental measures considered in Agenda 2000, the current proposal for CAP reform, could not replace the CAP:[19]

> Under current arrangements some 5% of expenditure can be related to such measures. To increase funding for environmentally approved systems or production and to the point at which it fully replaced current commodity support, would lead international competitors to complain of unfair competition. To provide support on this scale in ways which did not support production would effectively mean taking out of commission large parts of existing food production. Such a system would require support into an indefinite future…Thus, whilst it is sensible to expect substantial increases in environmentally related expenditure in farming, it would be irresponsible to think that such a redirection of funding could meet the severe adjustment problems likely to confront EU agriculture as it enters the next century.

B. The Agri-Environmental Regulation[20]

In 1985 the EC allowed Member States to provide funding from their own resources for schemes in environmentally sensitive areas, and this was reinforced with Council Regulation (EEC) no.1760/87 (OJL 167), which has been summarised by the Agriculture Select Committee:[21]

> The 1987 Regulation had the protection of the environment and the "lasting conservation of the natural resources of agriculture" as specific objectives, although it also had an objective of improving the efficiency of farms by developing and reorganising their structures. In particular the 1987 Regulation sought to reduce the production of cereals, beef and veal, and wine by at least 20%. In essence, it was directed at curbing the worst excesses of the CAP at a time when production, and hence expenditure, had increased to unacceptable levels as a result of the Community's market support measures. Therefore the Regulation mainly refers to extensification of production not in terms of any environmental benefit (although it does contain some, limited environmental aspirations), but rather "the conversion of products to non-surplus products" and the promotion of the "extensification of production of surplus products".

The Report sums up the role of the Regulation.

> 14. The Agri-environment Regulation allows for a number of practices and activities, including environmentally favourable methods of production, to be aided in order to achieve its goals. The Regulation's main aims are:

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[19] John S.Marsh, Look at it this way: The Common Agricultural Policy, *Outlook on Agriculture* March 1998 p.16

[20] Council Regulation (EEC) 2078/92 on agricultural production methods compatible with requirements of protection of environment and maintenance of the countryside (OJL 215)

[21] Environmentally Sensitive Areas and other schemes under the Agri-Environmental Regulation, Agriculture Select Committee Report, (1996/97 HC 45) Para 9

- the extensification of arable and livestock farming "including the conversion of arable land into extensive grassland;

- the promotion of land uses which are compatible with "the protection and improvement of the environment, the countryside, the landscape, natural resources, the soil and genetic diversity;

- the upkeep of abandoned farmland and woodland;

- the long-term set-aside of land for "reasons connected with the environment";

- management of land for public access and leisure;

- the education and training of farmers in types of farming compatible with the requirements of environmental protection and upkeep of the countryside.

15. To achieve these goals the Regulation, "subject to positive effects on the environment and the countryside", allows the provision of aid to farmers for a number of activities, including:

    - substantially reducing the use of fertilizers and/or crop protection products, keeping to reductions already made or introducing or continuing with organic farming methods;

    - changing to more extensive methods of crop production, maintaining previously introduced extensive production methods or converting arable land into extensive grassland;

    - reducing stocking rates;

    - using farming methods compatible with the protection of the environment, natural resources, the countryside, the landscape and local breeds in danger of extinction;

    - the upkeep of abandoned farmland or woodland;

    - the set aside of land for at least 20 years with a view to its use for purposes connected with the environment;

    - the management of land for public access and leisure activities.

In practice, although many schemes were put forward, the environment remained of marginal importance to the CAP. When the 1992 reform of the CAP introduced the compulsory set aside for arable land, the concern was to reduce output, not to improve the environment. The original plan was to insist that different land be set aside each year. That prevents farmers from choosing their worst land for set aside, but it also reduces to almost nothing the environmental benefit. There is no time for new plants and bushes to grow before they would be ploughed in for another wheat crop. The then UK Agriculture Minister (Mr Gummer) pressed successfully for another option whereby a larger percentage of land would be set aside, but the same land on the farm would be set aside each year. In the event, excess production was much less of a concern than expected in the mid 1990s, because of poor world crops, and the set aside rules were greatly relaxed. Set aside is to be virtually abolished in the Agenda 2000 plans for CAP reform, by being set at a rate of zero.

