FARMING AT THE MARGINS

ABANDONMENT OR REDEPLOYMENT

OF AGRICULTURAL LAND IN EUROPE

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SUMMARY

Background to the report

There has been concern about the causes and consequences of agricultural marginalization in Europe for several decades. It is uncertain how much land will remain in agriculture and how much will be deployed for other uses. The potential implications of further marginalization for nature conservation and other aspects of the environment are of increasing interest at a time when the future of rural policies in Europe is under scrutiny. For these reasons it is timely to consider which areas of Europe are vulnerable to marginalization and the environmental implications of this process.

Objectives of the report

The report is concerned with farmland which is becoming marginal under current use, some of which will leave agriculture and be redeployed for other purposes, such as forestry. The main objectives of the report are:

i. to *analyse* current trends and processes of agricultural marginalization in Europe;
ii. to *examine* the environmental consequences, particularly for nature conservation, of the land-use changes resulting from marginalization;
iii. to *examine* methods for identifying areas within which agricultural land is marginal and therefore may be expected to undergo a change of use or management;
iv. to *investigate* agricultural policies which might contribute to the mitigation of environmentally damaging effects of agricultural marginalization and encourage viable uses of land in marginal areas;
v. to *consider* possible management options for maintaining or enhancing the nature conservation value of marginal land which either remains in agricultural use or which is withdrawn from production.

Approach used

The report draws on two different approaches to the analysis of marginalization. One approach is to identify regions which might be susceptible to marginalization on the basis of indicators chosen from a range of European databases. The indicators selected cover agricultural structures, economic performance, social conditions, regional development, etc. The other approach is to examine aspects of the process of marginalization and their effects on the environment in a set of case-study areas.

Processes of marginalization

There is no clearly defined and commonly accepted definition of marginal land or marginal agriculture. Perhaps the most readily accepted definitions of marginal agriculture are economic, focussing on declining viability. Some studies emphasize land-use changes as the predominant indicator of marginalization. However, this was considered too restrictive for the present report, and the following definition was adopted:

> *agricultural marginalization is considered to be a process, driven by a combination of social, economic, political and environmental factors, by which in certain areas farming ceases to be viable under an existing land use and socio-economic structure.*

The present report focuses on regions where conditions are generally unfavourable for the more productive forms of agriculture and farming is in danger of becoming more marginal in relation to relatively favoured agricultural areas.

Factors influencing marginalization

Several factors influence marginalization and land-use change, including:

- environmental factors (e.g. soil, climate, water supply, slope). Such characteristics can limit the agricultural potential of an area;
- geographical location (e.g. distance from markets and sources of supply). Farming may be disadvantaged by poor access to supplies and markets;
- agricultural structures (including the structure of holdings, land ownership). Such factors can greatly affect the viability of farms;
- social factors (e.g. attitudes to farming, the age structure of farmers, social, educational and welfare facilities). Such factors can also indicate marginalization of rural areas;
- economic factors (e.g. competition from other agricultural areas; market prices). These considerations are a key factor in determining whether a farm is viable;
- policy factors (e.g. trade policy, agricultural support measures, incentives for afforestation). Policies play a fundamental role in determining whether farms and agricultural areas are 'marginal'.

The complex interplay of such factors influences marginalization and land-use change. An important feature of marginalization in Europe is that very different areas (e.g. highly productive and marginal) may exist side by side within one region or smaller area. A conceptual and qualitative approach has been used for the categorization of regions within the EU. It is possible to make a broad distinction between Productive, Intermediate and Marginal regions. The extreme Marginal regions are found in southern Europe and Scandinavia, and in exceptional situations such as the islands of northern Scotland.

The environmental implications of marginalization

The effects of marginalization and abandonment on flora and fauna can vary considerably; the ecological consequences can be complex, site-specific and far from uniform, even in a relatively small geographical region. Marginalization does not necessarily lead to progressively more extensive farming systems followed by abandonment. There may be a combination of intensification and extensification within the same farm or region, or the restructuring of holdings or new land uses such as forestry.

- In broad terms, the abandonment or conversion to more extensive management of land in intensive agricultural areas is potentially beneficial to nature conservation, providing opportunities for rectifying some of the degradation of wildlife habitats and communities which has been caused by agricultural intensification. However, maintaining existing areas of high nature value is often a higher priority than the extensification of land now under intensive management;
- The nature conservation implications in intermediate and marginal regions are often more complex and there are many areas where valuable semi-natural habitats and cultural landscapes are closely associated with agricultural management. In these zones uncontrolled changes in agricultural management can give rise to high environmental costs, including the loss of habitats and species associated with established agricultural practice. Continuity of management is important on many semi-natural habitats. Grazing by ruminants is often required. However, there are also areas where the withdraw of agricultural land would be beneficial for conservation.

Soil erosion and wild fires are major concerns in some marginal regions. There are substantial areas which are highly vulnerable to soil erosion owing to environmental conditions, such as steep slopes, thin and easily eroded topsoil, and extreme climatic conditions. Degradation can be caused to the inappropriate ploughing of slopes, overgrazing and the intensive management of forest plantations. Wild fires are a major environmental issue in southern Europe, where hundreds of thousands of hectares of vegetation are burnt each year.

It is necessary to identify areas where significant changes in agricultural practice and land use could create major environmental costs or generate real benefits, if effective and well targeted policies to guide land management in marginal areas are to be developed.

Indicators of marginalization and abandonment for the EU12

A review is made of potential statistical indicators from European databases which might represent some of the major driving forces behind the occurrence of marginalization. A broad set of indicators was selected, divisible into five general groups:

- indicators of biophysical conditions for agriculture;
- indicators of agricultural land utilization;
- indicators of farm income;

- indicators of farm structure;
- indicators of rural and regional development.

Information was obtained from the Farm Structure Survey (FSS) of Eurostat, the Farm Accountancy Data Network (FADN) of the Commission of the European Communities (CEC) and the regional databank (REGIO) of Eurostat.

The indicators were used as a means of investigating the potential occurrence of marginalization and abandonment of agricultural land in the twelve EU countries for which data is available. A limited number of key indicators was selected in order to simplify the analysis. They were to reflect important aspects of biophysical conditions, land use, farm income and structure:

Biophysical conditions

- Share of Less Favoured Areas (LFA) in Utilized Agricultural Area (UAA) (%)

Land use

- Decrease in UAA (%)

Farm income

- Family Farm Income per Family Work Unit (FFI/FWU) (ECU)

Farm structure

- Standard Gross Margin per hectare (SGM/ha) (ECU)
- UAA per holding (ha)
- Share of farm holders of age 55 years and older (%)

Identifying regions where marginalization is concentrated

On the basis of the indicators selected, a distinction was made between five different groups of regions within the European Union. These groups were derived from the indicators by using a cluster analysis which was carried out to find a certain structure in a broad set of observations with various phenomena. The five regions identified can be characterized as follows:

- regions with highly productive agriculture, covering almost 40% of UAA in the EU 12 and about 20% of agricultural holdings. They cover most of the northwestern part of the EU, excluding Ireland and parts of the UK;
- regions of medium farming productivity, covering about 10% of total UAA and accounting for about 10% of all farm holdings. This group covers large areas of Germany and parts of France;
- regions dominated by extensive farming. They cover about 30% of the UAA but only around 15% of agricultural holdings and include most of Spain, large areas in southern France, parts of the UK, Ireland and Italy;
- regions where small-scale farming dominates. These regions account for more than half of all holdings in the EU 12 and only about 15% of the UAA. They cover most of Portugal, Italy and Spain;
- a small residual group where agriculture is more extensive than the average in the EU. A substantial area of land lies outside the Less Favoured Areas.

Farming systems in potentially marginal areas and changes in CAP policy

Areas which are most susceptible to marginalization can be expected to be found in the groups of Extensive Farming Regions and the Small-scale Farming Regions. Direct and indirect agricultural subsidies to these regions are assessed. Direct subsidies in the period before the 1992 CAP reform have been more significant in regions with extensive farming systems than in the other groups of regions. In 1990/91 about 20% of all direct subsidies in the EU 12 were directed towards this group of regions, although their share of final production was only 9%. Direct subsidies in this group of regions on average, are about a third of FFI, corresponding to almost 3,000 ECU per holding, which was about double that of the average for all farms in EU 12 at the time.
Within the group of small-scale farming regions the share of direct subsidies in Family Farm Income was only 8%. They amount to an average of 640 ECU per farm.

In the group of regions with extensive farming systems CAP market and price support (indirect subsidies) for cereals, oil seeds and protein crops, milk, beef, sheep and goats are very important. In total they cover more than 80% of total indirect subsidies provided to farmers in these regions around 1990/91. In contrast, price support given to fruit, vegetables, wine, olives and tobacco together amounted to more than 40% of total indirect support in small-scale farming regions.
EAGGF expenditure per farm amounted to 2,900 ECU (extensive farming regions), 1,200 ECU in small-scale farming regions and almost 5,100 ECU in other regions.

Management options and public policies for marginal agricultural land of High Nature Value

Marginalization processes on farmland may result in a range of different changes in management. Those of particular concern from an environmental perspective include changes in farm structure, intensification and extensification of established farm systems, the decline or abandonment of traditional forms of management, grubbing up of permanent crops and afforestation, as well as diversification of income sources.

There are significant areas of land where the maintenane of open agricultural landscapes, or at least some level of agriculture or cutting is the prime concern. More specific management requirements are likely to apply within the areas of particular conservation value. In a further group of areas afforestation or abandonment will be the preferred environmental option.

Agricultural land management could be maintained and the viability of agriculture as a land use could be ensured through a variety of policies, including:

- market policies. The current system of headage payments for producers of beef cattle, sheep and goats has contributed to the viability of farms in many marginal areas, but it has also provided an economic stimulus for

intensification. There are arguments for awarding the support system, including the conversion of headage payments to annual area payments, although detailed studies are required of how those will work in practice. However, the distribution of support between areas with intensive and those with extensive agriculture is a sensitive issue and should be taken into account;

- cross compliance. A potentially useful policy mechanism, for example to prevent over- and undergrazing. However, the way how to apply it in practice needs further debate. The UK is the only government which is now experimenting with the attachment of environmental conditions to agricultural support measures for beef cattle and sheep;
- food quality and regional labels. There are opportunities to integrate environmental concerns into the system of regional food labels so as to ensure that appropriate forms of production are required of farmers benefiting from a premium for traditional local products;
- aid for Less Favoured Areas. It would be possible to refine the LFA supportmeasures so that conditions would be attached to the payments to encourage good environmental management, drawing on lessons learned from agri-environmental schemes;
- agri-environment policies. Regulation 2078/92 provides an important mechanism for directing aid to precisely targeted marginal and abandoned areas. There are arguments for altering the rules of Regulation 2078/92 so that owners and managers of land other than farmers are also eligible, provided that there are adequate safeguards;
- investment aid and early retirement schemes. Investment aid may be essential to permit improved environmental management on the farm. Retirement schemes may help to improve farm viability but may precipitate adverse environmental change.
- rural development initiatives. Measures to improve the rural infrastructure, education, health, alternative job opportunities and quality of life may have an important impact on the viability of traditional agrarian communities.

There are likely to be some areas of land where the continuation of agriculture is not the preferred option and others where it may be desirable environmentally but not achievable in practice. There are a range of alternative options for the management of such land, including measures to secure the appropriate use of abandoned land, afforestation, promoting multiple uses of land and management for nature conservation.

Conclusions

There is a need for an integrated EU strategy towards the management of farmland (either by farmers or others) for environmental reasons. It could include species-rich grassland, some stretches of low intensity arable, some traditional mixed production systems, areas where afforestation would diminish the landscape, etc. What is required is the formulation of environmental and land-use objectives which feed up into agricultural policy so that change is not driven purely by adjustment in agriculture.

Recommendations

A series of recommendations are formulated in order to develop a strategy for the appropriate management of marginal areas:

- detailed evaluation of how farmers in marginal regions and production sectors have adapted to changes in the economic and political climate since 1992;
- further development if efforts in operationalizing indicators of marginalization and abandonment;
- studies of the potential effects of possible changes in policy in marginal areas.

1 INTRODUCTION

1.1 Background

There has been concern about the causes and consequences of agricultural marginalization in Europe for several decades. However, in an era of rapid technical change and the social transformation of many traditional farming areas, it is widely assumed that the farming population and total number of farms in Europe will continue to decline. Many young people appear unlikely to follow their parents into an often arduous way of life which may offer only modest economic returns and there is uncertainty about how much land will stay in agriculture and how much will be deployed for other uses. If the Common Agricultural Policy (CAP) has played a role in maintaining the farming population and agricultural land in marginal areas, as many believe, it is timely to consider which areas of Europe are vulnerable to marginalization and the environmental consequences of this process. Further reform of the current system of CAP support is expected in the coming years and the social and environmental implications of policy change are receiving close attention.

The environmental implications of contemporary marginalization and potential management options for marginal land are amongst the main concerns of this report. This stems from a growing appreciation of the potential implications of further marginalization for nature conservation and other aspects of the environment. Over large areas, the farming systems which appear particularly vulnerable to marginalization, abandonment or transfer into other uses seem to be those of relatively high nature conservation value. Many are also of considerable landscape importance and typically are modest in their use of external inputs, such as agrochemicals and inorganic fertilizers. The processes of agricultural decline, abandonment and changing land use can affect significant aspects of the rural environment, such as the incidence of forest fires and the control of soil erosion. Even relatively small changes in management can reduce nature conservation values.

Environmental change occurs as part of a web of social, economic and cultural developments taking place at different speeds in marginal rural areas. These need to be understood as a whole. The environment is only one dimension of the marginalization debate but is an important element in the formula for integrated rural development which is increasingly seen as a central goal of European policy.

1.2 Summary of the study objectives

The study is concerned with farmland which is becoming marginal under current use, some of which will leave agriculture altogether and be redeployed for other purposes, such as forestry. The main aims of the study are:

i. to analyse the current trends and processes of agricultural marginalization in Europe;

ii. to examine the environmental consequences, particularly for nature conservation, of the land-use changes resulting from marginalization;

iii. to examine methods, particularly the use of European databases, for identifying areas within which agricultural land is marginal and therefore may be expected to undergo a change of use or management;

iv. to investigate agricultural policies which might contribute to the mitigation of environmentally damaging effects of agricultural marginalization and encourage viable uses of land in marginal areas;

v. to consider the possible management options for maintaining or enhancing the nature conservation value of marginal land which either remains in agricultural use or which is withdrawn from production.

1.3 Relationship to other studies

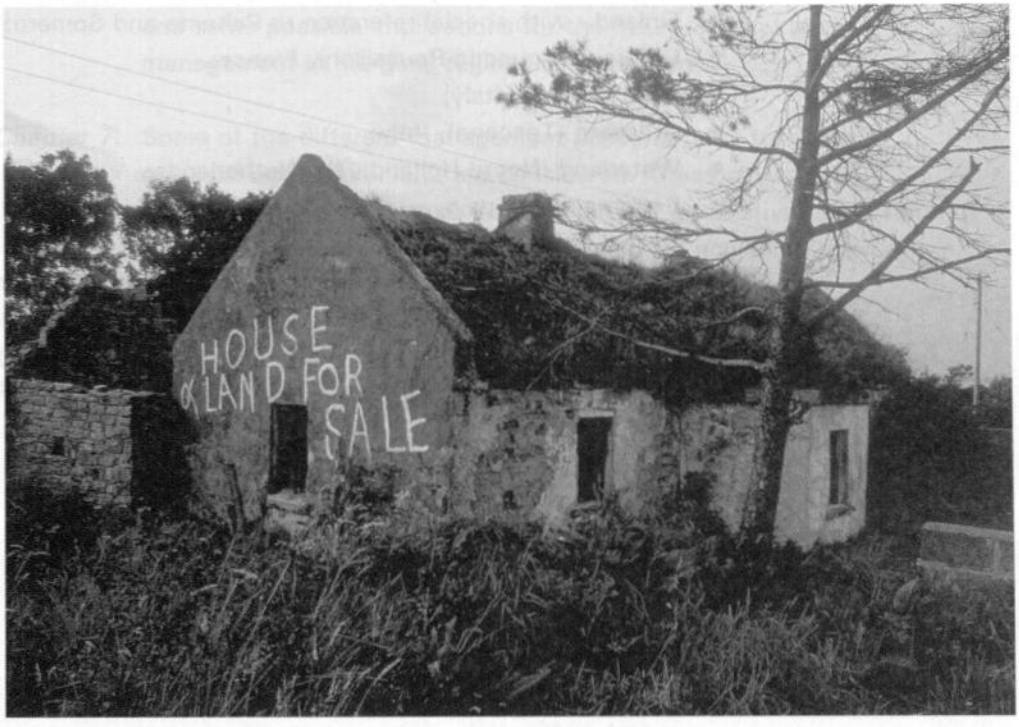
This project is designed to follow up earlier work by the Institute for European Environmental Policy (IEEP) for the Ministry of Agriculture, Nature Management and Fisheries in the Netherlands on nature conservation and new directions in the Common Agricultural Policy which was completed in 1993 (Baldock and Beaufoy, 1993). In addition, it builds on a programme of work undertaken by IEEP on the nature and distribution of extensive farming systems in Europe (Beaufoy et al., 1994) for which the Joint Nature Conservation Committee (JNCC) in the UK was a leading sponsor.

The study is intended to complement a programme of research work commissioned by the National Spatial Planning Agency (Rijksplanologische Dienst - RPD) in the Netherlands on Rural Areas and Europe (see also Appendix 1). The particular emphasis on nature conservation and forestry in this study is intended to complement the focus (for example, on the water storage and tourist potential in rural areas) of other work being undertaken within the RPD programme.

1.4 Method

The project took a multi-disciplinary approach led by the Institute for European Environmental Policy (London) working in collaboration with the Agricultural Economics Research Institute of the Netherlands (LEI-DLO) and local consultants preparing reports on selected case-study areas.

The intention of the study was to experiment with the use of two different approaches to the analysis of marginalization. One approach, reported in



Ireland. Decaying Farmhouse.
Photo by D. Hurn, Magnum/ABC Press.

Chapters 5 and 6, is to identify specific regions in twelve EU countries which might be susceptible to marginalization on the basis of indicators chosen from a range of European databases. These indicators cover agricultural structures and economic performance, social conditions, regional development, etc. A similar approach has been adopted in certain studies of marginalization in individual European countries, using national or regional data, as discussed in Chapter 3. The number of relevant European databases is rather limited, and some of the data is several years old. However, the approach offers a relatively consistent and systematic method of attempting to identify agriculturally marginal regions in the Union and provides a basis for examining the role of agricultural policy in influencing farm incomes in such regions.

The other approach was to examine aspects of the process of marginalization and the environmental effects arising from it in a set of case-study areas. Such case studies potentially offer insights into the variety of conditions and processes to be found within the EU and provide an empirical basis for some of the more abstract work derived from the use of indicators.

Case studies in five EU countries were selected, aiming at a geographical spread, while focusing on areas which *prima facie* appeared to be affected by agricultural marginalization to a greater or lesser extent. The study areas were also selected for their distinct agricultural and environmental characteristics. In some, data on marginalization *per se* was difficult to collect and the focus was on environmental aspects of land management, rather than socio-economic change. The case studies are as follows:

- Finland - with special reference to Paltamo and Somero;
- Lozère (Languedoc-Roussillon), France;
- Valle d'Aosta, Italy;
- Grosseto (Toscana), Italy;
- Waterland (Noord-Holland), the Netherlands;
- Extremadura, Spain.

The case studies provided an important source of data and material for the report, particularly for Chapters 3, 4 and 7. Illustrative material drawn from them appears in boxes in several places in the text. The case studies themselves are collected in a background report. The study of Lozère is in French, the others in English.

1.5 Structure of the report

The report is divided into eight chapters as follows.

Chapter 1: Introduction.

Chapter 2: Provides brief profiles of each of the study areas. These are intended to provide some basic information about the areas concerned and to introduce a few of the issues covered in the respective reports.

Chapter 3: Is concerned with processes of agricultural marginalization and the main factors driving them in the EU. There is discussion of the question 'what is marginal land?' and a synopsis is provided of recent and current trends in land-use change resulting from marginalization.

Chapter 4: Provides an overview of the environmental issues associated with marginalization, with a particular focus on the consequences for nature conservation of farmland abandonment.

Chapter 5: A review is presented of statistical indicators available from European data bases which may be used to highlight regions vulnerable to marginalization. Much of the data derives from the period 1988-1990, prior to the Mac Sharry reforms, the most recent available at the time of writing in 1995. A set of 'marginalization indicators' is selected and these are presented in map form. On the basis of these indicators and using a cluster analysis, a set of regions is identified as potentially vulnerable to marginalization.

Chapter 6: The groups of potentially vulnerable regions are examined in greater detail by reference to agricultural statistics. The analysis focuses on the period since 1988-1990 and the subsequent reform of CAP and considers developments in the selected regions, with reference to the performance of different farm sectors. Some recent policy developments and more speculative scenarios are reviewed briefly

and some possible implications for the future of rural land management in marginal regions are considered.

Chapter 7: Some of the different management policy options for areas of marginal agricultural land are considered. These include the maintenance of agriculture and a variety of alternative uses; some of the policy measures which might be used for achieving appropriate forms of management are considered.

Chapter 8: Draws together the overall conclusions of the study and proposes possible responses to the environmental challenges raised by agricultural marginalization.

2 PROFILES OF THE STUDY AREAS

2.1 Introduction

Six case-study areas were selected at a fairly early stage in the project, parallel to the analysis of indicators reported in Chapter 5. The areas were chosen with the aid of a literature search and assistance from local consultants with the aim of covering a range of geographical locations and farming conditions in both southern and northern Europe. A variety of different farming types, including livestock rearing, dairy production, arable farming and permanent crops can be found in the study areas. There was evidence of some form of marginalization in each of the regions selected. One case study was selected in the Netherlands to illustrate the kind of processes taking place in a relatively marginal area within a highly productive agricultural region. The location of the study areas is shown in Figure 2.1. Throughout the text of the report the case studies are referred to by the name of the author. The main authors are given at the end of each of the profiles that follow.

2.2 Finland - with special reference to Paltamo and Somero (afforestation)

Finland's geography and history have resulted in a pattern of land use which is quite different from most other EU countries. Average population density is low and the great majority of land is under forest. About 7% of the land area is devoted to agriculture, a smaller proportion than the inland lakes and water courses which are a distinctive feature of the countryside. Relatively large areas have moved in or out of agricultural use during the last century and in northern and eastern parts of the country particularly the boundary between farm and forest is more fluid than is usual in other parts of western Europe. Shifting cultivation was common in some areas in the nineteenth century and between 1880 and 1920, the total area of agricultural land expanded from around 2.2 million ha to 2.6 million. Following independence in 1920 approximately 600,000 ha of land were cleared manually. Land clearance and land ownership struggles have been a prominent feature of Finnish history. In the 1940s 11% of the national territory was ceded to the former Soviet Union and 40,000 displaced farming families had to be resettled further west, leading to the subdivision of many medium and large-sized farms.

