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ENVIRONMENTAL INTEGRATION AND THE CAP:

FINAL REPORT, DECEMBER 2001

NOTE: THIS PAPER WAS WRITTEN BY IEEP AND PROJECT PARTNERS. IT REPRESENTS THE POINT OF VIEW OF THE AUTHORS.

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1: Introduction and Context for the Study

1.1 Environmental Integration and the CAP

Integration

In recent years, following changes in the Treaty, the EU has placed increasing emphasis upon the need to promote sustainable development and, in particular, to integrate environmental considerations more fully into the sectoral policies of the Union. Six particular developments are relevant:

- The Cardiff Integration Process requires formations of the European Union Council of Ministers to develop comprehensive strategies to integrate environmental concerns within their respective areas of activity. Nine formations of the Council – Transport, Agriculture and Energy, Development, Internal Market and Industry, and General Affairs (GAC), Economic and Finance (Ecofin) and Fisheries, have been called upon to develop strategies. The Agriculture Council presented an initial strategy to the Helsinki Summit in December 1999, followed by an updated strategy document for the Gothenburg Summit in June 2001.

- At the same time the Commission launched a comprehensive overhaul of the CAP which was eventually decided in the Council in March 1999. The Agenda 2000 reform pursued environmental integration in many respects: it established the general obligation on the Member States to introduce appropriate environmental measures for a range of commodity regimes while leaving a wide degree of freedom as to how Member States can fulfil their obligation. Environmental clauses have been introduced into both market policies and rural development programming. Agri-environmental measures were consolidated as compulsory parts of rural development programmes.

- The Commission's 1999 Communication 'Directions Towards Sustainable Agriculture' acknowledged the importance of integrating environmental requirements into the Common Agricultural Policy, identifying agri-environmental measures as a significant instrument for this purpose.

- The EU's affirmed commitment to sustainable development, through the Treaty of Amsterdam has led to the production of a sustainable development strategy (SDS). The Commission's proposals for an EU SDS were published in May 2001, focusing on improving the effectiveness of policy and ensuring that different policies reinforce one another rather than pulling in different directions. Some elements of this were explicitly taken up in the Presidency Conclusions on the Gothenburg Council whereas – for the remaining elements – more specific discussions were requested from the different formations of the Council. The Commission will report to each Spring European Council on progress with the strategy.

- The Community's proposed Sixth Environmental Action Programme (6EAP) includes the integration of environmental concerns in all EU policies as one of its central 'strategic approaches'.

- Commission Biodiversity Action Plans were adopted in March 2001, and are now due for implementation. The Biodiversity Action Plan for agriculture focuses on the environmental impacts of agriculture in Europe and the integration of biodiversity concerns into the Common Agricultural Policy, particularly through the Agenda 2000 reforms.

There is no single pattern for progressing integration in different sectors. Precise objectives and the most appropriate means of pursuing them will vary between sectors, as well as evolving over time as experience is accumulated and circumstances change. Nonetheless, two strands can be expected in any integration strategy:

- Review and adaptation of the primary sectoral policies themselves – in this case the CAP;
- Complementary consideration and alteration, as necessary, of environmental policy.

Thus, account must be taken both of the performance of the CAP in relation to the environment and of environmental policy in relation to the agricultural sector. The focus of this study is on the EU level and it should be noted that there is a very significant degree of formal Community competence in both agricultural and environmental policy, especially in the former.

Agriculture and the Common Agricultural Policy

The CAP represents one of the longest established and most comprehensive EU sectoral policies. In statistical terms, agriculture is not a major economic sector - it contributes about 1.8% of GDP (Directorate-General for Agriculture, 2001) and accounts for a small, and a declining, proportion of EU employment - currently around 4.5%, although the figure varies considerably between regions (European Commission, 2001). However, such figures understate the importance of agriculture in a number of ways:

- Food is a vital and immediate component of people's daily experience. Therefore, food production is a particularly sensitive issue which has probably gained in importance as a result of recent health concerns, such as the BSE crisis;

- Agriculture is an integral part of the EU agrifood sector (including primary production, processing and related inputs) which has a share of around 6% of total gross value added in the EU as a whole and includes a number of Europe's largest companies;

- Agriculture is visible to citizens as the single largest user of land in the EU. More than three-quarters of the territory of the EU is agricultural or wooded land, and agriculture's share is over 50 per cent in many Member States. Farming has been and still remains a prominent feature of Europe's rural landscapes as well as a major determinant of EU biodiversity. It also exercises an important influence on the status of European soils, water and air.

- In many Regions, agriculture remains an important element in the social and political character of rural areas and many rural activities and cultural values are imbedded in an essentially agrarian matrix, particularly in the more remote areas of each Member State.

The Common Agricultural Policy (CAP) is based on the objectives set out in the Treaty of Rome which includes specific articles concerning the CAP as well as general provisions such as the requirement to integrate environmental concerns and the need to contribute to sustainable development. The CAP covers – with varying degrees of intervention - most but not all of the commodities produced in the EU. There is a wide spectrum of policies within the CAP, including different commodity regimes, structural and rural development measures, currently accounting for a budget of around Euro 40 billion per annum. There is a brief synopsis of the main measures in section 3.1.

EU Environmental Policy

EU environmental policy is made up of several hundred measures, introduced from the 1970s onwards. These cover nearly all the major environmental issues, including air and water pollution, waste management and disposal, the control of chemicals and dangerous substances, the protection of biodiversity, climate change and environmental assessment. A number of measures impinge on agricultural practice, particularly those concerned with protecting biodiversity within Europe, the supply of clean water, control of agrochemicals and GMOs, certain forms of waste disposal and environmental assessment. However, very few measures are concerned specifically with the agricultural sector. One exception is the Directive on nitrates from agricultural sources (91/676) which, inter alia, sets limits on the application of organic fertilisers in order to keep the concentrations of nitrate in fresh water below a given limit value.

Agriculture and the Environment

The relationship between agriculture and the environment is complex, being expressed in different media and at a variety of scales over a range of time periods. Some relationships broadly hold true over a large geographical area, others are site specific. Scientific knowledge is far from complete in many spheres, for example in relation to the impacts of different farm practices on the life cycles of different soil organisms.

Nonetheless, it is clear that agriculture both damages the natural environment and plays an important role in the maintenance and management of cultural landscapes. This dual role, described further in Section 2, is more pronounced than for most other economic activities and needs to be reflected in the integration process, as noted in the Agriculture Council's own strategy presented at Helsinki.

1.2 Study Aims and Methods

This study has the following objectives:

1. To identify the perceived ranking of environmental issues related to agriculture

2. To scrutinise these in the light of available evidence

3. To distinguish CAP *policy driven* issues from those driven by other factors such as technical change and economic and social developments

4. To explore the scope and means for further integration of the environment into the CAP

5. To reach an informed understanding of the main options for integration within the CAP, particularly

    - 'add-on objectives' approaches
    - 'add on instruments' approaches
    - removal of damaging instruments

6. To assess the compatibility of these approaches with the objectives of the CAP, particularly the implications for farm incomes and agricultural structures

7. To assess their compatibility and complementarity with environmental policies

8. To assess their budgetary implications

To address these aims, the study has involved the following stages:

1. Review of the literature on the environmental impacts of agriculture and their causes

2. Semi-structured interviews with a range of key stakeholder organisations and scientific experts active at the EU level

3. Development of a detailed analysis of the evidence for CAP effects on the environment

4. Consideration of the main options for further integration

5. Hosting two seminars with representatives of environmental and farming organisations (including input industries) as well as selected experts, to examine the issues covered in stages 2-4, above and consider the scope to develop a common approach to integration

6. Evaluation and refinement of an integration 'package'

Annex 1 gives details of those experts and stakeholders involved in the various stages of the study.

The work has been undertaken between December 2000 and December 2001.

1.3 Acknowledgements

The main project team would like to acknowledge the help and support offered by all interviewees and attendees at the seminars. Particular thanks should also go to Guy Beaufoy, Eric Bignal, Bernhard Osterberg and Hiltrud Nieberg at FAL Braunschweig and Thomas

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2: General Approach, Key Environmental Issues Associated with Agriculture, and the Main Influencing Factors

2.1 General Approach, Key Concepts and Terminology

In responding to the terms of reference for the study and putting the focus on specific policy effects rather than broader interactions between agriculture and the environment, the approach taken builds on certain policy concepts. A basic analytical framework and key concepts can be specified briefly at the outset.

- Significant changes have occurred and continue to occur in the farmed environment and in ecosystems affected by farming. The impact of agricultural activity can extend considerably beyond the area actually being farmed. At the same time, farming itself is affected by changes in the wider environment which are not attributable to agriculture – industrial emission of sulphur compounds are one example.

- Where the causes of environmental change associated with agriculture are understood, usually they can be traced to changes in farm management. These include the use of new or larger quantities of inputs, changes in the mechanisms employed, variations in the numbers, distribution and methods of rearing livestock, and alterations in cropping patterns, landscape features and water use. These *direct causes* of environmental change may include the cessation of previous farm management practices as well as the adoption of new ones. Some can be isolated individually, as in the case of direct impacts arising from the use of a single pesticide. Others are viewed more conveniently as changes in *farming systems* or new management philosophies. The replacement of mixed crop and livestock systems with specialist arable or livestock farms and the displacement of low input dryland agriculture with more intensive irrigated production are examples of changes in farming systems.

- In order to explain these direct causes of environmental change, it is necessary to identify *driving forces*. Technological changes, alterations in the costs of labour, land and other factors of production and shifting patterns of market demand are all potentially important driving forces. So are socio-cultural changes such as the emergence of new employment preferences. Amongst these different types of driving force, *public policy measures* are one important category. Distinguishing the role of specific driving forces, including public policy, in accounting for the spectrum of environmental change may be difficult. However, it is a necessary step for drawing conclusions with respect to both understanding the process and to designing any policy response. This is particularly important as regards the question of whether and how to adjust the CAP in order to meet the requirement of environmental integration and whether and how to establish complementary environmental policies setting the 'rules of the game' within which agricultural production would take place.

- In practice, the possibilities for drawing a clear-cut line between the different driving forces may be limited. While evidence may point to the role of certain driving forces it may be insufficient to identify the particular weight of each and the interaction between them at a given time. Analysis may be hampered by the various time lags in the chain which begins with the appearance of a new driving force, resulting in alterations in farm management over a certain period, in turn causing environmental change, which may not

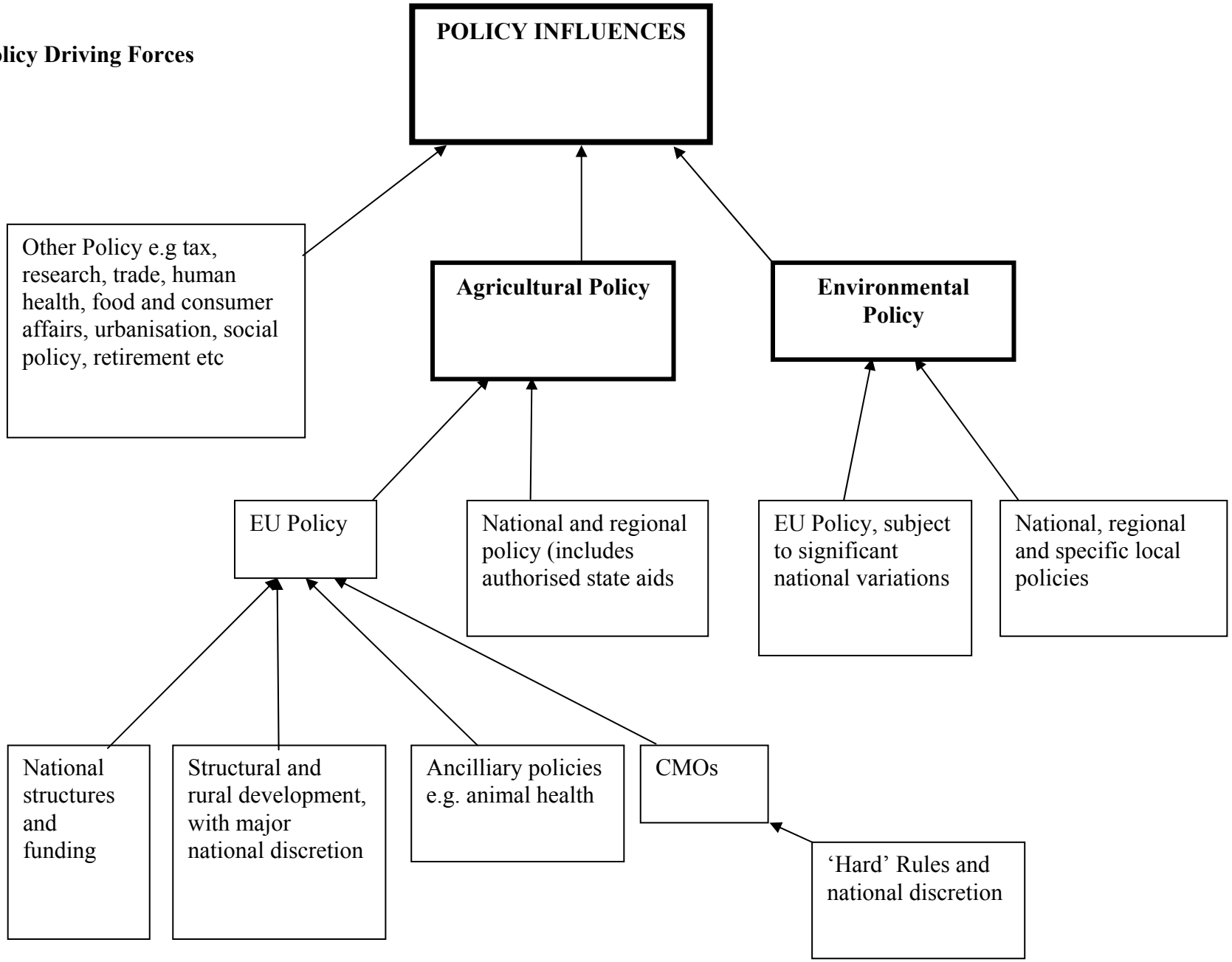
be recorded very rapidly once it has become apparent. Much of the best evidence explaining environmental change and farming practice can be found in geographically restricted local case studies. However, the extent to which the results can be extrapolated to a larger scale, particularly at the European level, is often unclear. The major variations in natural conditions, farming practice, socio-economic circumstances, local policy and market environments within the fifteen EU countries are such that generalisations must be treated with some caution. Complete precision in identifying the impact of individual policies often would be unobtainable.

- A range of different public policies may act as driving forces in agriculture. These include the *CAP itself*, national and regional policies and a variety of other measures in different policy realms. Economic, social, environmental, fiscal and land use policies for example can influence farm decision making (see Figure 1). The intention here is to focus on CAP policy impacts, separating them where possible from other strands in the policy mix.

- Any attempt to distinguish the impact of the CAP from other driving forces needs to take account of any variation in the implementation of the policy between Member States. All elements of the CAP in principle apply throughout the fifteen Member States. However, in practice they may not be implemented and enforced in an entirely uniform way. Even more significant are the variations which arise from the *discretionary elements of the CAP*. These include issues of potential environmental importance such as the choice of 'second pillar' measures, the implementation of the 'Common Rules' Regulation 1259/1999, the arrangements for applying milk quotas and the choice of 'reference yields' in certain market regimes. The ways in which Member States have utilised the freedom available to them in these policy fields must be considered alongside the more inflexible elements of the CAP.

- Any analysis which attempts to clarify the causal relationship between policies and change on the ground needs to consider the relative importance of the policies compared to other potential driving forces. Thus, an important question is always to address the 'counterfactual' situation, i.e. what would have happened without the policy? In scientific enquiry this question can be addressed by the use of 'controls' – situations where all variables other than the one under examination apply – so that comparisons can be made between 'policy on' and 'policy off' situations, in a direct way. In the realm of public policy analysis this kind of empirical approach is rarely possible, so other methods must be adopted to attempt to distinguish specific policy impacts. Nevertheless, the concept of the counterfactual remains critical because it is only once one has a clear appreciation of the relative role of specific policies vis a vis other factors that one can identify effective means of enhancing this, for the environment.

Figure 1. Policy Driving Forces



- In examining the policy adjustments necessary to avoid negative environmental effects and enhance positive ones, questions arise as to who should bear the resulting costs. Here, the *reference level* of 'good farming practice' provides guidance. *Good farming practice* means observing the rules resulting from mandatory environmental legislation as well as a level of environmental safeguard that a reasonable farmer is expected to apply anyway. Depending on the content of mandatory environmental legislation, respecting the obligations of 'good farming practice' could seriously constrain farmers' rights with regard to in land use. Thus the costs of avoiding negative environmental effects in compliance with 'good farming practice' would fall on farmers. This outcome arises from the application of the *Polluter Pays Principle*. However, where society calls upon a farmer to provide environmental outcomes above 'good farming practice', one would normally assume that a farmer's land use rights are affected. Providing environmental benefits above this *reference level* by deploying privately owned factors of production would, therefore, would create an obligation on society to offer a remuneration or compensation to the farmer. The definition of the reference level may change over time and will vary between Member States according to their legal traditions and the definition of property rights.

- In this sense, the reference level can be used to distinguish between *positive* and *negative* environmental effects. For example, if usual good farming practice does not require an uncultivated margin round the edge of an arable field its absence can be considered the lack of a positive effect rather than a negative effect. Penalties normally should apply in enforcing the avoidance of negative environmental effects below the reference level of good farming practice. Conversely, incentives would be offered for providing positive environmental effects above it.

- In considering the measures which could be adopted in order to strengthen integration, the focus is on three categories:

    1. The alteration or elimination of CAP policies which directly cause environmental damage.

    2. Measures which 'Add-on' environmental objectives to existing CAP policies, for example the addition of environmental conditions to direct payments in the commodity regimes, under cross-compliance;

    3. Measures which 'Add-on' instruments directly concerned with environmental outcomes. Agri-environment schemes would be a clear example of this approach.

    All three approaches could in principle have value and they are not mutually exclusive. A range of options is discussed in Section 4 of this report.

2.2 Environmental Issues and Impacts

Environmental assets in the EU include the basic resources of soils, water and air; rural landscapes, historic and cultural features, and biodiversity – both habitats and species. Farming can affect these assets in many different ways:

a) through the use of inputs, for example energy, agrochemicals, fertilisers, machinery, water, labour and land

b) through management practices – crop and animal husbandry techniques, including the pattern of rotations

c) through the allocation of farm land to different uses – changing cropping and stocking patterns on individual farms, increasing or decreasing the area of 'unproductive' land and landscape features

d) through structural and technological change, over time, including farm enlargement, specialisation of outputs, changes in production systems and farm types, and changes in factor productivity (in particular land and labour)

e) through the production and/or handling of farm 'waste' – eg manure, chemicals (pesticides and veterinary products, artificial fertilisers), plastics, dirty water, animal carcasses

f) through the creation or modification of the physical infrastructure related to agriculture eg new and old buildings, farm roads, water supply and irrigation systems, hedgerows, stonewalls, and terraces

g) indirectly, through the impacts of its changing relationship with consumers and markets eg developing high quality outputs or producing basic low-value commodities, producing for local markets or for export, selling direct from the farm or via a long 'food chain' (involving distributors, processors, retailers, etc).

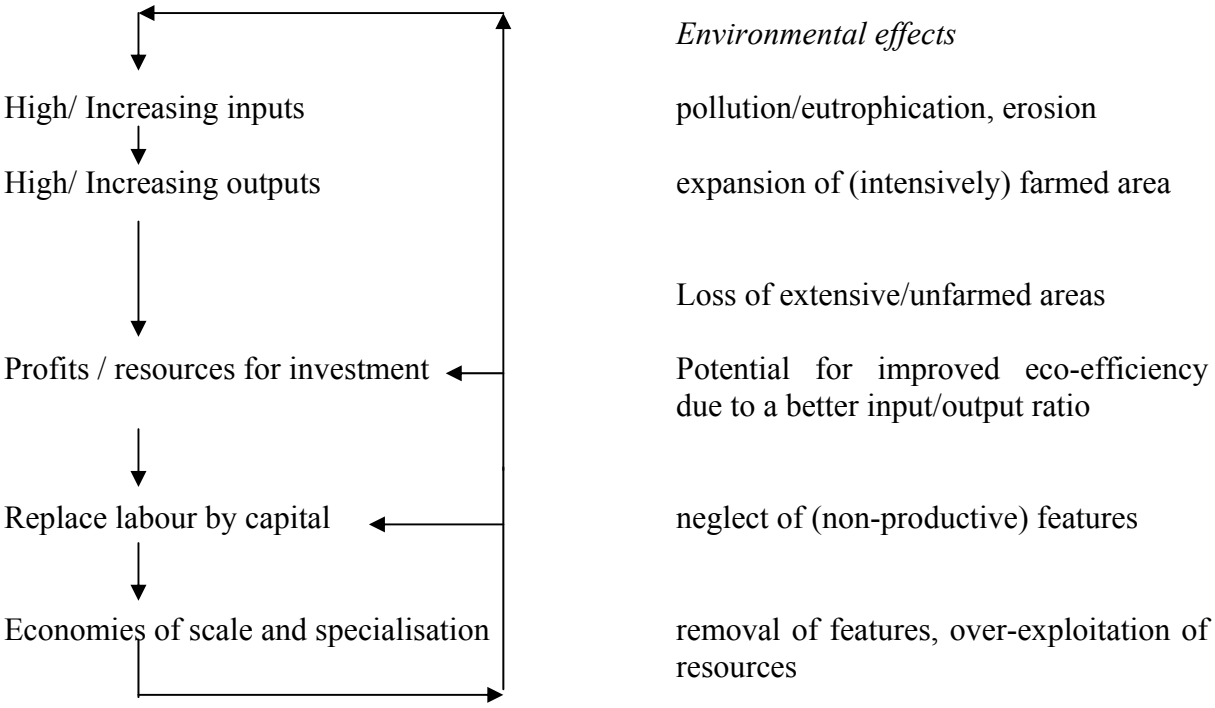
As farming in Europe has changed in recent decades, its environmental impacts have altered.

It is widely accepted that EU agriculture has helped to maintain and develop the great variety of landscapes and biodiversity which give the continent much of its unique natural and cultural value. For example, WWF in Sweden has recently estimated that 500 of Sweden's important species are dependent upon the protection and sensitive management of semi-natural grasslands which are the direct product of traditional agriculture. More broadly, several studies have emphasised the importance of so-called 'high nature value' farming systems which persist in many areas of Europe, in maintaining the continent's rich biodiversity and landscape heritage (eg Bignal and McCracken, 1996). In addition, over many centuries agriculture has created new landscapes and features which have acquired importance for ecosystem functioning and/or as ecosystems in their own right (eg traditional field boundary systems including hedges, ditches and stone walls).

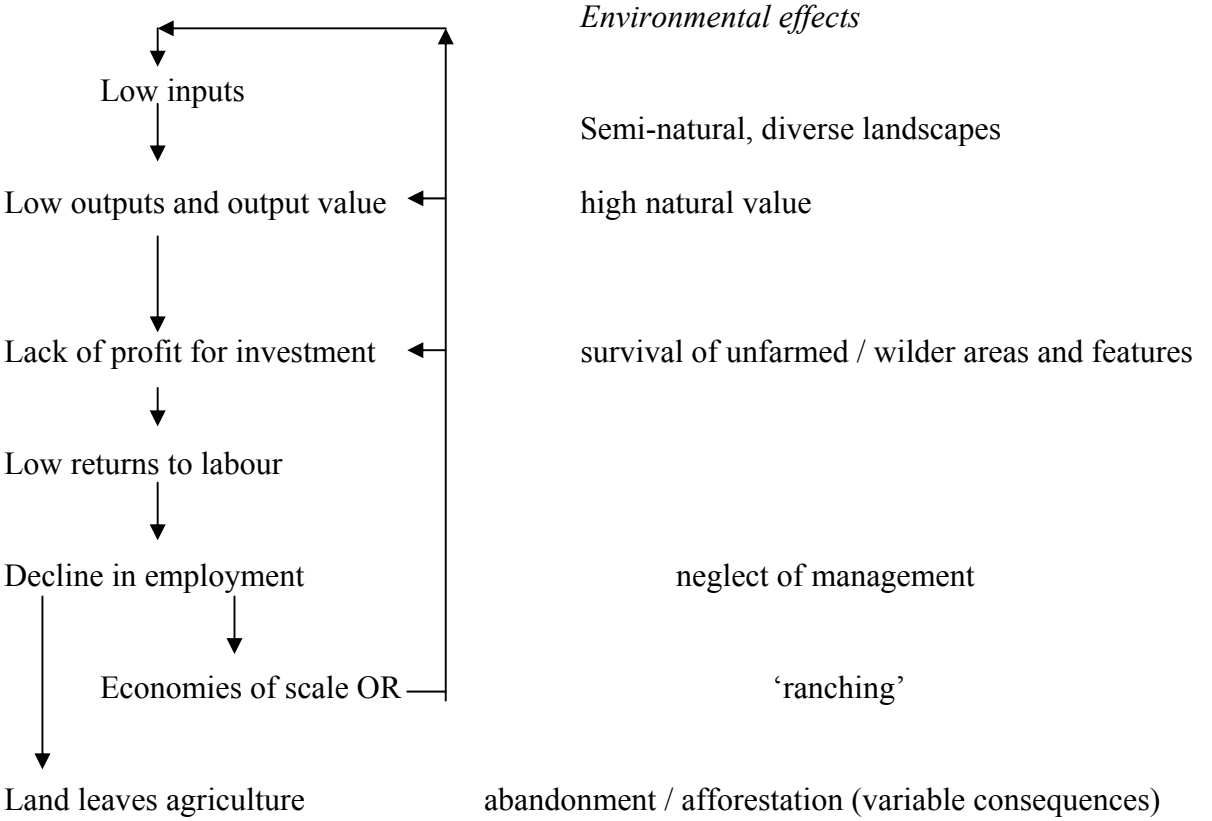
However there are many key issues of concern regarding agriculture's environmental impacts. Two simple models of adverse impacts arising from 'cycles' of intensification and marginalisation can be used as a tool to simplify these potentially complex and regionally variable effects (see Figure 2), but they mask some important details.