Research for the Countryside Commission, based on a survey of 600 British farmers between 1994 and 1997, concluded that the 1992 reform of the Common Agricultural Policy brought very limited environmental benefit to Britain.[22] In the arable sector researchers found that the unexpected trends in market prices since the introduction of the 1992 measures had prevented the predicted decline in cereal production that would reduce fertiliser and pesticide use. However, the researchers also blamed the CAP arable regime for failing to encourage a return to more mixed farming systems in many parts of the country. The beef and sheep sectors had been more affected by BSE and its effects than by the 1992 reforms. The "accompanying measures" which heralded an expansion of existing agri-environment schemes and the creation of some new ones had little impact, with only 7.4% of the farms taking part in one or more of the schemes. The best the researchers could find was that the reforms had reduced the chances of an expansion of environmentally damaging measures.

Part of the problem of trying to introduce environmental policy into agriculture is that the mainstream land use is often so profitable under the Common Agricultural Policy, particularly for arable farming. The normal arable farmer benefits from intervention prices set normally at well above the level of world prices and also arable area payments. It is therefore difficult to make it financially worthwhile to farm in a different way for environmental reasons. There are less profitable sectors of farming – for example livestock farming in hilly areas. Hill livestock compensatory amounts are paid to the farmers according to the number of livestock, so farmers are encouraged to have more animals grazing the land than may be desirable. At times, the CAP has been accused of subsidising over-grazing.

Another problem with EC agri-environmental policy is that the conditions in Member States are so different. It is therefore very difficult to lay down a centralised policy that makes sense. On the other hand, decentralised policies are expensive and difficult to administer.

C. Agenda 2000 and Environmental Policy

The European Commission Explanatory Memorandum on the March 1998 legislative proposals for Agenda 2000, covering the changes proposed in the CAP to facilitate enlargement of the EU, contains the following account of the environmental proposals in paragraph 2.4:[23]

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[22] The effects of the 1992 reform of the CAP on the countryside of Great Britain, 1998, Quoted in *Countryside* Spring 1998

[23] http://europa.eu.int/en/comm/dg06/agprop/mot-en.htm

> Action on the environment is to be substantially reinforced. The resources devoted to agri-environmental measures are increased and the aid for less-favoured areas is to be made into an instrument for consolidating, or even expanding, cultivation methods requiring low intermediate inputs. A major effort will be made to encourage truly extensive beef production by almost tripling the premium for this type of livestock farming. Finally, Member States will have to take detailed steps to ensure that environmental rules are complied with, including reducing or discontinuing direct payments.

The increase in resources may be welcomed but they still remain very small compared to the mainstream CAP. Crucially there is no mention of making arable area payments dependent upon the farmer satisfying environmental criteria. Indeed, since these payments are justified as being compensation for reductions in intervention prices, it might be difficult for the European Commission to gain acceptance for the imposition of environmental conditions. Environmental conditions in less favoured areas are perhaps more acceptable but there are also problems. For one thing, farmers in less favoured areas – often livestock farmers in hill areas - are often very poor. They are the ones who have received least benefit from the CAP. Therefore environmental conditions cannot reasonably be imposed without increasing their payments. There is a paradox here. Because hill farms are more attractive to the general public, it is more acceptable to impose further environmental conditions upon them. The second problem is that hill farmers do not want, in general, to farm in order to maintain the landscape. They see themselves as farmers rather than park keepers.

D. The Basing of Support on Environmental Conditions

Cross-compliance – whereby farmers have to satisfy conditions in order to receive financial support - has already been introduced in some areas, for livestock farmers. The idea is to prevent a situation where farmers are encouraged to have as many animals as possible and therefore overgrazing results. On the whole, the policy is resented by farmers who claim that overgrazing would be completely against their interests, through damaging the grass on which the animals feed. The disagreement as to whether overgrazing takes place reflects different definitions of overgrazing. Farmers take the term “overgrazing” to mean grazing to such a point that the regeneration of the grass is damaged. They point out that it would be very foolish and unlikely for a farmer to do this. Environmentalists take “overgrazing” to mean grazing so much as to reduce the range of plants on the ground. This, they argue, is relatively common in hilly areas, where farmers are paid subsidies according to the number of livestock.

It is much harder to impose environmental conditions on arable farmers than on livestock farmers. It is easy to have a rule that subsidies are only paid for a certain number of animals for each given area. Since hill farmers derive so much of their income from subsidy it would be feasible, if unpopular, to require satisfaction of environmental conditions for all subsidy. Public opinion might well support the idea, since it would be able to see the benefits of paying the subsidy.