Approximately 60% of the population of five million now live in urban areas compared with 21% in 1940. Gross Domestic Product (GDP) per capita is considerably higher than the Community average. In 1993 there were 191,800 larger registered farms; full-time holdings averaged 21 ha, while part-time holdings were no larger than 7.4 ha on average. Farmers still own and manage a

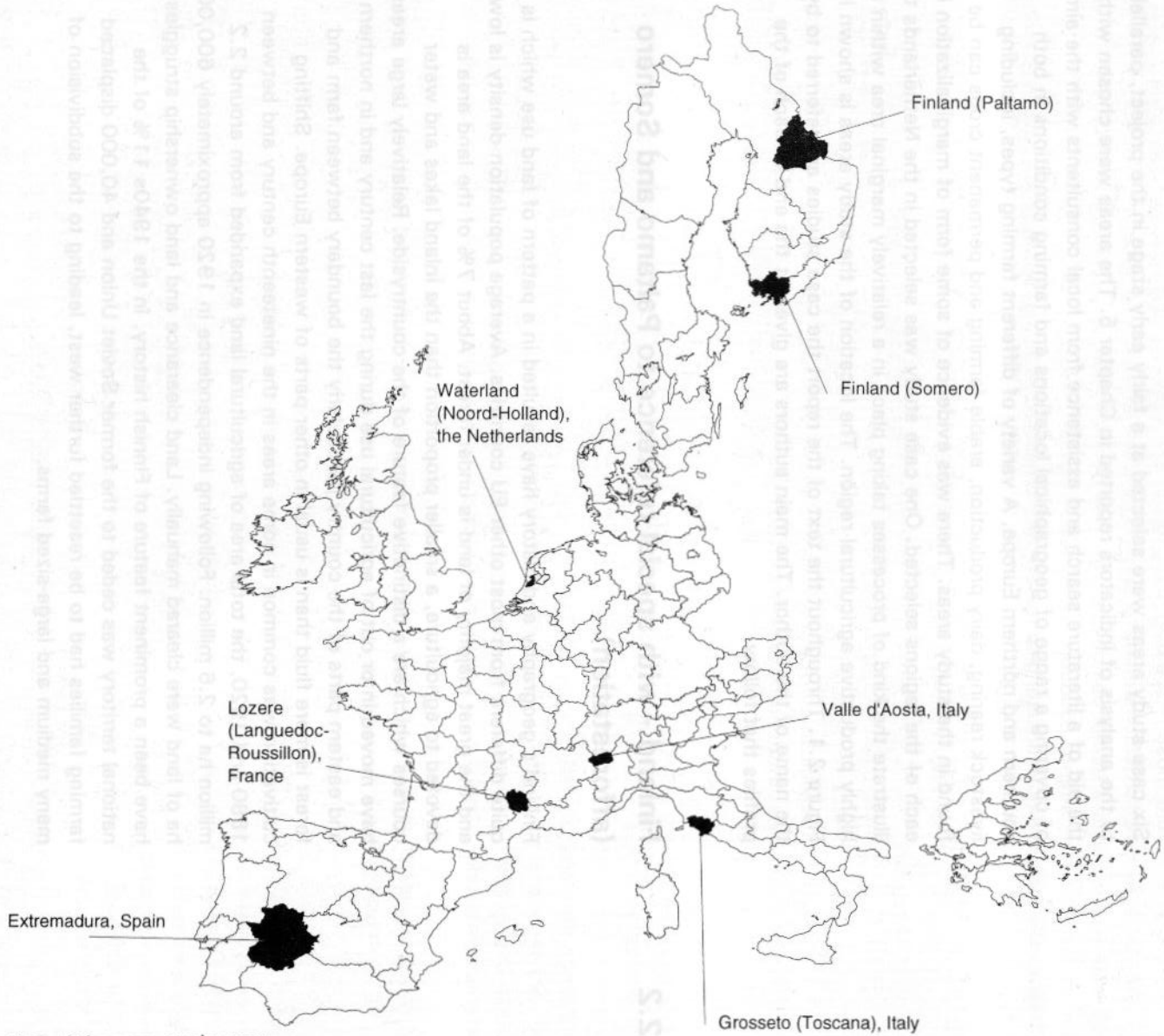


Figure 2.1 Location of the case-study areas

significant proportion of the forest, around 44% in the mid-1980s and there is close integration between farming and forestry activities. A survey undertaken in this period suggests that approximately a third of farms were oriented mainly to forestry and a third mainly to agriculture.

The aims of agricultural policy prior to accession to the EU were not dissimilar from those of the Common Agricultural Policy (CAP) except that there was an explicit commitment to attaining full self sufficiency in major food commodities and a formal objective of maintaining the structure and level of the rural population. Support levels were significantly higher than under CAP and farms are now adjusting to lower price levels for important commodities such as cereals and dairy products. Finnish farm incomes fell by around 7.5% on average in 1995 according to Eurostat figures, with a cut of 60% in aggregate farm product prices not entirely offset by a 70% rise in subsidy payments.

The growth in output and productivity in agriculture in the post war years has been accompanied by a rapid fall in the farming population and the marginalization of many smaller farms and those in peripheral areas. Overproduction has been considered a problem since the late 1960s and Finland was the first country in Europe to introduce subsidies for set-aside and for the afforestation of farms. About 200,000 ha have been afforested since 1969, with the annual rate increasing since the late 1980s. Sizeable areas are expected to leave agricultural production in the coming decade as farms adapt to the new policy climate. Less productive agricultural land in the northern and eastern parts of the country is most likely to be affected, including some of the remaining area of rough grazing, natural meadow and pasture, which is of particular environmental value. There is about 120,000 ha of such land at present. The total number of holdings also is expected to decline. Some estimates suggest that by the year 2000 there may be only 15-22,000 dairy farms compared with around 45,000 today (Selby, 1995).

More traditional forms of agriculture have been responsible for creating and managing both valuable landscape areas and a series of semi-natural habitats, now recognized as heritage biotopes. The future of these areas is of particular concern. Inventories of such sites are relatively recent. The heritage biotopes include dry and wet meadows, shorelines meadows, flood plains and marshland meadows, leaf fodder meadows and woodland and forest pastures. Surveys of endangered species indicate that the abandonment of dry meadows is the single most important reason for the reduced biodiversity on farmland. Semi-natural farmland habitats and cultural landscapes are mainly unprotected and their management depends primarily on the inclinations of the landowner. Research undertaken as part of the National Heritage Landscape and Biotope Project suggests that lack of appropriate management is an acute problem. Floral meadows have almost entirely disappeared, most grassland habitats have become overgrown and lost conservation value following the cessation of management and many of the remnants are threatened by intensification. Although the conservation status of pastures is better than that of meadows, only a small area is well managed. Woodland pasture is still extensive but grazing

is being reduced. In order to preserve the greater part of the remaining heritage biotopes and the species associated with them at least 60,000 ha of land should be brought under management, of which about 25,000 ha consists of meadows.

Two districts within Finland are picked out for closer examination (see Figure 2.1). One of these, the commune of Paltamo, is on the northern limit of agriculture in Europe. Slash and burn agriculture gave way to settlement only in the nineteenth century and the landscape is culturally young, although it contains some biotopes of conservation importance. By contrast, the other area, the commune of Somero, is in the southwestern part of the country in a relatively rich region with a longer history of settlement. In both areas, there are villages which are the subject of integrated landscape and forestry plans being prepared by the Central Forestry Authority, Tapio. These address management questions, such as which areas should remain open, the need for grazing and mowing of valuable grazed habitats, the management of game, the effects of clear cutting forests and the location of afforestation.

In both communes there has been a decline in the number of holdings over the last two decades and many of the remaining semi-natural habitats of conservation importance are threatened by either abandonment or intensification. Further afforestation is anticipated in both areas, particularly in the north. In Paltamo, nearly half a sample of 92 farmers envisaged ceasing farming over the next five years in a survey undertaken in 1993, 14% expected to afforest all their fields and 30% were considering afforesting poor or marginal fields. In the south-west, afforestation is likely to be on a smaller scale, partly because of the larger number of part-time farmers who plan to continue. There has not been a history of significant payments to farmers for environmental management in Finland and plans for the implementation of Regulation 2078/92 had only been completed recently at the time of writing.

Reference: Selby, 1995.

2.3 Lozère (Languedoc-Roussillon), France (extensive sheep farming)

Lozère in central southern France, has around 72,000 inhabitants spread over 517,000 ha, making it the least densely populated *département* in the country. The average altitude is about 1,000 metres, average rainfall is 850 to 900 mm and it is situated at the southern end of the Massif Central. Around half the land area is devoted to farming and 45% to forest and woodland; agriculture and forestry account for about 20% of employment. Most of the farmland consists of permanent grassland, used for grazing sheep, cattle and goats; livestock represents 95% of production. Most of the woodland is classed as productive and there are substantial areas of conifers as well as chestnut woods, many abandoned. The southern and north-west parts of the département are of particular nature conservation interest. Almost half the land area is classified as a

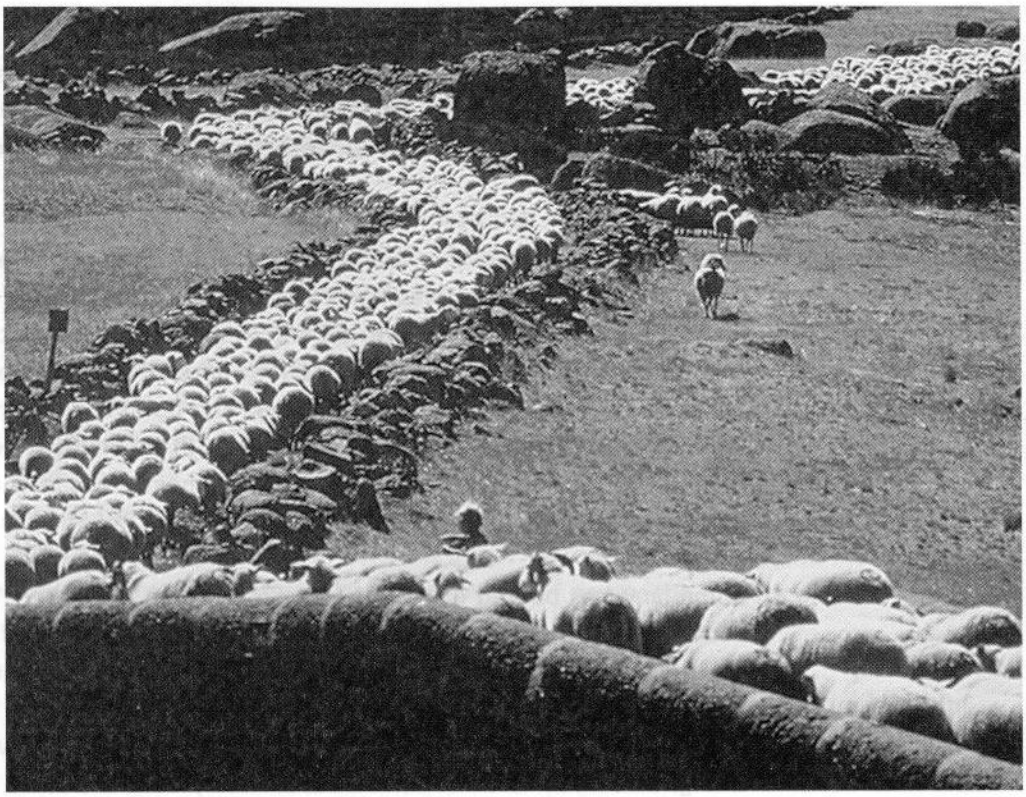
'Zone Naturelle d'Intérêt Ecologique Faunistique et Floristique' type II and the famous Cévennes national park is in the south of the département - a dry limestone plateau managed by extensive sheep and goat farming with a highly distinctive flora.

Depopulation began in the 1880s when the population was about double its present level. Emigration has been an important cause of the decline. Net emigration appeared to come to an end in the late 1970s but because of the high proportion of elderly people in the current population it is expected to fall by between one and 4% a year up to 2010. The number of farms declined from around 11,300 in 1970 to 4,200 by the end of the 1980s, during which time there were efforts to intensify production in most areas of the département and average farm size increased significantly.

Some land has passed out of agricultural use - an estimated 16,000 ha were converted to forest during the 1980s - but the contraction of the agricultural land area has been on a more modest scale than the fall in farm numbers. There have been changes in management, including a growth in shrubby vegetation in grazed areas, and a sizeable area of land has been transferred to new owners. However, outright land abandonment has affected fairly small areas.

The pattern of farming and land use varies considerably within Lozère, which can be divided into four distinct zones - Aubrac, the Causses, Cévennes and Margeride. Several different strands of the marginalization process can be observed within these zones with significant variation between areas. The overall tendency is for pastoral farming to be displaced by forest, especially on poorer soils. Often this arises from planned afforestation, frequently with pines, but there are several areas where spontaneous woodland is expanding, particularly on the edge of existing wooded areas. Some traditional forms of woodland management have declined; this is most evident in the chestnut woods of Basses - Cévennes which previously were worked actively. The area affected by forest fire has grown very significantly since the late 1970s. At the same time there are areas where intensification is still occurring; in Aubrac a number of relatively intact peat bogs of considerable conservation interest have been drained in recent years.

On permanent pasture the pattern of grazing has been changing, with the familiar pattern of more intensive management on better land and a parallel reduction in grazing pressure on poorer or more remote land. Undergrazing is visible in the form of lank vegetation, bush and scrub, notably a growth in broom on land in the north of the département and the colonization of pasture by conifers in parts of the Causses. This is a form of 'diffuse abandonment'. As the invasive woody species become more established, the costs of restoring the pasture and reversing the process increase. Consequently, the probability of long-term abandonment or afforestation is high.



Provence. Sheep migrating.

Photo by D. Fauré

In the Causse Méjan, selected for more detailed study, the traditional form of extensive sheep farming has continued, partly because of the premium available for milk used in Roquefort cheese. However, concern about the viability of the system has been growing since 1980, with falling prices for lamb. Between 1987 and 1991 the number of farms in the area fell by 8.8%, the area of land farmed fell by 3.7% and the number of ewes grew by 19.8%, illustrating the pressures for intensification. Several different scenarios for the future of the area have been considered; there is a strong local consensus in favour of continuing pastoral agriculture, if realistic incomes can be achieved. The abandonment of grazing would increase the risk of forest fires as well as having a major impact on fauna and flora.

Reference: Manterola and Guiheneuf, 1995.

2.4 Valle d'Aosta, Italy (dairy farming)

At the western end of the Italian Alps, Valle d'Aosta is the smallest region of Italy, extending to 326,000 ha. About half the region is above 2,000 metres in altitude. The population density is low but the region is relatively prosperous, with a Gross Domestic Product (GDP) per capita above the national average. Tourism is the mainstay of the economy; there are several winter sports resorts and communications in the main valley are good.

Forest and mountainous terrain dominate the landscape and agriculture accounts for only 30% of land use, almost exclusively grassland, most of which lies above the tree line. There are 42,000 ha of natural mountain pasture and about 55,000 ha of meadows. Milk production and livestock raising are the principal form of farming, employing about 2,000 people.

The region contains large areas of importance for nature conservation including half the Gran Paradiso National Park and the Mount Avic Regional Park. The National Park contains a range of habitats of types listed in Annex 1 of the Habitats Directive, the world's largest population of ibex (*capra ibex*) and several species of birds, reptiles, amphibians and invertebrates of European conservation concern. Grazing is important for the maintenance of the species-rich high mountain pasture vegetation.

The main focus of the case study is the system of livestock farming, mainly dairy cattle. These cattle graze natural mountain pastures in the summer months, playing an important part in maintaining the character of the alpine grasslands. In winter the cattle are kept in cowsheds in the valleys. This type of extensive system is becoming rare in the Italian Alps although it was once relatively widespread. Stocking densities in the 'alpeggi', the mountain pastures, are around 1 Livestock Unit (LU) per hectare and traditional local breeds of cattle are still used, notably the Dappled Red and Dappled Black. Herds utilizing 240 of the 350 alpeggi in Valle d'Aosta produce milk for the local speciality, Fontina cheese, which commands a premium price.

Sustained demand for Fontina cheese, the active backing of the regional government and a variety of support payments have contributed to the survival of the system. Investment aid is partly financed by the EU through the local rural development (Objective 5b) programme and agri-environmental employment premiums are available via a scheme developed under Regulation 2328/91, with the highest payments given to farmers who both milk their herds and produce cheese on the alpeggi. Farmers are also eligible for less favoured area payments.

Nonetheless, symptoms of marginalization have been apparent for some years. Between 1961 and 1991 the number of cattle declined by approximately 7.5% and beef cattle, requiring less management, became a greater proportion of the regional herd. The number of farms fell from 8,430 to around 2,600, each with about 17 cattle compared with an average of 5 or 6 in 1961. The number of people willing to undertake seasonal work in the high pasture has fallen, not surprisingly in view of the hard conditions and social disruption involved. Some of the less productive pastures are being abandoned entirely or, more often, grazed more selectively. Typically, patches, such as very steep ground, cease to be grazed, usually becoming scrubby vegetation. This can increase the grazing pressure on the remaining pasture. During the winter there is a parallel trend towards the greater use of concentrated feeds as insufficient hay is available from local sources. A growing number of cattle now overwinter outside the region on more intensive farms in Piemonte, illustrating the relationship between abandonment and intensification.

Further marginalization seems likely as a result of high production costs, the substantial investment required to maintain the infrastructure, the declining availability of seasonal workers and more stringent hygiene and sanitary standards, which are difficult to meet where cheese is made traditionally. For many farmers intensification and increased scale appears the only route to viability, although the sensitive application of the agri-environment Regulation 2078/92 could help to maintain traditional systems. The regional authorities have prepared a strategy for the future management of the alpeggi involving continued assistance, particularly focused on farms with appropriate environmental management, an increased role for agricultural tourism, the development of co-operatives and a scheme to manage abandoned alpeggi.

Reference: Petretti, 1995.

2.5 Grosseto (Toscana), Italy (olive cultivation)

Grosseto is a district of Toscana on the west coast of Italy, stretching from the Tyrrhenian sea towards the Appenines. It extends over 450,000 ha, more than a third of which is woodland. The population density is one of the lowest in Italy. Much of the region is hilly and there are sizeable areas of mediterranean scrub, as well as 150,000 ha of cultivated land, 40,000 ha of pasture, including some alpine meadows and approximately 11,000 ha of olive groves. There are temperate forests of *Fagus sylvatica*, *Castanea sativa* and *Abies alba*. The trend is towards a reduction in the area of cultivated land, which fell by 4,000 ha between 1987 and 1990, and a growth in woodland, which is expanding at a similar rate.

About half the area of olive groves in Grosseto consists of small family groves, rarely larger than one hectare, with much of the production retained for the family's use, other than in good cropping years. The remainder are commercial groves producing for the market and relying on paid labour, particularly at harvest. About 45% of the groves are considered to be extensively managed, 18% marginal, 27% abandoned and only 9% intensively managed.

In the southern inland part of the district there are only 25,000 inhabitants in an area of 94,500 ha, about 30% of whom live in scattered farm homes. Emigration has resulted in an aging population. This is a hilly area where the traditional *coltura promiscua* is becoming more marginal and subject to patches of abandonment where woodland is regenerating. Sheep numbers are increasing and sheep pasture is expanding on formally cultivated land.

Olives are an important form of production in the region. Marginalization is occurring in the lowest yielding groves, progressing in stages, beginning with the abandonment of harvesting and irregularity in pruning. Trees are becoming older, which has environmental benefits but leads to a loss in productivity. The numbers of farmers is declining, many are part-time and 30% are over 65 years old. The overall intensity of management is being reduced particularly on small,

fragmented holdings. This process has been accelerated by the very hard winters of 1985 and 1986 which killed most trees growing above 200 metres. Productivity is low; yields average around 3 tonnes per hectare, falling to 1 tonne in the most marginal farms, compared with a yield of about 8 tonnes in intensively managed areas. Olives are still collected by hand on most farms, resulting in high labour costs. Oil prices have not kept pace with production costs and producers are heavily reliant on CAP subsidies, paid at an average rate of 85 ECU per quintal of oil.

Abandonment has a variety of environmental effects. Where groves are replaced by arable crops or vineyards there is a loss of both biodiversity and landscape value. If the groves are abandoned and invaded gradually by natural vegetation the landscape becomes more enclosed and traditional features such as stone walls are displaced. Fire hazards also increase. The effects on biodiversity are more complex. Certain species, including some large mammals, will benefit from the termination of management, especially in the early stages of woodland recovery. However, another group of species adapted to a more open habitat will decline. Overall biodiversity falls as the woodland matures, although this does not necessarily provide a guide to conservation value; this depends more on which habitats and species are most in need of protection or restoration.

Future management options could include efforts to increase the viability of extensive groves, for example, by promoting co-operation and developing premium products, improving the management of marginal groves, accepting a level of abandonment, where natural conservation opportunities could be exploited, rationalising the oil mills in the locality and promoting agri-tourism.

Reference: Petretti, 1995.

2.6 Waterland (Noord-Holland), The Netherlands (extensive dairy farming)

Waterland is an area of a few thousand ha of predominantly brackish peat pastureland which is farmed less intensively than other parts of the Netherlands. It is situated in the western part of the country, in the central part of the province of Noord-Holland, north of Amsterdam, between the sea and the Markermeer lake. Most of the land consists of reclaimed peat bogs and the water level remains high. The landscape is open with grassland intersected by ditches, drainage channels and larger areas of water, with patches of reed bed and alder. There is an area of drier reclaimed land and coastal dunes in the western part of Waterland where the soils are heavier, agriculture is more intensive and farms are larger. Both horticulture and arable farming can be found in this part of Waterland.

The relatively light peaty soils of the reclaimed bogs can be divided into the water-bound polders, mostly islands surrounded by water and so inconvenient to

farm, and the land-bound polders which adjoin other land. Most of the fields are long thin strips, reflecting the history of reclamation from 1100 onwards. A combination of geography and history has deterred more comprehensive drainage. Stocking densities are lower than the national average and the area is of considerable importance for nature conservation and recreation. The density of meadow birds is higher than in any other area of peat pastureland in the Netherlands and the vegetation of the ditch sides and reed beds is of particular interest.

Several processes associated with marginalization are occurring. Some land in the water-bound polders has been taken out of use for conservation purposes and several small islands have been sold to nature conservation organizations or the National Forest Service. There has been a growth in the alder and scrub woodland. The number of holdings has declined by around 80% over the last three decades in the water-bound areas, compared with a national average of 50-70%. The small size of farms, coupled with the unfavourable production conditions and the slightly lower than average price obtainable for milk in Noord-Holland have led to a decline in the competitiveness of milk production, especially since the introduction of quotas in 1984. There has been some transfer of milk quota out of the region in recent years. Government slurry storage requirements, which necessitate substantial investment on some farms have added to pressure on small-scale milk producers. Nonetheless agriculture is relatively intensive compared with most Less Favoured Areas in Europe. Input of nitrogen per hectare averaged 239 kg per hectare in 1992. A decline in the intensity of production could be expected to reduce nutrient leaching and benefit water quality and other aspects of the environment. However, the large populations of ducks and meadow birds would be expected to fall if substantial areas of grassland were abandoned and replaced by spontaneous boggy woodland.