Figure 2 – Cycles of Intensification and Marginalisation in Agriculture

The Intensification Cycle – better land, economically favoured situations



The marginalisation cycle – poorer land/economically marginal situations



Following interviews with leading stakeholders and experts it has not proved possible to identify any clear ranking of environmental effects associated with European agriculture. However a number of principal concerns can be highlighted from the literature and discussions with stakeholders. Of these, some relate to most EU Member States while others are more a phenomenon arising in particular regions. Most obviously, there are some issues which are clearly more of a concern for southern Member States than for northern ones. The list below describes concerns according to these parameters.

- Water pollution including eutrophication from farm nutrients and wastes, pesticide contamination, and soil sediment. This affects both surface and groundwater and also the marine environment. It is a significant problem in some areas of intensive agriculture or vulnerable ecosystems, both north and south. Eutrophication applies particularly in areas of intensive livestock husbandry, while pesticide residues and soil sediment in water supplies are more a phenomenon of some arable and horticultural areas. Groundwater salinisation affects certain regions subject to intensive agriculture, for example part of the Mediterranean coastal strip. Certain crops, such as maize, olives and potatoes are liable to create particular risks as a result of the movement of soil sediment. Pollution from agricultural activities, particularly diffuse pollution, is currently a significant concern for most Member States as they begin to address the implementation requirements of the Water Framework Directive.

- Unsustainable levels of water extraction for agriculture. This is particularly a phenomenon of certain regions in the southern Member States, as well as southern and southwestern France. However, it has also periodically been an issue in some northern areas, particularly where irrigated arable crops are grown on thin, drought-prone soils.

- Air pollution from ammonia - a particular issue in parts of north-west Europe where high densities of intensive livestock are kept (eg the Netherlands). Data from other Member States is variable. Agriculture accounts for about 95% of ammonia emissions to the air in several European countries (OECD 2001)

- Agriculture contributed about 11 per cent of total EU greenhouse gas emissions in 1990-1997. Its share of carbon dioxide emissions was only about 2 per cent but it accounted for more than half of total nitrous oxides and nearly 45 per cent of methane emissions, (OECD, 2001). However, emissions are projected to decline over the next twenty years. There could be a role for agriculture as a carbon sink, although soil carbon storage is for a limited period and there are other options, such as forest sinks. At present, biomass energy from crops, replacing fossil fuels, is produced on a limited scale, for example on set-aside arable land. Some stakeholders consider there to be potential to increase biomass production substantially over the next two or three decades, thereby contributing to reduced dependence on fossil fuels.

- There are a number of concerns about soil quality, including reduced organic content and fertility, compaction, heavy metal and agrochemical contamination and acidification. Probably the most important and best documented impact is soil erosion, at unsustainable rates. This is particularly an issue in parts of southern Europe, including Spain, Portugal, Greece and Italy. Substantial areas of Italy, Portugal and Spain are recorded as having a severe risk of water erosion, above 22 tonnes/hectare per annum. There are also concerns about wind or water erosion in relatively limited areas of northern Europe. Inappropriate

cultivation of vulnerable land such as light soils on slopes and the selection of erosion prone crops, such as maize and sunflowers, are often cited as the cause of such erosion.

- Continuing declines in biodiversity. This is a very widespread phenomenon throughout the EU and its causes are not always fully understood. However, the loss or degradation of valuable semi-natural and fragile or particularly important ecosystems are still major causes for concern. These can arise from the marginalisation or abandonment of farming activities as well as the switch to intensive cultivation for cereals, silage maize, oilseeds, olives and other crops. Processes such as drainage of wetlands, irrigation of arid lands to enable cultivation and improve yields, and the ploughing up of unimproved grasslands can have a major impact on biodiversity. In all areas of Europe the loss of hedges, ditches and other "interstitial" features through field enlargement, and the loss of previously common 'weeds' and insects from farmed land due to the use of pesticides and veterinary products, are also cited as key factors.

- The threats to high nature value farming systems and the difficulties of maintaining appropriate forms of agriculture in many marginal areas in the face of farm enlargement or intensification on the one hand, and decline and abandonment on the other, is a significant concern in many regions particularly where there is a high proportion of such land. Abandonment per se is not necessarily damaging for the environment. However, the simplification and progressive withdrawal of appropriate farm management in many low input systems, such as the Spanish dehesas, has a range of mainly adverse consequences for biodiversity.

- Increasing scale and homogeneity in landscapes is cited as a more general trend, as is a significant decline in labour input for undertaking sensitive land management.

- Concern about both the environmental and human health impacts of specific technologies, most notably with respect to pesticides and, more recently, GMOs.

Some impacts have been historically important, such as the loss of a large proportion of freshwater wetlands to agriculture in northern Europe. Other impacts are of increasing concern for the future, such as the role of agriculture in climate change. Major habitat loss to agricultural intensification has declined in most countries in recent years but may still arise, in relation to infrastructure projects for example. More typical is finer grained intensification within individual farms and fields. The variety of specific local examples of environmental impacts in different Member States is large.

Where data on trends is available, it suggests that a number of sources of pollution may diminish over time, as a result of greater efficiency in input use and other factors. For example there has been a decline in nitrogen surpluses per hectare since the 1980s, which is projected to continue. Nonetheless, the average surplus of nitrogen in the EU in the late 1990s was around 58kg N/hectare, more than double the OECD average (OECD, 2001). Reductions have also taken place in the quantities of pesticide used, mainly as a result of technological change, but the environmental implications are less clear because of the changing patterns of use and the greater potency of some modern products. By contrast, the use of GMOs could increase significantly over time; but the environmental impacts of such a trend cannot be predicted with any confidence, at present.

2.3 Direct Causes of Environmental Change

Most of these environmental issues arise directly from farm practice on the ground, reflecting decisions by individuals and by farms acting in a group, as well as longer term trends in farm structures as land changes hands, farming systems change and investment patterns alter.

As outlined in section 2.1, there are known to be a wide range of factors influencing farming practices and structural change within the farming sector. Some contribute directly to the market signals facing farmers, others apply more broadly to influence farm families and their business development decisions.

Examples of changes in farming practice include:

- changes in the volume and composition of inputs, such as pesticides and fertilisers, brought onto the farm;
- the introduction of new technologies, such as silage making displacing hay making on many farms;
- changes in specific management practices, such as the timing of grass cutting;
- changes in combinations of practices and thus in production systems, for example increases in production intensity and the displacement of mixed farming by more specialist units;
- structural adjustments, including changes in field and farm size, the neglect or destruction of landscape features such as ditches and hedgerows, lowering of the water table by land drainage, or the introduction of irrigation to dry areas;
- changes in production patterns, including choices of crop, livestock type and breed, cropping patterns and diversity, etc;
- the withdrawal of production practices and/or technologies with a distinctive environmental impact, such as the shepherding of livestock;
- diversification into other activities on the farm, including forestry, recreation and tourism, small scale food processing and other ventures.

These changes can occur at a variety of scales, not only on individual farms but within a local farming community and over much larger areas. The cumulative impact of such decisions, for example where they result in marked regional specialisation, can have major environmental implications.

2.4 Driving Forces

These kinds of farming change can be influenced by a wide range of driving forces, as outlined in section 2.1. Some of the most important would include:

a) market changes (in relative prices for both inputs/factors and outputs, in demand and supply, consumer preferences, etc);

b) developments in technology, including in 'upstream and downstream' sectors (eg food processing and distribution, input industries) as well as the development of new machinery, new varieties etc for direct application on farms;

c) broader economic and social change in rural areas which can be stimulated by general changes in population mobility, wider economic conditions (including interest and exchange rate fluctuations), the availability of credit, communications, infrastructure and lifestyle choices;

d) independent as well as partly endogenous environmental changes (eg natural disasters, global warming, flooding);

e) institutional changes affecting farm organisation, infrastructure, specific agricultural advice and information;

f) policy changes, including changes in agricultural policy but also other policies such as environmental policies, spatial planning, transport, social policy, etc.

Some of these forces and their impacts are themselves extremely complex, reflecting the combined effects of many actors and influences. For example, the power of major supermarkets and retailers is perceived as a growing force, not only in determining price and food quality attributes, but also in other spheres. These include a demand for relatively uniform products, ease of processing, packaging and presentation, compliance with standards related to the environment or animal welfare, and often a preference for purchasing from reliable suppliers working in integrated supply chains. Such forces in combination with other aspects of consumer demand can influence farm enlargement and specialisation, the use of inputs and patterns of land use, as well as basic husbandry decisions such as the selection of crop types and varieties and the timing and frequency of management operations.

Among the key factors influencing the farming sector and farming change, the changing policy environment is frequently identified as critical. Policy changes that directly affect agriculture's impacts on the environment cover a considerable range and can include many elements that are outside the scope of the Common Agricultural Policy. Some policies are part of national agricultural policy, including changes to land/input and business taxation, changing farm social/insurance regimes, and approval systems for pesticides and veterinary products. Other changes come from other policies which influence farming, including health and safety regulations, environmental regulations, spatial planning policies, employment policies, etc. Some of these are national policies but others consist of EU legislation (for example, the Habitats and Birds Directives and the Nitrates Directive).

Table 1 summarises the environmental impacts of agriculture in Europe. A key question is the extent to which there is a link between the impacts and the mechanisms of the CAP, as suggested in most categories by environmental stakeholders.

Table 1

Issue	Major Sectors
Maintaining extensive pastoral landscapes	beef, sheep and goats, dairy
Maintaining extensive southern arable	Arable
Declining marginal farming systems	All above and some 'southern' crops eg wine, olives
Eutrophication of water (and related biodiversity decline)	pigs, dairy, beef, horticulture, arable, olives, sugar
Pesticides in water	Horticulture, arable, olives, vines, sugar
Soil erosion	Cereals, maize, oilseeds horticulture, sugar, also sheep and goats
Over-abstraction of water – irrigation	Arable, dairy (maize), olives, horticulture, sugar, wine
Ammonia from indoor livestock	Cattle (dairy and beef), pigs
Greenhouse gas production and potential contribution to climate change	Cattle, pigs (contribution) Grassland, energy crops (mitigation)
Biodiversity/landscape - loss of valuable habitat to intensive agriculture	Arable, dairy, beef, sheep and goats, horticulture, olives, wine, sugar
Biodiversity – decline in farmland species (pesticides, nutrients, field enlargement)	Arable, dairy, intensive 'southern' crops, sugar
Decline in biodiversity and landscape from neglect of management	Pastoral systems, areas of former mixed farming now wholly arable, traditional olives and vines in southern Member States

2.5 Environmental Policy and the CAP

Starting with the requirement of the Single Act that environmental concerns should be integrated into EU policies and the comprehensive integration process following the Treaty of Amsterdam, protecting the environment has become an explicit objective of central relevance to the CAP. However, important questions and issues still remain about the respective roles of the CAP, and of environmental policy, in seeking to ameliorate the impacts of agriculture upon the environment. These include

- Where can improvements be achieved through adjustments of the CAP?

- Where would environmental issues be more properly pursued by separate environmental policy measures with associated instruments and obligations to be defined at EU or Member State level?

- How far is it necessary to seek policy complementarity (ie where improving CAP measures can achieve only a limited reach as regards an environmentally problematic sector) and what is the scope for synergy (active promotion of win-win outcomes) between environmental policy measures and the CAP?

- Where there are unavoidable trade-offs between achieving environmental goals and traditional policy goals of the CAP (eg farm incomes, employment, etc), what should be

the right balance between them given the broader concept of sustainable agriculture (based on the combination of environmental, social, and economic objectives)?

An integration strategy can be built on a number of steps. A starting point would be, firstly, to discontinue CAP policy elements which cause identifiable environmental problems. Acting on the basis of what could be called 'logical complementarity' one would, secondly, refer to environmental legislation as a key component of the reference level of *good farming practice* and provide, thirdly, incentives or compensatory payments only to promote environmental benefits generated by farmers beyond this reference level. Whereas environmental improvements might be achievable through adjustments to the CAP on this basis and within an integrated strategy, there are likely to be cases where it will be necessary to use additional environmental policies to rectify remaining problems. This is partly because the policy reach of CAP instruments is limited to certain sectors and/or targeted issues. Agricultural activities over a significant area are little affected by the CAP and there are also limits to the reach of policies, such as incentive schemes, which rely on the voluntary participation of farmers.

Specific attention must be paid to the need to ensure that the CAP is consistent with EU environmental policies, such as the Nitrates, Habitats and Birds Directives, and also the new Water Framework Directive. There is a widespread view that implementation of many environmental directives applying to farmers needs to be strengthened. This implies action at a number of levels, particularly by Member State authorities. Pressure from the Commission to hasten implementation is also essential. Implementation, however, extends beyond the process of formal compliance and requires effective monitoring and enforcement on the ground. This is potentially time absorbing and expensive - if it is necessary to visit large numbers of farmers spread over a sizeable area on a regular basis.

In any case it must be ensured that CAP funded plans do not undermine the implementation of EU environmental legislation. This requires that concepts such as 'good farming practice', as defined in the context of rural development plans correspond sufficiently to those established on the basis of the Nitrate Directive.

In addition, a range of specific actions can be taken, including:

- De-facto 'cross-compliance' at Member State level, as was exemplified by the Commission's initiative to insist on progress by Member States in implementing the Nitrate and Habitats Directives in 2000 as a condition of approval of their rural development plans. One could drive this approach as far as introducing general rules such that infringement of EU environmental legislation should lead to the suspension of EU payments.

- Prioritising agreements within agri-environment schemes which contribute to achieving nature conservation objectives, such as those pursued by the Birds and Habitats Directives. (Of course the relevant prescriptions must be above the reference level). This could imply more specific conservation oriented schemes particularly targeted at key sites.

- Use of rural development funds (Article 16 of the Rural Development Regulation) to provide compensation in particular circumstances to farmers facing severe costs in complying with environmental law - below the reference level.

- Where agricultural policy options have different environmental impacts but remain compatible with overall agricultural and rural development objectives, options with a more positive environmental outcome should be preferred.

- Consistency requires also that farm and agricultural objectives will have to be considered in the elaboration of environmental programmes.

There are some areas of policy where European environmental objectives are not yet clear but are likely to be developed over the next few years. The best examples pertaining to agriculture may be the protection of soil and climate change. In both cases there is likely to be a role for both environment and agriculture policy. More broadly, it can be emphasised that environmental integration measures within the CAP can only be part of a balanced strategy within which specific environmental policy instruments will also have an important role.

3: CAP Effects upon the Environment

3.1 Conceptual Considerations

Many of the changes in European farming that have led to environmental impacts are linked to technological developments driven by competition in agricultural markets. The role of policy, and specifically of the Common Agricultural Policy (CAP) in influencing these trends is not always apparent. However, among a range of stakeholder organisations and in the view of a number of Member State governments, it is widely held that the CAP has been an important influence upon agriculture's environmental impacts. One central aim of this study has been to subject these views to a more thorough analysis, using a combination of literature review and reasoned discussion. This is because it is only once we have a clear idea of how the policy may have affected the environment, that we can identify the most effective means to further environmental integration within the CAP.

The claims which link environmental impacts generally to the CAP exist in policy papers by stakeholder groups as well as in documents produced by academic researchers and by government administrations. However, many of these papers do not provide a clear explanation of exactly what the causal link is believed to be, nor how it operates in any detail. In summary, our analysis of the literature suggests the following points:

- empirical data tracing the relationship between CAP instruments and environmental impacts is very limited – where it exists, some studies show correlation between adoption or reform of a policy and an environmental impact. Many such studies are based upon case studies of particular local areas, rather than EU-wide assessments. Some models have been used to examine the environmental impacts of different CAP policy scenarios, but these are also relatively limited in scope and in explanatory ability;

- there is very limited opportunity for studies to make a policy-on versus policy-off comparison, in examining policy effects, thus many studies do not consider the counterfactual situation;

- there are many examples of assumed links without any clear rationale to explain these assumptions - in some literature the CAP is described as though it were a single policy operating in a very simple way to support all production, when the reality is of course much more complex than this (see box 3.1);

- in several policy papers, in particular, there is a tendency for authors to argue that if the CAP has not prevented environmental damage or sustained environmental values, the policy should be reformed so that it can perform these functions. However, without an understanding of the relative role of the policy as compared to other factors (including environmental policy), it is difficult to be sure that the reforms proposed in these papers will be either necessary or sufficient to bring about the desired results.

Some of these themes are discussed in more detail below.

Available Evidence

The literature on agriculture and the environment in Europe often fails to distinguish between impacts directly attributable to policy and those arising from the development of contemporary farming, largely irrespective of specific policy signals. Although there are some reports which focus on particular aspects of the CAP (for example the papers assembled in Brouwer and Lowe, 2000 and Brouwer and Van Berkum, 1996), these frequently have difficulty in isolating policy impacts from other forces which are shaping farming practice and environmental outcomes. Whilst most of the authors acknowledge this difficulty, the tendency to assume a policy link remains strong.

In other areas of policy analysis, researchers have made extensive use of economic models to predict the impacts of various policy scenarios on farming change. However, in the area of environmental impacts, there is again relatively little research of this kind. For the purposes of this study, we looked at a range of models at both micro (farm-level or local area-level) and macro (Member State or EU wide) economic scales which claim to provide insights into the environmental impacts of agricultural policy decisions. In sum, the findings of our analysis suggest:

- that relatively few models exist which can make predictions about environmental impacts of policy changes, and even fewer of these have been empirically tested in this particular respect;

- that the level of sophistication of the modelling of 'environmental impact' usually equates to some measure of input use - working on the assumption that reductions in levels of inputs equates to environmentally beneficial change while increases in input use generally imply greater environmental risk or damage;

- that the models are therefore most usefully applied where one is interested purely in agriculture's impacts upon basic resources such as water pollution, and that they are much less able to say anything meaningful about impacts upon more complex resources such as European biodiversity or landscapes.

The limited availability of analytical studies of policy impacts, and the relative lack of models able to predict the impacts of policy change in the highly varied conditions within the EU in sufficient detail to illuminate their environmental implications, are a major constraint on the kind of policy analysis being attempted in this paper.

Policy-on versus Policy-off: the Absence of the Counterfactual

The scope to undertake empirical studies to isolate policy impacts from other impacts determining agriculture's effects upon the environment is constrained by the fact that there are relatively few cases where CAP instruments have been suddenly introduced and an equally distinct environmental effect is then observed. In most cases, CAP links are postulated for environmental impacts which have increased over a period of years during which the policy has operated but also many other factors have been at work.

It is sometimes possible to use situations where Member States joined the EU as a kind of policy-on, policy off comparator, and indeed there are a number of examples of cited CAP

effects which are argued precisely on this basis (eg claimed sheep regime effects upon overgrazing in the UK and Greece, possible arable regime effects on loss of semi-natural habitats to cropland in the UK, cited oilseed cropping effects upon soil erosion and biodiversity in Spain).
In other cases, the reforms to various regimes within the CAP since the early 1980s provide some examples where a new instrument is introduced and an environmental impact is cited in relation to this new instrument. Examples of this kind would include the irrigation premium introduced in 1992 and its cited effect on water abstractions, the forage maize premium also introduced in 1992 and also cited as a factor in the loss of permanent pasture since that time, and various effects attributed to the introduction and implementation of dairy quotas in the Member States, after 1984.

Recourse to Theory

The economic rationale for CAP influences is prevalent in much of the literature. Put briefly, this can be summarised as follows:

- From basic economic principles, it has been argued that in all CAP sectors where farm support is linked to output levels, this will encourage production at levels higher than would have occurred without such support. This is the classic case of a shift in the supply curve to the right, which increases the equilibrium level of production. Thus individual producers make decisions to produce at a higher level of output than they would without the support. This argument applies at aggregate level only in the absence of any supply control measures, but at farm level it may apply wherever producers do not have individual production quotas. Increased levels of agricultural production are commonly linked to intensification, changing farm structures, land improvement, and farmland expansion, which are often seen as a cause of environmental concern.

- Also from basic principles, it is possible to predict that the policy could have had a role in driving forward technical change in farming. By providing relative market stability, as well as support for direct investment in the modernisation of farm structures to increase efficiency and productivity, such development will, in theory, have been encouraged. Generally across the sector, the results of technological change have enabled the gradual substitution of labour by capital, and an increased reliance on external inputs in farming as well as greater specialisation and concentration. Thus if the policy has encouraged faster technological change than would have occurred otherwise, it is implicated as a contributory factor in these trends. Again, environmental reports and studies frequently identify this pattern of change as leading to environmental damage.

- The theoretical position on the relationship between the CAP, the farm labour force and the environment is less straightforward. It is sometimes asserted that the CAP has contributed to the decline in the farm labour force which has taken place in all EU countries since the middle of the twentieth century. However, it is clear from the experience of other OECD countries in particular that reductions, often of around 2% per annum, are not untypical and occur in most policy environments. Where less support per hectare is offered, as in the USA and Australia, the farm labour force is correspondingly smaller. Thus, compared with a more liberal model, the CAP appears to have retained more labour in agriculture than otherwise would have occurred. This has important

implications for the environment since several of the management practices which have shaped cultural landscapes have depended on a plentiful supply of labour - for example to manage field boundaries, produce crops in small fields, and manage organic nutrients. The decline in the farm labour force in combination with generally rising labour costs, makes it difficult to maintain these practices, although some can be replaced by mechanical alternatives. Thus, the theory suggests that the CAP's effects upon the labour force in agriculture may have brought some benefits for the environment.

- At the broadest level, economic theory provides a means of understanding and interpreting the common market effect, as it applies to agriculture and the environment in the EU. By establishing a single market for agricultural products within the Union, competition between producers in different regions should in theory lead to an economically rational allocation of resources such that different outputs are produced in those areas or situations which have some 'natural advantage' over others, helping to encourage regional specialisation in some cases. However, the same theory also predicts that where there is market failure, in that factor prices do not reflect their true costs, resource allocation will not be optimal. Thus if the environmental costs and benefits of agricultural systems are not internalised into factor prices, the operation of the single market could favour production systems regardless of their environmental costs while undervaluing those generating environmental benefits. The assumption that this generally works to the advantage of environmentally less benign, but more competitive farming systems, may explain why many environmental organisations and policy analysts believe that the CAP in combination with environmental policies should ensure the internalisation of environmental costs that are unaccounted for. On the same grounds, there would be arguments for doing more to support extensive producers in marginal areas, who tend to generate environmental benefits, and give less support to intensive producers who tend to generate environmental pressures.

Box 1 Components of the CAP

A. 'First Pillar' (generally commodity-related) Measures

a) Market support with intervention buying or private storage mechanisms:
- beef and veal, sheep and goats, dairy
- arable crops – wheat, barley, oats, maize, oilseeds, protein crops, sugar beet,
- olives, wine, cotton, starch potatoes, tobacco

b) 'Lightweight regimes' involving emergency buying and support for producer groups:
- eg pigs, poultry,
- fruit and vegetables.

c) Direct payments
- direct payments to compensate producers for cuts in intervention prices (eg beef and arable sectors, introduced in 1992 and extended in 2000)
- quotas and/or reference yields and area ceilings to limit overall expenditure on direct payments (eg in sheep, beef and arable sectors (since 1992) as well as wine (since 1998)

d) Supply management
- quotas on milk production since 1984, also on sugar, starch potatoes),
- maximum stocking density limits on eligibility for livestock direct payments, as well as extensification premia (introduced in 1992 but strengthened in 2000)
- compulsory set-aside of arable land (introduced in 1992 and continued since then).

e) Other elements:
- environmental or welfare requirements in some regimes (eg conditions on aid to producer groups, for fruit and vegetables, and minimum cage sizes for laying hens in egg production).
- 'outgoers' schemes (eg dairy) or aids for 'grubbing up' for different commodities in surplus (eg olives, wine, apples) – some introduced only for short periods, others more continuous.

B. 'Second Pillar' - Structural and Rural Development Measures

A second and increasingly significant part of the CAP has focused on broader structural, environmental and rural development aspects of agriculture and the countryside. This has included farm structures policies, the 1992 accompanying measures under the CAP which have been re-organised under the new 'second pillar' of the CAP (Rural Development Regulation 1257/1999). These policies include:
- aids for farming in Less Favoured Areas, now also in areas with environmental restrictions,
- agri-environment schemes to promote environmental sound agriculture beyond "good farming practice"
- aid for farm investment/modernisation and farm diversification,
- marketing and processing aids
- farm forestry (for taking land out of farming, as well as for the management of woodlands, processing and marketing of wood products)
- early retirement aids, and aid for young farmers
- vocational training for farmers and foresters
- aids for improved water management, for land reparcelling and land improvement
- support for developing farm-related tourism and craft activities
- a range of other farm-related rural development provisions (under Article 33 of the Regulation).

C. ***Horizontal Measures***

Introduced in 2000, the common rules Regulation 1259/1999 has implications for *both* first and second pillar measures, and with two important features:
- authorisation of 'modulation' to switch funding from commodity support to certain elements of the 'second pillar' (Article 4); and
- obligation for Member States to meet 'environmental protection requirements' in relation to market organisations (options: agri-environment measures, specific requirements, mandatory legislation)

3.2 Examination of Effects by Sector

As a result of the considerations discussed above, it has been necessary for this study to examine this issue in more depth by considering some of the main elements of the CAP and analysing the evidence for any environmental impacts. The remainder of this section is therefore focused around the following significant CAP regimes and instruments:

- Dairy
- Beef and Veal
- Cereals and oilseeds
- Olives
- Sugar
- Wine
- Fruit and Vegetables
- Rural Development and the Second Pillar of the CAP
- the common rules Regulation

Each section briefly describes the production sector or kinds of farming involved, considers the evidence of environmental impacts associated with these characteristics and finally discusses the evidence for CAP policy effects.