A recent House of Lords Select Committee on the European Communities report concluded against cross-compliance, partly because they favoured more radical measures.[24] They point out that cross-compliance can only be used in those areas in which the CAP provides direct income support, and argue that "these may be neither the product areas not the geographical regions in which the greatest gain from environmental expenditure can be made". They also favour the phasing out of all compensation and fear that its replacement by environmental measures would be used as an argument to resist change. They further point out that cross-compliance is tied to production and might well be seen by WTO partners as covert protection for EU farmers.

Although there is considerable logic in the Lords Committee objections, their viewpoint is very different from that prevailing in the EU. The Commission has not proposed extensive cross-compliance, not through fear of producing another argument against change, but because there is so much opposition amongst agriculture ministers to the most modest changes. Thus, Agenda 2000 is seen by both the Commons and Lords Committees as not going nearly far enough because of the high level of compensation for price reductions and the absence of any date for ending such compensation. On the Continent, however, there has been enormous opposition to Agenda 2000 by agriculture ministers that it risks damaging farm incomes.

At the moment, therefore, it is difficult to see how Commissioner Fischler will manage to get his proposals adopted without considerable further concessions. The idea of wanting to go further than cross-compliance does not currently seem to be on the agenda.

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[24] CAP Reform in Agenda 2000 the Transition to Competition: Measures for Rural Development and the Rural Environment (1997/98 HL 84) paragraph 81

III UK Agri-Environmental Policy

A. Codes of Good Agricultural Practice and Legislation

An important way that MAFF tries to improve protection of the environment has been to use Codes of Practice, as in other areas such as animal welfare. There are Codes of Good Agricultural Practice for the protection or air, water and the soil. The current versions are being revised after consultation. They describe the legal position but mainly concentrate on advice to farmers to minimise problems of potential pollution. The Codes of Practice are not statutory requirements, but could be cited in prosecutions. Thus a prosecution case might quote neglect of the code of good practice as evidence in a prosecution for polluting the water supply. The approach acknowledges the difficulties that would arise in trying to frame legislation so as to cover the whole area, along with problems of enforcement.

In 1994/95 MAFF and the Central Office of Information funded a study to evaluate the codes, which concluded that their impact was limited. While 45% of farmers were aware of one or more of the Codes, only 18% owned a copy of the Water Code, 7% the Air Code and 5% the Soil Code.[25]

There are also two codes relating to pesticides. The Code of Practice for the Safe Use of Pesticides on Farms and Holdings (the Green Code) gives practical guidance to farmers and growers engaged in commercial crop production in Great Britain in respect of Part III of the Food and Environment Protection Act 1985 (FEPA) and in particular the regulations controlling the use of pesticides under that part of the Act. The latest version warns farmers to assess the potential harm to people, animals and the environment before spraying pesticides. Farmers should give adequate warning to neighbouring communities and the relevant authorities of the days and times when they will spray pesticides. The other code is the Code of Practice for Suppliers of Pesticides to Agriculture, Horticulture and Forestry (the Yellow Code) which contains guidance for those involved commercially in the sale, supply and storage for sale of "pesticides approved for agricultural use".[26]

There is also a Department of the Environment Code of Practice for the Agricultural Use of Sewage Sludge (1996).

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[25] *MAFF News Release,* 1 May 1996
[26] *MAFF News Release,* 26 March 1998

Farmers are also subject to a great deal of environmental legislation. Laws cover waste disposal and also the use of sewage sludge for spreading on the soil. A farmer can be prosecuted under the Water Resources Act 1991 for causing or knowingly permitting a discharge of poisonous, noxious or polluting matter or solid waste matter into any controlled waters without proper authority. The Environmental Protection Act 1990 also allows environmental health officers to intervene in cases of statutory nuisance – including smell, noise or gases. That might be relevant to a farmer near a village, although tests of reasonableness are applied.

The Control of Pollution (Silage, Slurry and Agricultural Fuel Oil) Regulations 1991 (SI 324) (as amended) lay down strict rules for the way that silage, slurry and agricultural fuel are stored, with strict requirements for storage containers, many of which had to be completely rebuilt. The purpose, of course, is to prevent overflow of these fluids into streams and rivers.