Parts of the Waterland are classified as a Less Favoured Area under the Directive (EEC) 75/268 because of the constraints on production. Approximately 3,700 ha consisting mainly of water-bound polders, has been designated under Dutch national policy for agriculture and nature conservation. Most of this land will become subject to management agreements - some remaining in private hands, other areas being purchased as nature reserves.

The future of the Waterland is in some doubt. Recreation is expected to become an increasingly important element in the local economy and there is pressure to utilize redundant farm buildings for this purpose. In the case study three principal options for the farmed land are considered:

- continued agriculture, including some drainage and intensification;
- making nature conservation the primary aim of management, maintaining exclusively grazed pasture;
- preserving locally the present use of land, particularly for meadow birds with payments to farmers made under the government's management agreements (RBON agri-environment policy).

Different aspects of these options are explored and some of the potential costs are considered.

Reference: Pouderoyen Compagnons, 1995.

2.7 Extremadura, Spain (extensive arable farming and permanent pasture)

Extremadura is located in the southwestern corner of the Spanish *meseta*, covering just over 4.2 million ha. It is predominantly flat or undulating, with over 80% of the land between 200 and 600 metres altitude. However, the plains are broken up by several small mountain ranges. The climate is predominantly Mediterranean-continental, with annual rainfall ranging from over 1,000 mm in the upland areas of the north to around 400 mm on the southeastern plains.

Much of the region is covered by siliceous soils of low fertility. Yields in non-irrigated areas are extremely low: the reference yields established under the CAP arable support regime range from 0.9 to 1.8 t/ha. In very dry years, production in many areas may fall below 0.5 t/ha. The average livestock density for the region as a whole is 0.54 LU per ha of forage.

The region is of exceptional nature conservation value for a wide range of species, including reptiles, amphibians, flora, mammals, etc. Currently, most of the available data relates to birds. The Spanish NGO SEO/Birdlife has identified 50 Important Bird Areas (IBA) in Extremadura, covering a total surface area of 3 million ha. This represents almost 23% of the Spanish IBA. There are currently six Special Protection Areas (SPA) for birds in the region, covering a total land area of 191,000 ha.

The case study focuses on the two most characteristic types of land cover in the region: dehesas and steppes. Both are under a mixture of permanent pasture and extensive arable cultivation and are of very high conservation value. Dehesas are characterized by an open canopy of oaks, which traditionally formed an integral part of the farming system. Sizeable areas were completely deforested in the past, forming the extensive open landscapes known as steppes.

In broad socio-economic terms, Extremadura is an extremely marginal region, with a GDP of 51% of the EU average in 1992. Agriculture employed over 19% of the active population in 1993, whilst around 20% of the active population were unemployed. The population density is under 25 persons per km^2, with the majority concentrated in the main cities. Ninety per cent of the region is classified as Less Favoured Areas (LFA) in accordance with Directive (EEC) 75/268 (LFA in danger of depopulation and where the conservation of the countryside is necessary).

During the late 1960s and 1970s, the region underwent massive socio-economic change, principally as a result of industrialization. The population in rural districts dropped enormously as people moved into urban centres. In some mountain and upland areas, this process was accompanied by afforestation by the State of marginal farmland (particularly communal grazing lands) with plantations of pine and eucalyptus. Some other land in upland areas was abandoned to natural succession, for example, marginal pastures, dehesas, olive groves, terraces and woodlands, creating tracts of scrub and woodland.

In the lowlands, the most striking change was the abandonment of arable cultivation on marginal land in both dehesa and steppe areas. The area of non-irrigated arable land declined by some 450,000 ha between 1974 and 1992, the majority reverting to permanent pasture or rough grazing. As a result of the abandonment of much of the most marginal land, and an increase in fertilizer use, the proportion of fallow land declined from 86% of all arable land in 1974 to 64% in 1992.

Many commentators report that patches of land in marginal areas were abandoned altogether, allowing the development of scrub and natural woodland. However, the Ministry's land-use statistics show an overall *decrease* in the area of scrub in the region during the 1970s and 1980s, suggesting that only localized patches of farmland were abandoned.

From the time of Spanish accession to the EU in 1986, the processes of marginalization and decline which were evident in the 1970s and early 1980s appear to have been slowed, or even reversed. The CAP support regimes for sheep and goats, beef, cereals and olives are particularly significant for Extremadura. A campaign to eradicate African swine fever was established with EU finance and by 1994 the disease had been eradicated almost entirely, allowing an important revival in dehesa pig production. Most recently, the 1992 CAP reform introduced new payments which have added an important incentive for the maintenance of dryland farming systems. One indicator of the revival in agriculture is that cattle and sheep numbers seem to have strengthened significantly during the 1980s. Sheep and goats in particular had been in decline during the 1970s.

The environmental consequences of these changes are complex and only limited data is available. On the negative side, it seems that much of the afforestation of marginal lands carried out during the 1970s was environmentally damaging, resulting in significant losses of open habitat which are known to be of value for predatory species, such as lynx (*Lynx pardina*) and many raptors. These forest monocultures are also extremely vulnerable to fire and subsequent soil erosion. Some areas of pasture of value for species such as the chough (*Pyrrhocorax pyrrhocorax*) are thought to have been lost through abandonment and natural succession in upland areas.

In the lowlands, the widespread loss of a landscape mosaic of cultivated, grazed and fallow land at the expensive of extensive rough grazing may be detrimental

to farmland biodiversity and the conservation of certain species. Also, the abandonment of many traditional farming practices has had negative results, such as the neglect of stone walls and failure to ensure tree regeneration in the dehesas.

On the other hand, it may be that a certain reduction of agricultural pressure is environmentally positive in places where marginal lands are being over-exploited. For example, the cultivation of marginal soils for arable crops results in soil erosion and, in the dehesa, may cause severe damage to tree roots. The widespread abandonment of marginal arable cultivation in the 1970s and 1980s therefore may have had some positive results. Also, some localized abandonment and the subsequent development of patches of scrub and woodland may be beneficial in terms of habitat diversity in a predominantly farmed landscape.

At present, it seems that agricultural abandonment is not a widespread phenomenon. In fact, CAP payments appear to be encouraging the cultivation of land which had reverted to extensive grazing and in some cases may even have been in a state of semi-abandonment. The only significant amounts of land coming out of agricultural use are those being planted with trees under Regulation 2080/92; even these areas (16,000 ha in the period 1993-1994) are expected to be used for extensive grazing once the dehesa tree cover is established.

Also, although extremely low by north European standards, livestock densities have increased overall since the 1980s and are now excessive in many areas, probably as a direct result of the CAP support regimes. Even in the high mountain pastures of the Gredos mountains, the number of cattle present in summer is reported to have increased significantly in the past decade. Future strategies for the region should aim to reduce some of the pressure resulting from overstocking and to take some of the most marginal land out of cultivation whilst preventing the uncontrolled abandonment that might result from a removal of current levels of CAP support.

Reference: Beaufoy, 1995.

3 PROCESSES AND CONSEQUENCES OF MARGINALIZATION

3.1 Introduction

This chapter discusses concepts and definitions of 'marginal' and 'abandoned' land and the factors driving marginalization and agricultural land-use change in Europe. It also provides a brief synopsis of recent and current trends. As well as providing the background to the remainder of the study, the discussion presented in this chapter contributed to the selection of the case-study areas in this research project.

3.2 Defining marginalization

3.2.1 What is marginal land?

There is no clearly defined and commonly accepted definition of what is marginal land or marginal agriculture. Perhaps the most readily accepted definition of a marginal agricultural situation is one which is at the margin of economic viability. For example, a marginal site has been defined as one in which 'the present agricultural use yields a factor income which cannot cover the costs of the factor amounts invested in it or, given constant productivity and price trends, will cease to cover them in the next few years' (CEC, 1980).

However, there are many variables within such a broad definition. For example, how should costs be calculated? Many apparently marginal farming types in Europe depend for their viability on non-wage family labour, the costs of which are often hidden.

Clearly it is not economic factors alone which make a given agricultural situation marginal. This is reflected in the terminology in some languages for referring to farmland abandonment (a phenomenon commonly associated with marginalization). For example, in German there are terms for abandonment caused predominantly by social, structural or natural factors (see CEC, 1980):

- *Sozialbrache* refers to farmland which leaves agricultural use for social reasons, for example, agriculture near to cities which is abandoned as a result of the stronger income earning potential of employment in the city;
- *Strukturbrache* refers to marginalization caused by structural weaknesses, such as very small and/or fragmented holdings or poor infrastructure;
- *Grenzertragsbrache* refers to land which is inherently marginal due to physical conditions (soil, slope, altitude, climate, etc.).

An example of a marginal situation: olive groves in Grosseto, Toscana

Currently, the average rate of olive grove abandonment in Italy is estimated at 30,000 ha per year.

Olive groves yielding less than 1.5 tonne/ha are considered marginal and vulnerable to abandonment; a yield of 3 tonne/ha is considered acceptable, although more intensive plantations may achieve 8 tonne/ha. In the inner part of Grosseto province, yields are extremely low, ranging from 0.6 to 1.5 tonne/ha.

In this province, the average size of farms with olive groves is 1.08 ha. These small groves are cultivated mainly for family consumption, with only the surplus being sold. Almost 30% of the farmers are over 65 years of age.

It is estimated that approximately 30% of olive groves in the province are abandoned and a further 20% can be classified as marginal. In the absence of management, olive groves generally will be invaded by scrub within 4-5 years. After 9-15 years, a deciduous woodland structure is well developed.

Source: Petretti, 1995.

In French there are similar terms to differentiate between various sorts of abandoned land, such as *friche social, friche technique* (the result of technological change in farming systems), etc.

Marginal situations are the result of the interaction over time of a combination of factors. Pinto-Correia and Sørensen (1995) stress that marginalization is a dynamic concept, which is related directly to the conditions at the moment of analysis and which depends on a multitude of factors, including the geographical situation and the age, financial resources and character of the farmer in question.

Thus, a plot of land which, due to its physical characteristics and poor yield potential, may be considered marginal in southern England, may be regarded as good arable land in Spain. Similarly, a farm which is abandoned by an aging farmer in southern Portugal may be converted into a highly competitive holding by a young Dutch incomer with the necessary resources.

It is important to recognize in the context of the present report that marginal situations exist at different geographical levels, for example:

- Regional: in the European context, a region may be marginal in broad physical and socio-economic terms, with predominantly unfavourable conditions and uncompetitive forms of agriculture involving low productivity and income levels, remoteness from markets, aging population, etc. The possibility of widespread marginalization in such a region may be considered high, although there may also be agricultural areas which are highly productive and competitive.

- Local areas: within a region, certain types of land use may become marginal as a result of changing socio-economic and technological conditions. Grazing marshes provide a good example. Such areas exist even within generally very productive regions such as the Netherlands (for example, Waterland), south-east England and north-west France.
- Farm level: an individual farm may be uncompetitive for a variety of reasons, such as small size, fragmented land, degraded infrastructure and capital equipment, or the age of the farmer. Generally, such holdings are taken over by other farmers or land uses, depending on local conditions. In more marginal regions, total farm abandonment may occur.
- Within a holding, an individual plot of land may be marginal due to physical handicaps, such as poor access, steep slopes, waterlogging or distance from the main holding.

3.2.2 The process of marginalization

The term 'marginalization' is understood and used in a number of different ways. For example, a recent report from the Rural Areas and Europe (RA&E) project of the National Spatial Planning Agency in the Netherlands (Bethe and Bolsius, 1995) describes the marginalization of farmland as one of three interrelated processes:

- 'extensification'
  - a reduction in the level of input use per unit of land;
- 'optimalization'
  - a reduction from currently high levels of input use per unit of land, resulting in a more effective combination of production factors;
- 'marginalization'
  - a reduction in the level of input use per unit of land beyond the point of optimalization and usually leading to a change in use or abandonment.

Marginalization is thus considered as a specific form of extensification. Furthermore, a key part of the RA&E definition of marginalization is that it involves a change of use, *viz*: 'marginalization is a change in agricultural land use from a more profitable to a less profitable one' (Bethe and Bolsius, 1995). Typically, this might involve a change from arable cultivation to permanent grassland or from grassland to forest.

This emphasis on land-use change as the predominant indicator of marginalization is excessively restrictive for the purposes of the present study, and a slightly different definition was adopted, as follows:

> *agricultural marginalization is considered to be a process, driven by a combination of social, economic, political and environmental factors, by which certain areas of farmland cease to be viable under an existing land use and socio-economic structure.*

This process may produce a number of different responses from farmers. For example, some may attempt to improve viability and combat marginalization, whereas others may run down or abandon agriculture altogether. In certain circumstances, it may be possible to intensify production and to increase output per hectare, particularly when significant financial incentives are available in the form of production-oriented grants and subsidies, as was the case in most EU Member States during the 1960s and 1970s. During this period, there were many policy initiatives designed to create more economically viable farm structures, especially in areas of predominantly small-scale farming or *minifundia*, with public funding for restructuring and consolidation of holdings - generally transforming the landscape in the process. Publicly funded projects of this sort continue to be undertaken in certain southern regions of the EU, such as Galicia in Spain, often with a severe impact on the natural environment and landscape.

Where greater agricultural productivity does not appear a viable option, a gradual running down or abandonment of agriculture is more likely. However, before this situation is reached, a range of different management choices can be made by farmers with the aim of staving off marginalization and maintaining viability. Often these choices involve reducing labour intensive tasks, such as traditional hay-making, maintenance of walls, hedges, etc. The different responses of farmers will have a series of consequences for the land-use pattern, landscape and natural environment of a region. Possible responses include:

- a change from one agricultural land use to another, e.g. from crops to permanent grassland, typically involving the simplification of a mixed farming system into livestock production only;

- changes to farming systems which do not significantly alter the existing agricultural land use, e.g. reduced input use and/or stocking densities, reduced maintenance of infrastructure, etc., often known as 'extensification' in English;

- a 'contraction' of the farming system, usually involving an intensification of production on the better land and the running down or abandonment of poorer, less accessible parcels;

- restructuring of holdings as some farmers leave the land and others take it over in order to increase their farm size (often known as 'extensification' in French);

- complete farm abandonment, typically leading to natural succession and potentially to the development of scrub and woodland (sometimes referred to as wilderness);
- a change of land use out of agriculture, for example to forestry or urban building.

Within a given area, a variety of changes may take place side by side, in interaction with one another or quite separately. Marginalization often is a complex and dynamic process, proceeding at varying speeds. The outcome is not necessarily abandonment - indeed, the process can be reversed. In some cases, a significant decline in the number of farmers, accompanied by the abandoned or reversion to grazing of some parcels of land, may subsequently allow for the creation of larger and more viable holdings and hence to periods of greater stability.

The main concern of the present study is to consider larger areas or regions where conditions are generally unfavourable for the more productive forms of agriculture and farming is in danger of becoming more marginal in relation to more favoured agricultural areas. The result may be abandonment or a change of use, such as afforestation, on a large scale. This type of marginalization generally coincides with the situation known in France as *déprise agricole* (agricultural decline).

At the other extreme are regions where physical conditions may be favourable for agriculture, but where a high level of economic development and increasing urbanization of the countryside results in agriculture being driven out by other land uses, such as out-of-town shopping centres and horse paddocks ('horsiculture') or, in certain situations, being replaced by specialized recreation or conservation uses such as nature reserves or country parks. Here, marginalization is driven by external pressures and urbanization rather than by agricultural decline. A slightly different phenomenon affecting farmland in urban fringe areas is a combination of 'urban nuisance' (such as vandalism) and the anticipation of urban development which can lead to neglect and abandonment of farmland. A survey of London's Green Belt in 1979, for example, found that one third of farmland there exhibited signs of idling or urban nuisance (Whitby, 1992).

Baudry and Acx (1993) present the typical process of agricultural decline as a series of stages leading from extensification to abandonment, as agricultural production gradually ceases to be the primary objective of land management. Initially, the maintenance of production infrastructure is neglected and the intensity of management is reduced; later, management for agricultural production gives way to minimal maintenance and finally to abandonment. This process is illustrated in Figure 3.1.

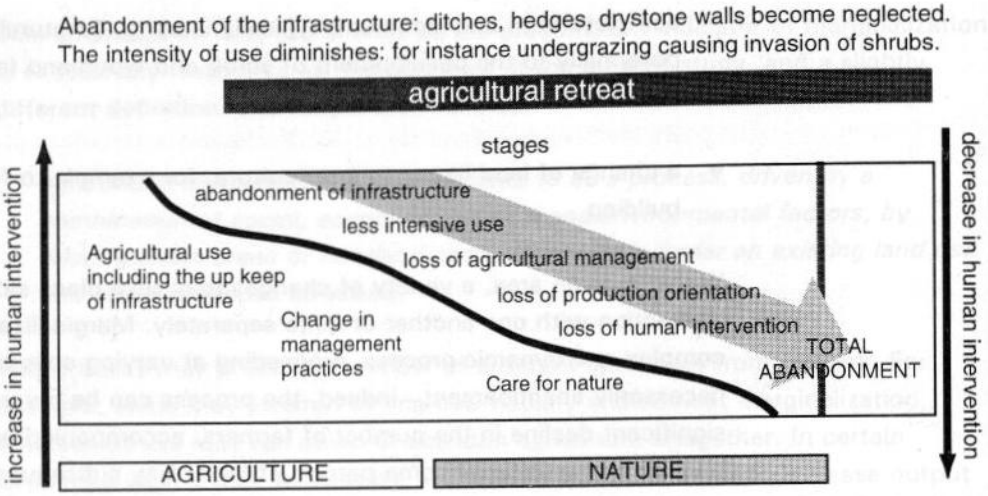


Figure 3.1 The different stages of abandonment

This illustration makes the important point that the total abandonment of a given piece of land is very often preceded by the abandonment of particular management practices. As they are gradually run down, traditional and relatively complex farming systems tend to be simplified. In particular, labour intensive practices, such as the maintenance of hedges and walls, hay-making and the shepherding of livestock are abandoned. This can have important implications for nature conservation, as discussed further in Chapter 4.

3.2.3 Land abandonment

The phenomenon of land abandonment and its associated problems is a common theme of research into agricultural marginalization. However, the notion of abandoned land is itself complex and often not clearly defined. For example, some commentators from regions with predominantly intensive forms of agriculture regard rough grassland and scrub managed under extensive grazing regimes as a form of semi-abandonment (for example, see CEC, 1980). However, in other regions this form of exploitation has been the norm for many years and may be considered no less viable than any other, given appropriate policy and market conditions and sufficiently large holdings. In many parts of southern Europe, large areas of land are managed only sporadically and under very extensive farming systems, but this does not mean they are on the verge of abandonment.

There is often confusion over the term 'abandoned land', particularly when translating between languages. It is important to differentiate between situations such as spontaneous abandonment and planned withdrawal. Increasingly in Europe, farmland is withdrawn from agriculture under schemes such as set-aside (nevertheless commonly known as *abandono de tierra* or 'land abandonment' in

Spain). Apparently abandoned land often is not truly abandoned, but merely temporarily out of use and awaiting a new owner or tenant. Even totally abandoned farmland in France and the Mediterranean countries often has a legal owner, probably living in a town or city, who may one day choose to put it to some use, such as building a holiday home.

Bandarra (1994) points out that it is often very difficult to identify abandoned land. Particularly in marginal regions, such as parts of Alentejo in southern Portugal, arable land may be left fallow for many years, with only intermittent grazing during this time. Over very large areas of Iberia, farmland is largely unfenced. Consequently, land which has been abandoned by its owner may continue to be grazed by sheep and goats for many years, thus preventing natural succession to woodland.

In general terms we can define abandonment as taking place when the neglect of the main productive elements is allowed to decline beyond a point at which recuperation is practical, or economically viable. The neglect of retaining walls on terraces in semi-arid regions to the point where landslips become established is a clear example.

In the case of permanent pastures, for most types of semi-natural sward it would be possible to define a species composition which is indicative of appropriate grazing pressure and more or less optimum productivity and nutritional value. In the event of insufficient grazing pressure, sward quality will tend to decline as litter accumulates and coarser and less palatable species become dominant. Ultimately, undergrazing can be expected to result in a decline in grazing value and hence abandonment, as well as in a significant loss of species diversity. Neglect and declining management may be illustrated equally by localized overgrazing, for example, by unshepherded flocks. Furthermore, the results tend to be the same, in other words, declining grazing value and ultimately abandonment.

In short, farmland may be out of agricultural use for several different reasons, not all of which can be attributed to marginalization in the sense adopted here, for example it may be:

Temporarily out of use

- farmland which is under only sporadic management; this may equate to semi-abandonment but may continue for many years;
- farmland which is temporarily out of use, for example, awaiting a new owner or tenant, but which is likely to continue under agricultural management;
- farmland which is temporarily out of use and which is most likely awaiting a non-agricultural use, typically in urban fringe areas (*Spekulationbrache* or *friche de spéculation*);
- farmland which is temporarily set aside under the Common Agricultural Policy (CAP) arable regime.

Out of use on a more permanent basis

- land which is under long-term set-aside schemes, such as habitat creation under Regulation 2078/92, and may therefore be subject to conservation management;
- land which has been abandoned on an apparently permanent basis by its owner but continues to be exploited by itinerant livestock;
- land which has been abandoned on an apparently permanent basis and is neither exploited nor managed.

Converted to other uses

- land which has undergone a planned conversion to another use, typically forestry, reservoirs, nature or hunting reserves or urban development;
- land which has come under another use following spontaneous abandonment.

3.3 Factors influencing marginalization and land-use change

3.3.1 Introduction

Some of the most important factors which determine whether an agricultural situation is marginal are discussed below. Certain of these factors are discussed further in Chapter 5 which is concerned with statistical indicators of regions vulnerable to marginalization.

3.3.2 Environmental factors

The most prominent of these are:

- soil;
- climate;
- water supply;
- relief;
- altitude;
- pollution.

Environmental factors have a fundamental influence on the agricultural potential of an area. Productivity may be severely limited by handicaps such as poor soils (thin, waterlogged, etc.), lack of rainfall, steep slopes (an obstacle to mechanization) and high altitude (which results in a short growing season. These factors hinder intensification and increased productivity per hectare. Technical solutions, such as irrigation and drainage, may enable previously marginal land to become far more productive, though often at significant environmental costs.