This section includes only a brief analysis of the common rules Regulation 1259/1999. In part, this is because the measures in this regulation have yet to be fully implemented in the Member States and thus any evidence of their environmental impacts is negligible at this stage. However it is also because the measures are discussed in more detail in later sections of the report, as potential components of a strategy for further integration.

3.2.1 Dairy

Background

Dairy farming is an important sector in most EU Member States, although production tends to be concentrated in particular regions of each country. The EU currently produces over 120 million tonnes of milk annually from around 20 million dairy cows, on fewer than 1 million holdings. However these figures mask great variation in the size and productivity of dairy farms and a polarisation whereby a small proportion of holdings produce the majority of output and a significant proportion have very small herds and produce relatively little. Production systems vary widely from large and highly intensive units in which cows may be housed indoors continuously and fed in stalls or pens, to extensive systems reliant entirely on grazing. Even among grazing systems there are those which use high levels of fertiliser to maintain maximum grass growth, where grazing management is carefully controlled (eg strip grazing, paddock grazing), to others where cows range fairly freely across pastures which have received little or no artificial inputs. In all systems, the use of feed supplements in the form of cereals and other concentrated sources of protein and other nutrients may also be a feature.

It should be noted that the relative intensity of different production systems does not in itself determine their environmental impacts, and some relatively intensive systems can be more

environmentally benign than some relatively extensive ones, depending upon the precise management practices followed in each case. Furthermore, intensity cannot itself be simply defined by reference to livestock density alone, although this is often used as an indicator for the intensity of husbandry systems, since intensity will be affected by specific grazing management practices, use of concentrates, organic and inorganic fertilisers, and crop protection methods.

Environmental impacts of dairying

Whereas it is entirely possible for relatively intensive systems to be sensitively designed and operated in ways which can benefit the environment, and for extensive systems to be poorly managed and thus to lead to environmental damage livestock densities and levels of external input use are often used as broad-brush indicators of the environmental pressures associated with different farming systems. A recent study for DG Environment (EFNCP/ CEAS, 2000), has adopted this approach and thus identified the following main environmental impacts of dairy systems:

Intensive dairy management (estimated to include about 80% of EU dairy cows and 84% of EU milk production)

- Excessive nutrient levels in manure and other farm wastes which are much higher than the absorptive capacity of the land available to the dairy unit. Thus, if all this waste is spread on the farm, however carefully, it can cause pollution of soils and water.

- High risk of environmental damage associated with the storage of large quantities of slurry on farms. If storage systems fail, the damage to surrounding habitats and water resources can be both catastrophic and long-term.

- Emissions of ammonia from large dairy buildings which can cause severe local acidification of habitats as well as posing a direct health risk to nearby residents. This is a particular problem in the Netherlands where an increasing proportion of dairy herds is housed year-round.

- Intensification of grassland management can damage biodiversity as swards' productivity is raised. Also, there has been a widespread trend towards ploughing permanent pasture in order to grow maize for dairy cattle in recent decades, since maize produces more biomass over a given period of time. Maize is generally grown with much higher use of pesticides than grass and it exposes bare soil for a considerable part of the year, leading to higher rates of soil erosion.

Extensive dairying (estimated to produce 6% of milk, accounting for 8% of all cows in the EU)

- Preservation of landscape and biodiversity in marginal areas – dairying has long been a traditional feature of many mountainous and upland regions in Europe, where extensive pastoral management is essential to preserve characteristic flora and fauna. For example, traditional dairying in Alpine regions is associated with particularly diverse habitats and valuable, fragile landscapes of high value for tourism.

- In northern regions where sheep farming is now the dominant pastoral system, the retention of cattle within the grazing system can bring particular benefits in maintaining grassland ecosystem diversity.

- Traditional dairy and beef production systems across Europe used a wide variety of local breeds and indigenous races which represent a valuable source of genetic diversity.

CAP Effects

The dairy regime offers price support which works irrespective of widely varying production costs among regions and individual producers. This policy has operated over a long period, during which changes in dairy systems have greatly increased milk productivity per cow and led to increased production and specialisation in the sector as a whole. Expansion in recent years has been coupled with increased specialisation in cattle systems towards specialist dairying, and significant herd enlargement particularly in those – mainly lowland - regions where dairy farming was gradually emerging as the dominant farm type.

A variety of studies and policy papers conclude that the guaranteed minimum price for milk and milk products under the dairy regime will have supported and indeed encouraged these kinds of change. Favourable markets, technological developments and the provision of investment aids to expanding producers are all also likely to have helped to encourage this same transformation, to an equal or greater extent. Thus it is difficult to separate CAP from non-CAP effects in order to assess the relative role of the policy. Certainly, similar patterns of intensification and specialisation have occurred in other non EU countries, under a variety of policy scenarios.

The introduction of milk quotas in 1984 was intended to limit the increase in milk production across the Community. Overall, production fell by 7% and the number of dairy cows declined by 26% in the EU-12 between 1984 and 1997. However, average herd size increased by 74% for the EU-15 (CEAS/EFNCP, 2000) over this same period, indicating that the quota system has not halted the overall trend in the sector towards fewer, larger herds and increased productivity per cow, with its increased environmental impacts as listed above. This is another indication of the relatively weak effect of CAP change as compared to non-policy influences on structural change in dairy systems.

Thus it seems quite likely that even without the price support mechanism, a similar trend in structural change might have occurred in the EU dairy sector. This conclusion also implies that in future, any dismantling of the price support regime could not be expected to stimulate significant extensification in the sector while market and technological conditions continue to favour intensive systems.

The 1984 policy enabled different quota administration systems to be developed by the Member States. An examination of these contrasting systems and trends in the Member States indicates that they may have had different effects upon structural change within the sector, with some implications for the environment.

In those countries where quotas have been effectively 'tradable' freely between individual producers (eg UK), it has been argued that by creating a newly tradable additional asset, the size of which had to be proportional to the scale of production per farm, quotas may have speeded up concentration in the sector. However, in countries where quotas belong to dairies and are reallocated between producers rather than traded on the market, this should have acted as a brake upon further concentration and specialisation in the sector (although reallocations by dairies could still favour more intensive dairy farms at the expense of extensive producers).

Observations made by stakeholders and experts at the second seminar for this project and afterwards suggest that:

- Dairy quotas have in some cases slowed structural change, geographical concentration and increasing size of units where the quotas were not tradable, particularly where there is a low overall quota for a Member State compared to the level of demand from producers (eg Spain).

- Sweden is an example of rapid concentration in the sector, where quota was tradable from the start.

- In Austria quota only became tradable in the 1990s, after which there was significant concentration and structural change. The processing sector also influenced this geographically, with organic milk processing and marketing chains having an impact on the location of milk production.

- By contrast in Italy, non-traded quota has been allocated preferentially to more intensive and competitive producers, so beneficial environmental effects have not been apparent here.

- The way in which the quota system was implemented in some Member States may have brought environmental benefits, particularly where there has been a conscious policy effort to ensure that marginal areas (eg mountain regions) continue to retain a significant share of quota.

These points could be subjected to more thorough analysis but an examination of this kind was beyond the scope of this report.

Conclusions

In sum, the evidence for significant CAP effects in the environmental impacts of the EU dairy sector is inconclusive. It is possible that price support has helped to encourage intensification and the processes of concentration, specialisation and increased economies of scale in dairying, but it is also very likely that such changes would have occurred under a much more liberal policy regime. It is also possible that the introduction of quotas in some Member States has helped to support and maintain more extensive and environmentally beneficial production in marginal regions of Europe.

Looking at the implications of future policy reform scenarios, experts' views are that any shift to more market influences is likely to lead to a redistribution of production patterns across the EU, more trade in milk and milk products, increased concentration and intensification of production, and a reduction in grass based systems for both milk and beef. In Germany, recent research has estimated that the level of milk production would not fall if the guaranteed prices were cut by 30% across the EU as a whole, alongside the removal of quotas (Kleinhanss et al, 2001). The model predicted that the EU milk price would fall by 25%, supply would increase by 5% and production would be reallocated to more competitive regions.

3.2.2 Beef and Veal

Background

There is a variety of beef production systems in the EU, with the majority of cattle derived from the dairy herd but a significant number found in suckler cow herds. Breeding and finishing stages are often separate, contributing to the diversity of beef enterprises on farms at a local as well as broader Community level. Many systems are intensive, with stocking densities above 2 Livestock Units (LU) per hectare, including indoor finishing units and most veal production. However, the sector also includes some of the most extensive production systems where cattle are grazed at relatively low densities and are exclusively fed on vegetation produced by semi-natural habitats with little or no use of fertilisers or pesticides. Such extensive pastoral systems typify many marginal areas across the EU, from the moorlands of western Britain and Ireland to the mountains of southern Bavaria and the Austrian Tyrol.

Environmental Effects of Beef and Veal Production

As with our discussion of the dairy sector, this section uses the broad categories of 'intensive' and 'extensive' production systems as proxies for their likely environmental impacts, although it cannot be assumed that the link between production intensity and environmental consequences is always consistent, in this respect.

The environmental impacts of intensive beef and veal production include water pollution derived from livestock wastes and intensive fodder production and emissions of methane, an important greenhouse gas.

More extensive systems, by contrast, contribute to the maintenance of cultural landscapes, especially pastoral habitats in the hills and mountains, wet grassland areas in northern Europe and more traditional mixed farms in the lowlands. The most valuable semi-natural habitats grazed by beef cattle support very low stocking densities - typically less than 0.5 LU per hectare. (EFNCP briefing)

CAP Effects

There are several different policy instruments deployed in the beef and veal regime. Until 1992 guaranteed prices were the main support measure, but following the 1992 reforms these prices were cut and producers were offered direct payments as compensation for the price cuts. The payments included a special premium on beef cattle (BSP) primarily to support those who fatten or finish beef cattle for the market, a suckler cow premium to support those who breed but may not finish beef cattle (particularly relevant to the extensive beef breeding systems typical of marginal areas - SCP) and 'extensification' payments offered to producers for whom the stocking density of livestock *on which claims were made* fell below certain threshold levels. Under Agenda 2000, both BSP and SCP were increased to offer partial compensation for further cuts in the guaranteed prices for beef and veal. In addition, the extensification payment was reformed so that it now relates to the *actual stock numbers* on a holding rather than only those stock on which claims for direct payments are made. It should be remembered that the extensification premium refers to cattle numbers as well as sheep and goat numbers.

To limit expenditure on these payments and to prevent them encouraging further expansion in the beef sector, eligibility for BSP and SCP were, from the beginning, subject to various ceilings. BSP claims were initially limited to a maximum of 90 head per holding as well as a national 'quota' on claims, while SCP was subject to a separate national 'quota'. The 90-head limit on BSP claims was lifted under Agenda 2000 but reimposed very recently as part of the 'emergency six point plan' agreed by the Council in mid-2001. In addition, Agenda 2000 imposed a new stocking density limit on all beef premia which will be reduced over time, and it introduced so-called 'national envelopes' to enable the Member States to make their own decisions about how to apply a proportion of the total direct aid to the beef sector. In some countries this aid has been used to increase the SCP while in others it has been used to support beef finishers via a new premium offered on animals presented for slaughter.

Thus for this sector there is now a relatively complex regime involving several different policy instruments. Some degree of market support remains through private storage and safety-net intervention, alongside a proportion of centrally determined direct payments made per head of stock, plus a small proportion of direct payments targeted specifically by the Member States rather than determined centrally, but also generally paid on a headage basis. The option exists for national envelopes to be paid on an area basis but it appears that no Member State has opted to apply them in this way.

The environmental implications of direct payments have been much discussed by policy analysts in recent years. Like the former price support for which they are offered as partial compensation, they are paid in relation to the numbers of animals kept on farms, but subject to the stocking density restrictions described above. It has been argued that – in spite of the introduction of density factors as an eligibility criterion - direct payments made per head of livestock provide an incentive to maintain cattle numbers at a level higher than would be the case under an unsupported market. This can be higher in some regions than would be desirable in relation to carrying capacity or the environmental condition of the land used for beef production. 'Excess' cattle numbers (implying excess over market requirements) may add to the environmental burden, particularly in those countries with highly concentrated numbers of cattle in particular regions (eg Germany, France, Netherlands, Belgium). For these and other reasons, many environmental organisations, research analysts and some Member State governments have called for reform of the regime in order to move away from direct payments based on headage, towards a more decoupled system based upon payments

per hectare of land. The argument is made that if stock numbers were based upon market signals they would tend to be lower than they currently are and that this would bring a general environmental benefit (generally seen in terms of reduced pollution). This broad reasoning is supported by the predictions of a number of modelling studies (eg FAL, 1998, Dabbert, 1998).

But clearly, decisions about cattle numbers and stocking rates are made by farmers on the basis of market signals as well as policy factors. From recent research there is evidence that in some regions of the EU, beef cattle numbers commonly exceed the numbers on which premia are available, suggesting that a move away from headage payments might not lead to a corresponding reduction in cattle numbers in these areas (Goss et al, 1997). Conversely, it is known that even under a supported market, there are marginal areas in the EU where traditional, extensive cattle production is in decline and this is seen as a significant threat to biodiversity and landscapes (eg EN, 2001). Thus again, a simple switch to area supports without any redistribution of aid towards marginal regions might not, in itself, be sufficient to help counter this trend.

As regards stocking density limits and extensification premia, the system in operation from 1992-99 was frequently criticised on environmental grounds (see Andersen et al 2000), because by calculating densities only in relation to animals on which aid was paid, any ability to use the measure to promote environmental extensification was weakened. This weakness was addressed in the Agenda 2000 package and may therefore have increased the potential for these measures to promote more extensive systems. Further limits on claims were introduced in the amendments to the beef regime made in June 2001.

Nevertheless, concerns about the present system remain among environmental organisations and policy analysts. These include:

- The level of the livestock density maximum for SCP and BSP claims is set at 2.0 LU, falling to 1.9 LU in 2002 and then 1.8 LU in 2003. In a wide range of environmental situations across the EU this maximum appears above current stocking rates and therefore would not act as an incentive to extensify. In the EU 12 in the mid 1990s the average density of livestock eligible for support was 0.9 LU per hectare (Brouwer and van Berkum 1996). Thus it will only be in the more productive areas of the Member States where these maxima could potentially promote extensification.

- In productive areas where farms are stocking above the maximum, they have the option of complying by adding to their forage area rather than reducing stock density on their existing land. In some regions (eg Scotland and parts of Spain) there is anecdotal evidence that farms have acquired the use of fields of semi-natural vegetation some distance away from their main holding in order to comply with the stocking density limits but without actually grazing this additional land (Bignal and Sumpsi, *pers comm*). Where this process involves marginal land which would otherwise have been farmed by a grazier (because owners will make more money by renting the land to an intensive producer than by grazing it) it could have adverse consequences for biodiversity.

- The environmental benefits from the extensification scheme depend largely on farms having an incentive either to maintain low intensity systems in appropriate areas or for those higher intensity systems associated with environmental damage to undertake

genuine extensification - ie to reduce the number of livestock per hectare. However, it has been claimed that the threshold for the extensification premium (1.4 LU for the full premium of Euro 100 and up to 1.8 LU for a reduced premium, for 2002 onwards) may act to support mid-intensity or even higher intensity systems, rather than very extensive systems which are characteristically those of high natural value (Bignal and Goss, 2000). It is argued that the premium functions as an incentive to reduce stocking density for a relatively narrow band of producers stocking just above the limit and, perversely, increases the profitability of pushing up stock densities to the 1.4 LU/ha limit on some more extensive farms. The scale and the environmental implications of this effect are, however, unclear.

- The national envelopes enable Member States to target aids in ways which reflect local socio-economic and/or environmental conditions. To date no country has chosen to use this measure for explicitly environmental purposes. As with other direct payments, the compensating role assigned to these aids constrains scheme design to ensure that the majority of producers benefit broadly in relation to their past income levels. While headage payments could be tailored more closely to environmental objectives, for example by increasing payments to producers with much lower stocking densities, this would redistribute support in favour of less intensive producers and create a category of significant losers.

Conclusions

The complexity of the regime and variety of local conditions are such that a thorough empirical investigation of their environmental impact at Member State level would be of great value. The beef and veal sector was not included in the recent suite of environmental impact studies commissioned by DG Environment of the European Commission, and there are clearly gaps in our understanding of its environmental implications. Moreover, this is a sector which is also likely to be influenced by the dairy regime.

Nevertheless, from the limited evidence and the policy literature discussed above, we draw the following tentative conclusions.

- There is little clear evidence to support the view that the CAP regime is the most significant factor determining the environmental impacts of beef production in the EU. As with the dairy sector, market signals and technological change are likely to have played, and to continue to play, an important role.

- Nevertheless, there is some evidence that the current regime has a limited ability to encourage more environmentally sustainable systems precisely because its mechanisms are too uniform to reflect the great variety of environmental conditions and capacities of beef production systems within the EU. For each mechanism that has been introduced with an environmental objective (often in combination with other objectives), local examples have been cited where the measure apparently fails to achieve the environmental goals.

- The introduction of national envelopes under Agenda 2000 potentially offers a way for Member States to experiment with the kinds of more decoupled support that many

environmental organisations have been calling for. However, to date these envelopes have been used on primarily compensatory grounds, in ways which offer few specific environmental benefits.

- The choice to offer direct payments on a headage basis has been widely criticised by environmental organisations because this is seen as production-linked support which provides an incentive at farm level to produce, often beyond the environmental carrying capacity. Whilst the evidence to support these claims remains partial, a shift to area-based payments may offer some potential environmental benefits as well as being favoured on other, non-environmental grounds. We therefore consider this issue later in the report, under 'options for further integration' in Section 4.

3.2.3 Cereals and Oilseeds

Background

Cereals, oilseeds and other arable crops are a significant feature of agriculture in almost all the Member States, occupying around one-third of the EU's Utilised Agricultural Area (UAA), although around 80 per cent of cereal production is concentrated in five countries of the EU - France, Germany, the UK, Spain and Italy (Boatman et al, 2000). In terms of volume and value, wheat and other cereals, including maize, dominate EU arable production, but oilseeds and protein crops also cover a significant area of farmland (ca 13% of cropland). Among the oilseeds, rape and to a lesser degree, linseed, are important in northern areas while sunflowers are grown on a large scale in central and southern countries. Protein crops are also significant (mainly field peas, beans and lupins).

Environmental Impacts Associated with Arable Crops

Four main areas are covered in a recent report to DG Environment (Boatman et al, 2000):

- soils - damage to soils by erosion and loss of soil structure as well as pollution and contamination by heavy metals;

- nutrient and pesticide pollution of water;

- declining biodiversity due to loss of non-cropped areas;

- simplification of arable farming systems, with knock on effects upon landscape quality and character.

Production systems for arable crops vary from relatively extensive to highly intensive, with varying levels of input use, mechanisation and monoculture. For the EU as a whole, the trend in arable systems in recent decades has been one of increasing intensification (Boatman et al, 2000). In southern Europe, the split between irrigated and unirrigated crops can be particularly significant in environmental terms, in that unirrigated systems generally use significantly fewer inputs of fertilisers and agrochemicals. The availability of additional water facilitates the adoption of high yielding varieties and higher input use. There are

relatively small areas of low input, high nature value arable farming remaining, notably including dryland systems in Spain. These are low yielding and often marginal in economic terms (Beaufoy et al 1994). In northern Europe, there is an important environmental distinction between cereal crops that are winter and those that are spring sown. Generally, winter cereal crops in northern European climates require a relatively higher level of fungicide protection, and with a longer growing season they can respond to higher levels of fertilisers than spring crops. Winter cereal stubble associated with some spring grown crops is a beneficial habitat for some bird species. However, soils which are left uncropped over winter may be more susceptible to erosion than those that are already sown in autumn. The proportion of EU arable crops that are irrigated, and the proportion of winter crops as opposed to spring crops in northern Europe, have both increased significantly in recent years.

Over centuries the proportion of arable crops, grassland and other semi-natural habitats in the farmed landscape has shifted in response to market signals, consumption trends and, more recently, policy changes. Changes in the extent of arable farming can be of environmental significance. Advances in technology during the past century have enabled mechanised cropping to be practised in many environmental conditions which hitherto could not have supported arable crops. Ground can be rendered more suitable by drainage of wet areas or irrigation of arid land. These changes have enabled the spread of arable agriculture into new areas of land in some regions, particularly on better soils, with some negative environmental implications such as the destruction of semi-natural habitats and increasing environmental risks resulting from the use of pesticides and fertilisers. At the same time, some arable areas have been abandoned, for example at higher altitudes and on previously mixed farms.

While inorganic fertiliser inputs on cereals grew until the 1980s or late 1970s in most regions, subsequently they have tended to level off, although with considerable variations between regions and over time. In principle, precision farming techniques and the greater adoption of integrated crop management have the potential to lower the use of agrochemical and fertiliser inputs. However, there are a number of uncertainties about trends in production methods and input use.

Modern arable cropping is characterised by significant economies of scale. This triggers certain environmental risks:

- the creation of larger fields in order to reduce the time required for arable operations or to accommodate larger machines has led to a significant clearing and simplification of landscapes. Species decline has arisen as a result of non-crop habitats and simplification of systems, which has disrupted food chains (Boatman et al 2000);

- many rotations have been simplified so that the main crop, often wheat or maize, may be grown continuously without a break which often requires higher applications of pesticides and increases the erosion risk;

- the choice of technology associated with large scale farming often means replacing labour through capital with implications such as higher levels of herbicide use.

Some concerns have been raised with respect to the planting of GMOs which might have implications for herbicide consumption and biodiversity in particular.

Finally, the progressive transformation of large areas of formerly pastoral or mixed farming into contemporary arable systems, which began in the 1940s in some areas but which continues today in some regions, has led to widespread loss of biodiversity and landscape features, as hedges and ditches are removed, small woods are neglected or cleared and fields are enlarged. A recent analysis of the decline of farmland birds in both EU and central and eastern European countries suggests that cereal yields are an indicator of 'an interconnected suite of changes in crop and livestock husbandry practices…that have reduced the suitability of habitats and the availability of food for birds' (Donald et al 2000).

CAP Effects

The view is widely held among a variety of stakeholders that the arable regimes of the CAP have encouraged the expansion and intensification of these systems since the 1960s because of the overall level of support. However, technical changes, such as the introduction of new seed varieties and pesticides and larger scale machinery clearly played a role in this, along with other driving forces. Separating out the role of the CAP is not easy and direct empirical evidence is hard to find. The points below briefly cover the main areas where policy links appear most likely.

- Economic theory suggests that price support will drive up both output and input use beyond the level it would otherwise reach. In countries with lower levels of price support than the EU (such as the United States or, recently, Central and Eastern Europe) both yields and input use tend to be at a lower level. Countries joining the EU and experiencing an increase in cereal prices, such as the UK in the early 1970s, show evidence of change.

- The reduction in institutional prices for cereals which started with the introduction of the so-called stabiliser approach in the late 1980s and was reinforced in 1992 was certainly one driver towards lower levels of input use than otherwise would have occurred. In principle, a shift to lower prices and compensation for farmers through area payments is likely to have acted to reduce the impetus behind intensification. However, we have to take into account the fact that the CAP intervention system is only one among several different factors. High world market prices which followed during the mid 1990s not unexpectedly counteracted this effect. In addition, evidence from New Zealand shows that the downward trend in input use after liberalisation was reversed afterwards with input levels driven by favourable world market prices and technical development. As regards the EU, a certain correlation between reducing the intervention level for cereals and a reduction in input use over the subsequent decade has been identified in research reports.

- There is empirical evidence to suggest that the introduction of the direct payments regime in 1992 has acted as an effective brake on structural changes in land use by creating an incentive for farms with eligible land to keep cropping all this land, continuously.

  > 'the scheme has fixed a pattern of arable agriculture that is neither ecologically sustainable nor desirable in landscape terms. The eligible areas were set in this way after many years of arable expansion and specialisation and, in eastern England in

particular, may serve to preserve all-arable systems. So far, they have provided a powerful disincentive to a return to mixed or more integrated farming systems'.

(Winter et al, UK, 1998)

- The 1992 reform should, to a certain degree, have limited the ploughing of grassland for the cultivation of cereals which was a cause of environmental concern in some regions, such as parts of the Atlantic coast in France. Land previously outside arable rotations was not eligible for the new area payments so this apparent incentive should have been removed. However, in establishing the base area, some changes in land use seem to have occurred - uncertainties arose in particular where grassland has traditionally been an element of long-term rotations and, therefore, was included into the base area.

- The 1992 reforms involved the setting of base areas in order to calculate the level of direct payments for the total area under production of various crops, at Member State or regional level. This gave rise to a particular environmental issue in relation to the treatment of maize. For maize, Member States argued that it was not possible to distinguish areas used for growing grain maize (an established arable crop) from that used to grow forage maize for livestock feed, since this choice varied from year to year according to growing conditions. Thus direct payments became available to forage maize producers. Forage maize production is typically highly intensive and can cause significant problems of soil erosion, pollution of water by nutrients and soil sediments, pesticide damage to wildlife, as well as the destruction of valuable extensive pasture which is ploughed up to grow maize (Poux, 2000). The EU forage maize area has doubled since the early 1980s while that for grain maize has remained relatively constant. The expansion in the area of forage maize at the expense of grass has undoubtedly been driven by several factors, including technological change, the refinement of new varieties that grow well in cooler climates and the growth of intensive livestock units. However it is also possible that direct payments were also a factor, after 1992. With maize now established as a forage crop in many areas of Europe, the impacts of removing the premium are difficult to estimate but few experts believe that it would result in a significant reduction in the maize area. Many believe that the high profitability of including maize as part of intensive livestock production systems will leave the proportion of maize largely unchanged. In addition, once farmers have made the decision to adopt a new system involving a range of different equipment and management techniques, it cannot be assumed that previous changes will be simply reversed.