B. Environmentally Sensitive Areas

Environmentally Sensitive Areas (ESAs) date back to the *Agriculture Act 1986* s.18. The scheme was later approved by the European Union, and is now part-funded by the EU under agri-environment regulation 2078/92. The idea is to select an area of particular environmental sensitivity and offer farmers annual subsidies for particular types of behaviour which help to preserve these features, to compensate for income foregone. The objective is laid down in sub-section 18(1) of the 1986 Act.

> If it appears to the Minister that it is particularly desirable -
>
> (a) to conserve and enhance the natural beauty of an area;
>
> (b) to conserve the flora and fauna or geological or physiographical features of an area; or
>
> (c) to protect buildings or other objects of archaeological, architectural or historic interest in an area,
>
> and that the maintenance or adoption of particular agricultural methods is likely to facilitate such conversion, enhancement or protection, he may, with the consent of the Treasury and after consulting the persons mentioned in subsection (2) below as to the inclusion of the area in the order and the features for which conservation, enhancement or protection is desirable, by order designate that area as an environmentally sensitive area.

There is no general rule as to what farmers must do. They may be asked to reduce winter grazing, to keep up water levels, to reduce fertiliser levels and so on. The idea is that the requirement is carefully tailored to the particular area. The scheme is normally considered to have been a success and is popular with farmers. It has been the model for an EC scheme, within which the UK scheme now operates.

One major problem with schemes of this type, however, is that they operate very well in a particular area but they are expensive and it would be difficult to extend them nation-wide because of the cost. The ESA introduced the idea that farmers can be expected to be compensated for anything that they do to benefit the environment. That is not entirely a healthy attitude and is very different from the position of landowners wishing to erect buildings. They have to conform to planning law and do not receive any compensation if the application for planning permission is refused. All they have is the right of an automatic appeal against the refusal of planning permission. One problem of the approach in agriculture is that the policies offering subsidies for desirable behaviour work well for limited areas but would cost too much to be generalised over the whole country.

A further problem with schemes like the ESAs is that the annual payments have to be continued in order to maintain the benefits. A recent study emphasises the point:[27]

> Discontinuation of the scheme would induce a number of changes that would largely undo changes effected by farmers joining the ESA scheme over the past few years. This would result in intensification of mainly livestock (and some arable) enterprises, increased production of forage and more use of fertilisers and pesticides. Some land converted from arable to grass-based enterprises would also probably revert to arable. The main driving force for introducing such changes would be the desire to offset loss of revenue and income derived from ESA payments.

C. Countryside Stewardship

This is the main incentive scheme for the wider countryside in England outside ESAs. The objectives of the programme are:

- to conserve and enhance important English landscape (outside ESAs) for their scenic beauty, wildlife, habitats, history and archaeology and
- to provide opportunities for people to enjoy the countryside.

The scheme encourages farmers and land managers to enter into 10 year management agreements. The eligible landscapes and features include chalk and limestone grassland; lowland heath; waterside land; the coast; uplands; historic landscapes; old traditional orchards; old meadows and pastures; community forests; the countryside around towns; traditional field boundaries (hedges, stone walls, banks and ditches) and the margins of arable fields. In consultation with interested organisations MAFF identifies certain key landscapes and features from this list for each county, and these are given priority for available funds.

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[27] Economic Evaluation of Stage II and III ESAs: Final Report (GEAS for MAFF) August 1997 p.x

MAFF is planning an experimental scheme to test an integrated approach to rural economy in and agri-environmental issues in the uplands.[28] The idea is to bring together thinking on agri-environmental and rural development measures, partly since this integration was proposed by the European Commission's Agenda 2000 in 1997. The experiment is to test the approach using existing mechanisms and powers currently available.

D. Other UK environmental Schemes

The **Habitat Scheme** in England was launched in 1994 as a pilot scheme, aiming to benefit wildlife on three types of land: water fringes in six designated areas; farmland previously in the Five Year Set-Aside Scheme; and coastal saltmarsh. The **Countryside Access Scheme** is designed to encourage farmers to provide public access to land set aside under the Arable Area payments Scheme. Since set-aside is not a feature of the CAP reforms in Agenda 2000, and since the uptake of the Scheme has been extremely low, it is unlikely to have a future.