In many countries, attempts have been made to define physical characteristics such as those listed above in order to identify land which is marginal. For example, in Germany arable land is considered unsuitable for mechanized working if it has a slope of over 18%. The equivalent value for grassland is put at 24-30%, depending on the region. A mean annual rainfall of less than 500 mm and a growing season (period of the year with mean daily temperature >5°C) of

less than 200 days are also taken as indicators of marginal sites in Germany (CEC, 1980). Soil-climate indices are quite often used as indicators of agricultural potential. In the RA&E study of marginalization, a rating of less than 35 on the *Bodenklimazahl* soil-climate index is taken as an indication of marginal land (Bethe and Bolsius, 1995).

Following the guidelines laid down in Directive 75/268, EU Member States use a limited set of criteria referring to altitude and slope in the identification of land which is proposed for designation as 'mountain areas' under the Less Favoured Areas (LFA) scheme. The thresholds used vary according to the region and the prevailing environmental conditions. For example, a key consideration for establishing the altitude threshold is the number of frost-free days in the year. Thus in Spain mountain areas are defined as those above 1,000 metres whereas in Germany the threshold is 600 metres. For the designation of non-mountain or 'other' LFA, a mixed set of indicators is used including depopulation tendencies, poor land fertility, unfavourable farm results and other specific handicaps (Terluin et al., 1995). A full explanation of the criteria used in each Member State is provided by Onofre (1993).

Verheye (1992) has pointed out that it is often not sufficient to grade agricultural land solely according to its potential productivity in terms of volume of output. Qualities such as taste, appearance, oil and aroma content have an important influence on the value of certain crops. These qualities are influenced by soil and climate and may be better where conditions are adverse and volume production therefore is lower. Examples of crops which may produce a higher value product in apparently adverse conditions include vines, olives and durum wheat.

Environmental factors may limit the alternative uses to which agricultural land can be transferred. Special management may be required; for example, traditional terraces in dry Mediterranean areas often are highly susceptible to soil erosion without appropriate management. Agricultural pollution of groundwater or soil may limit the use of land for water abstraction or habitat creation, respectively. Land withdrawn from intensive agriculture usually requires careful management during longer periods in order to redevelop natural values, due to the impoverished state of wildlife communities on such land.

Finally, although it remains broadly true that land with the least favourable environmental conditions for agriculture is more likely to be abandoned, this does not discount the contraction of agriculture in areas with favourable conditions. The development of 'agriculture without soil' may lead to the concentration of production on a smaller land area, releasing fertile land for other uses (Bethe and Bolsius, 1995).

3.3.3 Geographic location

Key factors appear to be:

- distance from markets and sources of supply;
- physical factors affecting the potential for generating non-agricultural income.

Farming in remote areas may be disadvantaged by poor access to supplies and markets, resulting in higher input costs and reduced competitiveness. Geographic location has an important influence on the potential for diversification into activities such as direct sales of farm products to the public and providing on-farm tourist accommodation. However, even within an area with apparent tourism potential, only certain farms will be well-placed to take advantage of this potential (e.g. those near to roads, with good views, etc.).

3.3.4 Agricultural structures

Relevant factors include:

- structure of holdings;
- land ownership and tenancy structures;
- rural infrastructure.

Agricultural structures greatly affect the viability of farms. Areas with predominantly very small, fragmented holdings (typical of many parts of southern Europe) have difficulty competing with equivalent areas which have a more rationalized land-use structure. In areas with poor soil fertility and low rainfall, large holdings are required in order for agriculture to be economically viable. In practice, many farms in regions with these characteristics are far too small to compete with inherently more productive regions. A fundamental question for the future viability of such areas is whether farm sizes will increase, for example, through the abandonment of some farms and their take-over by neighbours. Some problems regarding farm size and structural rigidity in Spain are elaborated in the Box.

The pattern of land ownership and farm tenancy in a region can play an important role in the development or stagnation of agriculture. In some regions, for example, parts of Scotland and south-west Spain, many farms are owned by absentee landlords who may take little interest in the adaptation of their farms to new socio-economic conditions and changing policies. The degree of legal autonomy and security conferred on the tenant will be significant factors in such cases.

The provision of infrastructure is important to the viability of farms, particularly in areas which are remote or suffer from severe physical handicaps. Examples include access to roads, watering points and shelter for animals and shepherds in remote areas, irrigation, drainage, etc. A mountain pastoral area with poor or degraded infrastructure is disadvantaged compared with a similar area in which the infrastructure is well developed and maintained - as illustrated by the Spanish and French Pyrénées respectively (see Section 3.5.2).

The problem of farm size and structural rigidity in Spain

Over half of all farms in Spain possess fewer than 5 ha of land (although farms over 50 ha in size possess over 55% of the total Utilized Agricultural Area).

Farm size is an extremely important factor influencing the viability of holdings. A recent study (Fuentes Quintana and González Olivares, 1994) of arable farms in Tierra de Campos (Castilla y León) estimated the size of a holding, required to produce an income of 80% of the average national non-farm income under the conditions of the post-reform CAP arable regime. On the most productive land in the area, 300 ha was found to be the minimum size, whilst almost 1,000 ha were required in the least productive parts, where a large proportion of land must be fallowed each year. Currently, the average holding size in the area is 60-75 ha.

This situation is typical of many parts of the country. Often, a small number of large and relatively efficient farms exist alongside numerous small, marginal holdings. It seems that considerable structural changes are needed in order for more holdings to become economically viable on a full-time basis. However, apart from a few exceptions, there appears at present to be a lack of dynamism in Spanish agriculture which is preventing adaptation and change. For many farmers and landowners, agriculture is a part-time and marginal activity of little interest. Yet, at the same time, the land market is extremely rigid and renting is not popular. Land prices in dryland arable areas are reported to be considerably higher than the productivity of the land might indicate (Fuentes Quintana and González Olivares, 1994). The generous support payments currently provided by CAP may exacerbate this situation, encouraging landowners to keep their land and to continue with their marginal, part-time farming activities which they might otherwise abandon.

During the 1980s, the average size of holdings barely increased on the national level, despite the great decline in the number of persons employed in farming. By contrast, in France during the same period the average size of holdings increased by 20% (Bontron et al., 1992), suggesting a far more dynamic process of adaptation in the face of marginalization.

Source: Beaufoy, 1995.

3.3.5 Social factors

Some of the most important seem to be:

- age of farmers;
- availability of successors and laws of inheritance;
- attitudes to farming;
- rural population trends;
- provision of training and advice to farmers;
- social facilities (education, health, sports, entertainment).

Marginal rural areas tend to be characterized by a high proportion of elderly farmers with no known successors. Laws of inheritance can have an important influence; the equal division of land between all children in countries following the Napoleonic code has often resulted in the fragmentation of holdings and confusion over ownership and responsibility. In Greece, land ownership and land-

use rights in marginal areas seem to be particularly complicated and often act as an obstacle to a rational use of resources, such as grazing land (Louloudis et al., 1994).

Different attitudes to farming can also play a significant role. In some areas, agriculture and land ownership are regarded as conferring social status; in other areas, there is a stigma attached to farming, particularly peasant farming.

Bandarra (1994) identifies rural areas which suffered more than the average rural population decline (-50%) since the 1970s as particularly vulnerable to abandonment. Although many rural regions in the more economically developed parts of the EU have increasing populations, rural depopulation is still a common feature in large areas of Greece, Spain and Portugal, and in the Mezzogiorno and Massif Central. Even where rural regions show an increasing population, this is often due to growth of local urban centres (CEC, 1988), whilst the number of people living in and managing the countryside continues to decline. Regional population statistics therefore should be treated with care as indicators of marginalization in rural areas.

The provision of training, information and advice is of great importance if marginal farmers are to be able to adapt to changing socio-economic circumstances, for example, through diversification or participation in agri-environment support schemes. The scope of farm extension services varies greatly throughout Europe. In some marginal regions of central and northern Europe these are relatively well developed and further enhanced through mechanisms such as regional parks. In many parts of southern Europe, farmers receive very little guidance of this sort.

Rural depopulation and abandonment of the countryside in Margeride, Lozère

Although the rate of emigration from Lozère *département* has slowed and even been reversed since the late 1970s, the population continues to decline as a result of the low birth rate and large proportion of elderly people. The population in some areas which have suffered large scale emigration in the past, such as Cévennes and Causses, has recently stabilized and even increased around certain poles of development.

However, other areas continue to decline. Some *communes* of Margeride have lost over 20% of their population since 1988. Particularly notable is the decline in the presence of *managers* of the countryside, as opposed to consumers, such as tourists and newcomers. The latter tend to live in small and medium towns, rather than in the countryside.

The possibility of farmers being employed to manage the wider countryside may not be an option in some areas. The remaining farmers may be too busy making a living from their livestock. In some places, there are simply too few farmers to undertake the necessary work.

Between 1980 and 1990, the area of farmland in Margeride declined by 6%. Over 16,000 ha were converted to woodland, a process further encouraged by financial incentives for afforestation.

Source: Manterola and Guiheneuf, 1995.

Greece. Three generations of the Katsoulis family.

Photographer unknown.

The lack of social, cultural and recreational facilities is an important factor in the abandonment of rural areas, particularly by young people. Some practices, such as transhumance, historically involved long periods away from the family home and could result in extended seasonal absences from school by children affected. Lifestyles of this kind have become less acceptable in most rural communities in Europe.

3.3.6 Economic factors

Relevant economic factors are:

- competition from other agricultural areas and production systems;
- competition from other land uses;
- rising cost of living and rising income aspirations;
- alternative employment possibilities;
- relative costs of inputs, especially labour;
- changes in demand for farm products;
- market prices;
- developments in agricultural technology;
- availability of capital/loans.

Competition from other producers is clearly a key factor in determining whether a given farm is viable. In combination with other economic forces, competition leads to the concentration of production in areas and regions with a comparative advantage and the abandonment of production in areas which are marginal. Other factors, such as trade barriers, support measures and investment aids, may both

encourage and hinder this process. These considerations are discussed in more detail in Chapter 6.

Clearly, competition from other land uses varies greatly according to the area but the alternatives may include:

- urban fringe (houses, shopping centres, 'horsiculture');
- tourism (including walking, skiing);
- forestry;
- reservoirs;
- nature management;
- hunting.

Some of these alternative uses for agricultural land, such as hunting, 'horsiculture' and nature management, maintain a landscape which may be quite similar to the farmed landscape. However, significant ecological and environmental changes may occur. In parts of Spain and southern Portugal, many large farms have developed commercial hunting as a complementary activity; some have been converted into hunting estates. Urban development, skiing and commercial forestry clearly have a more fundamental impact on the landscape and natural environment.

Areas where agricultural production is marginal because of declining competitiveness and which have limited potential for alternative uses are most likely to suffer from land abandonment. Abandonment is much less likely where agriculture is still viable but has ceased to be competitive with other land uses - such as urbanization.

Where land-use planning laws allow a change of use then competition from alternative land uses tends to increase the market value of farmland thus enabling farmers to sell up. In areas with little non-agricultural potential, falling land prices have created particular problems in recent years. For example, in the Alentejo region of southern Portugal, some arable farmers who mortgaged their land in order to borrow heavily in the mid-1980s are reported to be farming at a loss under current conditions. They cannot abandon agriculture because their land is now worth less than it was mortgaged for and selling it would not pay off the debt. Such farms are marginal, but the need to service their debts prevents abandonment. Whole farm set-aside under the CAP arable regime may be attractive in some of these cases.

Incomes from agriculture in marginal areas are usually unable to keep up with rising costs of living and rising income aspirations. In many cases, options such as intensification and increased productivity, or value-adding and specialist marketing, are not available. Additional or alternative employment, usually in urban centres, is the only option in such cases. However, the role of alternative economic activities in maintaining or eroding agriculture in marginal regions appears not to be straightforward. The complex role of alternative income opportunities is further examined in the next Box.

The complex role of alternative income opportunities

Several studies indicate that local socio-economic conditions and opportunities for employment outside agriculture have a major influence on the viability of farming in more marginal areas (e.g. Terluin et al., 1993). The Arkleton Trust, in one of the few major European studies concerned with the evolution of farm households, found that many small and medium-sized family farms that have been marginalized in terms of agricultural production nevertheless have avoided socio-economic marginalization through recourse to pluriactivity (Arkleton Trust, 1992). Indeed, low agricultural incomes do not necessarily indicate low farm-family incomes (Strijker, 1994); in certain areas, a large proportion of farm-family income is earned outside agriculture.

Where part-time employment is available, this may act as a brake to the restructuring of farms, thus helping to maintain a countryside of predominantly small farms and leading to the development of a farming community which depends only partly on the agricultural economy (very different examples of this phenomenon exist in southern Germany and northern Portugal). On the other hand, the availability of more attractive income earning opportunities in urban centres is also considered to have been a major factor leading to farmland abandonment near to towns in parts of Germany in the 1960s (CEC, 1980).

In some situations, the absence of alternative opportunities may result in families continuing to try to make a living solely from agriculture, thus slowing down abandonment. The lower unemployment and social security payments in southern European states compared with most northern countries may also be a significant factor in encouraging the continuation of marginal types of farming in many regions of the south. The case study of Extremadura (Beaufoy, 1995) suggests that the lack of economic development in the region, and consequently very high unemployment, is a key factor in maintaining many apparently marginal farms. The availability of CAP support payments and a regional Rural Employment Subsidy for part-time farm workers combine to make agriculture economically attractive, even in its most marginal forms.

Ultimately, however, areas which depend very largely upon agricultural employment may be the most vulnerable to total abandonment (Comolet, 1989), particularly as this situation often is combined with an aging population structure.

The importance of market demand for both ordinary and specialist farm products should not be underestimated. For example, in southern Europe many of the existing livestock systems which are now regarded as traditional were only established in recent decades in response to the emergence of a previously unknown demand for dairy and meat products from urban centres and processing factories. Demand for the specialist products of certain rural regions contributes significantly to the survival of farming systems which otherwise would not be viable (for example, *appellation controlée* cheeses produced from extensive sheep and goat raising in central and southern France). Regulation 2081/92 on the Protection of Geographical Indications and Designations of Origin for Agricultural Products and Foodstuffs allows producers to increase their income in return for improving quality and guarantee production method and origin.

The relative costs of agricultural inputs has a considerable effect on the viability of different farming systems. Labour costs, in particular, have increased greatly in

recent decades relative to the costs of other inputs. Farming systems requiring a high labour input, as is often the case with the more traditional systems found in marginal regions, have been put under severe economic pressure as a result.

Developments in agricultural technology and systems can result in the abandonment of certain types of land. For example, many small arable fields on slopes in mountain areas which previously were ploughed with animal traction have been abandoned or converted to permanent pasture with the introduction of tractors. Since the 1960s, the almost total disappearance of animals for traction, combined with the widespread substitution of hardy breeds of livestock with more productive modern varieties, has lead to a decline in the grazing of coarse grasses and scrub in upland and mountain regions of Spain, Portugal and Italy (Beaufoy et al., 1994).

The ability of farmers to invest in their holdings is an important economic consideration. In many countries, special terms of credit are made available to farmers, especially in certain categories, such as young farmers. However, a significant change in farmers' ability to invest is stressed by M. Neveu (in Valette, 1989). In the 1960s and 1970s, credit was readily available and farmers could achieve viable returns through improved productivity. Since 1984, interest rates (in France) have tended to be much higher and returns less positive. This situation may have contributed to a slow down in intensification and renewed interest in systems which are less capital-intensive.

3.3.7 Policy factors

In EU countries, some of the most relevant policies have been:

- trade policy, including effects of internal market;
- CAP agricultural support measures;
- national and regional agricultural support measures;
- special support measures, particularly in designated areas;
- restrictions on agriculture, particularly in designated areas;
- EU regional policy;
- land-use planning;
- land taxes;
- environment and nature conservation policies.

Agricultural, regional, economic, trade and environmental policies play a fundamental role in determining whether areas are 'marginal'. Over the centuries and up to the present day, government intervention in agricultural markets and prices has resulted in large fluctuations in land use. In northern Europe, the most notable shifts in the past 100-150 years have been between arable cultivation and permanent grassland; in the south, policy-induced change has also affected vineyards and olives on a large scale. In all regions, the historical ebb and flow between agricultural and other uses of land, such as forest, has been influenced strongly by government intervention.

Marginalization as a result of policy changes in Portugal

A significant proportion of the land in southern Portugal currently under cereal cultivation was converted from grassland and forest during the 1930s as a result of very high cereal prices and market protection under the 'wheat campaign' for self-sufficiency. The lower prices of the EU, combined with the effects of the internal market, have made many of these areas now appear highly marginal for cereal cultivation. For the time being, they may be kept in cultivation as a result of high transition prices in Portugal plus CAP area payments for certain arable crops and set-aside land. In areas of importance for steppeland birds, Regulation 2078/92 schemes may also play a role.

Ultimately, though, the Portuguese government expects a considerable decline in the national Utilized Agricultural Area (UAA) as areas such as these become increasingly marginal in the EU context. A national study by the *Centro Nacional de Reconhecimento e Ordenamento Agrario* concluded that little more than half of the national farmed area is actually suitable for agriculture, or about 26% of the total land area compared with the 48% currently farmed (MAPA, 1990).

These figures indicate that almost 2 million ha of current farmland theoretically are in an inappropriate use. A reduction in the agricultural area, and a corresponding increase in afforestation, are therefore expected by the Ministry as part of the process of modernising and rationalising Portuguese agriculture in order to adapt to the conditions of the EU.

The policy context should be seen as an important qualification when land is classified as being marginal. The support provided by CAP and by national policies, combined with measures such as investment aids, has helped to drive the expansion of agriculture, and of arable land in particular, during recent decades. Considerable areas of land which previously were marginal, such as marshes, moorland and woodland, have come under cultivation throughout western Europe. At the same time, agricultural support policies are currently helping to maintain agriculture in marginal regions, such as the Less Favoured Areas scheme of the EU.

Consequently, the return of poor cereal land to permanent grassland as a result of changing policies and prices is a specific form of marginalization. Such land has simply become marginal for arable cultivation under current policy conditions; indeed, in many cases, permanent grazing may be considered a more appropriate use.

The EU's commitment to a free internal market in agricultural produce, which effectively provides the cornerstone of CAP, has profound implications for marginal agriculture. Removing barriers to trade can be expected to stimulate intensification in areas benefiting from a comparative advantage and a decline in production in less competitive regions.

As more countries join the EU, or progressively open their borders to agricultural trade under new agreements with the EU, similar effects will be felt in marginal

regions which previously were sheltered from competition with the highly productive agriculture of western Europe. The broader liberalization of international trade in agricultural products, set in motion by the conclusion of the Uruguay Round of the General Agreement on Tariffs and Trade (GATT), is likely to be associated with a reduction in internal support prices within the EU. This may put additional economic pressure on marginal agricultural systems, unless price cuts are compensated for with specially targeted support payments.

Comparison of the incentives offered for afforestation (Regulation 2080/92) versus payments under the national agri-environment scheme (Regulation 2078/92) in Extremadura.

Approximate profitability of dryland arable system (0.9 tonne/ha yield) [1]

Gross margin per ha without CAP area payment	CAP area payment	Margin with CAP area payment
-2,000 Pts	5,040 Pts	3,040 Pts (19 ecu)

Payments offered under national 2078/92 scheme for extensive arable systems [2]

Average annual payment per hectare is estimated at	4,675 Pts (approx. 29 ecu)

Incentives for farmland afforestation (payments per ha) [3]

Planting subsidy (maximum one-off payment)	400,000 Pts/ha (2,500 ecu)
Maintenance subsidy over five years (maximum annual payment)	30,000 Pts/ha (188 ecu)
Annual compensation over twenty years (maximum annual payment)	
- first 25 ha	35,000 Pts/ha (219 ecu)
- thereafter	28,000 Pts/ha (175 ecu)

Current situation

It is clear from these figures that the incentives for afforestation are very much higher than those for environmentally-friendly farming. Furthermore, at the time of writing (September 1995), the 2078/92 scheme had still not been made available to farmers in the region. The afforestation programme, on the other hand, was well into its second year of application. During 1993-1994 some 16,000 ha of farmland were afforested under this scheme, according to the following land uses:

Arable land	2,854 ha
Fallow land	5,686 ha
Pastures	6,529 ha
Permanent crops	824 ha

[1] Fernández Orueta and Naveso, 1993; [2] IRYDA, 1994; [3] Junta de Extremadura, 1993.
Source: Beaufoy, 1995.

Furthermore, despite the intended 'level playing field' of the EU internal market and CAP, there are considerable disparities in the level of support provided for agriculture in different regions of the EU; in addition to the CAP regimes, Member States influence the viability of farming by measures affecting social security payments, soft loans, crop insurance, support for co-operatives, etc. Generally, the more marginal regions are those with the least developed national and regional support structures.

In recent years, the range of policy measures which influence agricultural land use has increased throughout the EU. Partly as a result of EU policies and partly in response to national priorities, lines are being drawn on maps in many countries to designate areas with particular land-use objectives. Several policy areas are involved, including agriculture, land-use planning, environmental protection and nature conservation. Measures include the LFA Directive, national and regional parks and other protected areas, agri-environment schemes such as Regulation 2078/92, the Birds and Habitats Directives, the Nitrate Directive, measures related to Objective 1, 5b and 6 regions, etc.

In some cases these designations are accompanied by incentives for particular types of farming and/or by restrictions on certain practices and land uses. Some measures tend to maintain existing patterns of land use whilst others actively promote change. Large areas of marginal farmland come under the influence of both types of measure. The relevant EU measures and their potential implications to the future prospects of marginalization of agricultural land are discussed in Chapter 6.

Incentives for afforestation have become increasingly significant in recent years, resulting in the conversion to commercial forestry of vast areas of marginal farmland. Many regions throughout Europe have been affected, including western Ireland, Spain, Portugal, Finland, parts of Hungary and several upland regions in France. In some cases conflicts are emerging between afforestation schemes and agri-environment measures within a region, particularly where generous incentives are offered for afforestation (see Box on comparing incentives offered for afforestation versus payments under the national agri-environment scheme in Extremadura).

Many other measures usually formulated at the national and regional levels also have an important influence on land-use change. For example, land-use planning laws in many regions restrict the conversion of agricultural land to other uses. However, where controls are weak, developments such as building for tourism and second homes may take place on a large scale on marginal land, as has happened in Kriti. An important factor in France which apparently hinders a shift to a more extensive use (or afforestation) of farmland is the system of taxes which are levied by the *communes* on utilized agricultural and forestry land and on which the latter are often very dependent, particularly in areas with little other economic activity. This system seems to encourage abandonment where an extensification in land use might otherwise occur (Valette, 1989).

3.4 Existing studies of marginalization in the EU

3.4.1 Information sources

In researching the present chapter, a brief survey was carried out of existing studies of marginalization at a European and national level. There are no comprehensive studies of the topic for the EU as a whole. A study into agricultural land abandonment undertaken in 1980 for the Directorate General for Agriculture of the European Commission includes some consideration of marginalization processes, mostly based on German experience during the 1950s to 1970s (CEC, 1980). However, the information in this report is now rather old and limited mainly to the western part of Germany, the UK, Ireland, Italy, Belgium and the Netherlands. Other than the LFA Directive, there is currently no EU classification of land or regions according to criteria of agricultural or rural marginalization.