- The setting of reference yields as a basis for differentiating compensation payments among regions might have led to some increase in irrigation. For irrigated cropland, where the yields were generally higher than on arid land, it was agreed that a higher level of compensation should be paid to producers in compensation for arable price cuts. Thus, some Member States adopted different reference yields for dry land and irrigated crops of the same type. The much higher payment for irrigated crops per hectare appears to have provided farmers with a particular incentive to initiate irrigation or to claim their land to be irrigated. As with the example of maize, identifying the areas of irrigated and unirrigated crops in theory should have provided no incentive to increase irrigation. However, either because agreed irrigated areas allowed for some flexibility or growth in some regions, or because the penalties for overshooting the base area did not counteract the significant incentive to do so, some evidence suggests that introducing direct payments in 1992 contributed to an expansion of irrigated arable land in some regions.

- Since 1992, perhaps the most direct impact of the CAP on arable land use has been the introduction of obligatory set aside, affecting all larger scale cereal producers wishing to claim direct payments. In addition, there have been incentives for voluntary set aside. There is no definitive environmental appraisal of the impact of set aside at a European level, although there is widespread agreement that environmental benefits can be greatly increased by appropriate forms of management. One of the best studied aspects of the environment on arable land is the conservation benefit for birds. There is some evidence that set aside can produce conservation benefits for a range of bird species but that the greatest potential can be achieved only with specific forms of management not generally associated with routine market set aside. (Wilson et al 1995) This may be true of other forms of environmental impact too, although they are less well documented. Undoubtedly set aside introduces some potential for creating more favourable conditions for the environment in intensive arable landscapes, particularly where continuous cropping and monocultures would otherwise prevail.

Conclusions

The overall level of intensity in arable farming in EU countries is higher than that in many other countries where market support levels for cereals and other arable crops have been lower, since the 1960s. In general, more intensive cropping is associated with higher levels of fertiliser and pesticide use, and there is evidence of a relationship between the level of input use and a range of environmental risks. Thus the economic rationale, supported by some empirical evidence, leads to the conclusion that until 1992, cereal price supports encouraged production at higher levels and higher intensities than would otherwise have occurred in the EU, with some detrimental environmental effects. A similar argument can also be advanced for the effects of direct payments for oilseeds, prior to the 1992 reforms. However, since 1992, the increasing reliance on direct payments for cereals and the Agenda 2000 move to set direct payments for cereals and oilseeds on an equal footing, have changed the relative incentives for production. Thus the significance of the current CAP arable and oilseed regimes as drivers of intensive arable production is much less clear than in the past. Comparisons with other countries suggest that the CAP direct payments have some role alongside other driving forces, such as technological change.

The method of determining the compensation levels for cereals and oilseeds producers, and the treatment of irrigated crops and forage maize production have introduced some environmental risks, in particular with respect to increased area of forage maize production and increase in the area irrigated. Some of the adjustments having taken place since the early 1990s may have been driven by other factors than the CAP. However, there are certainly rigidities in the allocation of arable land as a result of the direct payment system which may not be optimal from an environmental point of view. These might also affect other policies, such as the take up of agri-environment schemes. As regards set aside, the environmental impacts of this instrument merit closer attention, but current empirical evidence suggests that these will be dependent upon precise management decisions which are beyond the current scope of the regulation.

3.2.4 Olives

Background

Olive plantations cover around five million hectares in the EU, mainly in Spain, Italy, Greece and Portugal. The character of plantations, their age, the size and spacing of trees, the approach to management and the yields of olives all vary greatly. Plantations range from ancient, low-density types, often on terraces; to modern, densely-planted and irrigated crops. Management systems range from almost no intervention, with manual harvesting and occasional control of invading scrub; to high-input cropping systems, making intensive use of herbicides, pesticides, irrigation and mechanisation. Most EU olive production is from the more intensive, increasingly irrigated plantations, especially in certain regions eg Jaén and Córdoba in Spain, Puglia in Italy, Crete in Greece. The most intensive plantations yield 10-20 times more per year than the least intensive plantations (Beaufoy, 2001).

Environmental impacts of production

The environmental implications of olive production are as variable as the management systems now found in Europe. A sharp distinction can be made between the environmental pressures created by modern high-yielding, high-input systems and the much lower impact and positive landscape value of more traditional systems (Beaufoy 2001). Recent reports on the topic have stressed the following points.

- Soil erosion is widespread in areas with intensive olive farming. In Andalucía, *average* soil loss in olive plantations has been estimated by a government agency at 80 tonnes/ha/year. Soil loss of >50 t/ha/year is considered 'very severe'.

- Water pollution is associated with many intensive systems, often caused by eroded soil, which is often the main agricultural pollutant of surface water in Mediterranean regions. Residual herbicides (eg Simazine, widely used in intensive olive plantations), remain highly concentrated in the top 5-15cm of soil and are washed into streams, rivers and reservoirs in heavy rain. There appears little empirical data to clarify the scale of the problem in surface or groundwater although both are a concern according to Beaufoy (op cit). High inputs of nitrogen and herbicides in intensive systems combined with prevailing, relatively vulnerable soil types, also suggest a build up of contaminants in groundwater.

- Irrigation is expanding rapidly in the olive sector and is contributing to the heavy pressure on aquifers in several regions. For example, in Puglia (Italy), Crete (Greece) and Jaén (Spain), irrigated olive plantations continue to expand although ground waters are already being severely depleted.

- Biodiversity loss arises from a variety of changes in management. It can result from the rationalisation of production through replanting which has become common in some regions, usually accompanied by the clearance of remaining patches of natural vegetation, field boundaries, rocky areas and dry-stone walls. This leads to a significant loss of wildlife habitat and the erosion of the ecological infrastructure of the farmland (Kabourakis, 1999). New olive plantations have encroached on arable land in areas of

importance for steppeland bird communities, for example in Córdoba and Málaga (Spain) and in Alentejo (Portugal). The intensive application of frequent tillage and heavy pesticide use also results in a very considerable reduction in the diversity and total numbers of flora and fauna, including beneficial insect species (Cirio, 1997).

On the other hand, the environmental impacts of, particularly, low–input systems are of considerable value:

- Biodiversity tends to be high in traditionally managed olive plantations as their structural diversity (trees, understorey, patches of natural vegetation, dry-stone walls) provides a variety of habitats. Keeping the level of pesticide use low supports a rich flora and insect fauna.

- Traditional olive terraces are a characteristic of upland landscapes in many Mediterranean regions, and contribute to their attraction for tourism. Terraces also help to slow run-off and improve water penetration, reducing the risk of floods in lowland areas. However, the stone walls which support them are now often in a state of general neglect and semi-abandonment, resulting in a loss of form and function which becomes irreversible after a period of time. This is a particular concern in parts of Italy.

- In areas with a high proportion of land under forest and scrub, and consequently high fire risk, olive plantations can play a useful role as firebreaks.

CAP Effects

The system of support for olive oil production includes payments made in direct relation to output on the farm, delivered to an approved processing plant. There is a clear incentive to increase production up to the point where marginal returns, including subsidy, exceed the marginal production costs. The higher the profitability, the more incentive farmers have to invest in intensive techniques, including mechanical harvesting, in order to secure long term profitability through cost reduction.

The introduction of the CAP olive regime to Greece and Spain from the 1980s resulted in increased returns for producers in these countries and was followed by a process of intensification and expansion, which appears to have been driven by the regime itself as well as other factors such as technical changes. This intensification has been associated with all of the damaging environmental impacts cited above (see for example Fotopoulos, Liodakis and Tzouvelekas, 1997; CEC, 1997). In Spain, around 50,000 ha per year were planted during the 1990s, and average annual production almost doubled over that decade.

However, the CAP has not been the only driver. In combination with enhanced production incentives under the CAP, increased labour costs leading to the abandonment of traditional management on many small farms, and the availability of new technology, have contributed both to the intensification of production and to the conversion of new areas into olive plantations. The introduction of irrigation to previously dryland plantations has been an important element of intensification in some areas, often associated with water pricing at well below the supply costs, as well as assistance through government and EU funded structural investment programmes (see also Dwyer et al, 2000).

At the same time, Beaufoy and others report marginalisation and abandonment of low input systems in some areas. These plantations rarely appear to benefit from a market premium and there was relatively little application of agri-environment schemes in this sector in the 1990s, which might otherwise have helped to sustain such systems. Relatively low support payments for small, extensive producers under the CAP are a consequence of the production linked formula in the regime. Thus the expansion of irrigated olive plantations into semi-natural and natural habitats (50 cases were reported in Córdoba during the 1990s) has been accompanied by abandonment in others.

Conclusions

The olive sector illustrates some of the greatest differences between high intensity modern production systems potentially generating considerable environmental pressures and more traditional low input systems playing an important role in the maintenance of cultural landscapes. The CAP regime does not in itself offer a means of distinguishing between different production systems on the basis of their environmental value. There is some evidence that the regime has stimulated increased production in certain Member States and contributed, via support coupled to production, to the expansion of intensive systems. However, it is also the development of new production techniques and the resulting potential for cost reduction which has brought significant changes. The role of structural funds in encouraging the adoption of new production techniques, particularly through enabling irrigation and mechanisation via major infrastructure projects, appears also to have been significant in some countries (IEEP, 1991, Rosell et al, 1995).

Given the absence of support targeted specifically towards more traditional production systems, these have become increasingly uncompetitive in the market and their progressive decline has been accompanied by adverse environmental consequences such as erosion and the loss of valuable habitats.

3.2.5 Sugar

Background

The EU produces around 14 per cent of the world's sugar and France is the world's largest producer of sugar beet. In European production systems, sugar beet is commonly grown in rotation with other crops such as wheat, and it is generally found in the most productive arable regions of the EU. Most sugar production in the EU is relatively intensive, and mechanised and involves a particularly high level of herbicide use compared to other major

temperate crop types (Francis et al, 2000). Apart from France, other main producers of sugar include Germany, the UK, Belgium, Italy and Spain and a total area of two million hectares was grown in 1999.

Environmental Impacts of Sugar Production

References to the environmental impacts of sugar production are relatively few. However, a recent report by the UK alliance 'Sustain' (Francis et al, 2000) listed the following environmental risks (not in order of importance):

- the dependence of sugar beet production on herbicide use has contributed to a general decline in weeds, insects, mammals and birds in farmland areas where beet is grown;

- high levels of nitrates potentially released from the leaves of the plant pose a risk for the pollution of groundwater and surface water;

- the use of irrigation to produce sugar beet may have localised impacts where abstraction in the dry season reduces water flows in nearby sensitive aquatic habitats;
- mechanised harvesting of beet has led to high levels of soil loss from land and some areas where beet is grown are also vulnerable to erosion by wind.

However, some potential benefits were also recognised:

- because sugar beet is also a fodder crop, its retention within arable rotations as a profitable element in its own right may have incidentally facilitated the retention of livestock, in certain mixed farming areas;

- as a spring-sown crop which commonly follows cereals in a rotation, sugar beet production in some areas helps to retain winter stubbles which are valuable for certain ground-nesting birds.

The scale of these effects is not clear from the limited literature available. Sugar production is concentrated in high yielding areas and is often associated with large field and open landscapes.

CAP Effects

The EU sugar regime offers guaranteed minimum prices to domestic producers of sugar and production is subject to quotas which are generally administered by sugar processing companies with total quantities being allocated by the Member States. There are three types of quota – 'A Quota' is set at a level intended to meet domestic demand for sugar; a second 'B Quota' defines an additional quantity of production which is designed to cover special needs arising from a shortfall in supply or increase in demand. Sugar produced over these quotas is called 'C Quota' and this receives no price support and must be sold at world market prices outside the EU. There is also a scheme to supply low cost sugar to the chemical industry. Processors contract farmers to produce given quantities of sugar for their factories.

Producer levies, split 40:60 between processors and producers, help to finance the costs of exporting EU sugar onto world markets. The levy is higher for B Quota than for A Quota, but at Member State level these rates may be combined into a single average rate for producers.

Economic analysis suggests that the regime has offered a high degree of price support to EU producers and that this support has encouraged significant expansion of the sugar area in the past, prior to the introduction of production quotas. In some regions, such as southern Spain, the sugar beet area expanded significantly as irrigation was newly introduced into some formerly arid areas, with significant environmental consequences (Rosell and Viladomiu, 2000). Thus, once the quotas were introduced and the level of sugar production was stabilised, this led to a situation of 'institutionalised over-production' (Frances et al, 2000) in the EU. A recent EU Court of Auditors report (2001/C 50/01) further states that 'the maintenance of production on a scale which substantially exceeds EU demand led to negative environmental impacts which could be avoided.'

Economic analysis suggests that, in the absence of price support and quotas, the area of land in the EU devoted to sugar production would be significantly lower than it is today. Thus the land currently used to grow sugar would probably be used to grow another crop – for example other arable crops or even field vegetables. If arable, this might imply lower levels of pesticides, nutrients and soil erosion than the sugar crop, so the change might be generally beneficial from an environmental point of view.

In respect of the intensity of production, there seems no immediate reason to expect that sugar production – where it would remain competitive - would automatically shift to more extensive production systems under an unsupported market. Technological developments are already far developed and this situation seems unlikely to change significantly if price support is reduced. There may be a disproportionate fall in production in less competitive areas. However, in southern Member States where sugar beet is grown on irrigated land, it is possible that a reduction in price support, combined with reforms to water policies so that the environmental cost of irrigation is more fully reflected in its cost to users, could be an effective strategy to combat environmental problems.

Conclusions

Given the limited availability of research overall, it is difficult to provide empirical evidence about the negative environmental effects of the CAP sugar regime. However, theoretical considerations support the view that the regime has helped to keep in place a particularly intensive production system associated with high environmental risks, which would not prevail otherwise, at least at the current level. In the absence of price support and production quotas, the EU would probably devote a smaller area of land to sugar production and this could bring benefits of lower input use, reduced water use and/or reduced soil erosion, in some areas, although the net effect would depend upon the pattern and intensity of subsequent land use in all those areas where sugar production ceased. Some producer representatives are already predicting a significant decline in EU sugar production as a result of the EU's recent 'Everything But Arms' agreement with less developed countries, but it is too early to test these assumptions empirically. More research is required to investigate these issues fully.

3.2.6 Wine

Background

Europe is the world leader in terms of area, production and consumption of wine. Production is concentrated in central and southern Member States, with France accounting for nearly half of total annual wine output by value (CEC, 1999), and Spain, Italy and France accounting for over four-fifths of the total land area devoted to viniculture in the EU. The sector is highly diverse, including a significant area devoted to traditional production systems where vines are grown 'in areas where other agricultural activities would be difficult or impossible' (ibid) and they play an important role in rural economies and landscape maintenance. However, there are also significant vine growing areas where crops are produced with high levels of inputs, including pesticides, fertilisers and irrigation. In some regions (eg central France, Germany), viticulture is a fairly specialised activity, whereas in other areas vines are grown alongside other crops and livestock on mixed holdings, often on a very small scale (eg central Portugal). This diversity of systems may be found within a single Member State, as is the case in Spain:

- The majority of Spanish production comes from small and medium sized mixed farms run by older than average farmers who generally supply co-operatives where wine is processed but frequently not bottled or marketed directly.

- A second, smaller share of production is from specialised, 'good-sized' enterprises with their own wine cellars and usually distinctive brands and marketing arrangements. (Viladomiu and Rosell, 1998)

Environmental Impacts of Viticulture

Relatively little research exists as to the environmental impacts of vine growing in the EU. The important role of vineyards as landscape features and in preventing soil erosion and land abandonment is cited in some policy documents and papers (Tracey, 1998), as a particular feature of certain regions. Traditional vineyards on steep valley slopes can be found in several countries. However, the environmental impacts of intensive and irrigated viticulture have been subject to some criticism by environmental NGOs and others. Brouwer, Terluin and Godeschal (1994) cite vineyards in some regions as particularly high users of pesticides, relative to EU crop production as a whole.

Evidence of the environmental effects of different types of viticulture is provided from a number of case studies, such as the following description from Spain:

- Traditional vineyards in La Mancha coexist with olive trees, winter cereals and sheep, on arid lands. Cultivation of vines on dry land 'only needs a small amount of fungicides, pesticides and fertiliser'. However, there is a trend whereby these kinds of 'least productive vineyards on the worst land will be grubbed up while there will be continued plantings of new varieties with high yields and with the installation of irrigation. Wine yields under irrigation are much higher than on dry land (in 1994 they were three times higher, in a year of normal rainfall, more than twice as high).'

- In recent years, there was an increasing trend of grubbing up of dryland vineyards and their replacement by irrigated annual crops, including maize, sugarbeet and alfalfa, as more water has been made available to farms through increased abstraction from groundwater sources.

(Viladomiu and Rosell, 1998)

CAP Effects

The EU wine regime is characterised by an effort to control the volume of production, as well as an element of support for producers. Historically, support prices have been set and maintained by private storage aids and aids for compulsory distillation. These have been accompanied by a wide range of measures attempting to reduce the volume of low-quality wine produced in the EU and encourage improvements in wine quality. The quality end of the market has remained buoyant while the low quality market has contracted and has been subject to structural surpluses for many years (Tracey, 1998).

Measures have included aids for grubbing up of vineyards, particularly in regions with structural surpluses, as well as for restructuring and conversion of vineyards, and bans on new planting in some areas. In other areas, replanting rights were given to enable producers to replace varieties of low market potential with those for which markets were buoyant. The grubbing up measures helped to reduce the wine growing area of the EU from almost 4 million hectares in 1987 to 3.4 million by 1997 (CEC, 1999).

In addition, the regime includes a detailed series of technical measures including regulations on production and processing practices, and controls on traceability and labelling.

Under the reform of the wine regime in 1999, new planting rights were provided for but under strict controls to ensure that they are only used in situations where producers are supplying expanding, quality market segments. Replanting rights and restructuring aids were continued, but most of these aids became conditional on Member States providing regional inventories on areas, varieties and planting rights, distinguishing normal renewal and vineyard restructuring actions so that CAP funds are used exclusively for the latter. The market measures of private storage aids and distillation aids were also continued under the reformed regime.

Some criticism of the wine regime from an environmental perspective has been that it has failed to provide adequate support to traditional wine growing by comparison to the support offered to alternative crops under other regimes (most notably, the arable and sugar regimes). Thus in situations such as the one described above in Spain, apparently sustainable dryland viticulture is being outcompeted by irrigated arable farming. However, it is likely that such trends would occur also in the absence of support, as driven by markets and the decline in the demand for low quality wine, as well as investment in irrigation.

Another criticism is that under the restructuring programmes, the grubbing up, replanting and modernisation of vineyard production is pushing technological development which is not tailored to the environmental requirements with respect to the land concerned and which may increase pollution and unsustainable resource use in viticulture (particularly where it is

associated with a switch to irrigated production). Again, the precise role of these policy-driven effects, as opposed to market-driven effects and the effects of other policies (including water policies and structural aids), is difficult to clarify in the absence of more specific research. Nevertheless, the scale of change directly supported by the regime in this respect (CEC, 1999) would suggest a potentially significant policy effect. The Court of Auditors' report on 'Greening the CAP' reports that 'grubbing up has had negative impact in Spain and in Sicily (Italy), where since 1992 over 15000 hectares of vines have been uprooted at a cost to the community of ECU 111 million.' Since the reform of the wine regime in 1999 Member States have been given the ability to introduce environmental conditions on the granting of grubbing up aids, but it remains unclear to what extent this option is being used, to date.

Conclusions

The lack of empirical research makes it difficult to substantiate the environmental impacts of the sector, and to identify the precise or direct effects of the CAP regime upon these impacts. Nevertheless it is possible to deduce on the basis of broad economic considerations and from observable trends in the sector, as well as a variety of case studies from particular countries (eg Rosell and Viladomiu, 2000) that the regime is likely to have had detrimental environmental effects in some regions. The main causes in southern Member States appear to be re-structuring aids as well as market support which will have contributed to the expansion of intensive wine production in certain regions while simultaneously encouraging the replacement of traditional and marginal farming systems in areas of significant landscape character, where these products were increasingly surplus to market needs. However, in these situations the role of water policies is also likely to be significant. With respect to other parts of Europe, where viticulture involves high levels of pesticide use, it can be argued on the basis of economic theory that the regime could be a driver, alongside market and technological factors, in supporting intensive production that is associated with increased environmental risk.

3.2.7 Fruit and Vegetables

Background

Fruit and vegetable production is a major feature of agriculture in certain Member States including France, the Netherlands, Spain and Italy. Glasshouse production is an important feature of the sector, as is production under plastic. Horticulture tends to be concentrated regionally – in the Mediterranean States, irrigated horticulture along the coastal strip has become a particularly significant feature over the past 20 years. Generally speaking, the majority of fruit and vegetables produced for the domestic market within the EU are grown in relatively intensive systems and often in controlled environments. The use of some inputs in particular systems is characteristically high (eg fungicides on soft fruit, fertilisers on salad crops) but in other areas there has been a marked growth in the use of integrated farming systems applying techniques such as biological pest control and water recovery systems (eg in glasshouse tomato production).

Environmental Impacts of Fruit and Vegetable Production

Across the EU as a whole, the sector has seen significant intensification of production systems in recent years, with greatly increased use of energy, artificial inputs and irrigation, as well as significant expansion of production under plastic. Southern Member States, particularly Spain, have seen a rapid expansion of intensive fruit and vegetable production to supply buoyant consumer demand in the north. There has been a massive expansion of irrigated crop production, often under glass or plastic, using high levels of inputs and often situated in coastal areas. This has led to significant environmental concerns related to unsustainable water abstraction, water pollution by nutrients, pesticides and soil sediments, and soil salinisation and subsequent land abandonment due to unsustainable irrigation practices (eg see Dwyer et al, 2000).

The production of fruit from permanent crops in northern Europe has shifted away from the cultivation of significant areas of extensively managed traditional orchards towards smaller areas of intensively managed, high input orchards growing a reduced number of fruit varieties. The particularly high agrochemical input use in these production systems can lead to increased risks of negative impacts upon the environment.

There are some areas of the EU where fruit and vegetables provide welcome diversity in cropland areas – particularly soft fruit produced in northern Member States. There are also significant examples of local areas and production sectors in some countries where systems have been transformed using integrated, low input or organic methods, often through programmes which are linked to labelling and quality marketing or quality assurance initiatives.

CAP Effects

The Fruit and Vegetable regime provides a level of support to producers of these commodities via partial compensation offered to producer organisations, for surplus produce withdrawn from the market, if prices fall below certain levels (Tracey, 1998). In addition, up to 1996 stabilisers were frequently used to cope with temporary surpluses so that excess production in one year led to price cuts of up to 20% in the following year, and export refunds maintained differentials between EU and world market prices. However, a stagnation of consumption within the EU in the 1990s coupled with difficult export conditions under the Uruguay agreement and despite the stabiliser mechanism, brought about a structural surplus which led to continually significant withdrawals, year on year up to 1995 (Ledermann, 1998).

Market support through the Fruit and Vegetables regime may have contributed to the expansion and intensification in the sector. However, this CMO 'has been relatively liberal, intervention being limited and emphasis being placed on market forces' (Ledermann, 1998). Certainly, most of the trends and changes cited above have also been strongly favoured as a result of non-CAP regime influences including market trends, technological developments and broader rural socio-economic changes in the countries concerned. The rapid scale of structural change and environmental impacts on water resources in particular, illustrate how powerful this combination of factors can be, in shaping agricultural practices within the EU.

Nevertheless, the following policy influences appear potentially relevant:

- EU accession gave Spain access to the single market, and many analysts cite this as a particularly strong driving force behind the growth of intensive horticulture along the Mediterranean coastal strip. In the period 1975-85, prior to accession, horticulture in these areas was increasing but this was through an increase in both labour and land use. After accession, there was a reduction in both these factors and a marked process of intensification, which has been described as 'high degrees of capitalisation under trade protection' (Ochoa, 1998). However, it is unclear to what extent Spain would have become a major supplier to northern Member States even if it had remained outside the single market, and thus to what extent it has been the CAP, rather than other factors, which has driven these developments. Nevertheless, it seems that the high profit expectations in the sector, as a combined result of favourable market conditions and support under the regime, did motivate significant intervention using EU structural and cohesion funds to help develop the sector. These gave a major boost to intensification of production through investment aid and the development of infrastructure, including water supply facilities for irrigation. There is some evidence that a similar pattern of change, influenced by similar factors, also occurred in Portugal over the same period (IEEP, 1991).

- In the period up to 1992, CAP structural aid was provided to apple producers to encourage the grubbing up of orchards of 'unmarketable' fruit and replanting of specified varieties of apple that were identified as 'marketable'. In some countries such as France and the UK, traditional orchards have been characterised by a large number of local varieties of the fruit, representing a valuable genetic resource and a source of local biodiversity, since the trees commonly have a wide variety of growth form and provide habitats for a range of other species. Under the aid scheme, owners of such traditional orchards could seek aids to grub them up and replace them with standard cultivars, usually grown on dwarf rootstock and managed under more intensive and mechanised systems. However, such changes will also have been favoured to some extent by market developments for orchard fruit, since traditional orchards are less productive and more costly to manage.

- From Greece, there is some evidence that immediately following the 1996 reform of the regime, which limited the withdrawn quantities of products and the prices offered for withdrawals, significantly in some sectors (eg peaches, apricots), production levels for these sectors fell substantially, even though producer prices rose that year. This would indicate a potentially strong CAP effect upon production levels for these particular fruits, whereby producers are sceptical of future prospects under the reformed regime and some are abandoning the sector (Mattas and Galanopoulus, 1998).

- In particular before the 1996 reform, there were anecdotal reports that the buying in of surplus quantities and their subsequent disposal on landfill sites led to locally significant levels of water pollution.