E. Hedgerows

The *Hedgerows Regulations 1997* (SI 1160) came into force on 1 June 1997, although the measure was passed during the life of the Conservative Government. They aim to protect important hedgerows in the countryside by controlling their removal through a system of prior notification. Anyone removing a hedgerow illegally may face an unlimited fine. Before removing any hedgerow, including a stretch of hedgerow to which the Regulations apply, the owner (or in certain cases a relevant utility operator) must notify the local planning authority. The hedgerow may then not be removed if the local planning authority serves a hedgerow retention notice, which may be done only if the hedgerow is important according to specific criteria laid down in the Regulations.

However, the Environment Minister, Mr Meacher, has set up a review group to recommend ways of strengthening the Regulations. The group will consider giving local authorities longer to consider hedgerow removal notices, and how to improve the definitions of important hedgerows, including possibilities for simplification.[29] Its report is now with Ministers and a response is expected before the 1998 summer recess.

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[28] Environmental Management in the uplands, MAFF Consultation Paper, March 1998

[29] *DETR Press Release,* 29 July 1997

Certainly the current definitions are complex, including criteria for historical and biological importance. The latter include the number and types of species found in the hedge, including various detailed points on the measurement, such as:

> (3) where the length of the hedgerow exceeds 100 metres, but does not exceed 200 metres, count the number of woody species in the central stretch of 30 metres in each half of the hedgerow and divide the aggregate by two.

The Council for the Protection of Rural England claims that current hedgerow legislation only protects 20% of England's 374,000 kilometres of hedgerow.[30]

F. Will there be a tax on fertilisers and pesticides?

This idea has been considered in the DETR discussion document, Economic Instruments for Water Pollution, November 1997. The Executive Summary notes that water pollution can arise from run-off from agricultural land as well as from urban land.

> 20 For such sources, in addition to tradeable permits, the main relevant economic instrument is likely to be a product charge (intended to reduce the use of harmful substances and to encourage the use of less harmful alternatives).
>
> 21 As identified above, two of the sources of water pollution about which concern is frequently expressed are nutrients (nitrates and phosphates) and pesticides (although the impact of pesticides is wider than on water alone). It may be possible to use economic instruments, such as a charge paid when the product is bought or a tradeable permit scheme operating in a small area, to support wider policies on nutrient use and to limit pesticide use to the minimum necessary for effective pest control.
>
> 22 Any such economic instruments need to be properly targeted to achieve such objectives whilst remaining relatively simple to administer. For example, with pesticides, there are many different products with different polluting effects. These effects depend on the constituents of the products and the way in which they are used. A scheme must be able to cope with these differences whilst remaining practicable. Any instruments would also have to be consistent with European obligations, particularly in terms of the operation of the single market.

A tax on fertilisers or pesticides is therefore a possibility but there is some way to go before it becomes a definite proposal. There was no reference to it in the 1998 Budget.

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[30] CPRE Press Release, 10 June 1998

G. Indicators of Sustainable Agriculture

MAFF has released a consultation document about the development of indicators on how sustainable UK agriculture is.[31] The indicators are grouped together, not necessarily in order of priority, under the following themes:

(a) Nutrient losses to freshwater;
(b) Nutrient management practices;
(c) Ammonia emissions;
(d) Greenhouse gas emissions;
(e) Pesticide use;
(f) Water use;
(g) Soil protection;
(h) Agricultural land resource;
(i) Conservation value of agricultural land;
(j) Environmental management systems;
(k) Rural economy;
(l) Energy

The document covers the area to be covered by the indicators, but does not offer the actual indicator itself. That will appear in a later document.

[31] Development of a Set of Indicators for Sustainable Agriculture in the United Kingdom, MAFF 22 June 1998

IV Organic Farming

A. What is Organic Farming?

There are various possible definitions of organic farming, but one from the USA Department of Agriculture in 1981 is generally acceptable:

> Organic farming is a production system which avoids or largely excludes the use of synthetically compounded fertilisers, pesticides, growth regulators and livestock feed additives to the maximum extent feasible. Organic farming systems rely on crop rotation, crop residues, off-farm organic wastes, mechanical cultivation, mineral bearing rocks and aspects of biological pest control to maintain soil productivity and tilth to supply plant nutrients and to control insects, weeds and other pests.