Various European and national studies include a consideration of the changes in agricultural land use which may take place in the future (e.g. Netherlands Scientific Council for Government Policy, 1992; Lee, 1990; Burnham et al., 1987; Moati, 1987). The paper of the Commission of the European Communities on the future of rural society published in 1988 (CEC, 1988) referred to estimates of a 6-16 million hectare surplus of farmland by the end of the century. Some of these are referred to below. However, such studies usually are based on projections of recent patterns of supply and demand or on simple indicators such as the decline in farming populations. They mostly are not concerned with the complicated processes of marginalization which the present study aims to address.

Only in France, where there has been considerable debate and research into the question of *déprise agricole*, were significant national studies of marginalization encountered. In addition, the RA&E research programme has resulted in reports on marginalization in the Netherlands, Germany and Denmark and a summary covering the three countries (Bethe and Bolsius, 1995). The main findings of the French and RA&E studies are reviewed in Section 3.4.2.

Marginalization processes have been studied in detail at the local level, for example, in France, Spain and Italy, sometimes with a particular focus on land-use change and abandonment (e.g. Balent and Gibon, undated; Baudry and Bunce, 1991; Peco and Suárez, 1993; Lasanta Martínez, 1988; García Ruiz, 1988). Some of these are referred to briefly below and in Chapter 4; however, a comprehensive review of local studies was not foreseen under the present project.

3.4.2 National studies

France

A study undertaken for the French Ministry of Agriculture and Forests (MAF) analyses the structure and viability of farming in France in the period between 1979 and 1988 and identifies the geographical areas which appear to be the least viable both in terms of farming structures and rural marginalization (Bontron et al., 1992). Using a set of criteria (including gross margin per holding and unit of work, overall income, farmers' level of training, age, potential successors, degree of income diversification, etc.) to characterize farming in each *canton*, French agriculture is categorized in seven groups, according to future viability. The two least viable categories (Group 6 'Hardly developing' and Group 7 'Marginal') are the most relevant to this study (see Figure 3.2).

Group 6 farming is described as predominantly extensive (although in relatively small holdings of 20 ha average) and with an average gross margin per work unit of less than a third of the national average. Some 14% of *cantons* come within this group, the majority in the south of the country (Corrèze, Dordogne, Lot, Pyrenean foothills, etc.) although also including parts of the north (e.g. the Vosges). This group is also characterized by an unsustainable age and successor structure implying that large areas of land will be released in the near future. A significant question is whether such land will be taken over by other holdings.

Agriculture in Group 7 is severely handicapped by difficult physical conditions; 58% of the land area in this group is under very extensive management or is semi-abandoned. *Cantons* in this group make up 9% the total and are concentrated in high mountain regions, particularly in the Vosges, northern Alpes, Vivarais, Lozère, Corsica and Pyrénées. Interestingly, farming in this group is characterized by a far higher level of diversification or 'pluriactivity' than other groups, mainly based on tourism. Furthermore, although the age structure is weak, with a large proportion of farmers over 55 years old, the rate of takeover by young entrants is well above the national average. This may be due in part to the availability in most of these *cantons* of a higher level of aid than elsewhere for young entrants.

By adding broader socio-economic criteria, such as availability of off-farm employment and access to social facilities (e.g. kindergarten) the study produces a parallel series of seven groups of broader 'rural viability' categorizations. Although not corresponding exactly with the previous agricultural categories, there is a strong correlation. The rural categorization highlights additional problems, such as a shortage of off-farm employment for women in Group 6 cantons ('generally fragile') and the isolation of Group 7 cantons with respect to access to social facilities. A very high proportion of bachelor farmers and a continuous decline in the farming population is identified in the latter group, although the overall population in these *cantons* increased slightly from 1975 to 1990. The economic importance of tourism is stressed again.

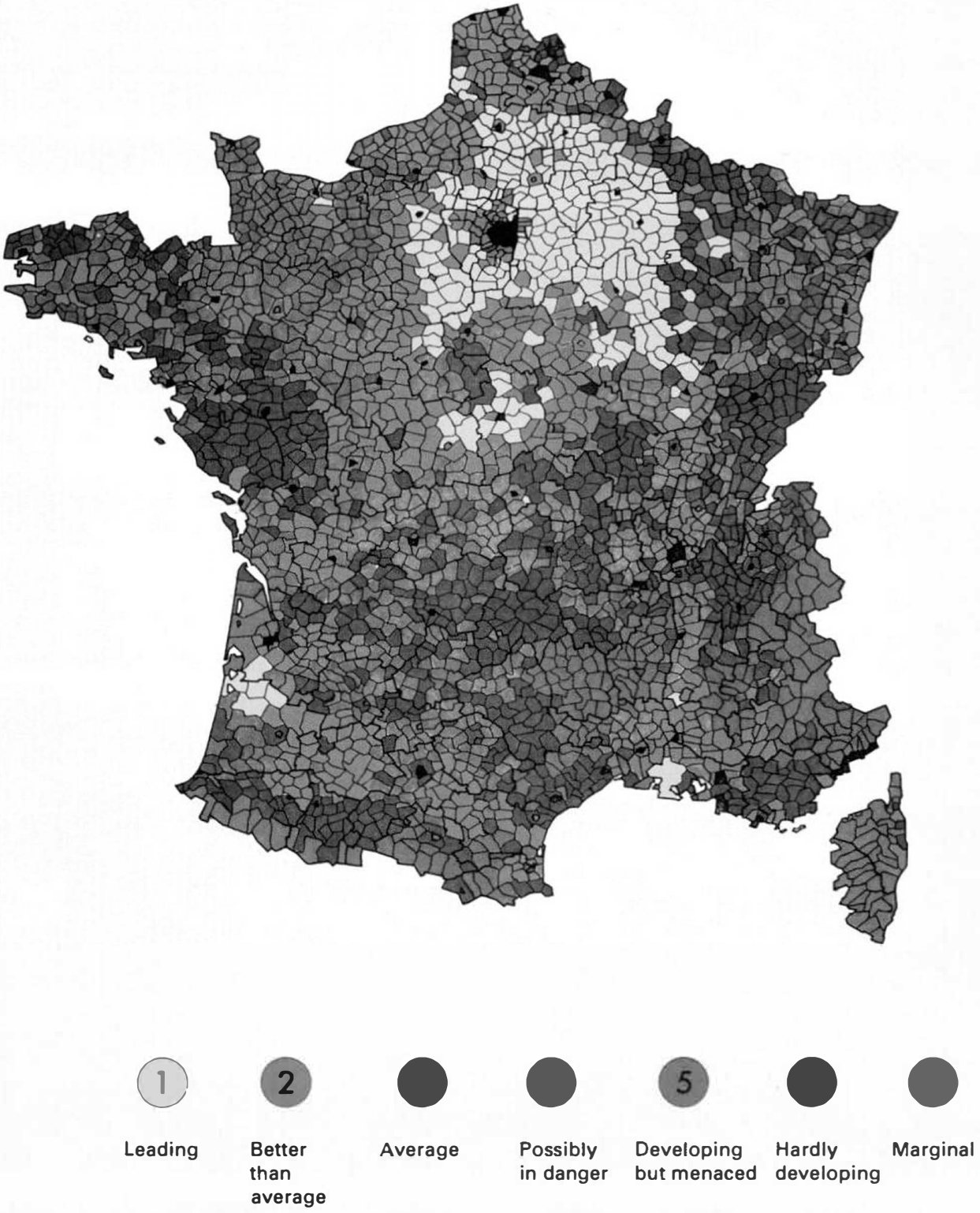


Figure 3.2 Regional diversity in agricultural structure. Agricultural typology of the French cantons based on a 1 5 indicator multivariate analysis. Source: Criteria by RGA 1988 (SCEES) and by 1990 (INSEE) Statistical work bij RSRU DERF/SEGESA 1992.

The study also analyses patterns of 'intensification' and 'extensification', defined in terms of increased or decreased gross margin per hectare, over the period 1979 to 1989. The picture is one of considerable intensification in more productive regions and extensification in less productive regions, particularly in the many mountain regions and parts of Bretagne and some other areas. This pattern suggests that extensive systems in France are becoming less viable and less able to compete with more productive systems, at least in terms of gross margin per hectare.

Another French study (Valette, 1989) describes a survey of about 30,000 farms in 1,200 *communes* (covering 32 *départements* - about half the country). The aim of the survey was to look at the future prospects/intentions of farmers and particularly the question of the abandonment and take-over of land. However, marginal farms were explicitly excluded from the survey. Marginal farms were defined as those estimated to be less than 0.25 of the designated SMI (*surface minimum d'installation*). The national SMI for outdoor mixed farms currently equates to 25 ha. In some cases non-marginal farms may be smaller than 6.25 ha (0.25 x 25), for example, intensive indoor or highly specialized holdings.

An interesting finding of this study is that individual *communes* and, indeed, whole regions, tend to undergo a cycle in which periods of restructuring and replacement of old farmers by a younger generation are followed by relative stability. Neighbouring *communes* may have very different characteristics and prospects partly because they are at different stages in this cycle.

Netherlands

Bethe and Bolsius (1995) in their investigation on the Netherlands consider marginalization as a process in which agricultural production is becoming decreasingly viable in economic terms. A limited range of indicators was used in order to try to identify marginal areas, namely:

- economic production capacity based on gross margins;
- intensity of production;
- production sector;
- availability of successors;
- whether farming is a part-time or full-time economic activity.

Physical conditions were not taken into account (compared with other countries, these are relatively homogeneous). The analysis revealed no marginal areas of a significant size in the Netherlands, nor areas which might become marginal in the near future. Any parcels which are released from agriculture tend to be taken over quickly due to the very strong demand for land for urban development.

However, local studies revealed that marginalization may be affecting individual farms and parcels of farmland in areas with physical limitations, such as Waterland near to Amsterdam (Pouderoyen Compagnons, 1995). Partly in response to a combination of the CAP system of milk quotas and the national

system of manure quotas, farmers tend to want to acquire land but to concentrate production on the most fertile areas, leaving poorer parcels more or less in a state of extensification. In some localized areas, abandonment of grassland has taken place.

In Oldambt, in the northeastern part of the country, land until now cultivated for cereal production seems likely to be converted to permanent grassland for cattle production (pigs and agro-forestry are other possibilities), partly in response to the recent changes to the CAP arable support regime. However, these soils are relatively fertile and are expected to remain in some form of agricultural production.

More widespread processes of decline are prevented to some extent by policy measures such as the 'Relatienota' (dating from 1975), under which farmers may enter into management agreements in areas designated as less favoured and environmentally sensitive in accordance with CAP regulations. The *Relatienota* also provides for the acquisition of 100,000 ha of farmland for nature conservation purposes, in addition to land already owned and managed by conservation bodies. Some 80,000 ha has still to be purchased in order to meet this original objective. The Nature Policy Plan of the Netherlands, published in 1990, includes the objective to purchase a further 50,000 ha of land for the purposes of 'nature development' (Pouderoyen Compagnons, 1995).

Germany

The process of marginalization in the Federal Republic of Germany, described in Bethe and Bolsius (1995), is based upon 14 indicators to identify regions which are vulnerable to agricultural marginalization (defined as a process of extensification and/or abandonment) (see also Figure 3.3). The indicators include:

1. Biophysical indicators
   - an area's rating on the *Bodenklimazahl* soil/climate index was considered as particularly indicative to marginalization for agricultural production;

2. Socio-economic indicators
   - farm size, farm type, accessibility, infrastructure;

3. Agricultural indicators
   - yield, arable land with cereals;

4. Political indicators
   - level of subsidies, designation as disadvantaged region.

The presence of a high proportion of permanent grassland was not regarded as a significant indicator.

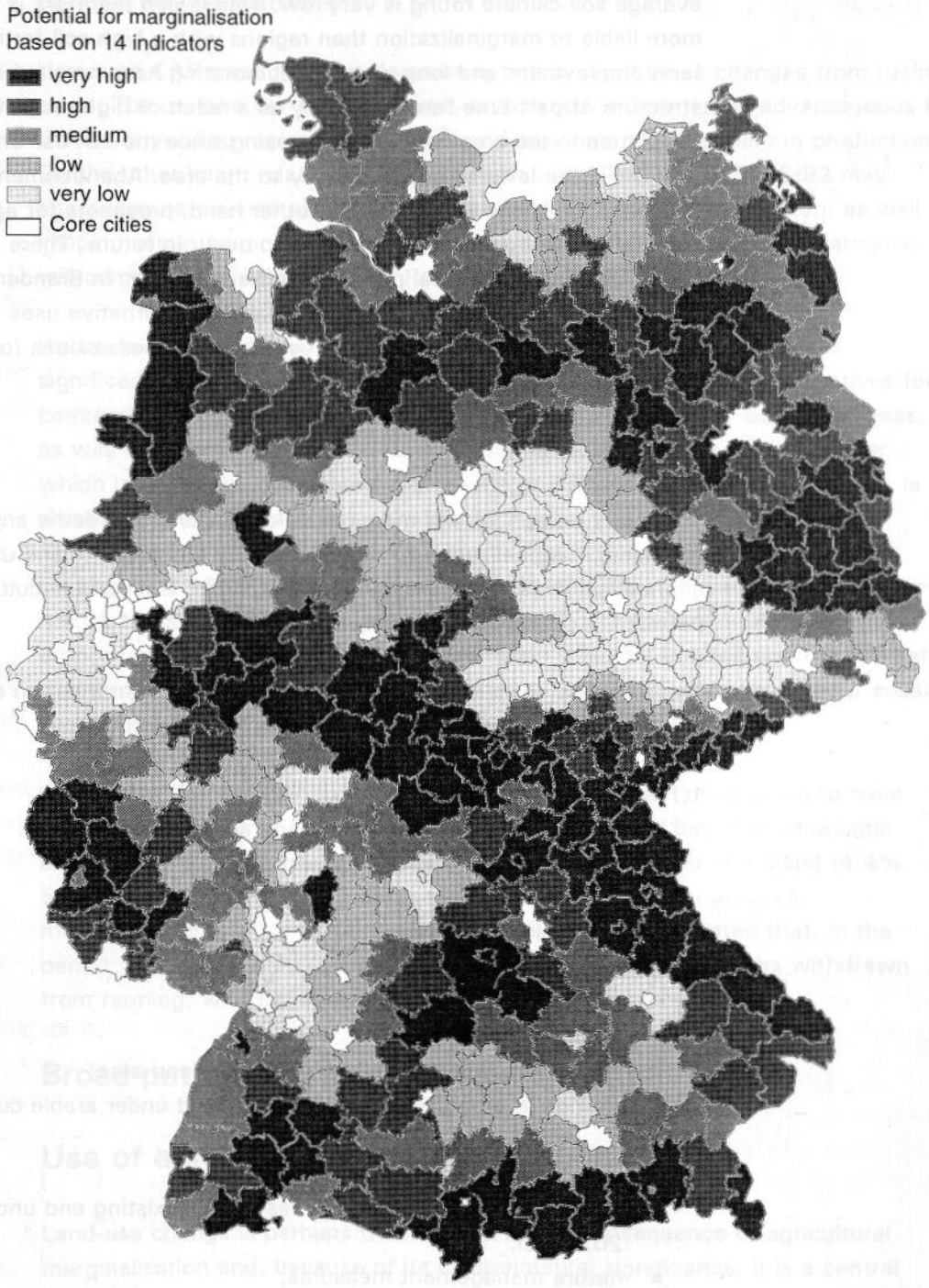


Figure 3.3 Potential agricultural retreat regions in Germany

Source: Bethe and Bolsius, 1995.

Regional case studies were carried out in Brandenburg, Aurich (Ostfriesland) and Freyung-Grafenau (Bayern). In the sub-alpine area of Freyung-Grafenau, the average soil-climate rating is very low. This region therefore is considered to be more liable to marginalization than regions with a high soil fertility. However, off-farm employment and long-distance commuting have resulted in a stable structure of part-time farming. Partly as a result of high recreational values, the population in the area has been increasing since the 1970s. Unemployment is high, as is the level of public subsidy to the area. Abandonment seems unlikely. In Brandenburg and Aurich, on the other hand, prospects for agriculture are poor and significant abandonment is likely to occur in future. There is considerable migration away from rural parts of the Neue Länder. In Brandenburg, land withdrawal under set-aside is widespread and alternative uses for this land are often absent. In other areas, however, there are possibilities for nature development.

Denmark

The study on agricultural marginalization in Denmark (Bethe and Bolsius, 1995) considers marginalization to be indicated by a change in land use towards an economically less significant use, for example, from arable cultivation to permanent grassland or woodland.

Three groups of indicators were selected for the identification of areas most vulnerable to marginalization:

1. Physiographic aspects
   - sandy soils as proportion of land area;
   - wetlands as proportion of land area.

2. Agricultural structures
   - standard gross margins;
   - crop yields per hectare;
   - livestock per hectare;
   - permanent grassland as proportion of land area;
   - change in proportion of agricultural land under arable cultivation.

3. Planning and management
   - Environmentally Sensitive Areas (ESA) (existing and under Regulation 2078/92);
   - nature management measures;
   - afforestation measures.

The study found that there are large areas of arable land in Denmark where yields are at or below the limit of economic viability. This land is predominantly on sandy soils and wet areas throughout the country, but especially in west and north Jutland. If prices for arable products continue to decline in line with recent trends, considerable tracts of land in the latter region are expected to be converted to permanent grassland, thus accentuating the specialization of this

region in livestock production. Smaller areas may be withdrawn from agriculture altogether. In the predominantly arable east of the country, meadows and saline pastures may be abandoned.

However, CAP measures may to some extent prevent these changes from taking place. The uniform set-aside payment established in Denmark is advantageous for the lower yielding regions of the west and may help to keep them in production. On the other hand, relatively high payments under Regulation 2078/92 may encourage conversion to permanent grassland (and some afforestation) as well as keeping some marginal grassland in production. Some 160,000 ha of farmland will come under the influence of Regulation 2078/92.

Policy-driven changes in agricultural land use are already affecting quite significant areas of land in the country. Particularly significant are incentives for conversion to permanent grassland in existing Environmentally Sensitive Areas, as well as incentives for afforestation. The land-use planning system, under which land may be designated appropriate or inappropriate for afforestation, is also an important factor.

In the period 1989-1992, 6,300 ha of arable land were converted to permanent nature areas with the aid of grants under the Nature Protection Act, a large proportion consisting of national afforestation projects. In addition, it is estimated that some 2-3,000 ha of farmland have been afforested privately without subsidy and a further 300 ha afforested with grant-aid.

Apart from these policy-driven changes, true marginalization appears to have been minimal to date. Forecasts made in the 1980s and based on economic analysis predicted the marginalization of large areas of land in Jutland (4.4%, 5.9% and 8.2% by 1991, 1996 and 2010 respectively). In practice, marginalization on this scale has not taken place. It is estimated that, in the period 1981-1992 only 0.5% of the national agricultural area was withdrawn from farming, with no significant differences between regions.

3.5 Broad patterns of land-use change in the EU

3.5.1 Use of agricultural and land-use data

Land-use change is perhaps the most pervasive consequence of agricultural marginalization and, because of its environmental significance, it is a central concern of the present study. Land abandonment in particular is a relatively clear sign that some form of marginalization has taken place. Agricultural statistics generally do not include a separate category for abandoned land. One exception is Portugal, where the 1989 farm census indicated over 245,000 ha of recently abandoned farmland, with clear concentrations in interior regions. However, land-use statistics can be used to identify the development of natural woodland on farmland, which generally indicates abandonment. Agricultural statistics can also highlight shifts from arable cultivation to permanent pasture, from farmland

to commercial forestry and from one form of livestock production to another, such as from dairy to beef cattle. Such changes may indicate a form of marginalization, although this will depend on the particular circumstances.

Great care must be taken in drawing conclusions from broad agricultural and land-use data. For example, it would be wrong to assume that a change from arable to grazing use necessarily represents marginalization of a sort that ultimately will lead to abandonment. Neither is the intensity of a production system necessarily in proportion to its viability. On sufficiently large holdings, extensive grazing land may be relatively viable under current support conditions. At the same time, certain irrigated arable areas in Spain and Portugal have been marginalized and are threatened with abandonment since these countries joined the EU. Several experimental examples exist of intensive farming systems which have shown increased net incomes following a carefully planned conversion to a more extensive system (see for example Limaux and Meynard, undated).

Bontron et al. (1992) emphasize that the challenge is to identify which areas are suffering from a process of decline in the management of rural land (private and collective). In the short-term, this process may not be visible; later it manifests itself in natural succession, ruined buildings, etc., but by this time it may be too late to halt the process.

There are other pitfalls present among agricultural statistics. For example, communal grazing lands often are not taken into account in the calculation of forage or grassland areas or of the total Utilized Agricultural Area (UAA). Common grazing usually has survived on poorer land which has not been subjected to agricultural improvement and such land often is of high environmental interest. In some areas it has become increasingly marginal to the mainstream agricultural economy in recent decades (e.g. grazing marshes in Normandie); in certain other areas, common grazing is still exploited as a significant forage resource and may even be over-exploited as a result of support incentives (e.g. parts of the UK uplands). In the UK, there are 600,000 ha of common land (Whitby, 1992). In southern Europe, the areas are much larger. In Greece, there are some 5 million ha of common grazing, supporting a population of about 15 million sheep and goats which play a very important role in supporting peasant agriculture in the mountains and foothills (Louloudis et al., 1994).

Agricultural and land-use data in most countries are only readily available at national, regional and sub-regional levels. Although data exist at the local district level (e.g. French *communes* or Spanish *comarca agraria*) and in some cases at the farm level, gaining access to such data usually is very time-consuming. Generally such data have been used only for local studies - France is an exception, as discussed above. Data is mostly at least two or three years old. Other than in a very few specific cases, the most recent developments are difficult to identify and have yet to emerge from official statistics.

3.5.2 Historical and current tendencies

The EU has seen significant changes in the overall Utilized Agricultural Area (UAA) in recent decades. During the 1960s and 1970s there was a notable decline in the total farmed area. From a 1961-1965 base-line, the UAA of the EU 12 had declined by 8%, or 11 million ha, by 1983. During this period, the forest area increased by almost 15%, much of this taking place before 1977 and thought to be due to spontaneous growth on abandoned land rather than planned afforestation (CEC, 1988). Since the early 1980s, the decline in UAA has slowed down; in the period 1970 to 1987, the UAA of the current EU 12 declined by just under 6%, much of which probably can be accounted for by conversion to new uses, such as urbanization, roads, reservoirs and afforestation (Lee, 1990).

The available statistics seem to indicate that, for the EU as a whole, farmland abandonment and conversion to other uses slowed down during the 1980s and early 1990s as compared with the 1960s. Furthermore, earlier predictions of widespread abandonment seem not to have been fulfilled (for example, see Section 3.4.2 on Denmark and the Box regarding the unfulfilled predictions of land abandonment in France). In part, this may be because farmers adjust to adverse situations more readily than researchers expect.