- In the reform of the fruit and vegetable regime in 1996, important changes were made specifically to enhance the environmental impacts of such production. The regimes offer aid to producer groups to help improve links in the supply chain and ensure better marketing of produce. Under the 1996 reforms this aid was linked to environmental conditions such as:

- the attachment of environmental requirements to the subsidies granted to producer groups' operational programmes which include investments in restructuring and modernisation of production, processing and marketing of fruit and vegetables;

- the establishment of the condition that part of the operational programme investments must be devoted to environmental improvement in production, processing and marketing of fruit and vegetables (eg integrated pest management, production and processing of organic fruit and vegetables, removal of plastics and other wastes, saving water to alleviate aquifer overexploitation, use of environmentally friendly materials and equipment, etc).

Conclusions

The analysis of this regime has highlighted two important points in relation to the CAP and environmental integration.

Firstly, there is some evidence particularly from southern Europe that the policy itself, prior to 1996, had a role in encouraging the increase in pollution, unsustainable water abstraction, soil erosion and other apparent impacts of the expansion of intensive horticulture in various regions (see Dwyer et al, 2000, for more details). However, these changes were clearly also encouraged by market and technological developments, including the influence of the single market within the EU, and by the results of investment and infrastructure policies in the countries concerned, including Structural and Cohesion policies.

Secondly, this sector provides a clear example where the policy from 1996 has taken steps to encourage more environmentally beneficial developments in production systems by introducing new conditions on aid granted to producer groups, alongside other measures to limit production support and encourage more co-ordinated processing and marketing arrangements in the sector. It would require an assessment, on the basis of empirical data, to see whether this has helped to promote more sustainable practices within this sector, where non-CAP influences have been a strong determinant of change.

3.2.8 Rural Development and the Second Pillar of the CAP

Overview

In overview, the EU vision for the 'second pillar' of the CAP heralds the development of integrated programmes of policy measures that are both environmentally sustainable by design, and that use aids that aim to improve the competitiveness of EU agriculture in a sustainable way. The measures eligible under the second pillar are de-coupled from production and should not encourage intensive or inappropriate husbandry. The Rural Development Programmes are to be implemented at the appropriate regional level. Whereas Member States have a wide degree of discretion as to where the priorities should be, all rural development programmes must contain agri-environmental measures, which are a key

instrument of environmental integration and are discussed in more detail in Section 3.9 and 4.2.

Environmental Impacts of Second Pillar Measures

It is too early for this study to be able to assess the environmental impacts of Rural Development Programmes implemented under the second pillar of the Agenda 2000 CAP reforms, since these were only launched in 2000. However, it is possible to consider evidence concerning the impacts of predecessor policies that have formed the basic components of the new measures, to achieve a better understanding of the likely impacts of the Regulation. It is also important to consider how the Rural Development Regulation differs from these previous policies, and the way in which it is being implemented in Member States, in seeking to assess likely environmental impacts of the programmes that it supports.

Considering all these factors, the following points appear relevant.

- Many of the measures available within the RDR derive from former Structural Fund measures which were first conceived in the early 1970s when the CAP encouraged farm modernisation and investment to increase both profitability and productivity. With a view to improve the competitiveness of agriculture, some RDR measures retain a focus upon farm modernisation, structural adjustment, and productivity increases, whereas others support the diversification of income sources for farm households beyond agriculture. However, importantly, under the RDR the aids include extra environmental safeguards and constraints designed to ensure that investment aid does not support expansion in the main commodity sectors, or developments that would damage the environment.

- In order to ensure that farmers observe mandatory environmental requirements in line with the Polluter Pays Principle, Member States have to specify verifiable standards of usual Good Farming Practice ,(GFP), which form a baseline to be respected for both LFA payments and agri-environmental measures. The latter are designed to provide agri-environmental premia only for farmers' commitments going beyond the reference level of Good Farming Practice. (i.e. for benefits which are seen as a service provided by a farmer, whereas GFP should be observed at the farmers' expense). In many Member States, the definition of GFP has been established by listing the provisions of existing environmental legislation which apply to farms, while some countries have also made reference to Codes of Good Practice which may go beyond the requirements of mandatory legislation.

- The Less Favoured Area aids within the RDR have a major social and environmental purpose – that is, maintaining agricultural management in disadvantaged marginal and high altitude areas against a prevailing trend towards reduced competitiveness, abandonment and desertification of land. Prior to 2000, the environmental focus of these compensatory payments was generally weak at EU level, although some Member States implemented the payments in a way that was sensitive to environmental conditions in their marginal regions, while others did not (Smith, 1986). Under Agenda 2000 the compulsory shift in the basis of payment away from headage and towards area payments is designed to enable a 'greening' of these payments so that they no longer contribute to overstocking (as experienced in several regions, in Ireland, UK and Greece for example).

Again, this is an important positive move towards environmental integration. However, is too early to draw conclusions about actual outcomes. The positive environmental effects of switching towards area payments might be disguised by the continuing use of headage payments in the main livestock regimes, which may be a much more significant component of farm income in these marginal areas than the LFA aids (Drew Associates, 1997). No clear analysis of the way in which Member States have implemented area payments in practice has become available, so it is difficult to judge the impact on farm management decisions or the environment.

- A new measure, Article 16, allows Member States to compensate farmers who are subject to restrictions on agricultural use arising from limitations introduced by EC environmental legislation (although now specifically excluding the Nitrates Directive, as clarified in the implementing regulation). This may cover costs incurred and income forgone and is subject to limits specified in the Regulation. This is intended to assist farmers to observe environmental obligations such as those defined within Natura 2000 sites. The justification for such payments is based upon the same logic as compensatory allowances in LFAs. These provide support to farmers in order to keep land management activities in place where they would otherwise disappear due to adverse natural conditions and the resulting low profitability of farming. Thus, this approach can work in favour of environmental objectives since it helps to prevent the abandonment of land. Whereas on the one hand, such payments can be seen as breaching the Polluter Pays Principle they can, on the other, be seen as offering pragmatic support for the implementation of environmental legislation. This is particularly relevant to Natura 2000 measures, where some Member States face serious implementation problems because they are pursuing implementation through compulsory measures, whereas others are not and therefore can adopt alternative approaches. For example in the UK, the legislation which implements Natura 2000 does not oblige farmers within SACs to follow specific practices in these areas and instead, agri-environment schemes are used to encourage sensitive management on these sites which goes beyond GFP. To date, take up of the new Article 16 by the Member States has been limited.

- Forestry measures within the Second Pillar are significant, covering support both for afforestation of farmland and for woodland management, including management of unproductive woodland for its nature conservation value. The main previous forestry measure, Regulation 2080/1992, seems to have had highly variable environmental impacts. One unpublished study suggested clear benefits in some Member States and a mixture of damaging and more positive effects in others (IEEP, 1998). A formal evaluation was launched by the Commission in 2000 but the results are not yet available. Steps were taken to strengthen the environmental aspects of the forestry measures in the Rural Development Regulation. There is, as yet, little information on how they are being implemented in practice. Some environmental NGOs claim that afforestation aids (eg in Portugal) continue to be implemented without due regard to the environment and that biodiversity is suffering as a consequence, while other NGOs (eg in the UK) support the application of the forestry measures in their countries as sustainable and fully integrated with environmental needs.

- The range of rural development measures offered under Article 33 (development and adaptation of rural areas) includes some with significant positive environmental potential and others which, in the past, have been linked to environmental damage. The former

group includes aid for protection of the environment and aid for marketing quality products, which could help to promote more sustainable management practices under certain conditions. The latter group includes aid for rural infrastructure (eg roads), land reparcelling and water resources management (eg irrigation).

- In addition, support for training offers particular environmental opportunities if it is used by the Member States to raise awareness of environmental impacts and environmental management techniques on farms.

Conclusions

This brief consideration highlights the apparent potential of the second pillar as a mechanism for environmental integration within the CAP, particularly if it is enabled to grow and develop. Among stakeholders, environmental and farming NGOs are generally very supportive of the aims and most of the components of the second pillar, and many also call for significantly increased resources for it, in future. Some of the principal measures are considered further in Section 4.

3.2.9 Agri-environmental Measures

Background

Agri-environment schemes offer farmers voluntary, multi-annual contracts where they are paid for delivering environmental goods and services which go beyond the 'reference level' of good agricultural practice in the country or region concerned. The earliest such schemes were established in the 1980s and first received community cofinancing under Regulation /85, as part of EAGGF guidance funds for structural measures. The schemes were made accompanying measures to the CAP, cofinanced by EAGGF guarantee funds and compulsory for all Member States, as part of the 1992 MacSharry reforms (Regulation 2078/92). Under Agenda 2000 they were integrated within the broader framework of the rural development Regulation 1257/1999, but their compulsory nature and their purpose and scope remain relatively unchanged from the 1992 situation. Cofinancing rates for agri-environment programmes (AEPs) are 75% in Objective 1 areas and 50% elsewhere. In principle they apply throughout the territory of each Member State but in practice, application varies widely between countries, with some covering nearly all their farmed land (eg Austria, Finland) while others are tightly targeted to particular sub-regions or specific environmental situations.

Agri-environment Measures and the Environment

Currently, around 20% of UAA in the EU Member States is enrolled in agri-environment programmes (AEPs). This represents a significant achievement in a relatively short space of time, for a new instrument which is both voluntary and innovative in approach. For the majority of environmental and farming NGOs, these programmes represent an important step forward in integrating environmental considerations into agricultural policies and many would see their future growth and development as a particular priority for the future.

To date, there is little consistent information at EU level to indicate the overall effectiveness of agri-environment measures in addressing the environmental impacts of agriculture. However, a significant and increasing number of studies examines these issues at more local level, either in relation to specific schemes (for which monitoring and evaluation are now required under the relevant EU legislation) or in relation to particular environmental aims – for example, in the context of Biodiversity Action Planning for important species or priority habitats.

An early but still relevant overview of effectiveness was provided in an unpublished study to DG Environment of the Commission (IEEP, 1998), based upon more detailed analysis in several different Member States. It concluded the following:

- agri-environment schemes provide both incentive payments and a more supportive policy context for farmers pursuing forms of production which are well matched to environmental requirements but potentially less able to compete with alternative [more intensive] practices;

- schemes can bring benefits as they limit pressures from input use, constrain pollution and overgrazing, and contribute to maintaining valued cultural landscapes and semi-natural habitats;

- where implemented over sizeable areas of land, agri-environment schemes have led to modest but worthwhile improvements in the management of livestock, the upkeep and maintenance of field boundaries and small habitats, the application of manure and inorganic fertiliser, the utilisation of pesticides and the volume of irrigation water consumed. Many of the authorities responsible for schemes are in the process of reviewing and strengthening the stipulations included in management agreements. The extent of environmental benefits can thus be expected to increase accordingly, over time;

- over a smaller area there have been more substantial changes in farm management, including the re-establishment of valued habitats such as extensive pasture, the conversion of farms from conventional to organic production, significant reductions in the use of agrochemicals and fertilisers and, in a few cases, a decline in livestock numbers.

Since that report was produced, further evidence of specific benefits of schemes for particular issues such as species recovery has emerged (eg RSPB, 2000), as well as evidence which highlights the need for continuing development of the schemes to improve their effectiveness, learning from the experience gained to date (eg PDNP, 2000, Dutch study, 2001). In sum, few scientific experts or environmental organisations in Europe fundamentally question the potential effectiveness of AEPs but many believe there is a need for increased local management sensitivity and more innovative management solutions, if their full potential is to be realised (eg Dwyer, 2001).

A number of issues have been raised about the appropriate focus, the basis of payment, and the potential for growth of these measures in future. These are covered in section 4 of this report, since they are important considerations in assessing the potential of the instrument to promote further integration.

3.2.10 Horizontal Measures – the Common Rules Regulation

Introduced as part of the Agenda 2000 reforms, the common rules Regulation 1259/1999 puts in place new obligations for Member States in relation to first pillar direct aids offered under many of the CAP commodity regimes, and offers an opportunity to shift funds at national level between first and second pillar aids through the application of modulation.

The Regulation applies to all direct payments made from EAGGF Guarantee funds except those under the RDR. Under Article 3, it requires Member States to take measures to ensure that agricultural activity within the scope of the Regulation is compatible with ***'environmental protection requirements'***. Such measures may include:

- Support in return for agri-environment commitments (ie agri-environment schemes);
- General mandatory environmental requirements (ie environmental legislation); and
- Specific environmental requirements constituting a condition for direct payments

In order to enforce compliance with the latter two options, Member States are authorised to reduce or cut the direct payments that farmers are entitled to receive under the market regimes. This mechanism is normally referred to as "cross-compliance" .

In the implementing Regulation for 1259/1999, published in mid-2001, Member States are obliged to produce a series of reports to the Commission showing how they intend to meet their obligations under Article 3. In particular:

- all must produce a report by April 2002 reviewing the impact of agricultural activity within the scope of the Regulation upon the environment; and
- all must report to the Commission the details of any actions taken under the options presented above, to enable them to meet the Article 3 obligation.

Under Article 4, the Regulation enables Member States to cut up to 20% of all CAP direct payments made to farmers under the various commodity support regimes. Reductions can be tailored according to the labour force on the farm (expressed in annual work units), the magnitude of direct payments received under CAP support schemes and/or the standard gross margin of the farm.

Article 5 stipulates that the funds which remain unspent, either due to the reduction of direct aids through modulation, or as a result of penalising farmers who fail to comply with environmental standards, will be available for a Member State concerned for financing the accompanying measures (agri-environment, pre-retirement, afforestation, LFA payments).

In an amendment to Regulation 1259/1999 this year, the so-called 'small farmers scheme' has been added. This enables very small-scale producers who receive relatively low levels of direct aids from CAP commodity regimes to opt for a simplified aid scheme in place of the separate regimes previously applying to them. Under the simplified scheme they can receive a lump sum aid payment based upon historic receipts.

Current Implementation

The implementation of Article 3 is still at a relatively early stage. All Member States are pointing to the existing legislation and Codes of Practice that they have in place already and to their agri-environment programmes. A few have announced new initiatives to introduce particular environmental requirements as a condition for farmers receiving direct payments. To date these have been relatively specific, for example relating to pesticide use in starch potato crops in the Netherlands and the obligation to obtain appropriate permits in relation to water abstraction for farmers claiming premia for irrigated maize in France. In Denmark an explicit link has been made between eligibility for certain direct payments and compliance with a pollution control measure requiring appropriate field management along the banks of streams and rivers (Petersen and Shaw 2001).

Article 4 has so far been implemented by France and the UK, and a further three Member States have made commitments to implement it by 2003 (Germany, the Netherlands and Portugal). For all these countries, the main driver for implementation is in order to generate additional funds for accompanying measures under the RDR (particularly agri-environmental measures) and to achieve a shift in the balance of funding between pillar one and pillar two. As such, it is clear that the measure is seen as an important tool to enhance the environmental or multifunctionality goals of CAP support. However, some other Member States, notably Finland which has a particularly large agri-environmental programme already, have made it clear that they see no need to use the measure because they feel their current balance between first and second pillar spending is appropriate.

We have not been able to obtain any information about likely implementation of the small farmers scheme in the Member States – many are currently consulting on how the scheme should operate, within their territories.

Common Rules and the Environment

In this section we cannot evaluate the environmental impact of these measures from empirical evidence, since their application is currently so recent and still subject to development. However, it is possible to appraise the potential impacts of the measures through a combination of reasoned *a priori* argument and experience with other similar instruments in the past (for Article 3, most notably in the area of environmental policy itself).

Article 3 is clearly an important element in the current integration strategy. It has the role of seeking to ensure that environmental standards are being met where direct payments are being made. It provides a means of reinforcing compliance with environmental requirements while accepting that there will be considerable variations between Member States, both in defining environmental standards and selecting measures to seek compliance with it. From a brief appraisal of the options implemented so far by Member States, it appears the measure could play an important role in improving farmers' adherence to specific elements in existing environmental legislation (eg the water licensing system in France), as well as helping to strengthen the influence of 'codes of good practice' and other advisory materials.

There is another potentially valuable element in the reporting obligations of the Member States under Article 3. When they submit their April 2002 reports on the environmental

'situation' on farms receiving direct payments, a public debate on their appraisal and on the measures proposed could be facilitated and this would help to provide new momentum for environmental integration at national and EU levels, which requires, of course, that such reports be publicly available.

These aspects of Article 3 and thus its potential to promote further integration are considered in more detail in section 4 of this report.

The application of Article 4 by Member States in itself does not imply an immediate environmental outcome. The specific measures adopted need to be evaluated in their own right, both individually and collectively. However, using modulation money to increase spending on accompanying measures under the RDR should have a broadly beneficial impact as long as these measures promote environmental protection and enhancement, which on balance they seem likely to do.

The broader role of modulation as one option for promoting a shift of resources from first to second pillar of the CAP is potentially an important element in a future integration strategy which will be considered further in section 5 of this report.

The application of the small farmers scheme should achieve a greater level of clearly decoupled first pillar support for a potentially significant proportion of producers in some of the Member States, if the measure proves popular among those farms that are eligible. Since this aid is also subject to the Article 3 provision in Regulation 1259/1999, environmental protection requirements must also be ensured under the scheme, as for other regimes.

Conclusions

Whilst it remains too early to make a robust appraisal of the environmental impacts of the common rules Regulation, it is possible to anticipate that its influence should be positive, particularly in respect of Article 3. It is also clear that all of the instruments in the regulation have potential to contribute to an environmentally favourable development of the CAP.

3.3 Conclusions

This section has sought to take stock of the likely impact of CAP on the environment. Whereas this investigation could be based to a certain degree on the available literature, discussions with stakeholders and scientific experts, and reasoned analysis, there are clear limits on what could be achieved through a study such as this. In addition to the limited timescale and resources available, the empirical information on the environmental effects of CAP measures is limited, particularly for the purpose of isolating these effects from the effects of other drivers. We have focused on a selection of CAP measures which illustrate the great variety of instruments, sectoral characteristics and complex policy and non-policy interactions concerned. Ideally, the analysis should be extended to cover other regimes not discussed here (eg sheep and goatmeat, tobacco, rice, cotton) and to include a more thorough empirical testing of linkages and trends cited in the literature, particularly at EU level.

Nevertheless, the material presented here has clarified a number of key points of relevance to this study.

- The examination by sector presents evidence of the impacts of agricultural systems upon the environment. Those systems that involve high levels of inputs (nutrients, water and pesticides) and outputs, that generate significant levels of 'waste' (eg surplus manures), and particularly where production is highly spatially concentrated and specialised, give rise to pollution of water and soils and loss of biodiversity. As these types of farm system expand into new and potentially more vulnerable areas – a continuing trend in some regions – valuable ecosystems are lost and water and soil resources may be depleted. At the same time, there remain significant areas of land in the EU where generally less productive, more extensive and often long-established farming systems help to preserve landscapes and biodiversity and protect fragile resources. These include pastoral areas in marginal and mountainous regions, dryland arable areas in the Spanish steppes and longstanding vineyards and olive plantations, often on terraces, in many southern marginal areas. The variety in farming systems is found as much within sectors as between them. Thus, policies which are focused on sectors will affect both ends of the spectrum, intensive and extensive.

- The complexity of these findings contrasts with the much simpler picture of CAP effects on the environment that is presented or implied in much of the literature produced by various stakeholders and researchers and which often fail to distinguish CAP effects from those of other drivers. Nevertheless, certain common themes are apparent. Box 2 summarises the tentative conclusions for the measures examined in this report.

Box 2 – Tentative Conclusions from Section 3 Analysis

Dairy

- Inconclusive evidence for significant CAP effects.
- Price support may have helped encourage intensification and structural change in dairying, but very likely that such changes would have occurred under a liberal policy regime.
- Quota management approaches in some Member States may have helped to support more environmentally beneficial production in marginal regions.

Beef and veal

- Very complex regime with multiple and varied effects.
- CAP unlikely to be the most significant factor determining environmental impacts.
- Headage payments may provide an incentive to produce beyond the environmental optimum.
- Current regime has limited ability to encourage more environmentally sustainable systems because mechanisms are too uniform to reflect environmental conditions and capacities.
- National envelopes offer some potential for Member States to address this but have been applied for other purposes, to date.

Cereals and Oilseeds

- Until 1992 cereal price supports and oilseed direct payments probably encouraged production at higher levels and higher intensities than would otherwise have occurred, with detrimental environmental effects. Since 1992 the effect is less clear - direct payments probably have a role alongside other driving forces.
- There is evidence that the treatment of irrigated crops and forage maize production in the 1992 reforms was not helpful to the environment.
- There are rigidities in the allocation of arable land as a result of the direct payment system which may not be optimal for the environment.
- As regards set aside, environmental impacts are dependent upon precise management decisions not covered by the regulation and they can be either positive or negative.

Olives

- Some evidence that the regime has stimulated increased production and contributed to the expansion of intensive systems in certain Member States, although new cost-saving production techniques have also promoted significant changes.
- The role of structural investment policies in encouraging adoption of new techniques appears significant in some countries

Sugar and Wine

- Theory and limited evidence suggests the sugar regime has supported intensive production with high environmental risks at a level which would not occur without support
- The wine regime in the southern Member States has probably contributed to the expansion of intensive wine production in some regions and encouraged the replacement of traditional, marginal systems in areas of natural value. However, the role of water policies is probably also significant.
- The wine regime could also be a driver, alongside market and technological factors, in supporting intensive production that is associated with increased environmental risk, across Europe.

Fruit and Vegetables

- Some evidence from southern Europe suggests the regime before 1996 encouraged increases in pollution, unsustainable water abstraction, soil erosion via the expansion of intensive horticulture in various regions. However, market and technological developments were also highly significant, as well as the single market and investment and infrastructure policies
- Since 1996 the regime has encouraged more beneficial developments but there is little information by which to judge its effectiveness

Second Pillar

- Evidence suggests significant potential as a mechanism for environmental integration within the CAP, particularly if enabled to grow and develop and if environmental elements are strengthened

Common Rules Regulation

- Article 3 in particular offers important environmental potential, but it is too early to judge results.

- Partly because of the diversity of farming systems across Europe, but also because of the strength of other forces acting on EU agriculture over the past few decades, the evidence of CAP effects upon the environment is highly variable. In some cases and sectors, clear links appear either weak or not proven; for example, between guaranteed prices for dairy products and environmental pollution. In other cases, there is evidence to suggest that policies have had an impact; for example, in relation to the various headage and stocking densities under the beef and veal regime or the output-related payments in the olive regime. In many cases where it appears that a policy measure may have contributed to environmental pressures, this relationship is not universal because different farming systems across the EU apparently respond differently to common instruments. Variability of response may also relate to decisions made at Member State level, about how to implement various aspects of the common policy (eg to determine base areas and reference yields in the arable regimes, or how to apply national envelopes in the beef regime).

- It is clear that a number of policy instruments now in place under the CAP – particularly, but not exclusively, those in the 'second pillar' – can help to promote a positive relationship between agriculture and the environment. To date, it is not possible to provide an overview on the substance and the order of magnitude of these effects because many of the measures have only recently been introduced (eg the environmental conditions for producer group support in the fruit and vegetable regime). As we will discuss further in section 4, there is clear evidence of the benefit of agri-environment schemes (despite recent criticisms) as well as certain other measures, in particular regions (eg marketing of quality products, in certain marginal areas). Furthermore, the potential for these measures to promote enhanced environmental effects in future is widely recognised and endorsed by experts and stakeholders within the EU.

This study must therefore now turn its attention to a consideration of how developments in the CAP, and its application within the Member States, can complement the objectives and instruments of EU environmental policy to encourage:

- Amelioration of environmental issues of concern related to particular farming systems or sectors, particularly where the existing policies may be exacerbating such concern but also where there is scope to promote greater synergy through the use of CAP measures;
- Strengthening and promotion of environmental management as a central component of agricultural production systems and rural development policies, alongside the other objectives of the CAP.

4: Key Integration Measures for the CAP

Building upon the evaluation in Chapter 3, this section makes a more detailed analysis of potential key measures for further environmental integration, in respect of the CAP.

4.1 Background and Rationale for the Selection of Measures

Background

Considerable progress has been made in seeking to raise environmental standards relating to agriculture in Europe through policy measures. However, significant problems remain, not least in production sectors benefiting from the CAP.

Stakeholder Perspectives on Further Integration

Environmental critiques of the CAP often highlight the pressures arising from intensive forms of agriculture in the EU, emphasise the relatively high levels of support in many sectors under the CAP, portray this as the major driver of intensification and note the relatively low share of support benefiting low input producers, often the more environmentally benign. On this reasoning, solutions may be advocated which:

- seek to reduce the level of support for sectors where intensification has been widespread in order to reduce or reverse the momentum of change. There may also be a concern to avoid 'rewarding' farmers in these sectors;

- modify or attach conditions to the support payments such that they no longer act as drivers of intensification or environmental damage;

- increase the level of support for environmentally preferred methods of farming, in particular including organic and high nature value farms, in order to increase their competitiveness relative to other sectors and farming systems.

Some proposals go further and propose greater policy discrimination in favour of smaller producers who are said to be more environmentally sound. Such orientations are often based on a line of reasoning according to which small, traditional farmers should be generally supported on environmental as well as socio-cultural grounds. However, the relationship between farm size and environmental performance is far from simple, and many NGOs recognise that there is no conclusive evidence at a European level that small farms are necessarily preferable in environmental terms.

The views of stakeholders were considered in some detail in the preparation of this report. This was done by a review of literature, relatively detailed interviews with about 20 stakeholders and two seminars held in Brussels. The cooperation of stakeholders was much appreciated.