It is a legal requirement[32] for anyone producing or preparing, including packaging, organic food, or importing it from outside the EU, to be registered and to operate at least to EU regulation standards.[33] Annex I to the EC Regulation defines principles of organic farming at farm level, for plants and plant products:

> 1 The principles set out in this Annex must normally have been applied on the parcels during a conversion period of at least two years before sowing or, in the case of perennial crops other than grassland, at least three years before the first harvest of products…
>
> 2 The fertility and the biological activity of the soil must be maintained or increased, where appropriate, by:
>
> (a) cultivation of legumes, green manures or deep-rooting plants in an appropriate multiannual rotation programme;
> (b) incorporation in the soil of organic material, composted or not, from holdings producing according to the rules of this Regulation. Pending the adoption of common technical rules concerning organic livestock production, by-products from livestock farming, such as farmyard manure, may be used if they come from livestock holdings respecting existing national rules or, in the absence thereof, internationally recognised practices concerning organic livestock production.
>
> Other organic or mineral fertilizers…may be applied only to the extent that adequate nutrition of the crop being rotated or soil conditioning are not possible by the methods set out under (a) and (b) of the preceding subparagraph.
>
> For compost activation, appropriate micro-organism, or plant-based preparations (biodynamic preparations) may be used.

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[32] Under the *Organic Products Regulations 1992*, which implement *EC Regulation 2092/91*

[33] *MAFF News Release* 1 October 1992

3 Pests, diseases and weeds shall be controlled by a combination of the following measures:

- choice of appropriate species and varieties,
- appropriate rotation programme,
- mechanical cultivation procedures,
- protection of natural enemies of pests through provisions favourable to them (e.g. hedges, nesting sites, release of predators),
- flame weeding.

Only in cases of immediate threat to the crop may recourse be had to products referred to in Annex II [other organic or mineral fertilizers].

B. Support for Organic Farming

In the UK, organic farming tends not to be profitable, and more support would almost certainly increase the proportion of land being converted. A large problem is that costs are incurred over at least two years, and perhaps five, before the conversion is complete and therefore before the produce can be sold at a premium. Only 0.3% of UK agricultural land is devoted to organic farming, a low figure by international standards.[34] Organic farming covers less that 1% of agricultural land in France, Spain and the Netherlands, but is between 1 and 2% in Germany and Italy. It is between 7 and 8% in Austria. A survey, conducted by the University of Cambridge Agricultural Economics Unit,[35] noted that income levels on wholly organic farms compared unfavourably with conventional farms. In contrast, on partly organic farms, especially for those engaged in arable cropping and horticulture, they compared very favourably with conventional farms. However, the partly organic dairy farms and mixed livestock farms performed worse than their conventional counterparts. When the report appeared, there was some comment that it showed just how unprofitable organic farming was. Although that is true, the conclusions do show a slightly more encouraging picture in some areas, notably for the mixed farms, suggesting perhaps that organic farming can have a profitable role within a larger unit. However, there is little sign that organic farming is ever likely to operate on a large scale.

Some work has been done on consumer demand for organic food. A general conclusion is that most people like the idea but are unwilling to pay the large premiums placed on prices of organic produce. One study noted that interest in consumption increased sharply when the price premium was below 20% but in practice price differentials were often 40-100%.[36] Another, more recent study noted the importance of expense, and concluded that consumers were not put off organic produce by its uneven appearance.[37] Over the fast few years sales of organic

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34 HC Deb 16 June 1998 c.159W

35 M.C.Murphy, *Organic Farming as a Business in Great Britain (June 1992)* pp.2-3

36 B.Beharrell and J.H.MacFie, Consumer Attitudes to Organic Food, *British Food Journal, 1991* p.29

37 A.Tregear et al., The Demand for Organically Grown Produce, *British Food Journal,* 1994

produce have increased sharply as supermarkets priced them much nearer to the prices of ordinary produce. A recent newspaper report was enthusiastic:[38]

> Despite organic vegetables costing 20%-50% more, supermarkets are struggling to meet demand, which has grown by 50% every year for the last four years. The organic market was worth £265m last year, over half in fruit and vegetables. However, it still accounts for only 2% of all food sales in Britain.

Another report cited a survey of 10,500 households, with 25% of consumers saying that they buy organic food.[39] However, with so little UK land devoted to organic farming, retailers rely heavily upon imports. It is possible, however, that if the demand continues, more UK farmers will convert to organic methods.