However, the pattern of changing agricultural land use in western Europe over the past forty years varies greatly depending on the nature of the land or region in question. There seems to be a clear overall pattern:

- on potentially productive land (and where farm structures allow), there has been an almost universal process of conversion to more intensive uses since the 1940s, often with an expansion of arable land at the expense of permanent grassland, wetlands and woodland and an intensification of grassland management. In many cases, public investment in irrigation, drainage, scrub clearance and other forms of land improvement has made this possible;

- in marginal areas with physical or socio-economic obstacles to modern agriculture (steep slopes, small terraces, wet areas without drainage, remote mountain regions) arable land and mixed systems have been abandoned on a large scale, to be replaced by specialized (mostly extensive) livestock systems, plantation forestry or natural succession;

- these processes often take place simultaneously within an area or even on a single farm, as agriculture is concentrated on the land which is most appropriate for modern production systems. The result tends to be a rationalization of land uses and a simplification of the landscape.

In Britain, for example, there has been an expansion of arable land at the expense of grassland in recent decades. The areas of land under permanent pasture and rough grazing declined by 2.4 million ha and 1.4 million ha respectively between the 1930s and 1980s (Pain et al., 1994). In productive regions of south-east

England such as Kent, which have experienced an expansion of arable cultivation, patches of land which traditionally were grazed and cannot be cultivated (such as steep escarpments on chalk downland) have been abandoned to natural succession (Green, 1990). A similar situation exists in parts of northern France (Barret et al., undated). However, apart from such local examples and some isolated parts of the Scottish uplands there is very little total abandonment of farmland in the UK (Baudry and Bunce, 1991).

A similar pattern of expanding arable land and declining permanent grassland can be seen in the more productive areas of France, Spain and Italy, where hundreds of thousands of ha of grassland have been cleared for cultivation in recent decades. In Spain, the withdrawal of livestock from marginal areas and their concentration on more productive land has added to the decline of extensive grazing areas; the area of scrub and scrub-woodland increased by over 1 million ha between 1973 and 1989 (MAPA, 1990).

The trend of decline in the area of permanent grassland appears to be common to a number of European countries. However, sometimes a longer-term perspective helps in trying to analyse more recent developments. For example, the area of permanent grassland in France has fallen considerably since the 1970s, but it is still much higher than it was in 1908. Baudry and Acx (1993) cite the example of La Manche, where the proportion of land under permanent grassland increased considerably between 1918 and 1964, not as a result of marginalization but due to changes in the production structure of the region towards a specialization in livestock raising (see Figure 3.4). Since the mid-1960s, the process has been reversed and the proportion of land under permanent grassland has declined. Similarly in Britain, grassland decline generally is measured from a 1930s baseline, which marked the end of a long period of expansion of grassland at the expense of arable land.

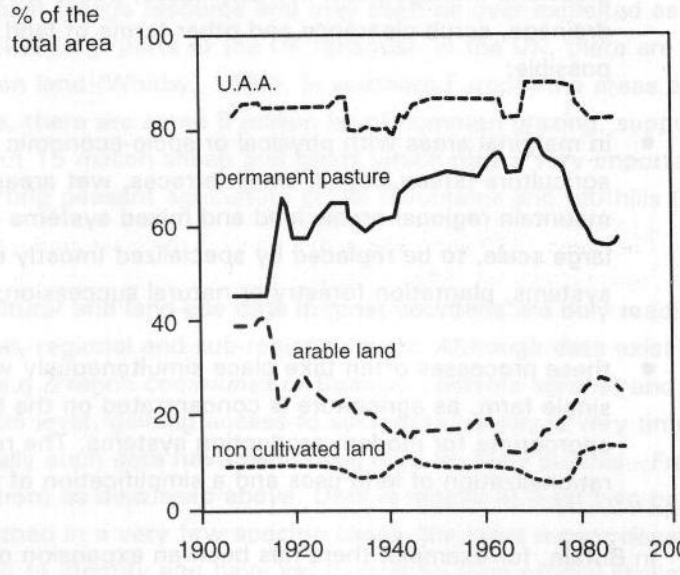


Figure 3.4 Development of the Utilized Agricultural Area and non-cultivated area in the département La Manche

Source: Baudry and Acx, 1993.

Furthermore, national trends often hide significant regional variations. Whereas in Spain as a whole the area of permanent grassland declined by approximately 800,000 ha between 1974 and 1992, in Extremadura the widespread cessation of extensive arable cultivation lead to an *increase* in the area of grassland by some 485,000 ha during the same period. In France, the biggest decline in permanent grassland between 1970 and 1985 was recorded in the regions of the north-west, where over 50% was lost during this period. On the other hand, some regions less well suited to intensification, such as Auvergne, experienced an increase in permanent grassland. Nationally, the only types of forage land to increase during the 1970s and 1980s were maize and rough grazing, which seems to indicate a process of rationalization in land use, with intensification on more productive land and extensification (or abandonment of cultivation) on poorer land (Beaufoy et al., 1994).

Unfulfilled predictions of land abandonment in France

According to Bontron et al. (1990) the concept of a national *déprise* is not appropriate in France. Land uses are changing differently according to regional and local conditions. In some cases, marginal farmland is being replaced with new afforestation, in others urban growth is taking over farmland. In some regions, agriculture is still expanding.

A number of recent studies in France have refuted the predictions of large-scale abandonment which were made in the early 1980s, often on the basis of demographic trends in the farming population (for example, Moati, 1987). Bontron et al. (1990) found that, between 1979 and 1990, the UAA in France fell by only 3%, which is largely accounted for by urban and infrastructure development. During the same period, the proportion of farmers under 35 actually increased from 11% to 13%. *Défrichements* (land clearance for agriculture) were found to involve a larger area than *enfrichement* (abandonment). Bretagne was one of the very few regions with a net increase in *friches* in the period 1982-1987.

Laurent (1992) found only limited signs of abandonment in the Pays d'Auge of Normandie, a region in which a high level of abandonment had been predicted by Moati (1987). Apparently abandoned fields often were simply in a period of transition, for example, the previous owner may have died or retired from farming but had not yet been able to sell or rent the land to another.

According to Bontron et al. (1990), the total UAA in France extended in some regions between 1979 and 1988 and not only in the most productive regions (increases were recorded in, for example, Ardèche and Puy-de-Dôme). In other regions, the UAA diminished considerably (e.g. 8-10% down in Bretagne, Limousin, Vosges and Cévennes).

In the same period, holdings increased in size by an average of 4-5 ha or 20% between 1979 and 1988. To accommodate the release of land which it is estimated will result from a continuing farmer exodus, the average farm size would need to increase from 40 ha to 52 ha over the next 10 to 15 years. This scenario is considered feasible but the process is clearly unlikely to follow the same pattern in all regions and farming categories. Particularly in regions with many older farmers and few potential successors, holdings seem unlikely to increase by the amount necessary (estimated at over 50% in some categories) to take up all the land which may be released.

In many marginal areas and particularly in mountain regions, there has been a dramatic decline in the arable area as largely self-sufficient rural societies have collapsed or contracted and abandoned subsistence cultivation. This process has been taking place for many decades in mountain areas of Spain, southern France, parts of northern Greece and Italy. For example, in the central French Pyrénées, some areas which previously were a relatively intensively managed mosaic of meadows, pastures and arable plots are now used for extensive grazing (Balent and Gibon, undated). Studies of parts of the Spanish Pyrénées show that over 60% of the historically cultivated area had been abandoned by the mid-1950s, most of it corresponding to land with difficult geomorphological conditions (Lasanta Martinez, 1988).

This process of arable abandonment is most notable in the least developed regions of Europe, where traditional agrarian societies survived up until quite recently. Over the last thirty years in Spain, cultivation has been abandoned on a large area of marginal arable land. One result of the contraction of arable cultivation in Less Favoured Areas has been the development of large areas of grazing land and natural forest on abandoned farmland. Another has been a rationalization or concentration of agricultural land uses and a consequent reduction in landscape diversity. Marginal land in many areas has been converted to plantation forestry.

In Italy, these effects of the widespread withdrawal of agriculture from mountain regions (*spopolamento della montagna*) have been relatively well documented. Nevertheless, diverse landscapes of cereals, pasture and coppice woodlands survive in the hills and at lower altitudes in the Appenines. High altitude seasonal grazing in the Alps also survives, but is reported still to be in decline (Petretti, 1993).

In southern Europe, changes in traditional land-use practices such as transhumance have had significant impacts on the farmed landscape in many regions. In Greece, for example, sheep and goat production has undergone an evolution from the ancient nomadic systems which were still practised up to the pre-War period, through pastoral transhumant systems in the post-war period and latterly to pastoral sedentary systems. The decline in transhumance has left large areas of sub-alpine pasture neglected. There is also a tendency to undergraze or abandon scrublands, whilst pastures are often overstocked. Nationally it is estimated that as much as 40% of all extensive grazing land are undergrazed (identified according to the species composition of the sward) or have been highly eroded and are now unsuitable for grazing (Louloudis et al., 1994).

However, it should be recognized that not all marginal areas are suffering from abandonment and withdrawal. Over-exploitation of marginal land is a problem in many regions, particularly as a result of overstocking with sheep and/or goats, largely as a result of the incentive provided by the CAP sheep (and goat) regime. This phenomenon is apparent in regions as diverse as the uplands of Wales, west of Ireland, uplands of Greece, Sardinia, central Italy and Extremadura in Spain.

The above discussion has focused principally on the situation within the EU 12. Many of the phenomena described are also common to the new Member States (Sweden, Finland and Austria), although with several variations peculiar to each of these countries. In Sweden and Finland, for example, small-scale farm forestry is an essential component of many farmers' economic activities. In Sweden, much arable land was abandoned during the 1950s and 1960s, mainly small farms in less productive regions. Some of this land was converted to forestry but much was left unmanaged (e.g. wet areas in southern and central Sweden) (Johnsson, 1992).

In Finland, substantial areas of forest were cleared for agriculture in the nineteenth and early twentieth centuries. Land-use change has been a central feature of the Finnish countryside for well over a hundred years. Most holdings combine agriculture with forestry (see Box on farming and forestry in Finland). Areas of active forest clearance can still be found but the government has been subsidising both set-aside and field afforestation since the end of the 1960s in an attempt to reduce the area of excess arable land. Recent estimates suggest that there may still be 1 million ha or more of surplus agricultural land (Selby, 1990).

The picture in central and eastern Europe is quite different from in the west and cannot be covered by the scope of the present study. The collapse of the COMECON trade bloc, together with the withdrawal of grants and subsidies to agriculture, has had dramatic effects on land use in central and eastern European countries. To cite just one example, in Poland since 1989, the proportion of fallowed land has risen from 1% to 9% of the total arable area (about 1.3 million ha were fallowed in 1993).

Farming and forestry in Finland

In contrast to most other EU countries, forest land is the dominant land-use type on farms in Finland. The boreal forests are a climatic climax vegetation covering about 84% of the land surface, from which some 10% has been cleared for farming. Only 7% of the total Finnish land surface is under fields. In 1993, the average field area was 13.5 ha, whereas the average forest area was 48.7 ha. Finnish non-industrial private forests have traditionally been in farm ownership and in the past about 65% of the non-industrial private forest area was owned by farmers (Reunala, 1974). These forests were an integrated part of the farm economy but the relationship between farmers and their forests changed throughout the 1970s so that by the mid-1980s only 44% of the forest area was owned by farmers (Karppinen and Hänninen, 1990). Of the holdings investigated in the 1980s, about a third were concerned primarily with agricultural production, 10% divided their production equally between farming and forestry, while 33% were oriented mainly to forestry. This change has accelerated with the decline in full-time farmers and the increase in absentee farm-ownership (Karppinen and Hänninen, 1990). A consequence of the structural change in the ownership of agricultural and forestry holdings is that agricultural land-use policy and forestry policy are increasingly difficult to integrate at the practical level.

Source: Selby, 1990.

3.5.3 Marginalization prospects according to regional characteristics

This section proposes a broad approach to characterizing marginalization according to regional types, based on the literature research undertaken in the course of the study. Given the great range of different conditions existing within the EU, it is difficult to arrive at a characterization which is not either too generalized or too complex to be of practical use. At the national level, the task is easier and perhaps more realistic. For example, Bowler (1992) proposes a regional interpretation of the marginalization process in the UK, using the following characterizations:

- Agro-industrial regions (East Anglia, central-southern England) where soil and climate are suited to agriculture and large-scale enterprises predominate;
- Market-niche regions (adjacent to large conurbations), particularly areas with recreational qualities, attractive landscapes, national parks and coasts;
- Peripheral regions (uplands of Scotland, Wales and northern England and the south-west) where physical constraints limit agricultural potential but forestry, nature conservation and extensive agriculture may have a future.

This characterization is useful and works up to a point for the UK but is not applicable on a wider European scale without considerable additions and qualifications. Table 3.1 therefore categorizes agricultural regions in the EU according to three broader groupings: Productive, Intermediate and Marginal regions. These groupings are only loosely defined and inevitably there are considerable areas of overlap, especially between the Intermediate and Marginal categories. There are also large variations within categories; the Marginal regions, in particular, include a wide range of different environmental and socio-economic situations. Nonetheless, these broad groupings provide a working framework in which to consider the main currents of change which can be expected to affect agricultural land use at the European level in the foreseeable future.

The Productive regions in this characterization include the predominantly arable lowlands of northern and central EU countries as well as certain more fertile areas in the south, particularly in river valleys, such as the Po in Italy and Guadalquivir in Spain. Crops include cereals, oilseeds and sugarbeet as well as vines in the south. Only very limited abandonment has taken place, or is expected, in these regions, usually affecting localized patches of historic grazing land. Examples include marshes in Normandie, calcareous grasslands on slopes in south-east England and the Pas-de-Calais and moorland in Bretagne. In France, land of this sort often is under collective ownership or management (Barret et al., undated). Even in the Netherlands, marginal grazing areas have been identified, in Waterland (Bethe and Bolsius, 1995).

Very little land is likely to be abandoned 'spontaneously' in these regions; changes, such as the conversion of arable land to grassland or forest, will be driven largely by agricultural, environmental and land-use planning policies. Some agricultural land in Productive regions may also be marginalized as a result of economic growth and urban expansion.

Intermediate regions include most of the uplands of the UK and in central and eastern France, northern Italy and Germany, as well as the permanent grassland areas of the south-west of the UK, north-west France and parts of central Ireland. These are predominantly livestock regions. Compared with extreme marginal areas, the farming systems in areas such as these are quite well developed and supported by national and regional measures and organizational structures. However, a process of contraction is taking place, driven in part by factors such as grants for afforestation and the introduction of milk quotas. In most cases, afforestation involves the planting of permanent grassland with coniferous species, which often is environmentally damaging. Spontaneous abandonment has taken place historically on the poorest land. Currently abandonment tends to be localized, but may become more widespread if support measures are reduced or if competition increases.

Measures such as Regional Parks tend to proliferate in such regions and may have a significant role to play in directing the evolution of agricultural and other land uses. The presence of employment opportunities in economic sectors other than agriculture (particularly in tourism and urban centres) may also be an important factor in the decline of farming in such regions. An example of an Intermediate region is Valle d'Aosta, apparently one of the wealthiest regions in Italy and yet where mountain livestock farming is suffering an ongoing process of contraction.

The more extreme Marginal regions are found predominantly in southern Europe and Scandinavia, and in exceptional situations such as the islands of northern Scotland. In addition, the Neue Länder in Germany can be considered as a special case of extreme marginalization and there are many regions in the potential new EU Member States of central and eastern Europe which would also qualify. In these cases, conditions are quite different from those found in the Marginal regions of the Mediterranean countries and Scandinavia.

Rural areas in Greece, Spain and Portugal did not experience the 'golden age' of CAP of the 1960s and 1970s (when price support and investment aids were at a higher level than in the Mediterranean countries) and have only recently been exposed to the European internal market (Bandarra, 1994). Although it would be quite wrong to assume that all agriculture in these regions is unviable (particularly in the more fertile areas, there is a high proportion of well-structured and competitive farms), large areas nevertheless are suffering various forms of rural decline, with characteristics such as aging and declining populations, uncompetitive agricultural structures and lack of alternative employment. It may be that, following the widespread abandonment of the 1960s and 1970s, the introduction of CAP, with its relatively generous levels of support, has provided a

Table 3.1 Characterization of EU regions

	Productive and economically developed regions	Intermediate regions	Marginal regions, less developed economically, widespread rural decline
Principal regions in the EU	Lowlands of north-central Europe, some river valleys in south.	Uplands of north-central Europe, parts of Ireland.	Southern Member States and peripheral areas such as west of Ireland, islands of Scotland, arctic regions.
Relevant EU designations	-	Include many Objective 5b regions and Less Favoured Areas.	Mostly Objective 1 and Less Favoured Areas.
State of agricultural development	Highly developed agro-industrial systems.	Farming mostly modernized and well-supported by organizational structures but probably unable to compete with intensive lowland systems without special support.	Large areas of farmland have not been modernized or restructured. Physical conditions require large holdings for viability, but many are small and fragmented.
Historic land-use change	Expansion of arable cultivation and urban land, loss of permanent grassland and natural habitats.	Historic mixed systems abandoned many decades or even centuries ago.	Historic mixed systems abandoned during recent decades, or survive in modified form.
Marginalization problems	Localized abandonment and neglect of small patches which do not fit into the agro-industrial system. In urban fringe areas farming is pushed out by other land uses.	In more marginal areas, where physical handicaps and depopulation are most serious, there is significant afforestation and some abandonment, particularly when farms 'contract' onto better land.	The process of historic abandonment is continuing in many areas. Many traditional systems are run down and neglected but more survive in these regions than elsewhere.
Relevant initiatives	Small areas withdrawn from agriculture for habitat recreation, afforestation and water protection.	Relatively well developed policy measures (regional and national parks, agri-environment schemes) assist viability.	Compared with Intermediate regions, few initiatives relative to the size of the areas involved. Weak support/advisory services.
Tourism and other income diversification	Tourism generally is not significant, but direct sales, and some recreation, e.g. horse-riding and shooting may be.	Tourism and marketing of local products is well developed and economically important.	Tourism and marketing of local products is poorly developed, although considerable potential may exist.

period of greater stability for less favoured rural areas in the newer Member States. However, structural weaknesses remain in most areas and may be decisive in the future evolution of farm structures and agricultural land use.

Areas such as these in southern Europe are further marginalized by the existence of more developed and better financed national and regional support measures and organizational structures (e.g. advisory services, maintenance of infrastructure, marketing co-operatives, Regional Parks) in equivalent areas in countries such as France, Germany and northern Italy. The effects of this competition between equivalent areas may be a contributory factor in the abandonment of agriculture in the less developed regions of southern Europe.

In the most marginal areas, spontaneous abandonment has been taking place for many years, in some cases on a large scale. Particularly in the upland and mountain areas of southern Europe, traditional mixed farming was abandoned during the 1950s to 1970s as many of the production systems ceased to be economically viable and populations emigrated to take up new jobs in the cities. Farming in such areas has since tended to concentrate on livestock and land has been either afforested, allowed to scrub over or used for grazing and fodder production. The predominantly livestock systems which survive tend to be small-scale, largely traditional and not competitive with modern intensive systems. Similar trends can be observed in parts of Scandinavia, including northern Finland.

In many typically Mediterranean areas, the abandonment of traditional subsistence systems saw the widespread conversion of arable land to tree crops (olives, almonds, oranges, figs and carobs). In both upland and many lowland areas, dryland arable cultivation, vines and tree crops survive in a largely traditional form, often with small and scattered parcels, but many such systems are run down and neglected. In more remote areas, this process probably is irreversible. Where location and conditions are more favourable, restructuring of holdings to produce more viable units may be necessary if agriculture is to survive.

Off-farm economic opportunities are being affected by the decline in manufacturing industries in many Marginal regions as the EU internal market takes effect and industry concentrates in certain zones with good infrastructure and other advantages. Increased employment in services tends to be in bigger towns, partly as a result of rationalization of both public and private services including shops, police stations, schools, health centres, cinemas, transport, etc. (CEC, 1994).

Although historical data is available to illustrate the considerable changes which have taken place in southern European countries in recent decades, current processes tend to be poorly documented and little understood. However, it seems that a range of inherent weaknesses and handicaps threatens many areas with abandonment. Broad categories of area particularly vulnerable to change and abandonment in southern Europe include:

- mountain regions (mostly sheep and cattle raising);
- other areas suffering severe depopulation, often with environmental limitations, such as semi-arid zones (sheep, arable and permanent crops);
- areas with extremely fragmented agricultural structures (mixed farming);
- peri-urban areas (mixed farming).

3.6 Conclusions

A key aim of the present study is to identify the areas of the EU where marginalization is most likely to occur, as well as understanding the processes at work. The overview, provided in Section 3.3, of the great range of factors influencing marginalization illustrates the difficulty in taking a 'mechanistic' approach to this task. It is the complex interplay of factors which results in marginalization and land-use change. The categorization of regions proposed in Section 3.5, therefore, is conceptual and qualitative, and consequently no attempt has been made to produce a map indicating the three types of region. Indeed, an important feature of marginalization in Europe is that very different areas (e.g. Productive and Marginal) may exist side by side within one region.

Having discussed the concepts and processes of marginalization, and having considered the recent patterns of land-use change in the EU, the environmental implications of marginalization are examined in Chapter 4.

In Chapter 5, a more systematic and quantatitive approach is taken to identifying the regions of the EU which are most vulnerable to rural marginalization. Statistical analyses which use a limited number of simple indicators, such as agricultural gross margins or land-use intensity, in order to identify areas which are marginal in purely agro-economic terms, must be interpreted with care (Pinto-Correia and Sørensen, 1995). The approach taken in Chapter 5, within the constraints of data availability, is to draw upon a range of complementary agro-economic and social indicators. The regions identified by this statistical analysis can be expected to be found broadly within the 'Marginal' group of the categorization presented in Table 3.1.

Having characterized and identified the regions vulnerable to marginalization in statistical terms, Chapter 6 focuses upon the prospects for these regions in the context of CAP and future policy developments.

4 ENVIRONMENTAL IMPLICATIONS OF MARGINALIZATION

4.1 Introduction

From ancient times up until the present day, the impact of agriculture on the natural environment in Europe has been widespread and often severe. Past and present farming activities have played an important part in shaping contemporary ecosystems over the greater part of the European land area. Even areas which are not farmed at present mostly have had their ecology altered as a result of past exploitation.

Although there is a lack of comprehensive research on the subject, it is clear that farmers will respond differently to adverse socio-economic conditions, according to their own position and local circumstances. Marginalization does not necessarily set in motion a generalized process of extensification leading ultimately to abandonment. In fact, it may lead to a combination of intensification and extensification, or to the restructuring and amalgamation of holdings, which may enable farming to continue in a different form.