Much of the literature commenting on integration of the environment into the CAP is phrased in very general terms. Relatively little material is available from farming organisations at a

European level. At a national level there are more specific proposals and reactions to individual measures such as cross-compliance. However, most of the position papers from farm organisations are designed more to illustrate the burdens on farmers and argue for continued levels of support rather than to address the broader integration question in a systematic way. There is general scepticism about the possibility of transferring support from the first to the second pillar of the CAP and a concern that this may reduce farm incomes. Restricting the eligibility for second pillar measures to the farm sector is a further concern, particularly given the need for Member State financial contributions, which are not considered secure in several countries and the need for farmers to find their own resources to complement funding opportunities under rural development programmes. However, it is much less clear whether farming organisations believe that there are effective second pillar models which would meet their expectations. Some land owning bodies, by contrast, have a more positive view of the second pillar and are more sceptical of the continuation of first pillar measures in their present form.

Organic or biological farming is the topic of growing discussion and support for the organic option is widespread in the environmental community as well as within the sector itself. Most of the policy proposals from the organic side focus on increased support for the sector, through both conversion and longer term management incentives in the second pillar. Support is also sought through derogations from certain rules applying in the commodity regimes and for assistance in strengthening marketing, research etc. There is some concern about the potential effects of a reduced price premium as the number of farmers adopting organic methods grows but the organic sector has varying views about the value of maintaining current market regimes in the CAP.

Environmental NGOs have produced a much greater volume of material addressing the challenge of integration although much of it pre-dates the Agenda 2000 reforms. Many NGOs have not yet produced detailed analysis of the CAP as it stands since Agenda 2000 was agreed, from an environmental perspective. Several are now working on new policy papers and positions which may fill this gap. Some past analysis and proposals remain relevant despite the Agenda 2000 changes, for example work on the olive oil regime.

One of the major weaknesses of the NGO papers is a general assumption that the CAP is the primary driver of changes that have occurred in agriculture in current Member States in recent years. Thus there is a tendency to argue directly from the evidence of intensification and marginalisation to the need to change measures within the CAP without an interim analysis of the precise role played by CAP policies in the past and their likely impacts in future. Other important drivers, such as changes in the markets, in technology and labour costs are often acknowledged but frequently understated. During discussion NGOs often conceded that other drivers were important but in many cases insisted that CAP policies were the variable which could be altered and therefore were the legitimate focus of their arguments. It is also clear that analysing driving forces is difficult and NGOs point to the failure of other stakeholders to disentangle other driving forces either. The total effect is selectivity by nearly all the parties involved.

Generally, environmental NGOs were critical of high support levels in the first pillar but varied in the emphasis given to reforming first pillar measures as opposed to building up the second pillar. There is strong support for greater focus on agri-environment measures in the CAP, including incentives for organic farming but some criticism of certain of the current

measures in rural development plans. Many of the NGO proposals for addressing the market regimes lack detail, often being couched in terms of a general critique of a regime, coupled to a statement of preferred general direction rather than a more analytical consideration of specific instruments in their individual roles. There are exceptions to this general rule but the absence of detailed material and overall shortage of case studies of CAP policy effects per se considerably hampered the study.

Considerations from Previous Sections of this Report

The material presented so far in this report underlines the importance of understanding the role of policy drivers, both in the past and in current conditions, in influencing agriculture and its environmental impacts. Although difficult, it is preferable to look for efficacious integration measures which seem likely to produce the desired response on the ground rather than to simply reverse historic drivers, especially if their precise role is uncertain.

Our consideration of 'the counterfactual' tends to suggest that the widespread removal of a range of CAP measures cited in the literature as damaging to the environment – particularly those measures that provide general production-related support to a sector – would not necessarily bring about the reversal of the environmental impacts that have been associated with them. Some economic models and limited evidence from past trends in the cereals regime suggest that removal of support can lead to lower production, which implies a reduced level of input use. Either production becomes concentrated on smaller areas of land, or there is some net 'extensification' of production overall. Arguments from theory also suggest that removal of support should, in general, lower the budgetary cost of agri-environmental measures because they no longer have to compete against existing production supports in order to attract farmers to join – thus creating an 'environmental dividend' (eg OECD, 2001). However, there is some evidence that the removal of support might have indirect, adverse consequences for the environment; for example where it leads to significant restructuring towards greater intensification and specialisation (eg Kleinhanss et al, 2001) or further neglect of management in marginal situations (eg Potter et al, 2000).

Thus the environmental implications of removing production linked support are uncertain and may vary significantly between sectors and localities. This is not an argument for maintaining support *per se* but for considering the potential impact of integration measures in the light of interactions between policy drivers.

It must also be noted that, if environmental efficacy is a key criterion for the selection of integration measures, the choice will not always correspond to the policies which would be selected on equity grounds. The case for integration needs to be argued on its environmental merits, although the scope for synergy between environmental and socio-economic goals should also be promoted wherever possible.

Rationale for Selection of Measures

1. From the examination of environmental impacts, as summarised in section 2 and detailed by sector in section 3, it is clear that significant environmental issues are associated with most sectors of EU agriculture. This suggests *that integration measures should seek to*

address the broad range of agricultural-production, not just individual sectors. This can be achieved either by using 'horizontal' measures applied through a non sector-specific policy mechanism, or by separate measures tailored to each sector. Non-sector specific mechanisms could include horizontal measures applied to CMOs as well as measures applied through the second pillar.

2. One important theme arising from the previous sections is the need to secure certain environmental outcomes irrespective of often unpredictable changes in market conditions, technology and farmer decisions. This confirms the value of specified environmental policies applying to the full range of farmers in all conditions. The first step towards an integration strategy must be to establish an acceptable reference level or foundation using environmental policy as the primary tool. This involves approaches which can be taken in parallel, at Member State and/or EU level. In particular, this report has highlighted the importance of water policy as a key influence in agriculture's environmental impacts. The implementation by Member States of the Water Framework Directive should lead to enhanced performance in this area.

3. Another theme of the previous sections was the difficulty of achieving appropriate farm management decisions, from an environmental perspective, by means of conventional support policies in the first pillar of the CAP. At any given level of support there are many farms operating more intensive management practices than are environmentally desirable and at the same time there are others that are creating fewer environmental pressures, but that may be more marginal in economic terms. In several sectors the latter group is dwindling in size. This implies the need for more targeted interventions in order to focus on appropriate management at farm level. Three approaches are particularly relevant:

   - agri-environment payments, above the reference level, targeted at management which is appropriate to local conditions;

   - more targeted measures within the first pillar, such as the use of 'national envelopes' to vary the normal rules within a market regime. This offers the option of adapting general rules to regional conditions and taking account of environmental priorities;

   - enhanced development and more effective environmental application of other second pillar measures, particularly LFA and Article 16 where appropriate, but also quality marketing, diversification, investment to address environmental priorities and sensitive forestry measures, to complement the goals of agri-environment measures and to encourage long term sustainability through balanced development of rural areas.

4. A fourth concern is the need to bring environmental standards throughout agriculture up to an appropriate level. Several instruments are available to support this objective. Logically, the starting point is to remove any subsidies or direct CAP interventions which are environmentally damaging. However, this alone is not sufficient. There is also scope for both 'add on objectives' and 'add on instruments'. In the first pillar, there is the possibility of adding environmental conditions to existing support policies in order enforce compliance with the reference level of good farming practice, including mandatory environmental requirements. In the second pillar, there is the possibility to support farms undertaking the adjustments necessary to meet the required standards (Article 16 of the RDR). This is a pragmatic solution to implementation problems which have arisen with

certain environmental policies applying to the farm sector such as the Habitats Directive. However, since it could be read as a temporary suspension of the Polluter Pays Principle, it should be revised regularly.

5. A fifth concern to emerge from Section 3 is the influence of a number of market regimes where there is still a strong production link. The case for adopting alternative, more decoupled support systems needs to be considered. The options for further 'decoupling' of production-related supports may enable the potential removal of harmful effects without necessarily triggering radical restructuring. These options, such as a switch from production payments to area payments for olives or a change from headage to area-based direct payments for beef and veal and sheep and goats, can be seen as instruments for integration in their own right, but their value will vary according to the specific regimes considered.

6. Finally, the importance of the market rather than policy, as a driver has been noted several times in the analysis. This suggests the need to consider measures to reinforce trends in the market which support environmental objectives as part of the strategy. Food labelling and quality assurance initiatives are part of this approach.

Drawing together this analysis, it is concluded that an integration strategy should be drawn up on the basis of the core instruments listed below. Such a strategy needs to be considered within the context of the wider reform process and to deploy individual measures in a coherent way.

1. A significant expansion/enhanced application of agri-environmental measures and/or increased incentive/obligation on Member States to ensure that these measures meet key environmental needs

2. Enhanced or broader application of cross compliance at Member State and/or EU level.

3. Further decoupling of aids from production, eg:

   - the conversion of headage payments in the beef and veal and sheep and goatmeat regimes into area payments

   - conversion of olive aids into area payments

   - a move to establish a more common area payment to replace a wide range of existing support mechanisms in different regimes

   - conversion of dairy and sugar price support to area payments.

4. Reductions in support measures targeting those regimes/elements associated with the greatest environmentally negative impacts.

5. National 'envelopes' in specific first pillar regimes which can allow Member States to pursue environmental objectives.

6. Increased use of aid under the Less Favoured Area provisions of the Rural Development Regulation including Article 16 to support the continuation of sensitive farming practices in marginal or other environmentally sensitive areas.

7. Enhanced application of other RDR measures to promote more environmentally sustainable agricultural and rural development (including structural adjustment, training and diversification aids).

8. Labelling initiatives and stronger policies on quality assurance as a means of encouraging more sustainable practices across the EU.

The remainder of this section therefore examines each of these 'measures', while Section 5 addresses how they might be combined, and with what strategic financial changes, to promote integration as an effective 'package' in the light of farm income and budgetary considerations.

4.2 An Enhanced Application of Agri-Environment Measures

There is broad consensus about the importance of agri-environment measures as a central instrument in integrating environmental and sustainable development objectives into the CAP. It is now the only obligatory measure for all Member States under the Rural Development Regulation and pilot agri-environment schemes are being put in place in all central and eastern European accession countries, the majority with assistance from SAPARD. Nearly all environmental NGOs and many other organisations have argued that the budget for the policy should be expanded further so that it becomes one of the core elements of the CAP, in future.

To fully utilise the potential for agri-environment measures it will be necessary to consider the implications and feasibility of expanding them substantially in future. There are also some specific issues about their appropriate purpose and scope which need to be addressed in evaluating this particular instrument as a tool for further integration.

Purpose and Scope - Environmental Priorities for Agri-environment Programmes

Some concerns about AEPs have centred around whether they should be focused mainly upon the protection, enhancement or creation of environmental assets. A related issue is the extent to which they should seek general improvement in environmental impacts across the farmed area, or whether they should be focused on 'priority' issues or areas (eg areas of high environmental impact, or areas of high environmental value).

In many Member States uptake of AEPs has been relatively limited in more intensively farmed areas where many of the most severe environmental pressures occur. However, agri-environment may not be an appropriate instrument for tackling many of these pressures which often involve practices below the reference level. There are also limits on the use of voluntary schemes in this context. Thus it is questionable how far AEPs can contribute effectively to resolving chronic problems of water pollution, for example. Nevertheless, experience shows that incentive payments beyond good farming practice can help to form an

element in a co-ordinated package of measures to tackle general problems arising from unsustainable techniques in productive areas. This may be so particularly where they are combined with advice and they concentrate on encouraging early adoption of new and more sustainable management systems which must, once fully established, be commercially viable without ongoing support.

A firm relationship between payments and environmental benefits is essential, but the latter also needs to be viewed from the perspective of retaining environmental value, particularly during a time of potential large scale change in farming systems, as well as providing new goods and services in areas of special need or opportunity. Protecting and enhancing existing resources is applicable particularly to pastoral farming in some marginal areas across the EU as well as to some types of vineyards, traditional olive plantations and high nature value landscapes such as the dehesas in many southern regions. Creating new features and habitats, as well as maintaining ecological and landscape value through novel approaches to intensive systems (including organic farming and integrated management) may be particularly important in the most productive farmed regions (although other policy instruments should be used to address longer term compliance with mandatory environmental requirements representing the reference level of "good farming practice"). All these kinds of activity can be legitimately supported through agri-environment schemes.

These considerations imply the need for schemes to combine some 'broad and shallow' characteristics seeking widespread but relatively basic management services across a large proportion of land, with other 'narrow and deep' elements which pursue clearly defined and more demanding outputs and targeted benefits in particular 'priority' areas. At present, several Member States or regions adopt either one or the other approach. It may be preferable in all countries to encourage the development of multi-level schemes, for example offering a lower level, relatively shallow package across a whole farm on condition that the agreement also includes one or two more demanding elements. Such multi-level arrangements already exist in some Member States and are being actively considered in central Europe.

The Basis of Payment

At present payments for farmers are determined by reference to the compensation required to cover the loss of income entailed by complying with specific environmental restrictions and the management cost of actions required. In addition to a premium calculated on the basis of available farm costs-accounts, a top-up of up to 20% can be added in order to provide an incentive sufficient to cover the high transaction costs entailed in many schemes. In practice, the use of the 20% incentive is subject to major variation between schemes and Member States and is frequently not offered at all.

There are sizeable areas in the EU, particularly in southern Member States and central and eastern Europe where marginalisation and land abandonment is the major threat to environmental values on farmland. Here, there must be doubts as to whether the current payment formula, in mirroring current market conditions, provides farmers with an adequate incentive to continue production.

Under the current formula, loss of income and costs of management are calculated by reference to a farm's variable costs such as input use and labour. The actual costs to a farmer

of joining an AEP can include the cost of management time to adapt to new techniques or provide an enhanced level of monitoring and record keeping, as well as costs associated with enterprise restructuring. Fixed costs, including appropriate facilities for livestock or the maintenance of terracing for example may have to be incurred to meet environmental obligations and establish a coherent management approach. Thus it may be both legitimate and advisable to include fixed and start-up costs in calculating payments in areas where this is demonstrably necessary.

Arguably, the threat of abandonment will spread further in the coming decade as a result of further liberalisation and structural change. Thus, a more comprehensive formula for calculating payments may be necessary, if farmers are to continue to join schemes while contending with falling commodity prices and, in the long run, compensation payments. This implies that either the compensation formula be re-examined if agri-environment schemes are to play a more strategic future role, or that separate funding – most notably, LFA supports - might be needed in combination with agri-environment, in order to fulfil this need.

One issue relating to the appropriate basis of payment that has attracted increasing attention recently is that of outcome-oriented payments. The idea is to pay farmers for environmental outcomes actually achieved rather than for changes in behaviour and the adoption of certain practices. This creates no difficulties when the outcome is a direct function of the practice which the farmer has agreed to follow, for example to introduce grass field margins around arable fields. However, where the outcome is much less direct and subject to uncertainties beyond the farmers' control, serious problems can arise. For example, if the farmer is rewarded only in relation to the number of breeding birds on the holding at the time of survey rather than for following specific forms of grassland and field boundary management, risks well beyond the farmer's control arise. Birds may not be present for reasons unconnected with that year's farm management, as a result of weather patterns, larger population fluctuations, changes in land use or hunting elsewhere or a simple preference for nesting elsewhere. Disregarding farmer's costs in adopting suitable management practices would undermine the general workability of agri-environmental incentive systems. There would also be a great danger that checking environmental outcomes in every single case would require considerable additional costs for on-the-spot checks which would render the system (which anyway is prone to high administration costs) unacceptable.

Assessing Needs and Budgetary Implications

The distribution of agri-environment payments within the EU partly reflects historic spending by Member States on the measures in place before the introduction of the Rural Development Regulation. There is widespread evidence to suggest that it does not correspond well to the distribution of 'environmental services' that could optimally be delivered by farmers in the EU. There is a strong bias in favour of northern Member States for example which clearly contrasts with the relatively large proportion of high nature value farming systems found in southern regions of the Community. While this may reflect political preferences in the countries concerned, as well as the availability of national funding and institutional issues, it is not a robust long term foundation for these measures. A more objective assessment of needs and opportunities for implementing these policies would be useful to guide future strategy and the longer term development of the measure.

The Gothenberg Council conclusions on the Sustainable Development Strategy point towards the greater use of agri-environment measures in pursuing Community environmental objectives, by well targeted measures. This implies focussing more schemes on areas and issues of high priority under the birds and habitats Directive or the proposed new soil strategy for example.

The agri-environment budget is strictly limited by the allocations to Member States under the RDR. Given the level of spending under these measures that had been achieved by 2000, little growth is provided for in the period up to 2006 unless governments adopt modulation to redirect funds from the commodity regimes. However, there is evidence to suggest considerable scope for expanding application of agri-environment programmes, both by extending the coverage of existing schemes and by developing schemes which could more fully reflect the issues and opportunities outlined above.

- In some Member States and regions, notably Austria and Finland as well as some German Länder, take up levels above 70 per cent of UAA have been achieved for relatively broad schemes seeking a relatively simple level of environmental enhancement across large areas. This pattern is not confined to northern Europe. There are signs that schemes could achieve considerable popularity in CEECs as well - early response to the new Slovenian scheme has been positive, with more than 15,000 farmers expressing interest. High levels of uptake are also a feature of some schemes in Southern Italy. Currently, several Member States are not offering these widely available, relatively accessible schemes despite calls for this by environmental and farming groups (eg WCL, 2001). If these calls were to be heeded, the wider provision of such schemes could raise the overall level of participation several-fold in a number of Member States such as Greece, Spain, Denmark and the UK.

- Targets for converting a specified proportion of the total land area to organic production have been set in several Member States, including Germany and Sweden. If these are to be met, a growth in conversion needs to occur prior to 2006, implying increased expenditure on organic schemes within the agri-environment chapter.

- It is clear that many Member States are expecting to rely on the use of agri-environmental incentives to achieve 'favourable conservation status' on sites designated under the Habitats Directive. The process of agreeing the complete catalogue of sites required under the Birds and Habitats Directives has still not been concluded but there are indications that considerable areas that are likely to be in the final network still lack reliable means of achieving favourable conservation status. This alone suggests a certain degree of unmet need for agri-environment schemes.

- Studies in the UK by English Nature, WWF and others have attempted to assess the budget required to meet priority nature conservation objectives applicable to farmland. These suggest expenditure three or four times larger than the current level. Given that the share of the UK programme devoted to nature conservation is already sizeable relative to many other Member States this may point to a substantial current need elsewhere as well.

- There is evidence that several Member States were slow to implement Regulation 2078/1992, at first and the uptake of some new measures under the RDR, for example CTEs in France, has been below expectation initially. However, these patterns often

occur because government administrations, as well as farmers, need time to develop their understanding of new measures and capacity to implement them. The trend in most countries has been towards higher levels of participation over time once initial difficulties have been addressed, confidence in both schemes and their administration improved and unsuccessful initiatives have been eliminated.

Implementation Issues

Monitoring and evaluation of the first agri-environment schemes under Regulation 2078/92 was patchy and often behind schedule. Standards have risen in response to Commission pressure and the requirements of the RDR. The Commission has given greater weight to monitoring and evaluation questions when scrutinising proposals in the Rural Development Plans put forward by Member States in 2000. Much of the onus to improve schemes now falls on Member States. Nonetheless, the Commission should give high priority to ensuring that weaknesses are identified and effective remedies proposed in the course of the review process for RDR measures due by 2003.

Strengthening the institutional capacity to administer schemes effectively is another priority for some Member States. At the same time the relatively high administrative and extension costs of delivering these schemes effectively, compared to many other CAP measures, implies a need to seek ways to increase the efficiency of these mechanisms.

Conclusions

Agri-environment measures, now with clearer environmental objectives and stronger monitoring and reporting requirements under the RDR are a potentially more powerful instrument for environmental integration than in the past. However, to realise this potential, sufficient resources must be allocated to funding them and continual improvements made in scheme design and implementation, to reflect the experience acquired since 1992. The expansion and further refinement of agri-environmental measures should be a priority for an environmental integration strategy. This would allow greater provision of a range of basic environmental services on more farmland, as well as targeting specific enhancement and protection of particularly valuable environmental assets in more restricted situations.

If it is to become the centrepiece of an expanded second pillar, the available resources (including Community cofinancing), the scope of application and the basis of payment for farmers delivering environmental services in some regions would need to be broadened in order to give the policy a more ambitious role in supporting cultural landscapes across Europe.

4.3 A Broader Application of Cross Compliance

Background to Current Policy

The possibility of attaching obligatory environmental conditions to CAP receipts, particularly direct payments, has been the subject of discussion for more than a decade with strong support from certain environmental NGOs such as Birdlife International. In the 1992 reform

of the CAP a form of environmental cross-compliance was introduced for obligatory arable set-aside, while Member States were permitted to attach conditions to both beef and sheep headage payments. For many years the UK was the only country to experiment with such an option, adopting a procedure with some environmental benefits but considerable administrative complications (see Dwyer *et al* 2000).

The current policy was ushered in by Article 3 of Regulation 1259/1999 and the relevant implementing Regulation 963/2001. The first paragraph of Article 3 defines the options which Member States can use to fulfil their environmental obligations under the Regulation: these are agri-environmental measures, environmental legislation, and specific environmental standards. The second paragraph authorises Member States to reduce or withdraw direct payments as a sanction in order to enforce compliance with either option two or option three. This latter mechanism is often referred to as cross-compliance meaning the reduction or outright removal of payments that farmers are entitled to receive under the market organisations as a penalty to enforce environmental requirements.

Potential

Effective cross-compliance measures could result in significant environmental benefits:

- by improving compliance with existing legislation and Codes of Practice and through the introduction of new conditions;

- by raising broader environmental awareness in the farming community and, possibly, amongst authorities administering direct payments;

- by providing a means of reaching farmers who are not receiving second pillar payments and may not seek to get them, especially in intensively farmed areas.

Experience in the United States is of limited relevance because the system applied is different than that within the EU. Nonetheless significant benefits have been achieved there, particularly in the control of soil erosion. (Heimlich 2001)

In the longer term there are limitations in the role of cross-compliance as an integration measure.

- The sanction of reducing farmers' direct payments for failing to respect environmental obligations is intended primarily as a means of strengthening compliance with compulsory standards. It should, therefore, not be confused with a tool for seeking positive engagement by farmers in pursuing environmental goals. Such engagement is particularly desirable with respect to a wide range of environmental land management goals.

- Significant administrative costs for national administrations are likely if a fair system for establishing farmers' failure to comply with standards and for reducing their payments is put in place. Several Member States have been seeking clarification of the monitoring requirements which would apply to national cross-compliance rules and their potential

exposure to disallowance for inadequate checks at farm level. This is not specified in Article 3 or the implementing Regulation.

- Large-scale removal of benefits would be politically difficult, as became clear from the US experience, In any case the removal of support payments must respect the condition of proportionality. This underlines the point that a penalty system of this kind is not a means of securing a significant flow of new funds into agri-environment measures.

- There are in built disincentives for Member States to penalise their own farmers or to design more ambitious cross-compliance systems than are in place in other parts of the EU.

- Imbalances can result from differences between CAP market regimes in sectors which are not supported by direct payments at present and those that are. Applying conditions to beef cattle but not dairy cattle for example, seems inappropriate in environmental terms, and would be an artefact of differences in the support regime. Farmers in different support sectors guilty of the same offence could face disproportionately different penalties unless they are subject to similar national rules applicable to all regimes and enforced through fines rather than cross-compliance in sectors without direct payments. Adopting direct payments in all the main CAP livestock sectors would, of course, diminish such anomalies.

- It must be kept in mind that making increasingly ambitious environmental standards part of cross-compliance requirements, as advocated by some environmental groups, raises the level of good farming practice which, by definition, includes mandatory environmental requirements. Thus, including environmental commitments in cross-compliance requirements that were formerly eligible for support under the agri-environment package narrows the scope for using agri-environment policy and increases reliance on a command-and-control system. This raises questions in particular given the patchy record of implementing the existing set of mandatory environmental requirements in the agriculture sector. This was one reason for the introduction of a pragmatic compensation tool - (Article 16 of the Rural Development Regulation).

Bearing in mind these constraints, there is scope for strengthening the role of cross-compliance as an integration measure. In developing and implementing cross-compliance Member State authorities should be aware of opportunities:

- to reinforce the implementation of existing regulatory measures, including relevant EC environmental Directives (eg the Nitrates Directive) where this is appropriate and effective in national circumstances;

- to introduce other measures addressing gaps in current EU environmental standards, for example in relation to soil erosion;

- to include awareness raising and broader mitigation measures, such as the completion of farm audits, appraisals and plans, or attendance on a training scheme, as well as direct land management requirements. The latter could include the appropriate management of field margins or hedges and buffer strips along watercourses;

- to promote the uptake of agri-environmental schemes where this is particularly needed.

Concern about the administrative costs of monitoring compliance with obligations at farm level needs to be addressed. Costs can be high, particularly if a significant proportion of farms need to be inspected annually. Realistic monitoring and enforcement procedures are essential.

At national level there may be scope to minimise these costs by:

- co-ordinating cross-compliance monitoring with other farm-level checks to reduce the number and frequency of visits;

- using risk assessment techniques to target monitoring to areas or sectors where compliance is thought likely to be weakest;

- considering the scope for 'public policing' or enforcement by industry bodies or local authorities who already inspect farms for other purposes (eg quality assurance, health and safety).

There are also options for developing the policy at EU level.

- The scope of Article 3 could be extended to regimes beyond the present list as and when they are amended to include direct payments or other measures for which the cross-compliance approach is appropriate.

- Some observers argue for a consistent set of environmental conditions to be applied throughout the EU. While this might be appropriate for some conditions, for example compliance with EC law, a standardised set of compliance obligations would stifle worthwhile local variations and it would be difficult to agree a core list. It would be preferable to set standards locally but maintain vigorous reporting standards to the Commission, accompanied by a more transparent set of procedures, with the key documents publicly available. There is scope to link local standards to definitions of verifiable Good Farming Practice required under the RDR.