In the UK, MAFF aims to sponsor organic farming in three ways; thorough the operation of standards, for organic foods and their production, through research and through a direct incentive scheme for conversion. The aid for conversion is offered through a scheme opened in August 1994 under the EC agri-environment programme, with 50% of expenditure reimbursed by the EC. The Organic Aid Scheme pays aid to those converting to organic farming on an area basis with a minimum eligible size of one hectare. There is no maximum eligible size of a unit, but aid is paid up to 300 hectares.[40] Participants are required to maintain the organic status of their unit whilst aid is being paid on any part of it. The scheme is open to applications throughout the year. Participants must register their proposed land for conversion with one of the organic sector bodies or with the UK Register of Organic Food Standards, and provide a conversion plan.[41]

Uptake has been lower than expected, with spending in 1995/96 and 1996/97 well below the level planned. In 1996/97, the planned total scheme costs were £1,226,000 but actual spending was only £627,000.[42] The low level of take-up suggests that MAFF believed that the incentives would have more effect than has proved to be the case. The Government established a review into the level of aid, whose principal recommendation was that the total aid paid should be increased from £250/ha to £450/ha for land eligible for the Arable Area Payments Scheme and to 3350/ha for ineligible land, excluding unimproved land/rough grazing. The Minister, Dr Cunningham, announced an interim package of measures to support the organic sector.[43] Full decisions on the structure of aid will be taken in the light of the Comprehensive Spending Review.

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38 Evening Standard, 10 June 1998

39 The Herald, 24 January 1998. The survey was by Neilsen Homescan

40 *The Organic Farming (Aid) Regulations 1994* (SI 1721)

41 *MAFF News Release*, 1 July 1994

42 *MAFF Annual Report 1997*, Cm 3604, p.109

43 *MAFF News Release*, 2 April 1998

One problem is that conventional arable farming is so profitable that considerable grants are needed to persuade a farmer to forego those benefits, irrespective of any merits of organic farming. Another problem is that organic produce must be on land that has not had inorganic fertilisers or pesticides used on it for five years. Therefore there is a period after conversion to organic farming before the produce can be sold as organic.

There seems to be more interest in promoting organic farming abroad. In November 1996, the Dutch Government launched Plan Vanaanpark to overcome the problem of low consumer awareness of organic food. The plan is worth $29m over four years and aims to boost the market with advertising campaigns.[44] There has been some interest in the UK in the policy of Tesco of selling organic produce more cheaply, but this is believed likely to result in more imports rather than in higher domestic production, at least for some time to come.[45] Tesco is also sponsoring some research to try to develop ways of growing organically on a large scale. The argument is that since the vast majority of produce comes from large commercial growers, progress towards organic farming will only come when ways are developed for these farmers to grow organic produce cheaply.

One way in which the CAP could be more environmentally friendly would be to offer more incentive to organic farming. In many ways it fits in with the EU's objectives. It does not aim at maximising production and therefore would not contribute to increasing surpluses. It does not contribute to the various environmental problems associated with intensive farming, particularly from pesticides and fertilisers. It is related to the traditional small-scale farming to which the Commission is sympathetic.

However, it should not be assumed that organic farming is necessarily free of environmental problems. There are two issues here. First, organic farming involves use of organic rather than inorganic fertilisers and pesticides. Second, organic farming is often associated with farming that is not intensive.

The use of organic, rather than inorganic, fertilisers does not remove the possibility of environmental damage. Organic fertilisers can contribute to nitrates in water, just like inorganic fertilisers for example. It is difficult to make an appropriate comparison because so many aspects of the farming, including scale, would differ from conventional farming.
Many environmental problems arise from intensive farming. A common one relates to excrement from cattle. The slurry from a few cows can be a useful fertiliser. However, if large numbers of dairy cattle are kept close together, their slurry can be a major problem through pollution of water supplies. The problem with extensive farming is that more land is needed in order to produce the same amount of food. Critics of organic farming argue that it

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[44] *Financial Times*, 12 November 1996

[45] *Guardian*, 5 November 1996

may be no more beneficial to the environment per unit of output than conventional farming. Therefore if account is taken of the need to produce food for the whole population organic farming is not necessarily an environmentally acceptable option. In the UK context, it is difficult to make a sensible comparison between the farming system used on only 0.3% of agricultural land and that used on the rest.