Marginalization is most likely to occur in the regions characterized in Chapter 3 as intermediate and marginal. Here there are some intensive systems but there is a large area of agricultural land use which is extensive and largely traditional in character and relatively well integrated with the natural environment. Many such farming systems are associated with the conservation of important semi-natural habitats and cultural landscapes (Beaufoy et al., 1994). From the point of view of nature conservation, the most important issues in marginal regions are concerned with a decline in land management as traditional farming systems are run down and agricultural production becomes polarized and concentrated on the most productive land or is abandoned altogether. These processes have other important environmental implications, particularly the increased incidence of wild fires in dry regions.

Certain types of extensive farming result in land with a high diversity of habitats and species. However, the absolute species diversity of a given habitat is less important from a conservation perspective, particularly at a European level, than the protection of those habitats in need of conservation or restoration measures because they are rare, threatened or otherwise valuable. In many areas semi-natural grasslands are threatened more than forest but, for example, in Scotland large natural forest has become extremely rare. Thus, both local and European or wider international priorities are relevant to an assessment of the effects of marginalization on nature conservation.

The natural habitats of many flora and fauna species which are now found in semi-natural habitats have largely disappeared, together with the wild herbivores that used to maintain them. These natural grasslands occurred in mosaics with

natural forest. Both have been destroyed or degraded by widespread reclamation since the early Middle Ages and more intensive management. Thus many species became dependent on semi-natural manmade habitats, which were essentially substitutes for the original habitats. However, due to intensification on a large scale this century with increased fertilizer use, drainage and ploughing, these semi-natural grasslands in turn have become very rare. Species-rich grasslands are now amongst the most important semi-natural habitats in Europe, with several types being listed in Annex 1 of the Habitats Directive. In most lowlands of north west Europe these habitats have been reduced to a small percentage of the farmed land. However, they still occur in north west Europe, particularly in the south and south east of France and the British uplands with smaller areas in Scandinavia. In southern Europe they appear to be more widespread. However, throughout Europe, these habitats, on which many species of flora and fauna, particularly insects, depend, are under continuous threat either from further intensification, marginalization or abandonment. This was an important factor in the decision to undertake this current study.

In some specific areas, farming is maintaining a pattern of land cover on which particular rare or endangered species depend for their survival at the European or even global scale. The preservation of many of these priority semi-natural habitats is required by existing legislation, such as the Birds and Habitats Directives.

However, it is important to recognize that in certain marginal regions, production systems which are apparently extensive in nature nevertheless are applied over-intensively at present, with consequently negative impacts on the natural environment. As in the more productive regions, there are situations where a reduction in agricultural intensity or land withdrawal are necessary in order to tackle certain local problems, such as soil erosion. Perhaps the most widespread example is the overstocking of sheep, largely driven by Common Agricultural Policy (CAP) headage payments, which affects many upland areas in northern and southern Member States including the UK and Ireland as well as certain steppelands in the Iberian Peninsula (Beaufoy, 1996). Other examples of the over-exploitation of marginal lands include the cultivation of shallow soils on steep slopes in some Mediterranean areas, such as parts of Andalucia in Spain. Often this is used for olive plantations or cereal production.

This chapter considers some of the environmental implications of the marginalization, abandonment and change of use of agricultural land in intermediate and marginal regions. To simplify the discussion, these effects will be further explored in the following sections:

4.2 Nature conservation and landscape implications of marginalization and abandonment.

4.3 Nature conservation and landscape implications of conversion to other land uses.

4.4 Other environmental considerations associated with marginalization.

4.2 Nature conservation and landscape implications of marginalization and abandonment

4.2.1 Current state of knowledge

The effects on flora and fauna of alterations in agricultural management or of more fundamental land-use change depend on a multitude of factors each of which is variable according to the situation. These factors include:

- the prevailing environmental conditions (soils, altitude, vegetation, climate, etc.);
- the type of agriculture currently practised;
- the existing pattern of land use in the area.
- the change in use taking place and the management system or absence of management which results.

Studies of the evolution of wildlife communities following changes in land use have been undertaken in many parts of Europe and in a range of situations including, for example, natural succession on abandoned arable and grazing land and abandonment of traditional mixed farming in mountain regions. The changes in populations of certain communities, such as flora, spiders or birds, have been recorded at several sites and the general pattern of ecological succession is broadly understood, although the form which it takes varies considerably.

In ecological terms, agricultural habitats can be classified as plagioclimaxes arrived at by human intervention altering the natural succession towards the climax vegetation of the region in question. When the human intervention is removed, the vegetation can be expected to return towards a new climax, although this may not occur for decades or even hundreds of years, depending on the local circumstances. The climax is likely to be a form of forest in most regions of Europe with exceptions such as wet, arid and high altitude habitats. However, the species composition may be significantly different from that in the original forest before agricultural management was introduced. In the original forest cover, large wild herbivores would have contributed to grazing pressure and the creation of open habitats within the canopy, creating conditions suitable for some of the species now associated with semi-natural grassland habitats.

The effects of marginalization and abandonment can vary greatly and several studies show that the process of abandonment and its ecological consequences can be complex, site-specific and far from uniform, even in a relatively small geographical region. Where species-rich grasslands have been abandoned, they are often replaced by less diverse and often more common vegetation communities. However, if the land is low in biological interest, such as many areas of improved grassland, abandonment can result in an overall increase in conservation value and perhaps the diversity of flora. Although they are not applied in practice very often, there are methodologies for measuring the biodiversity of a parcel of land, a landscape or even a region in a way which

takes account of species rareness, distribution, etc. (for a review of biodiversity indices, see Magurran 1988; for an example of practical application at a regional level, see Devillers et al., 1990).

At a broader national and European level, there is some basis for setting nature conservation priorities. There are international Conventions, national and EU legislation and existing inventories of species which are rare or endangered nationally or in Europe (e.g. the Red Data books). Inventories of priority habitats, such as that of Important Bird Areas (IBA) and legislation such as the Birds and Habitats Directives help to provide baselines against which conservation objectives can be set for certain habitats and species. In practice, the most comprehensive data is available for birds and it is more difficult to take account of other species' requirements when attempting to set priorities.

There remains a need for more specific objectives and targets for priority species and habitats in Europe, building on progress being made by organizations such as the UK Biodiversity Steering Group (HMSO, 1995). Ideally, this requires improved information on the wildlife value of existing land-use patterns and management practices, on the processes of change taking place and likely to take place in the near future and on the potential effects on particular wildlife communities.

Bearing in mind the limitations of current knowledge, the following discussion considers some of the implications for nature conservation of marginalization and abandonment, based mainly on available examples.

4.2.2 Abandonment (land withdrawal) in productive regions

In broad terms, the abandonment or conversion to more extensive management of land in intensive agricultural areas is potentially beneficial for nature conservation, providing opportunities for rectifying some of the degradation of wildlife habitats and communities which has been caused by agricultural intensification. For example, land may be withdrawn from agriculture for dedicated nature conservation management and habitat recreation, fragmented patches of habitat may be reconnected and the quality of remaining semi-natural habitats, such as permanent grassland, can be improved through changes in agricultural management practices, principally reducing the intensity of exploitation. Only relatively small areas of intensive farmland have high conservation value - such as the wet grassland sites used by breeding and wintering waterbirds in the Netherlands.

In practice, spontaneous abandonment is extremely improbable in intensively managed areas, other than on very localized patches of land, such as calcareous grassland slopes and patches of marsh and heath. In these specific cases, abandonment of management (traditionally grazing) is likely to result in natural succession and the consequent loss of specific habitat types which have become rarer and hence more desirable than the woodland or scrub which would develop.

Elsewhere, the removal of land from agriculture or the extensification of management depends largely on policy measures such as land purchase or long term set-aside. The nature conservation issues associated with withdrawing land from agriculture in productive regions are relatively well-researched and documented. The achievement of nature conservation goals requires careful targeting of such measures. The location and subsequent management of land withdrawn from agriculture are the key concerns. The areas of land in question are generally small and have been subjected to intensive management for many years. The potential for habitat recreation and natural colonization depends on considerations such as the physical, chemical and biological state of the soil at the time of abandonment, the seedbank which is present, the presence and distance of neighbouring semi-natural habitats, the prevailing climatic conditions (and the particular conditions in the year of abandonment), the management history of the site, etc.

However, the financial costs associated with 'buying-out' productive agricultural land for environmental purposes are high, as illustrated in the Waterland case study (Pouderoyen Compagnons, 1995). The costs and relatively high level of intervention which may be required by public authorities probably will limit the overall scope of this approach, although it will remain valuable in selected locations, especially where more natural habitats have been largely eliminated. On land used for products covered by the CAP market regimes, such as cereals, beef, sheep and dairy production, the costs are increased further by the high level of subsidy provided by CAP. In terms of European biodiversity, it may be argued that greater benefits can be achieved by investing in the conservation of the extensive semi-natural habitats that are threatened with abandonment, rather then in recreating habitats in areas of intensive farmland.

4.2.3 Marginalization and abandonment in intermediate and marginal regions

More extensive farming systems tend to predominate in the regions characterized in Chapter 3 as marginal and in a significant proportion of the regions characterized as intermediate. Here the prospects of extensification and abandonment are more immediate and much has occurred already, the nature conservation implications are often more complex and the ecological values at stake are considerably higher than in productive regions. The historic and potential processes of abandonment affect not only individual parcels in an otherwise agricultural landscape but whole areas and landscapes which often are already closer to the 'natural' state.

Although there is a lack of data about the precise habitat requirements of many priority species, there is a growing volume of evidence showing which farmland habitats have become rare and are now a conservation priority in their own right. There are others which are not in themselves rare but are essential for the maintenance of existing populations of particular species. Abandonment of agricultural management and subsequent natural succession will result in the loss

of these habitats and their associated flora and fauna and controlling this process on sites of high conservation value remains a priority (see Box on the possible threats to nature conservation in Causse Méjan, France). In Finland, for example, 363 endangered species, approximately 21% of the total, are associated with cultural landscapes, predominantly water meadows, woodland pastures, dry meadows and parkland. About 60% of these species are invertebrates, more than half associated with dry meadows. Recent survey work suggests that the abandonment of dry meadows is the single most important reason for reduced biodiversity on farmland, accounting for about 16% of all endangered species (Komiteanmietintö, 1991). The decline of meadows and pasture has resulted in threats to the range of plant species such as *Gymnadenia conopsea,* and *Listera ovata* in moist meadows and *Sorbus intermedia* and *Ophrys insectifera* in leaf-fodder meadows (Selby, 1995).

Possible threats to nature conservation in Causse Méjan, France.

The Causse Méjan is a calcareous plateau of high conservation interest in Lozère. Species which depend on the particular grassland habitats of the area include steppeland birds such as the little bustard (*Tetrax tetrax*), numerous species of butterfly, including the increasingly rare *Parnassius apollo*, as well as notable insect species, such as *Coenagrion mercuriale*, a beetle listed in the Habitats Directive.

The case study undertaken in the course of this project shows certain clear tendencies in the evolution of agriculture in the area during the 1980s:

	1982	1991	% change
Number of holdings	68	62	- 8.8
Utilized Agricultural Area in ha	28,300	27,300	- 3.7
Number of ewes	16,700	20,000	+ 19.8

In the face of economic difficulties, the study reports that many farmers have intensified production, concentrating particularly on the output of sheep's milk for Roquefort cheese. There has been some abandonment (1,000 ha) and a reduction in the total number of farms.

The predominant threat to the conservation of species associated with the Causse grasslands is the *combination* of abandonment, scrub development or afforestation, and intensification on the remaining areas of pasture.

Additional support for maintaining the grasslands is provided by the *prime à l'herbe* (300 FF/47 ECU per ha) and by a zonal programme (1,100 FF/171 ECU per ha), both established under the agri-environment Regulation 2078/92.

If support for agriculture were significantly reduced, it is predicted that forestry and hunting, with some tourism where a relatively open countryside was maintained, would soon come to dominate the area. Such a development would have extremely negative implications for many of the wildlife species currently considered of conservation valued in the area.

Source: Manterola and Guiheneuf, 1995.

Table 4.1 Selection of known examples of farmland habitats harbouring species of conservation interest and suffering effects of marginalization

Habitat and location	Type of marginalization	Nature conservation implications	Other comparable situations
Flood meadows of Saône valley, France [1]	Combination of intensification and abandonment	Threat to rare flora and *Crex crex, Numenius arquata,* etc.	Shannon river flood plain, Ireland.
Upland grasslands of Jura, France [2]	Decline in grazing of more remote pastures Afforestation	Threat to flora.	Upland pastures in several Intermediate and Marginal regions
Heather moorland, UK uplands	Abandonment of traditional management Overstocking	Changes to flora and vegetation structure important for breeding birds.	Marginal grazing lands in Greek islands.
Calcareous grassland, Nord pas de Calais, France [3]	Localized abandonment of escarpments	Threat to flora and butterflies.	Chalk grassland in south-east England.
Steppes of Almería, Spain [4]	Traditional dryland cultivation has been abandoned and converted mainly to irrigation and almond plantations	Local extinction of black-bellied sandgrouse and little bustard.	Other steppe areas in Iberia threatened with irrigation and/or afforestation.
Sub-alpine grasslands in Valle d'Aosta, Italy	Abandonment of grazing	Decline in populations of chough, Greek rock partridge, mole rat and Ursini's viper.	High mountain pastures in Pyrénées and Haut Jura
Upland meadows, Iberian mountains, Spain [5]	Abandonment of transhumance and seasonal grazing	Threat to flora and endangered butterflies.	Meadows in other mountain systems, e.g. Portugal, Cantabria
Lowland grasslands of Doñana National Park, Spain	Decline in grazing, partly due to restrictions imposed by Park	Threat to feeding grounds of *lynx pardina*.	Exclusion of grazing from afforested areas, e.g. Sierra de Gata
Olive grove pastures, Serra d'Aire e Candeiros, Portugal	Abandonment of grazing	Threat to chough.	Permanent pastures in many upland and coastal locations.

[1] Broyer in Bignal, McCracken and Curtis (eds.), 1994; [2] Bruneel in McCracken and Bignal, 1995; [3] Barret et al., undated; [4] Manrique and De Juana in Goriup et al., 1991; [5] Viejo in McCracken and Bignal, 1995.

Some of the best researched cases of abandonment threatening rare endangered species involve birds. Examples include cultivated and grazed steppelands and their associated bird communities in Iberia and pastures and meadows which support species such as the chough (*Pyrrhocorax pyrrhocorax*) and corncrake (*Crex crex*). Less well researched cases include the open grasslands and dehesas in Iberia which provide hunting grounds for predators such as the spotted lynx and several species of raptors.

Many of the species and habitats affected by the decline of traditional agricultural management, particularly extensive grazing, are not rare at a European level but are of regional importance. The disappearance of regionally important habitats, such as hay meadows, has led to the erosion of locally distinctive features over large areas of Europe and affected many once common species. A number of examples of important farmland habitats which are subject to marginalization and abandonment are shown in Table 4.1. The loss of grazing is the most prominent common theme in this table but other changes include afforestation, the cessation of cultivation and the declining management of meadows.

The outcome of marginalization for flora and fauna depends not only on the character of the farmland affected but also on the overall landscape which results. The species present, as well as the character of the landscape, will vary at different stages in the abandonment process. Many cases have been recorded in which species or habitat diversity has increased in the initial stages of

Abandonment of olive groves in Grosseto

Research in Grosseto in Toscana on marginal and abandoned olive groves illustrates how species composition changes over time. In this region, there are significant areas of extensively managed olive groves, some of which support a wide range of species. If they are replaced by vineyards or other intensively managed crops, a loss of several species can be expected. If management is withdrawn, the groves will become scrubland after a period of four or five years. In Tables A5.1 and A5.2 in Appendix 5 an indication is given of the effect of abandonment on different taxa as marginalization progresses.

In this example, field work suggests that there is an overall increase in the number of both vertebrate and invertebrate species during the three stages of marginalization. Several larger animals may benefit from the change in habitat including porcupine (*Hystrix cristata*), wild boar (*Sus scrofa*), pine marten (*Martes martes*) and wolf (*Canis lupus*). However, as the woodland starts to mature, the undergrowth thins out as it is shaded progressively by species such as holm oaks (*Quercus ilex*) which develop a relatively dense canopy. This can be expected to cause a decline in species diversity, including many of those dependent on direct sunlight, such as butterflies and reptiles. Some passerine birds, feeding predominantly on insects and berries and breeding in shrubby vegetation, can also be expected to disappear.

Source: Petretti, 1995.

abandonment and then declined as the landscape becomes more uniform and dominated by woodland. Examples include mixed farming in the Appenine hills in Italy (Farina, 1991) and in the Cantabrian mountains in Spain (Gómez Sal et al., 1993). Some of the consequences of abandoning olive groves in Italy are shown in the Box, indicating the occurrence of abandonment of olive groves in Grosseto.

Extensification and the processes associated with marginalization and abandonment are not always damaging for nature conservation and can be beneficial even in extensively farmed areas. Species associated with open habitats, particularly grassland, will tend to decline as spontaneous vegetation takes over farmland and conditions will be more favourable for species associated with forest and scrub habitats (Baudry and Acx, 1993). In certain areas where important inner-forest species are still present, vegetation development, a decline in human intervention and abandonment may be beneficial to some species of very high conservation value, such as bears, as well as less critical local species, such as dormouse (*Muscardinus avellanarius*), edible dormouse (*Glis glis*), black woodpecker (*Dryocopius martius*), etc.

Farmland abandonment and conservation of the Iberian lynx

The Iberian lynx (*Lynx pardina*), only found in the Iberian Peninsula and whose total population probably does not exceed 800, has been identified by the International Union for the Conservation of Nature (IUCN) as the world's most endangered feline (Oberhüber, 1995). The main surviving populations of the Iberian lynx are in the south and south-west of the Peninsula, in regions where extensive livestock raising is widespread. The species requires a habitat mosaic which combines open grassland, for hunting, with Mediterranean woodland and scrub, for security. For example, one conservation project aims to achieve a land-use pattern with at least 60% woodland/scrub and the remainder under grassland (Oberhüber, 1995).

Dehesas adjacent to uplands with natural woodland and scrub are thought to be a particularly valuable habitat for the lynx. The total abandonment of grazing and browsing is thought to result in less favourable conditions for the species, as scrub and woodland soon come to dominate such landscapes. On the other hand, a degree of abandonment to natural succession in farmed areas adjacent to remaining lynx populations (mostly uplands) could be beneficial for the species, in creating a more diverse mosaic than is currently the norm.

A major obstacle to the effective conservation of the Iberian lynx is the fragmentation of populations and habitats. Part of the challenge for lynx conservation seems to lie in achieving a less intensely farmed landscape than presently exists whilst preventing large-scale abandonment. A global conservation strategy for the species requires the development and linking of existing populations; the abandonment to natural succession of carefully chosen areas of farmland could aid such a strategy.

Research into mountain grazing systems in northern Italy shows that abandonment has led to a loss of certain types of grassland and associated birds and mammals (e.g. choughs, Greek rock partridge, *Alectoris graeca*, mole rat, *Spalax leucodon* and Ursini's viper). However, at the same time, reduced pressure from stock and shepherds has benefited large mammals (e.g. bear, wolf and wild boar (*Sus scrofa*)) and some raptors. The presence in such areas of natural woodland allows species-rich natural succession whilst wild herbivores (e.g. chamois, deer) may continue to maintain quite large grazed areas, although in a different form (Farina, 1994).

The decline in the presence of livestock and in the density of human population in many upland regions of Spain has resulted in the resurgence of certain large mammals, such as wild boar, wolves and roe deer (Blanco, 1995). Such species have even begun to inhabit the islands of woodland and scrub which are found on agricultural land in the adjacent lowlands. Although some commentators claim that the decline in livestock in upland areas reduces the availability of an important food source for large carnivores, such as the wolf, specialists in the study of this mammal have pointed out that domestic livestock often is rapidly replaced by wild species following abandonment. The grazing resources required by one sheep will support 2.5 roe deer, whilst one cow consumes the equivalent of 20 of these ungulates (Blanco, 1995).

In summary, the conditions in which marginalization or some form of abandonment of farmland may be beneficial for nature conservation are likely to be:

- where agricultural management is too intensive and is damaging a habitat, extensification may be the appropriate response;
- where the agricultural land affected was without conservation interest, for example swards of improved grassland or conventionally managed arable land;
- where a process of extensification takes place on a habitat which is not initially of high conservation value, for example where there is some growth of shrubby vegetation on grassland;
- where the habitat created as a result of marginalization is a greater conservation priority than its agricultural predecessor;
- there may be conservation value in land at different stages of natural succession; in the early stages of abandonment of arable land interesting pioneer species may take over for example. Within a given area there may be species which would benefit from a mosaic of land at different stages of succession.

Table 4.2 Processes of extensification and abandonment of extensive systems and their potential effects on nature conservation and landscape

	Decline in production intensity	Rationalization of production system	Neglect of traditional management practices	Abandonment of individual patches and fields	More extensive abandonment of whole farms and larger areas
Examples	Conversion of meadows to extensive grazing. Reduction in grazing of pastures and rough grazing. Abandonment of cultivation and reversion to pasture.	Simplification of rotations, abandoning traditional crops such as oats, legumes. Abandonment of mixed (livestock/arable) farming. Concentration on one livestock type.	Abandonment of shepherding. Neglect of features such as stone walls and hedges, terraces. Neglect of silviculture.	Typically least productive parcels such as wet or sloping grassland and fields furthest from the farmstead or village.	In the most marginal regions, entire districts have been abandoned in recent decades. In regions such as Bretagne and Alentejo, whole farm abandonment is not uncommon at present.
Potential negative effects	Loss of pasture-meadow-cultivation mosaic. If grazing declines beyond a certain point, floral diversity of pastures decreases. Forage quality may also decrease to point where recovery becomes impractical.	Loss of traditional varieties. Loss of crop mosaic, increased landscape homogeneity. Simplified grazing patterns lead to reduction in diversity of grazed habitats.	Livestock concentrate in certain areas. Possible overgrazing. Loss of landscape features. Visual signs of abandonment may accelerate rural decline.	Loss of specific habitats on less productive land, such as wet pastures.	Loss of open habitat types (although natural succession may not progress beyond shrub stage in arid zones). In longer term, increased homogeneity and closing of landscape.
Potential positive effects	Reductions in input use and stocking densities. Recreation of permanent pasture.	Possible increase in fallow in dryland arable systems.	Predators may benefit from decline in 'traditional' persecution by shepherds.	May add variety to more uniform habitats/landscape	In initial stages, overall diversity may increase. Large mammals (bears, wolves) and inner woodland species may benefit if present.

However, once an area has begun to suffer from neglect and abandonment, the process may acquire a momentum of its own. As the agricultural (and social) infrastructure is depleted, farming becomes increasingly difficult for those remaining, thus reinforcing the cumulative process of decline (Smit et al., 1991, Manterola and Guiheneuf, 1995). In upland Mediterranean regions once subject to mixed farming, there appears to be a relatively typical pattern of change leading to complete abandonment, although with local variations. The general progression tends to be:

Conversion of arable land to either tree crops (olives) or meadow
|
abandonment of hay-cutting and use for extensive grazing only
|
abandonment of grazing
|
abandonment of tree crops
|
total abandonment.