- Nonetheless, there is a case for requiring all farms receiving direct payments above a certain level to undertake a farm environmental audit to a standard subject to approval at Community level. Such an audit could include an inventory of the farm's environmental resources, statement of key management requirements, a nutrient input-output analysis, accompanied by soil tests as appropriate (for both nitrogen and phosphates) and a review of grassland and stock management. Other factors such as a review of water management or measures to control soil erosion could be added, depending on local conditions. Such an audit would need to be established within a period of, say, two or three years and reviewed every five years. The costs need not be large and the design would need to ensure that the exercise was helpful for farm management as well as environmental purposes. One benefit of this approach would be to clarify the nature and extent of environmental concerns and pressures in a more consistent way at a European level. It would add greater transparency to the wider policy debate as well as to local farm

management and would be particularly relevant to the implementation of the Water Framework Directive.

- Ensuring that Member State reports on their implementation of Article 3 are thorough, and lead to appropriate proposals, will be an important element of implementation. These reports should be subject to public scrutiny and should be available to NGOs and others for comment.

- At a much broader level there is scope for linking Member States' implementation of the major EU Environmental Directives impinging on agriculture, including the Nitrates, Birds and Habitats Directives in particular, with the clearance of EU funding under the CAP by the European Commission. Although routine withholding of funds would be undesirable, delays and financial penalties could help to give priority at national level to implementation in an area where Member State performance has been poor and transfers from the EU budget are large. The effectiveness of this approach was demonstrated in relation to the Habitats and Nitrates Directives at the time when approval was being sought for the clearance of the RDP budgets in 2000. Such a mechanism would help to reduce the potential for unjustifiable differences between Member States which also affect farm competitiveness.

Conclusions

There is an opportunity to raise environmental standards in EU agriculture by the effective implementation of Article 3 of the Common Rules Regulation. It is complementary to the requirement in the Rural Development Regulation for beneficiaries of several different measures to comply with usual Good Farming Practice. The commitment to review the operation of Article 3, made in the Agriculture Council's 2001 integration strategy paper for Gothenburg, should be seen as a trigger for ensuring that implementation is sufficiently consistent between Member States.

Specific measures proposed here at the EU level include:

- extension of Article 3 to a wider range of CAP regimes, as they are adapted;

- development of an EU farm environmental audit which would be applied on all farms receiving direct payments above a certain level;

- establishing an appropriate linkage between Article 3 implementation and usual Good Farming Practice;

- establishing a link between Member States' compliance with key EU environmental Directives and authorisation of expenditure for certain CAP measures.

In the longer term, however, cross-compliance probably has a more limited strategic role in the integration of environmental conditions into the CAP. For the majority of stakeholders and experts, it is seen as a secondary instrument relative to targeted measures under the rural development policy which would then need to be expanded through a transfer of money from the first to the second pillar of the CAP.

4.4 Area Payments

Introduction

Several policy proposals have been made that could represent further decoupling of support payments from production, as a tool to promote environmental integration by removing artificial incentives triggering levels of intensity, concentration or specialisation that are potentially damaging (see section 3.1). These include:

- the conversion of headage payments in the beef and veal and sheep and goatmeat regimes into area payments;

- conversion of olive aids into area payments;

- a move to establish a more common area payment to replace a wide range of existing regime support mechanisms (eg moving towards a single payment per hectare on all farmed land);

- conversion of dairy and sugar price support to area payments, as a means of integrating these support systems into the common area framework.

In this section, we deal with each of these options.

4.4.1 Headage to Area Payments for Livestock

As described in section 3.3, the market regime for beef and veal provides direct payments to producers in the form of annual payments per head of livestock, subject to a range of limits, rules and conditions. The sheep and goatmeat regime also offers payments per head on breeding animals, again subject to various conditions. The Commission's proposals for a modified sheep and goat regime published in 2001 confirm the continuation of a headage payment for ewes, but at a fixed rather than a variable rate. It was also agreed as part of the Agenda 2000 package to introduce a form of headage payments in the dairy sector after 2005, although the regime is subject to review and potential amendment before then.

Headage payments have been subject to criticism by a range of environmental organisations (eg Birdlife, Great Britain countryside agencies, WWF) essentially because they reward the keeping of livestock *per se* without regard for environmentally sustainable levels of production and forms of management. Overgrazing, concentrated in certain regions and often most severe on commons or publicly owned land, is often cited as an environmental pressure derived, at least in part, from inappropriate headage payments. In section 3.3, this report considered the environmental implications of the level of payments, eligibility rules, stocking density conditions and other limits on payments. However, the implications of a switch away from headage payments and towards area payments in these regimes has not yet been examined. Such an examination is essential in order to evaluate its potential as an instrument of further environmental integration.

Broad Principles

- Area payments can be largely or entirely 'decoupled' from output. In this sense, there need be no incentive to produce any marketable output, although minimum grazing or management regimes may need to be specified for environmental or other reasons. In its form as a decoupled aid, an area payment would be compatible with Annex 1 of the WTO Agreement on Agriculture ('Green Box').

- Area payments can be designed in such a way that the recipient's production decisions are not influenced by administratively determined rules (e.g. numbers or types of eligible livestock, breeds, stocking densities etc). Thus there should be no policy-induced incentive to keep environmentally inappropriate combinations or numbers of sheep or cattle. Production systems and stocking decisions would be influenced by economic signals (market price and production costs) as well as environmental incentives or constraints.

If the sensitive management of landscapes is the chief environmental benefit associated with livestock farming, then a payment per unit area appears a more targeted means of paying for this service. Farms producing livestock intensively in indoor housing would be eligible for greater support than those utilising land more extensively. However, due to effects on land prices, area payments tend to support land owners rather than those who actually manage the land and arrangements between landowners and tenants exacerbate this effect.

- Area payments can be linked to specific, mapped areas of land and thus provide a means of targeting further land-related conditions and/or additional supplements to achieve greater environmental benefits. Area payments are widely used in agri-environment schemes, partly for this reason.

Quite separately from these more general principles, there is an issue of policy simplicity and coherence. The use of area payments in the main livestock regimes, matching the parallel approach in the arable regimes as well as for LFA payments, could streamline CAP payment administration for the Member States.

Obstacles

Headage payments are designed to compensate for reductions in institutional prices. Whereas area payments under the CAP follow, in principle, the same purpose, they could at the same time contribute to the maintenance of environmentally positive land management functions. However, with the compensation for institutional price cuts being the guiding principle for direct payments, one might arrive at considerable differences in per hectare payments between farms and between regions. Huge differences in per hectare payments would make the implementation of an area payment system politically difficult. As far as the focus shifts towards the purpose of keeping environmentally benign forms of grassland management in place, then differences in area payments based on economic effects inherited from the former price support system become less and less justifiable.

If area payments were based on a flat rate throughout the EU, this would redirect funding in favour of less intensive producers and alter the balance of receipts between Member States. There would also be a redistribution of support between regions. The impact on farm incomes could be severe and many of the more intensive producers whose existence has been dependent on price support and headage payments would need to change their management plans. Some may be more viable on a larger scale but many may choose to abandon production.

Payment in relation to the land's agronomic characteristics, irrespective of past stocking, could attempt to combine environmental and social considerations by paying more on better land in recognition of the fact that this land would previously have been stocked more heavily, while still respecting environmental capacity. However this would require the introduction of a sufficiently differentiated land classification system which, for grassland, hasn't been developed yet in any Member State.

Area payments could be designed to *favour of certain types of forage* thus providing an incentive to improve environmental management. Some have proposed focussing forage payments partly or wholly on grass (or permanent vegetation). This would introduce a stronger environmental element. However, it would result in a larger scale redistribution of support at the expense of more intensive producers, again with social and economic consequences. In marginal areas which have lost some traditional forage crops, with land use becoming dominated by grassland, a restrictive grassland premium could undermine attempts to reintroduce a more varied pattern of vegetation of ecological value.

Beef production can be divided into a range of different systems, and there is a delicate balance between the different production segments. The more extensive specialist beef cattle breeding farms, which may include important areas of high natural value farmland, often rely on more intensive finishing farms to take their stock and fatten them for slaughter. In this sense there is often considerable interdependency between intensive and extensive producers. A shift in the support system in favour of the latter may not mitigate the problems arising from highly concentrated finishing which would have to be tackled by environmental policy measures outside the beef regime.

Distributional effects in *accession countries* should also be a consideration. Here cattle, sheep and goat numbers have declined sharply during transition. Numbers of cattle fell 3 per cent between 1996 and 2000, while sheep numbers declined by 23%. Beef and sheepmeat production fell by 16 per cent and 14 per cent respectively. (Data from national surveys reported in Agra Europe 3/08/2001). At this stage the introduction of quotas and other limitations attached to headage payments would introduce entitlements and a distribution of stock with no clear environmental rationale – instead reflecting turbulent and highly exceptional economic and market conditions. In these circumstances area payments detached from recent stocking levels would have distributional benefits, irrespective of other considerations, as long as landholdings are adequately established.

Operational Issues

- A system of area payments should be relatively simple to administer and more transparent for farmers, responsible authorities and the wider public. However, monitoring the forage

area of a farm is poses new and different administrative requirements relating to the definition of the eligible area for example.

- Particular problems arise where property rights are not clear attributed. This would be an issue for farming common land, village, communal and other collectively or institutionally owned grazing land where rights may be divided amongst many individuals. Such land amounts to a significant area in some Member States (such as Spain and the UK).

- In several Member States there are regions where graziers keep sheep for a considerable period on arable land, gleaning stubble fields after harvest. Often they utilise land they do not own and may occupy for only part of the year. Some land may be grazed or cut for forage on a regular annual basis, but other areas may be used only periodically for example when resting from vegetable crops or when free from leisure uses. Similar issues are relevant within the LFA as a result of the new policy under Regulation 1257/1999. In considering a broader move towards area payments, an analysis of the experience gained from conversion to LFA area payments would be valuable.

- The close relationship between *beef and dairy production* is a potentially important complication in designing area payments. It is possible to envisage ways of adjusting forage area to account for the milk production enterprise on farms with beef cattle, for example by using a standard formula for converting a farm's milk quota or dairy cow numbers into a nominal hectarage.

- In so far as the rationale for area payments depends on the benefits of grazing by livestock, a requirement to maintain the land in an environmentally favourable condition seems necessary. There are several technical questions about how such an obligation should be determined, specified and enforced.

Likely Impacts

Clearly, farm management strategies are likely to change if higher support payments can be achieved by maximising forage area rather than by maximising eligible stock numbers. One effect is likely to be to force up the price of land that could be available for forage, particularly if forage hectares at remote locations are eligible. This appears to have occurred already in parts of Europe in response to the introduction of stocking density limits in the beef regime (see section 3.3). Some environmental NGOs argue that developments of this kind could generate significant environmental costs.

The extent to which farmers would have an incentive to de-stock rather than maintain production is also open to question. One study in the UK based on model farms suggests that there would be relatively little incentive to de-stock if area payments were to be adopted, but much depends on the precise design of the scheme, market prices and prospects and the situation of individual farms (Entec 1995). Given the weakness of the beef market at present and the impact of BSE and FMD it seems likely that some farmers would choose to de-stock but others would seek to pursue economic adjustments through economies of scale and enlarge their holdings and increase output.

When LFA payments were converted from a headage to an area basis the Commission's intention was to achieve budgetary neutrality. In practice, some Member States have increased the resources devoted to LFA payments while others appear to have reduced them. Some increases have arisen from additional transitional expenditure agreed in order to minimise the impact of the change on 'losers' (eg Scotland). Thus, although in principle direct payments could be converted from a headage to an area basis without any increase in the budget, in practice, temporary compensation to cushion the impact on losers would be a probable outcome. However, such compensation should be degressive and time-limited.

Conclusions

In the longer term area payments appear better adapted to the objectives of a sustainable multifunctional agriculture and to the protection of the environment than the current headage payments. If the rationale for direct payments is re-balanced to favour the provision of environmental benefits more than compensation for price reductions, the environmental case for area payments becomes stronger.

However, there are political and technical difficulties in their implementation, as they would generate redistribution effects among Member States and farmers, leading in some cases to socially unacceptable reductions in income support. More work is needed to explore the implications of their deployment in different settings in greater detail and to assess their implementation in practice.

One means of doing this would be to establish pilot schemes, preferably in both the cattle and sheep sectors. Such initiatives could be financed through the 'national envelope' in the beef regime and the recently agreed equivalent in the sheep and goat regime. These envelopes were designed to give Member States greater flexibility but their potential to gain experience with area payments has not been used.

4.4.2 Conversion of Olive Aids into Area Payments

In the case of olives, the current support payment is given in direct relation to the quantity of olives produced by each farmer. Thus the economic case for this instrument promoting increased levels and intensities of production is relatively clear, and the expected impact of a switch to area payments here should be a decrease in output levels and input use, all else being equal. However, it is important to consider to what extent this is likely to happen in practice, and to examine the potential distributional impacts and the practical aspects of such a change, in assessing the value of this proposed instrument for environmental integration.

To some extent, the effects of switching from production-linked to area payments for olives would mirror the effects of the headage to area change discussed above. The key questions to be addressed include:

1. To what extent would current intensive systems alter - would some become unviable, would they extensify, or would they remain largely as intensive as they currently are?

2. How would the change affect extensive producers? Would their incomes be sufficiently improved to arrest further decline, or would other forms of agricultural production still outcompete them? Would abandonment cease?

3. What would be the future relationship between intensive and extensive production systems - would there still be an important incentive to intensify?

1. *Effects on Intensive Production*

It seems unlikely that, given the much greater profitability of irrigated intensive olives as compared to traditional extensive ones (Beaufoy, 2001), a simple shift to area payments would cause them to cease production.

Generally, the distributional impacts of a significant change in policy are likely to require transitional compensation measures. These should be a time-limited and degressive guarantee to producers that they would not receive less than a certain percentage of their support in the previous year - say, 90% in year 1, 80% in year 2 and then maybe 60% in year 3, before the move to an area payment was completed.

With such measures in place it seems unlikely that a large number of intensive producers would cease producing. Given the relative economic advantage of intensive production systems, a significant move towards extensive production seems unlikely. However, as was observed for cereals in the 1990s, farmers might opt for a slightly lower use of inputs, at least over the transition period. However, such effects could be expected from other important changes, in particular, the water policies in the Member States. If, as a consequence of the Water Framework Directive, authorities in the southern regions of the EU began to charge higher prices for irrigation water and/or to otherwise restrict water use, the incentive to continue with intensive, irrigated olive production would be significantly reduced, in some parts of these regions.

2. Effects on Extensive Production

A switch to area payments for olives would increase the relative level of aid given to those who produce most extensively. However, whether this would in itself be sufficient to enhance their viability and to arrest current levels of decline depends very much on several factors. These include the level of the area payment and its relationship to aids given to competing cropping systems (e. g. oilseeds, cereals etc.), market incentives and the benefits to be obtained from adopting new technologies. Where the maintenance of low-intensive olive-oil production is desirable, for instance on environmental grounds, such factors would have to be taken into account. However, in addition to new area payment, one might pursue the underlying environmental objectives through special measures from the second pillar, including LFA and agri-environmental aids.

3. Effects Upon the Incentive to Intensify

It seems likely that a move to area payments could reduce the relative incentive to intensify production systems further. However, other powerful incentives would still remain in some areas, particularly where there has been investment in new technologies and infrastructure such as expanded irrigation facilities (with or without EU Structural Fund support). Reducing these kinds of incentive would require action beyond the scope of the CAP regime - notably in water policy, but also in the area of alternative rural development options, so as to offer producers other ways in which to improve their incomes and support rural communities. This highlights a potentially important role for second pillar instruments, as well as structural funds, in bringing about a more sustainable pattern of land use in these areas.

Practical Considerations

It is known that in the past, the scope for fraud under the existing regime has been significant, since the claims for aid are based upon recorded deliveries to processing plants which to monitor independently have proved to be difficult. The Commission has long stated its wish to move to a payment system for olives based upon the number of trees per producer because such a system is less open to abuse. However this change has been held up because Member States have claimed that it is not possible to monitor tree numbers with any great accuracy until they have proper satellite equipment in place.

A move to area payments should, in theory, be a lot simpler to monitor and police than one based upon tree numbers since it would entail producers identifying precise areas of land on maps, on which payments would be made. Of course there would be scope for some dispute about qualifying areas, particularly where traditional trees may be widely spaced and olive groves may coexist with crops grown underneath them. Nevertheless, the system would not be unlike the current arable area payments system whereby producers have to choose which of their land should qualify for payment under which regime, but they cannot claim twice for the same area. There could be a danger that this kind of system might, however, create an incentive for producers to cease intercropping and instead to maximise production of a single output on the land, as determined by whichever regime they chose to classify it by. The use of agri-environmental payments or cross-compliance conditions (depending on the relationship with the reference level) in order to preserve intercropping systems might therefore be needed.

Conclusions

This brief discussion draws out three important points about a move from output-based to area payments for olives:

- the environmental effects of such a change appear likely to be positive but they are unlikely, on their own, to bring about a significant shift towards sustainable olive production systems in the EU;

- in order to strengthen the benefits created by such a change, additional use of a range of second pillar measures might well be needed, including agri-environment, LFA and other rural development aids;

- equally if not more significantly, there would need to be changes in other policies outside the CAP, notably water policy and structural investment policies, in order to maximise the potential for sustainability in these systems.

4.4.3 A Move to a Common Area Payment System for All Farm Land

This proposal involves the institution of a common area payment to replace a wide range of existing regime support mechanisms under the CMOs (eg moving towards a single payment per hectare on all farmed land or on all grassland). It has been called for as a kind of logical extension of the principle of decoupling payments from production, and supporters of this approach in different variants include major European NGOs (Birdlife) as well as certain governments (Germany).

It is difficult to subject this proposal to the same degree of reflection as we have done for the two preceding examples of decoupling, precisely because it would be a much more radical and comprehensive change affecting many sectors and the whole variety of production systems and environmental conditions across the EU. The proposal is generally put forward as an alternative to all forms of commodity-linked support - ie replacing all current amber box and blue box subsidies in the CAP. This would represent a significant change from the current situation. Some of the key issues to be considered, in assessing the potential of such a change as an instrument for environmental integration can be listed briefly.

- Moving to a flat rate payment on all land would tend, in theory, to mean that land allocation decisions would then be made more in response to market and other non-CAP signals than in response to the regimes. However, the level of the area payment would itself determine how strong an incentive remained to keep land in conditions compatible with agricultural use - presuming that this were a condition of the payment. If the payment were quite high, it would tend to prevent land from being abandoned or moving into alternative uses, relative to a situation in which no support were paid. This could be either beneficial or detrimental to environmental concerns, depending upon the likely alternative uses.

- This effect would not necessarily deliver more sustainable patterns of land use than the current arrangements. Much would depend upon the development of market prices for different products, and the influence of other policy and non-policy drivers, including environmental policies. However, there could be a general effect leading to some reduction in input use in some regions or systems, principally in those sectors where previous support was either more clearly coupled to production or where direct payments provide incentives to follow more intensive crop rotations or production systems. A common system of area payments could reward land management, and could help to support marginal farming systems in some areas.

- As noted in the discussion on olives, above, it seems likely that this kind of transformation would leave certain needs unmet, particularly in the case of traditional,

high nature value extensive systems and their current pattern of intensification and/or decline in many regions. For these areas, the policy would most likely need to be combined with an enhanced use of second pillar measures in sustainable ways, in order to achieve desired environmental aims.

- Appropriate transition arrangements would be required as well as a new policy design itself. Unintended impacts on farm incomes, employment, the environment and competitiveness would need to be avoided. Different starting points for a more universal area payment would be possible, for example beginning with those regimes where direct payments already apply. It would be valuable to develop and apply appropriate models to help design the transition phase in order to avoid perverse effects wherever possible, and to monitor the impacts of transition as changes were introduced.

- Direct payments were originally introduced as a mechanism to compensate producers for price cuts. A shift to a flat rate area payment would involve breaking the direct compensatory logic of the payments since its distributional impact would bear little relation to that which prevailed under price supports. It may, nevertheless, become necessary either to anticipate the future removal of these aids, once established, or to give them another legitimate purpose, if they are to continue (eg environmental land management or simple income support). It is unclear at this point which of these options would be preferable, from an environmental point of view, since so much would depend upon developments in second pillar measures and in other policies outside the CAP.

4.4.4 Conversion of Dairy and Sugar Price Support to Area Payments

This option is generally proposed by those who already take the view that decoupling is desirable and necessary, for the future sustainable development of the CAP. It thus becomes one of the transitional steps in a broader process such as that discussed in the previous paragraphs. However, since these sectors are both due to be reviewed in the next few years, the option presents itself as a potential step for consideration in its own right.

There are sound economic arguments for moving from price support to direct payments in these sectors, but the environmental case is less clear. In theory, such a change would enable the abolition of quotas and thus the freeing up of current structures to respond directly to market needs in these sectors, promoting greater efficiency in the allocation of resources.

From an environmental perspective, we must return to the considerations reviewed in Section 3 in order to analyse the potential impacts of such a change. It was suggested that the transformation of support in the dairy regime might bring limited immediate benefits since the trend to enlargement, intensification and concentration of holdings would be likely to continue. For different reasons, the same changes in the sugar regime appear unlikely to bring about immediate benefits, since the payment rate per hectare (if based upon full or more than 50% compensation, under a heavily supported regime) might well be sufficient to retain the current area of land in production and intensity may not decline significantly. However, there remain potential longer term benefits of the kind discussed in the previous section, if these changes were introduced as part of a broader move to decoupling alongside the development of a strengthened and expanded second pillar.

The budgetary implications of such a change would be significant because it would potentially increase CAP expenditure in the short term arguably limiting the scope for expanding the second pillar. On the other hand, while the regimes remain supported by price mechanisms they have proved particularly difficult to move towards encouraging sustainability, by using incentive mechanisms such as those in the second pillar. Hence a move to introduce decoupled payments into these sectors could be linked to the use of environmental conditions on these payments in order to help deliver enhanced benefits during the transition phase. This does not, however, overcome the budgetary issue.

Conclusions

This discussion highlights the difficulty of judging the appropriateness or otherwise of certain specific, stepwise changes in the CAP from an environmental point of view. Whereas it appears justifiable to assume that converting existing supports into de-coupled direct payments has mainly positive environment effects, in both the short and the longer term, neutrality or even negative effects cannot be excluded. A simple decoupled payment has attractions in principle and area payments provide a helpful platform for adding second pillar measures such as agri-environment schemes. Nonetheless, without further analysis of potential impacts, based upon evidence from localised and EU impact modelling and investigation work which is not currently available, it is not possible to provide a conclusive picture of the impacts of such a move from an environmental point of view.

4.5 National Envelopes

The introduction of a 'national envelope' within the Beef and Veal regime in Agenda 2000 gives Member States considerable discretion in the targeting of a portion of the overall budget available for the sector. Although representing a relatively small proportion of expenditure the initial envelopes amounted to EUR 493 million. Either area or headage payments are permissible forms of support within these envelopes. In principle there is the possibility of targeting payments at producers who meet nationally determined criteria, which could have a strong environmental element. Given the importance of beef production in managing a range of cultural landscapes and habitats, the scope for advancing environmental objectives by a more targeted measure, potentially based on area payments, has been stressed by several environmental stakeholders.

The utilisation of national envelopes by Member States to date for pursuing environmental objectives appears to be limited. Interviews suggested that there was considerable pressure in most Member States to utilise the envelopes in ways which met producer interests and avoided variations from the main system of headage payments as this would have caused higher administration cost. Resistance by producer organisations to the redistribution of support to farms offering higher environmental performance is likely to persist and this will limit the potential of national envelopes as an instrument for environmental integration. Nonetheless, the scope for adopting a more innovative approach at Member State level has been enhanced by the introduction of national envelopes now included in the revised sheep and goat regime as well The use by Member States of these envelopes could be more actively encouraged. Empirical evidence of the environmental impact of different policy instruments in the livestock sector is required and this is one route for generating such experience.

A form of experimentation that might be valuable would be to try the 'extensification' model used in the beef sector in other livestock regimes, including dairying when direct payments are introduced. This might be a useful means of reducing stocking densities in targeted areas, where overgrazing or excessive pollution loads more a problem.

4.6 Cuts in/Removal of 'Damaging' CMO Supports

Where a specific policy within the CAP is leading directly to environmentally damaging pressure there is a clear case for amending or removing the measure concerned. There is a considerable amount of literature pointing to the potential environmental impacts of a number of measures which provide high levels of support for a particular commodity and appear to be driving intensification above the level which would otherwise occur thereby causing environmental damage. One example referred to in Section 3 is the forage maize premium. Others not covered in Section 3 but cited in other studies, including the recent report by the Court of Auditors on Greening the CAP (Special Report No 14/2001) need to be considered also.

Within the constraints of this project we have not found detailed analysis of the precise role of policy as a driver for change in some of these regimes. In the case of silage maize, most experts doubted that abolishing the direct aid would lead a significant reduction in the area grown with silage maize.

However, the association between high support levels and intensive production is clear in several cases, notably:

- the support for maize as a fodder crop, within the cereals regime;

- the support for tobacco, which in any case has been called into question in the Commission's report on a sustainable development strategy for the EU; and

- the support for dried fodder, particularly the premium available for machine dried fodder which is intended to compensate for the fuel costs involved. This appears to have led to significant fuel consumption which are clearly undesirable for the environment and are in contradiction of the Community's emerging policy on climate change. (see Court of Auditors report)

Each of these regimes should be subject to an environmental audit with a view to achieving a clear appraisal of its role in driving practices which are undesirable environmentally. The Commission should be asked to bring forward recommendations as to any reductions in support or other amendments which may be required to eliminate environmentally perverse incentives. Where changes or outright removal of support was proposed, the need for, feasibility of, and possible form of transition arrangements would need to be considered. Second pillar measures could play a role in this regard.

4.7 Enhanced Use of LFA and Article 16

Significant changes in the Less Favoured Area (LFA) policy were introduced as a result of the Agenda 2000 reforms. These included the switch in support from headage to area payments for livestock production eligible for compensation in the LFA and the new option for Member States to compensate farmers subject to environmental constraints under Article 16.

Several stakeholders have proposed expansion of LFA support in order to reinforce the viability of more marginal and high nature value farming systems, most of which are located in the LFA. However, it must be recognised that more than half the EU agricultural area now falls in the LFA category and not all of this is devoted to low input or high nature value farming systems. Nor is LFA support evenly distributed within the Community, since payment levels to farmers in many southern Member States are substantially lower than other parts of northern Europe.

Since the LFA measure is simpler to administer than agri-environment schemes and not subject to the same degree of monitoring and evaluation costs, Member States might favour large scale support directed through LFA measures which is clearly less targeted than agri-environmental measures. At the same time it is clear that LFA payments provide an important element of the net income of many more marginal farms, which contribute significantly to cultural landscapes and may not have access to significant support through agri-environment at present.

There is scope for continuing to shift the focus of the LFA support system such that it takes on the characteristics of the lower tier of many agri-environment support schemes, with a reduced emphasis on compensation for disadvantageous agronomic conditions. Within this framework Member States could vary payment levels depending on the geographical conditions and require compliance with good farming practices including appropriate stocking densities. The area basis for payments to livestock producers forms a more appropriate foundation for the attachment of relatively simple environmental conditions than the previous headage based system. There would remain a distinctive role for agri-environment schemes providing additional assistance for more tailored and demanding management agreements.

Initial uptake of Article 16 by the Member States has been on a small scale. Nonetheless, potentially it has considerable value as an instrument in an environmental integration strategy. One the one hand, it could provide longer term compensation for producers affected by particularly onerous obligations based on environmental legislation. In this respect it could offer support for farmers subject to strict nature conservation controls whose farming enterprises might otherwise cease to be viable. This might help to reconcile social and environmental objectives in particular sensitive areas and could make the introduction and implementation of sufficiently rigorous regulations politically feasible.

A second, rather different, use of Article 16 would be as a form of transitional support. It is clear that farmers in many regions have difficulties in complying with current environmental legislation with regard to both pollution control and nature conservation. This is one explanation for the relatively slow progress in implementing certain measures in several Member States. Some realism in considering the role for transitional support for a limited period of years might allow environmental standards to be raised more rapidly, particularly in areas with low farm incomes. Assistance of this kind usually would constitute support for

activities below the reference level and therefore may be read as a temporary suspension of the Polluter Pays Principle. Nonetheless, this may be acceptable, particularly for a limited period of time and in the light of the real adjustment costs faced by predominantly small enterprises. Transitory aid of this kind is offered in the industrial sector not infrequently. Participation in Article 16 in a transparent way would be preferable to very extended delays in meeting environmental objectives. Use of this Article needs to be consistent with state aid policy.

In conclusion, LFA policy could play a part in an environmental integration strategy for the CAP. On the one hand the existing compensation payment system could be adjusted and extended to play the part of a simplified, lower tier agri-environment payment with appropriate conditions. On the other, Article 16 could be used more proactively either as a permanent or as a transitional support measure, particularly if the necessary funds were available from the RDR budget.

4.8 Enhanced Use of Other RDR Measures

The preceding sections have highlighted a number of instances in which there appears to be further scope to enhance the environmental impacts of the CAP by an enhanced application of RDR measures targeted towards the environment. They include:

- the increased use of investment aids to promote the restructuring of farm enterprises towards more sustainable systems;

- the use of training aids to help to provide farmers and foresters with environmental management knowledge and practical skills;

- the use of aids under Article 33 to promote investments in favour of environment protection as well as sustainable water management, and environmentally sensitive re-parcelling (which could create opportunities for biotope creation and the restoration of landscape features);

- the application of processing and marketing aids under Article 33, specifically to promote and increase the viability of high quality regional products produced in compliance with specified environmental standards;

In addition, there is scope for creative use of second pillar measures to help create alternative sources of income and viability for rural communities. This can help to find economically viable alternatives to intensive farm production, which is particularly relevant in areas where such intensity would be unsustainable. Such measures could focus on added value to local products, local marketing and tourism and leisure activities. Many experts and stakeholders believe there is significant untapped potential for growth in this kind of strategic development.

Several stakeholders have expressed concern about the administrative constraints that apply to a number of second pillar measures, restricting the flexibility with which they can be used and combined, and limiting the role of local agencies in distributing funds according to local priorities in an integrated way. In some cases these restrictions have arisen as a result of the

EAGGF Guarantee Section rules. These require payment and accounting procedures which were designed for the commodity regimes rather than the more diverse flexible and innovative set of projects being financed as a part of second pillar initiatives. Stakeholders urge that such obstacles be scrutinised in the mid term evaluation of the RDR with a view to amendment, simplification, and streamlining implementation and accounting procedures in this policy field.

A second potential constraint for an expanded application of second pillar measures is the requirement for Member States to provide matching funds, through cofinancing. The level of co-financing available has had an important influence on the readiness of Member States to implement rural development measures.

Cofinancing

All first-pillar measures are currently 100% Community financed, whereas all second-pillar measures are subject to co-financing. For agri-environmental payments, the cofinancing rate is 75% in Objective 1 regions and 50% elsewhere, while for most other RDR measures including LFA payments, the rates are lower, commonly around 50% and 25% respectively. Overall, it is estimated that just under half of the total budget used for RDR measures is funded by the EAGGF.

The differences between the first and the second pillar as regards the EU budget share has significant implications from an environmental perspective. For all measures that are 100% Community financed, the policy effectively acts as a redistributive mechanism between Member States. By contrast, for measures co-financed by Member State governments, the re-distributive effect is less significant and poorer Member States may find it difficult to implement measures when they have to find matching funds. This is often quoted as being an important reason for the disparities among Member States in spending on agri-environmental measures which, as discussed earlier, bears no apparent relation to the scale of environmental needs and opportunities.

The principles upon which cofinancing is based include subsidiarity and co-responsibility. It is argued that for measures which are optional or where implementation can involve a wide range of local variation, Member States should be free to decide how much they wish to implement and where. But in order to prevent this choice leading to uncontrolled spending of EU money, they are required to 'buy in' to the measures themselves as a separate commitment. Co-financing is intended to reflect a balance of responsibility between the Community and the Member State and, thus, ensure a correct implementation of rural development measures, while taking on board regional needs and priorities.

However, as first pillar measures are compulsory, 100% financed, and absorb 90% of the current CAP budget there is a restricted choice for Member States in this pillar.

There is a risk that environmental measures will be under-used in some countries because they put an additional strain onto the national budget. Consequently, some environmental NGOs call for higher rates of co-financing for agri-environment measures. Rates of 85% in Objective 1 areas and 75% elsewhere have been suggested in discussions, while some for even higher co-financing rates for agri-environment measures. A logical extension to this

approach might also be to increase the co-financing rates for Less Favoured Area payments and certain types of investments which contribute to achieving environmental objectives. However, there remains value in the need for Member States to contribute to national schemes and moving too close to 100% funding would be unwise.

An alternative strategy is to re-examine the financing of first pillar measures and to consider whether a more 'equal' treatment of resources could be achieved by introducing co-financing into the first pillar. However, while first pillar measures remain compulsory, such a step would merely increase the contributions required by Member States without allowing them any flexibility to choose to reallocate resources between pillars. From an environmental perspective, therefore, introducing first pillar co-financing would only be beneficial if it went hand in hand with making certain elements of first pillar spending optional, rather than compulsory.

4.9 Labelling and Quality Assurance as Instruments for Environmental Integration

EU Labelling Initiatives

This is one element in the CAP that has only recently emerged as a feature of discussions about 'greening' the policy. To date, the EU has a small number of labelling policies which have potential to encourage environmentally sensitive production in the agricultural sector. These include:

- an organic farming standard and associated logo, representing an agreed standard of arable production and husbandry for all organic farms in the EU;

- the classification of Products of Designated Origin, which allows specific labelling for a list of agricultural outputs whose production methods and geographical identity are distinct and deemed worthy of PDO status;

- the broader Environmental Management Standard EMAS, which any EU company can attain through following a set of procedures to ensure that environmental considerations are incorporated into company decision making and actions. Although this is not part of the CAP, it is a Community policy instrument that is available to the agriculture sector.

In addition, more detailed quality specifications apply to a variety of CAP regimes including olive oil and wine, as well as fruit and vegetables, but in general these do not focus on environmental considerations.

Potential Environmental Role

In theory, labelling products as a means of informing consumers about the environmental conditions under which they have been produced can be an important tool for encouraging environmental standards in agriculture. The growing use of the organic label and the significant and continuing expansion of consumer demand for organic produce have undoubtedly influenced farming practices in many Member States, but only for a very small minority of producers.

The PDO labelling system does not guarantee the environmental credentials of the products which attain the label. However, there is scope for PDO registration to involve the specification of environmental production criteria and this is a phenomenon of certain kinds of regional or speciality product (eg some varieties of French and Italian cheeses specify that milk must come from cows grazed extensively on permanent pastures). Within the broader development of measures under the Rural Development Regulation and, in particular, the promotion of marketing of high quality products under Article 33, comes increased scope to link these measures to the identification and safeguarding of particular environmentally sensitive farming methods associated with regional products.

EMAS could also be seen as a tool to promote environmental integration within European policy for the agriculture sector. In particular, since the system is generally designed for industry, there could be scope to promote its application via food processors and retailers who already exercise increasing control over product specification to their farmer producers, and to larger farming companies for whom the process would be most readily applicable.

However, each of these mechanisms would largely depend on consumers' choice to be able to make a significant impact on the environmental effects of the CAP as a whole.

Future Developments

There is a current idea that a new environmental label should be established for European agriculture, based upon the standards of Integrated Farming Systems (IFS). The argument is that such a label could provide a tool to encourage a much greater proportion of EU agriculture to adhere to enhanced environmental standards. IFS practices will be more readily adoptable by some farms as compared to the more stringent organic standards. A main feature of such a label would be to maintain on-farm accounts for environmentally relevant processes as well as routine checks concerning food safety in the down-stream sector. The label would provide a simple means of distinguishing IFS products from those produced in a less controlled environment. There are already activities underway in both primary production and processing to develop and implement such labels. Many environmental organisations would prefer that IFS principles were incorporated into basic good farming practice throughout Europe, rather than confined to a proportion of the sector. Some argue that by adopting such a label there is the possibility of unhelpful competition with organic products. A potential problem would be that consumers might become confused by a plethora of different environment and quality labels officially promoted by the EU.

Labelling is just one aspect of a wider development of the concept of 'Quality Assurance' in food processing and retailing. QA can be seen as a potentially powerful tool to encourage producers to adopt more environmentally beneficial production methods, providing that retailers, processors, and consumers agree that environmental attributes are an important feature of agriculture commodities. To date, the vast majority of QA initiatives by the food industry have focused mainly on other aspects of food quality, including storage qualities, appearance and consistency of product as well as safety. However, there are some positive developments in relation to particular environmental attributes, including reduced pesticide use, biodiversity actions and the adoption of biological control methods. These point to the potential to increase the environmental component of QA schemes in future.

Conclusions

There are some interesting ways in which existing or future EU labelling initiatives, complemented by industry-led developments in Quality Assurance, could help to reinforce environmental standards in agriculture. However, without a major shift in the foreseeable future it seems unlikely that they could represent a significant means of environmental integration within the CAP.

5 Towards a Strategy: Financial and Budgetary Considerations

5.1 Options for Shifting Resources to the Second Pillar

As discussed in Sections 2, 3 and 4, there are many environmental arguments for shifting resources away from the first pillar of the CAP - ie reducing the proportion of the budget that is spent on commodity supports – and increasing the resources devoted to second pillar measures. It has been argued that, in particular, additional resources should be allocated to those RDR measures that directly promote environmental benefits, such as the agri-environmental measures and the Less Favoured Area compensatory allowances, including Article 16.

Under Agenda 2000, Member States have the option to use modulation of direct payments in order to create additional resources for spending on the accompanying measures under the RDR (which include agri-environment and LFA supports). To date, the UK and France have implemented modulation, while Portugal has passed legislation to implement it in 2003 and Germany and the Netherlands have indicated an intention to do likewise. However, other Member States remain reluctant or are still considering the option. Meanwhile, a discussion has emerged about whether one should not seek compulsory modulation in the next round of CAP reforms, so that all Member States would be required to use this mechanism to increase the resources devoted to the second pillar.

However, under current financing arrangements, this is not a simple switch of money between the two pillars because of the differential treatment of first and second pillar money when it comes to Member State co-financing of measures under the CAP. In evaluating the strengths and weaknesses of the various options for switching resources from first to second pillar, the following points emerge.

Modulation

- Modulation of the kind already introduced under Agenda 2000 has the benefit of allowing Member States to apply it differentially according to national priorities. In France, the cuts are targeted mainly at large, more capitalised farming businesses (mainly arable). By contrast, in the UK modulation is applied as centrally determined cuts in direct payments – so all sectors are experiencing a uniform percentage cut in aid payments which will increase over time. The money is spent mainly on agri-environment measures.

- Modulation is optional and the maximum cut is set at 20% of direct aid. Faced with the competitive pressures of the single European market, few Member States would opt to apply modulation in ways that could put their farmers into a less favourable situation *vis a vis* other EU farmers.

- Although the concept of modulation started from the idea of differentiating payments among different farm types in order to introduce a certain social balance into the system of direct payments, the current focus appears to be on providing additional resources for second pillar accompanying measures while staying within the existing financial framework. However, given the requirement of co-financing, any modulation receipts will need to be matched by additional Member State money in order to be deployed under

the second pillar. If all Member States were required to moderate to a certain level, this would result in increasing overall CAP spending which seems to run counter the decision of Member States, as decided under Agenda 2000, to freeze the spending at the 1999 level.

Degressivity

- An alternative concept for reducing first pillar spending and enabling more resources to be used for second pillar measures is 'degressivity'. This would involve predetermined cuts in direct payments over time. Such a step would be consistent with the original logic of direct payments, in that they were introduced as compensation for one-off price cuts and thus their continuing legitimacy is open to question. Savings made in the CAP budget in this way would be available for redirection into second pillar measures. If all the savings were transferred to the second pillar the total amount of CAP resources would be larger as is the case under the modulation model. Up to now, it is unclear how far Member States would wish to go this way. It would be equally possible for the savings to be paid back to Member States which then should in principle be able to find the matching funds needed for additional second pillar measures financed through degressivity. Part of the funds could be diverted to other purposes within the overall EU budget.

- Degressivity could bring some environmental benefits where it reduces environmentally damaging payments. As discussed in Section 3, this reasoning would apply for the maize premium. Decisions about differences in the relative level of cuts between different sectors could have environmental side effects which would need careful consideration, prior to agreement on any package of cuts. This applies both to the regimes where cuts were agreed and to the knock-on effect on unaffected regimes where production is supported without using direct payments. For example, cuts in beef premia would undoubtedly affect the relationship between beef and dairy sectors and this could lead to a variety of structural change at national and regional levels, with secondary and potentially complex environmental consequences.

Changes to Cofinancing Arrangements

- Proposals to somehow 'equalise' or 'neutralise' the cofinancing disparities between first and second pillar measures are likely to meet mixed reactions from Member States because of their positions re the overall CAP budget. For net contributors, increasing national funding of first pillar measures could be an attractive option because it would allow them to make savings overall (eg Germany, UK). For net beneficiaries, it is likely to be a less popular measure. However, if first pillar spending were, at the same time, to become more flexible, allowing Member States more choice in the deployment of funds, (for example through national envelopes), the option might be more attractive. Nevertheless, the effects of introducing variability into first pillar spending on the 'level playing field' of the single European market could be very difficult to predict and it remains unclear how this factor might reduce willingness to make use of national discretion in an environmentally-optimal way.

- By contrast, proposals to seek a more balanced pattern of second pillar expenditure by increasing EU cofinancing rates for second pillar measures, without any balancing proposals for cutting elsewhere, would increase the total CAP budget. If this option was considered important for strengthening the second pillar it might be necessary to consider introducing it alongside proposals to cut or limit first pillar spending.

Conclusions

Implementing an environmental integration strategy along the lines set out in the previous section would incur significantly greater expenditure in the second pillar, requiring close evaluation of the different options for switching funds from other elements in the CAP budget in order to avoid overall increases in expenditure. It is difficult to predict with any certainty the net budgetary impact of the proposals outlined. While savings in the first pillar appear possible, of which the scale would depend on the extent to which modulation or degressivity options might be considered acceptable. Both these alternatives have advantages and drawbacks, the analysis of which extends beyond the scope of this study.

5.2 Budgetary Implications and Effects upon Farm Incomes

In Section 4 a number of potential 'elements' of a future environmental integration strategy for the CAP were reviewed. In deciding how these elements might best be applied, in varying packages and over a period of time, it is important to assess their likely impacts upon the overall budget of the CAP, and upon farm incomes. The effects of any proposed changes upon farm incomes in the Member States are likely to be a significant factor in determining the economic and political acceptability of an environmental integration strategy, at EU level.

It has not been possible in this study to provide a quantified analysis of potential effects upon the CAP budget and farm incomes, for each of the options considered as a potential tool for environmental integration under the CAP. To undertake such an analysis would require the development of quantified scenarios which could specify precise outcomes as a result of policy changes. This in turn would require details about the measures discussed, going beyond the level of information currently available in the scientific and policy literature. Currently available models are not adequate for this purpose.

Therefore, the table below seeks only to give a broad indication of the likely direction and potential scale of impact upon the CAP budget and farm incomes, for each of the options discussed in Section 4. In addition, a third column considers the likely timescale for the achievement of effective implementation of each option, in order to compare the potential pattern of impacts over time, for the range of options considered. In this way, it should be possible to consider the net effects of introducing a combination of measures over a period of time, as part of an integration strategy for the CAP.

Table 5.1

Option	Possible CAP budget effect	Possible farm income effect
Stronger/greater implementation of agri-environment programmes in all MS	Shift among CAP pillars – possible overall increase due to co-financing	Neutral or increase (depends upon payment rate formula applied)
Enhanced use of cross-compliance	Neutral	Neutral or negative
Area payments for beef and sheep	Neutral (temporary increase for transition measures possible)	Distributional effects – winners and losers
Area payments for olives	Neutral or increase (temporary increase for transition measures possible)	Winners and losers
Area payments for sugar and milk sectors	Increase	Winners and losers*
De-coupled flat rate area payment for different commodities	Neutral (temporary increase for transition measures possible)	Winners and losers
Removal of damaging aids (forage maize, tobacco, etc)	Decrease unless budget shift towards the second pillar	Negative
Increased use of national envelopes for environmental aims	Neutral	Winners and losers
Development of LFA/Article 16 – broader use for basic environmental management in marginal areas	Shift among CAP pillars – possible overall increase due to co-financing	Positive for those in new areas, neutral or small costs for some existing areas
More use of other RDR measures for environmental purposes	Increase but probably small cf first pillar budget changes	Positive, or neutral where supporting public good investment only
Labelling and quality assurance	Neutral	Short term establishment costs, Positive but indirect impacts

* it is expected that the dairy and sugar reform could require a relatively high level of compensation in return for price cuts.

Considering the picture presented in table 5.1, the development of an effective integration strategy should take account of :

- The timescale required to develop and implement the different elements of the strategy. This will vary depending on the extent of the proposed change, its technical complexity and implications for other policies, the political sensitivities involved etc. A further factor is the speed at which implementation could be expected to be achieved in the Member States. Thus the pattern of budgetary and income effects could alter, depending upon the pattern and combination of elements selected and applied.

- Particularly for options which involve potentially significant negative income effects on certain groups of producers (ie including those options described as producing 'winners and losers'), past experience suggests that there could be pressure for EU or national 'transitional' measures to be offered in the first few years of the change, to cushion negative impacts. Thus although implementing certain measures might in principle be budget neutral or might even involve a saving, there could be a need to provide for short-term budgetary increases, to enable this kind of transition assistance to be offered. In these circumstances, care needs to be taken to ensure that these kinds of assistance are truly 'transitional' and do not somehow become seen by Member States as a long term requirement which could put much greater strain on the CAP budget. Thus, aid which can offer an element of investment funding (eg for business planning and adjustment) might be more beneficial than aid which simply props up incomes for a short period.

- If a substantial shift was to take place between the first and second pillar measures, significant reductions in farm income could be expected to arise a result of reduced support in the commodity regimes. Some compensation would occur by means of increased expenditure delivered through the second pillar. However, there are limitations on the extent to which existing second pillar measures can contribute to farm incomes. Whereas agri-environment schemes can be understood as establishing a new economic activity through which farmers gain an income, this might not be enough to form an economically viable basis for their enterprises. For this reason, there is a case for a basic decoupled payment to be offered to all farmers. An area payment of the kind discussed in Section 4.4 above could play precisely this role. A set of relatively basic environmental conditions could be attached to the scheme. Such payment would provide a complementary measure to agri-environment schemes which are targeted at farmers accepting obligations above the reference level.

6: Conclusions

In constructing an environmental integration strategy for the CAP several different elements are required drawing on both agricultural and environmental policy. A helpful starting point is the strategy document developed originally by the Agriculture Council for the Helsinki Council and developed further for the Göteborg Council in June 2001. This stresses the importance of making the best use of the options available under the Agenda 2000 package It also underlines the need for environmental appraisal to be made of new proposals in EU agricultural policy. Establishing an appropriate process for evaluating the potential impact of new policy measures as well as existing ones is a fundamental step in almost any integration strategy.

It is also necessary to build on the Council conclusions on the Sustainable Development Strategy in Gothenberg, and the sixth Environmental Action Programme, when it appears.

One aspect of the strategy should be concerned with the effective implementation of EU environmental policy. At present there are several important measures where implementation is unsatisfactory. Additional measures, concerned with water quality, GMOs and pesticides for example have been recently agreed or are being developed. They need to be implemented by Member States in a more timely and complete fashion than some recent measures, such as the Nitrates Directive. While this is an important precondition for an integration strategy to be successful, these aspects were not the primary focus of this study.

Other elements of the strategy would be within the CAP itself. A primary step would be to enlarge the budget for the second pillar so that it is able to finance a range of measures, including agri-environment, Article 33, Less Favoured Areas and environmental training and investment initiatives on a substantially larger scale than the current budget allows. More use could be made of Article 16, which could have a more significant role in providing transitional or more permanent assistance to farmers unable to meet environmental standards at present.

There is a need to develop agri-environment programmes as a primary integration measure within the second pillar. This would result in substantially greater application of schemes in most Member States, with a commensurately increased budget. Agri-environment measures provide a means of targeting specific environmental concerns in a direct way, with the flexibility to develop and amend specific rules to match local requirements.

There are limits to the extent to which agri-environment schemes, while offering contracts for environmental services as a gainful activity, can provide a sufficient economic basis for farmers. This points to the need for alternative, decoupled forms of support if farm income objectives are to be met. In the Less Favoured Areas this could be based on a system of LFA payments which in turn could be linked to some basic environmental requirements, more closely resembling a first tier agri-environment scheme. However, a more broadly based direct income support scheme may also be required for the generality of farmers, with relatively modest environmental conditions attached.

In the market regimes further progress towards decoupling would be appropriate in environmental terms. This is likely to include conversion of headage to area payments in the beef and veal and sheep regimes and a similar move to area payments for olives and sugar.

The precise implications of such a transition are difficult to forecast and require further investigation. In the short term a priority is to have critical look at those CAP market regimes which appear most closely associated with direct incentives for highly intensive production at a level which otherwise may not occur and which exert certain environmental pressures. Such regimes include support for forage maize, tobacco and dried forage. In as far as these regimes are a cause of environmental damage, changes in the regimes need to be made urgently.

In parallel, certain steps could be taken to build on the common rules Regulation and the new provisions for cross-compliance under Article 3. Much of the responsibility to use this option lies with the Member States and it is important that the reports required address the issues fully and are subject to public scrutiny. At an EU level environmental standards could be strengthened under this measure, notably by the introduction of an environmental audit requirement for all farmers receiving significant levels of direct payments.

It is clear that changes in the market and new consumer perceptions are an important driving force for the whole agriculture sector. Steps to include an environmental element in marketing and food labelling policy would be a useful complement to changes in other aspects of the CAP.

To achieve a coherent strategy for further environmental integration under the CAP, these elements should be combined and phased in over a period of time. Bearing in mind their potential effects upon the CAP budget and upon farm incomes, favoured options for the short term (2-3 years) might include:

- compulsory modulation or degressivity of direct payments to enable an expansion of agri-environmental and LFA/Article 16 measures throughout the Community – a target could be set for the second pillar to represent a minimum proportion of total CAP spend at national level.

- introduction of greater flexibility, and delegated authority in certain aspects of second pillar implementation

- a move to area payments for the beef, sheep and olive sectors

- greater use of national envelopes in the livestock sector, taking the opportunity to build experience of implementing and payments and targeted extensification schemes.

- a reform of the sugar regime, involving significant price cuts and partial compensation via direct payments

- a removal of forage maize from eligibility for arable area aids and some obligation to address any unintended environmental consequences of differentiation arising from the use of irrigation/regional yield differentials

- removal or reform of aid for tobacco and dried fodder to neutralise their adverse environmental impacts, if they are clearly established.

- appropriate application of cross-compliance by all Member States following widespread scrutiny and debate of their April 2002 reports to the Commission.

- review of the environmental impacts of the wine and fruit and vegetable regimes with a view to introducing further enhancements in due course.

In the medium to longer term (4-10 years) these could be followed by:

- further, more substantial budgetary shifts from first to second pillar

- further price cuts, dismantling of quotas and introduction of a grassland premium as direct compensation, in the dairy regime, with environmental conditions

- harmonisation of direct area-based aids in livestock sectors

- development of a more robust and decoupled form of income support complementing measures targeted to meet environmental needs.

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Annex 1

The Common Agricultural Policy, Environmental Change, and Options for Further Integration: Interviews and Seminars with Stakeholders and Experts March-May and October 2001

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