Table 4.2 identifies some of the processes associated with marginalization in less productive regions and summarizes some of the potential implications for the landscape and nature conservation.

From the nature conservation viewpoint, marginalization and abandonment are likely to be of greatest concern where the agricultural habitats and the species which they support are of high natural value. Many of the most important of these habitats are species-rich grasslands where fertilizer use has been limited or non-existent. These include alpine grasslands, substantial areas of dry grassland in Iberia, Italy and other parts of the Mediterranean and smaller areas of chalk grassland and wet grassland in the lowlands. In France, for example, significant areas of semi-natural grassland of conservation interest are thought to remain in regions such as the Jura, Vosges, Causses, parts of Normandie, Auvergne, Aquitaine, Languedoc, Provence, the Alps, the Pyrénées and several river valleys (Van Dijk, 1995). Other important habitats under agricultural management include heaths, moorland, marshes, fens and wood pasture.

4.2.4 Landscape considerations

The term landscape is taken here to mean the visual landscape as well as the landscape as a recreational resource.

Landscape and nature conservation concerns do not necessarily coincide, although they often are related. The impact of neglect and abandonment on the visual landscape often is more immediately apparent and may constitute the first signs of marginalization. Landscape value is related to local tradition and culture, as well as aesthetic considerations, and is not usually assessed on scientific criteria.

The most common changes to the landscape associated with marginalization are:

- the emergence of a less tidy, less organized landscape, with an increasing element of more natural and often coarser vegetation;
- the degradation of features such as stone walls, hedgerows and buildings;
- scrub and woodland invasion following abandonment of the productive farmland area (e.g. grassland, arable land, orchards, etc.);
- eventually, closure of a previously open landscape.

Generally, an increased uniformity or homogeneity of the landscape is considered a deterioration in overall landscape quality. This may result from the simplification of agricultural systems and the loss of typical mosaic patterns of land use, or from more fundamental changes such as large-scale afforestation. Studies in many marginal areas of Europe have shown a tendency in recent years towards the polarization of rural land uses at different geographical scales and a generalized increase in uniformity (for example, see Vos, 1993; Fernández Alés in Baudry and Bunce, 1991). This is particularly the case in areas of smaller scale and mosaic farming systems, typical of many mountain regions.

On intensively farmed land or agriculturally improved grassland with no semi-natural features such as hedges, marginalization and abandonment is likely to result in a more diverse landscape. There are many areas of totally deforested farmland where the development of some natural forest would enrich the landscape. On the other hand, there are valued landscapes where openness is a defining characteristic, such as stretches of moorland where even scattered patches of afforestation can be visually intensive. As with biodiversity, the character of the area concerned is of critical importance in evaluating the impact of marginalization.

A particular concern in many upland regions and in large parts of Scandinavia, including northern Finland, is the 'closure' of the landscape due to the increasing dominance of forest. In the Parc Régional Naturel of Haut-Jura in France, for example, the proportion of land under forest is already 60-65% but there is some continued afforestation being driven by a combined process of agricultural abandonment and subsidies for the planting of new forests. Abandonment and afforestation therefore are associated with landscape closure and a process of increasing homogeneity (Bruneel, 1995). This process of landscape closure raises several concerns related to the loss of open landscapes, including the visual aspect, the loss of a recreation resource and a broader impression of rural decline.

4.3 Nature conservation and landscape implications of conversion to other land uses

Much of this chapter has been concerned with the effects of 'classical' marginalization and abandonment where spontaneous vegetation growth takes over farmland. This does occur in parts of Europe but often it is preempted by a change in the use of land frequently to forestry, which attracts grant aid almost everywhere. The redeployment of land or conversion to other uses is an important outcome on the marginalization process with major environmental consequences.

Agricultural land generally undergoes conversion in situations where there is economic pressure for the substitution of other land uses. This may be largely market-driven, as in the case of urban expansion or the conversion of farms into hunting estates, or may be created by incentives such as afforestation grants. Alternatively, the state may acquire agricultural land for purposes such as afforestation, irrigation projects, reservoirs, etc. In Finland, approximately 200,000 ha of fields were afforested as a direct result of policy initiatives between 1969 and 1993. It has been estimated that an equally large, or perhaps greater area, has been afforested by natural regeneration during the same period (Selby, 1995).

Extremadura. Goat grazing prevents closure of upland landscape.

Photo by G. Beaufoy.

In productive regions, even the higher grades of agricultural land may be taken over by more profitable uses, although in most countries there are restrictions on the urban development of high-grade farmland. In intermediate and marginal regions (other than near to cities), it is generally the least productive areas which are converted to other uses. State funded afforestation has affected extensive tracts of farmland, often common land, in these regions throughout Europe, and in some places continues to do so. In many cases, the land concerned was previously under extensive agricultural systems of potentially high conservation value such as permanent grassland, dehesa, rough grazing and moorland.

In Portugal, there are extensive areas in the centre of the country where the traditional farming pattern has been replaced almost entirely by plantation forestry. This process began earlier this century and accelerated from the 1950s, becoming a major social and environmental issue. Between 1970 and 1990, the area of eucalyptus trees increased by 400% in Portugal to reach 14% of the total forest area (MARN, 1991).

Although much reduced compared with past decades, damaging afforestation is continuing in many regions. With the introduction of Regulation 2080/92, which provides incentives for planting and woodland management, an expansion of afforestation on private farmland is expected, especially in marginal regions where high levels of grant-aid for afforestation have not been available previously.

Afforestation has profound effects on agricultural landscapes although these will vary greatly depending on the site, the species present, the type of planting which takes place, the structure and composition of the new woodland, the management of the site, etc. These are not easy to summarize. If natural regeneration or planting takes place in appropriate locations, the benefits can be considerable as emphasized in a Dutch government policy statement:

'The presence of forests must in general be judged positively. Forests have many beneficial functions, like nature conservation, water retention, climate regulation, CO_2 sink, recreation, etc. However, newly planted forests tend to be poor ecosystems, at least in the beginning, and may be located on places where nature values with a higher conservation priority consequently disappear. If, however, the location of afforestation is carefully planned and if attention is paid to species composition, afforestation can be beneficial in many cases'.

Marginalization increases the probability of land becoming available for other uses where the demand exists. In large parts of Europe forestry is likely to be the principal alternative form of production but there are other, usually more localized, forms of land use which may displace agriculture.

In marginal regions, and in Iberia especially, there are numerous projects for the creation of vast reservoirs in valleys which currently are under extensive forms of agriculture. Many of these projects are made possible by the availability of the EU Structural Funds.

Table 4.3 Examples of conversion of farmland to other land uses and potential effects for nature conservation and landscape

	Afforestation	Hunting	Nature and recreation management	Construction
Productive areas	Limited to quite small areas.	Usually combined with agriculture and woodland management.	Mostly small areas, but increasing in number.	Mainly urban expansion.
Effects	Positive, neutral or negative depending on type of afforestation, controls applied, land planted and location.		Positive. Often involve the maintenance of a quasi-farming landscape, e.g. grazing with hardy breeds.	Loss of habitat.
Intermediate areas	Widespread particularly in upland grassland areas.	Long-established land use in some upland regions, e.g. Scotland.	Some quite large areas, but usually with some land still under farming.	Second homes, reservoirs.
Effects	Loss of open habitat, especially permanent grassland. Closing of landscape.		Positive.	Loss of habitat.
Marginal areas	Widespread.	Conversion of larger farms to hunting estates is common in Italy, Spain, Portugal.	Mostly National Parks.	Especially reservoirs.
Effects	Loss of open habitat, especially permanent grassland. Valuable habitats may be destroyed but potentially beneficial in overexploited areas.	May be positive, especially as an alternative to abandonment or afforestation. Negative where intensive.	In Italy and Spain, effects often involve exclusion of farming activities, even where extensive and beneficial for some habitats. This may be changing.	Total loss of quite large areas of valuable habitat. However, some reservoirs become important wetlands for birds and are declared Special Protection Areas (SPA).

An increasingly common change of use in Spain, Portugal and Italy is the conversion of larger farms into hunting estates. There is little concrete information available concerning the nature conservation effects of this change of use. On certain estates, the traditional agricultural systems may be maintained largely unchanged in order to benefit game. Since food production ceases to be an economic objective, the intensity of production may be reduced and there may be significant benefits for a wide range of flora and fauna. On some other estates, agricultural management is abandoned and scrub and woodland are allowed to expand, thus benefiting species adapted to these habitats but ultimately resulting in the decline of open habitats and potentially of landscape diversity at the farm level. Sometimes estates are managed intensively for the production of game animals, which can be expected to result in an overall reduction in biodiversity. Practices such as the erection of deer fencing will have a negative impact on many species of wild animals. Table 4.3 provides an overview of the main types of conversion to non-agricultural uses in productive, intermediate and marginal regions.

4.4 Other environmental considerations associated with marginalization

4.4.1 Soil erosion

There are substantial areas of marginal land which are highly vulnerable to soil erosion as a result of environmental conditions, such as steep slopes, thin and easily eroded topsoil, extreme climatic conditions, prevalence of fires, avalanches, etc. Such land often suffers from serious erosion as a result of inappropriate exploitation, even though in some cases the farming systems which are practised may appear to be extensive, for example, in terms of input use. Causes of environmental degradation include inappropriate ploughing of slopes, overgrazing and intensive management of forest plantations. In some regions, such as the interior of Andalucia, it is common for olives and cereals to be cultivated on steep slopes which are ploughed repeatedly and which are highly susceptible to erosion in the event of heavy autumn rains.

Some marginal lands are the result of historic overexploitation, particularly where soils have been degraded as a result of deforestation of slopes, overgrazing, repeated burning and inappropriate cultivation techniques. In some cases, this overexploitation has created conditions which have acquired a certain conservation value, as in the case of moorlands. Nevertheless, there are situations in which a reduction in the current intensity of exploitation or even the total cessation of farming may be desirable in order to allow the recuperation of soils and natural vegetation.

Traditional terrace systems in Mediterranean regions enabled the cultivation of soils on slopes without erosion. Under some traditional systems of management, topsoil was even transferred from the bottom of slopes to the upper terraces.

Many terrace systems involve the cultivation of tiny plots of land which cannot be economically viable other than on a part-time basis. Such systems have been abandoned on quite a large scale in many Mediterranean areas. Where physical conditions favour relatively rapid spontaneous vegetation growth, with a low incidence of wild fires, such abandonment usually leads to the creation of stable communities of scrub and woodland. However, in more arid areas prone to soil erosion, a severe cycle of degradation may be set in motion as terraces collapse following abandonment, particularly if colonizing vegetation is removed by fires (see Section 4.4.2). The disintegration of terrace walls can lead to severe land slips in some conditions and gullying can develop if the system of water management deteriorates.

4.4.2 Wild fires

Wild fires are a major environmental issue in southern Europe, where hundreds of thousands of hectares of vegetation are burnt each year. Wild fires also affect some other regions, such as the heathlands of Bretagne, although usually on a much smaller scale. Although often referred to as forest fires, wild fires in Mediterranean regions also affect large areas of unforested land, including scrub, heaths, grassland and farmland in dry areas.

During the 1980s an average of over 430,000 ha were burnt each year in the Mediterranean countries of the EU (including France). In Spain alone, the average annual area burnt during this period was 230,000 hectares (Valladares and Fernández Lop, 1994).

There has been a significant increase in the occurrence of wild fires in many Mediterranean regions in recent decades. Various factors seem to have contributed to this phenomenon including:

- Afforestation schemes:
  - mostly carried out with species such as pines and eucalyptus which are highly prone to fire;
  - often give rise to social discontent amongst displaced rural populations, leading to arson attacks on forest plantations;
  - grazing generally is prohibited, thus allowing an accumulation of dry matter.
- The abandonment of traditional land management in marginal areas, in particular, a decline in grazing of grassland, scrub or forest (as a Spanish saying has it: 'What the sheep don't eat, fire will') and in the collection of wood and scrub for fuel, animal bedding, etc.
- Development of large areas of scrub on land which previously was grazed or cultivated.

- Increased recreational access to the countryside, particularly barbecues and picnics.
- The decline in rural populations means there is less vigilance and fewer people available to control fires which break out, for example, as a result of farmers burning off scrub.

Although the establishment of large, easily burnt pine plantations appears to be a major factor in the increasing incidence of forest fires in Spain since the 1960s, the statistics indicate that only 40% of the area burnt between 1961 and 1990 was in fact high forest (Table 4.4). Fires on scrublands, where dry matter traditionally was collected as fuel or consumed by browsing goats and mules, accounted for a similar proportion of the total area burnt.

Table 4.4 Area affected by wild fires in Spain 1961-1990 (1,000 ha)

Scrub woodland	210
Scrub	1,527
Rough grazing	453
High forest	1,500

The direct impacts of wild fires on habitats and wildlife are complex. Mediterranean ecosystems are to some extent adapted to fire. Many Mediterranean trees and shrubs are highly resistant to fire and recover relatively well from burning. The seeds of some species, such as cistus, are activated by fire. This plant quickly colonizes burnt areas. Localized fires create open areas within dense forest. Generally this adds to structural diversity and provides opportunities for non-forest and forest edge species although floristic diversity can be limited in areas of oak woodland colonized by cistus for example. However, large-scale fires are also highly destructive of habitats and wildlife.

In recent years, fires have caused considerable damage in protected areas. In 1991 the Serra de Arrabida nature reserve in Portugal, a nationally important example of ancient Mediterranean maquis forest, was severely damaged by a fire which burnt out of control for several days. In 1993, several protected areas of high ecological value were badly burnt in Andalucia. In Spain, a general policy of excluding traditional farming and land management within protected areas may have contributed to the risk of fire in such areas. Furthermore, this policy has created local hostility to the designation of protected areas. In 1993, fires were deliberately started in the Natural Park of Cabañeros in Toledo, probably in protest against proposals to designate the area as a National Park, which would involve greater restrictions on farming and hunting within the park (Valladares and Fernández Lop, 1994). In other parts of Europe, including Italy, grazing is excluded from some protected areas where it could be beneficial if well managed.

Apart from the destruction of habitats and wildlife (and the significant losses of human lives and property which occur annually), fires in Mediterranean regions often are associated with problems of erosion and land degradation. When slopes are left without vegetation following an intense fire, erosion may be severe during the winter rains. Although natural vegetation usually colonizes such sites quite rapidly, repeated burning in successive years can establish an irreversible process of erosion and degradation. Similar processes can affect abandoned terraces. Whereas such land may be colonized successfully by woodland species, if succession is interrupted by fire in the early stages, subsequent erosion may result in the collapse of the old terrace structure and subsequently more serious erosion and landslips.

Traditionally, grazing and browsing by livestock (especially goats and to some extent donkeys and mules) played an important function in reducing the fire risk in scrublands and forests of marginal Mediterranean regions. In Spain, the numbers of goats browsing in such areas is reported to have declined considerably in recent decades. In some cases, this process has been accelerated by State afforestation schemes. As browsing declines, the scrub closes in, making it more difficult for remaining goatherds to exploit the available resources. Often, they resort to fire as a means of opening up the scrub. Such fires, started by farmers to clear vegetation, often get out of control and are a major cause of wild fires (María Herrera, 1995).

The possibility of using appropriate grazing and browsing livestock on a sufficient scale to reduce the risk of fires in vulnerable areas is reported to have received little attention in Spain. In theory, it should be possible for local and regional governments to maintain and manage such livestock or to establish contracts with private goatherds to undertake this work (María Herrera, 1995).

Changing patterns of wild fires in Lozère, France.

The case study of Lozère in France (Manterola and Guiheneuf, 1995) shows a clear change in the pattern of wild fires over the past twenty years. The total number of fires per year has increased considerably since the 1970s, as afforestation, abandonment and natural succession have increased the possibilities for fires to become established. The total area burnt per year nevertheless has declined, as fire prevention, detection and control measures have become considerably more efficient.

Typical costs of fire prevention measures in forest plantations are estimated at 1,000 FF per ha, increasing considerably in zones of high risk and difficult operating conditions.

4.4.3 Environmental limitations to alternative uses for abandoned land

Although most of the land withdrawn from agricultural use in Europe will be appropriate for other purposes, such as woodland, nature reserves or water protection zones, there are circumstances where land may suffer from environmental handicaps which limit the uses to which it can be put. For example, land which has been under intensive agricultural management may be less suitable for the recreation of natural habitats. In particular, the presence in the soil of high levels of phosphates, other nutrients and/or pesticides, and the depletion of natural seed banks, limit the possibilities for establishing grassland communities of high conservation value without entailing high costs by operations such as removing the top soil or persistent mowing and removal of vegetation over a long period. The species of flora most in need of conservation tend to require nutrient-poor conditions.

Other environmental limitations may include high levels of acidity in soils which have been heavily fertilized and salinization of soils as a result of continuous irrigation in certain conditions. Soils which are highly vulnerable to erosion may require specific management regimes in order to establish stable vegetation.

4.5 Conclusions

Effective nature conservation does not depend upon the fossilization of existing patterns of land use or of existing agricultural systems and practices but rather upon an understanding of the potential effects of change and of the viable options for steering change in a way that maintains or enhances existing environmental values.

In broad terms, we can say that in regions currently dominated by intensive agriculture, extensifying agricultural systems and *restoring and recreating* semi-natural and natural habitats are important environmental priorities. In many of the regions characterized by extensive farming, the immediate concern is to *prevent* sudden, uncontrolled changes to existing agricultural land uses, in order to reduce the risk of natural disasters, such as fires and landslips, and to ensure the survival of species associated with current land-use patterns. For many semi-natural farmed habitats of conservation value, continuity of management, generally grazing by ruminant livestock, is essential in order to maintain the character of the site. Even where the intention is to allow the farmed habitat to develop into a more natural mosaic of grassland, scrub and forest, continued grazing will be required.

An important priority is to identify the areas where a change of land use or farming system is likely to create the greatest environmental costs, including loss of biodiversity, loss of landscape and recreational value, acute fire hazards and other dangers such as landslips. These areas can then be the focus of attention,

whilst change can be allowed to take its course more freely elsewhere. Such an exercise could be conducted at a regional level and could build on existing databases, including inventories of sites scheduled for protection under the Birds and Habitats Directives and information collected in preparation for implementing agri-environment programmes. The appropriate management of protected sites is a formal requirement under the Habitats Directive but outside these key sites, there are large areas of high nature value where management plans are also needed urgently. At present there is no guarantee that appropriate agri-environment policies will be developed for these areas or that farmers will enrol in voluntary schemes. Large areas of marginal agriculture, and the habitats associated with them, remain at risk from a nature conservation perspective.

5 INDICATORS OF MARGINALIZATION AND ABANDONMENT

5.1 Introduction

Marginalization and abandonment of agricultural land in Europe may respond to a wide variety of factors. Several of them have been discussed in Chapters 3 and 4 of the report. Important phenomena to be considered in an assessment of marginalization and abandonment of agricultural land include economic viability of farming, social structures of farm holders (e.g. age class), viability of rural development, socio-economic structures of farming, and environmental conditions regarding water availability and soil productivity. A possible transformation of European regions towards marginalization and abandonment of agricultural land is likely to result from a complex set of interactions.

So far, the available knowledge remains limited regarding the major driving forces of the occurrence of marginalization and subsequent abandonment of agricultural land in Europe. It is mainly based on diverse small-scale case studies. The objective of the present chapter is to explore a set of indicators across EU 12 which are potentially critical to an assessment on processes of marginalization and abandonment of agricultural land in Europe. This set of indicators is input to an analysis to group regions with similar characteristics. Such an analysis to cluster regions is aimed at identifying groups of regions which are considered to be susceptible to marginalization and abandonment of agricultural land.

A review is presented of statistical indicators that are available from European data bases. This is aimed at identifying regions and farming systems that are vulnerable to marginalization and susceptible for change. Where appropriate, linkages are made between the indicators in order to explore their possible mutual impacts. A broad set of indicators is selected and these are discussed in this chapter. A distinction is made between five groups of indicators:

- Indicators to reflect biophysical conditions for agriculture (Section 5.3);
- Indicators to reflect land utilization for agriculture (Section 5.4);
- Indicators to reflect farm income (Section 5.5);
- Indicators to reflect farm structure (Section 5.6);
- Indicators to reflect rural and regional development (Section 5.7).

The indicators selected will provide input to an analysis of marginalization and abandonment of agricultural land in Europe. This investigation derives from a cluster analysis of the indicators across the regions included. Finally, an assessment is made of regions which are susceptible for change (Section 5.8).

Assessments presented in this chapter are based on information from the late 1980s. This is aimed at reflecting the potential of marginalization during the period before the reform in 1992 of the Common Agricultural Policy (CAP). An investigation of the new support systems after 1992 is provided in Chapter 6 of

the report. Figures are presented in this chapter to depict the present state of the indicators around the end of the 1980s.

5.2 The available information in the European Union

Figures are presented at different levels of spatial detail because of the different data sources used to quantify the indicators. A distinction is made between 87 regions and 424 sub-regions.

Table 5.1 Description of the indicators [1]

Indicator	Year	Source	Regions	Sub-regions
BIOPHYSICAL CONDITIONS				
Share of Less Favoured Areas in Utilized Agricultural Area (%)	1989/90	FSS	87	424
LAND USE				
Decrease in Utilized Agricultural Area (%)	1975-1989/90 [2]	FSS	87	-
Price of land per hectare (classes) to reflect intensity of land utilization	'1987'	SAFER	87	-
FARM INCOME				
Family Farm Income per Family Work Unit (ECU)	'1989'	FADN	87	-
Share of direct subsidies in FFI/FWU (%)	'1989'	FADN	87	-
FARM STRUCTURE				
Change of Standard Gross Margin per hectare Utilized Agricultural Area (%)	1975-1989/90 [2]	FSS	87	-
Standard Gross Margin per hectare UAA (ECU)	1989/90	FSS	87	424
Utilized Agricultural Area per holding (ha)	1989/90	FSS	87	424
Share of farm holders of age 55 years and older (%)	1989/90	FSS	87	424
Share of farm holders with work time below 50% of Annual Work Unit (%)	1989/90	FSS	87	424
RURAL AND REGIONAL DEVELOPMENT				
Gross Domestic Product per inhabitant (ECU)	'1990'	REGIO	87	424
Share of farm holders with other gainful activities (%)	1989/90	FSS	87	424

[1] For a description of the abbreviations see LIST OF ABBREVIATIONS.

[2] 1979-1989/90 for Greece and Portugal;
1983-1989/90 for Spain.

'1987' a year between 1985 and 1987 (differs by Member State).

'1989' average of the accounting years 1988/89 - 1990/91.

'1990' average of the years 1989 -1991.

The set of indicators selected for investigation distinguish among five groups including biophysical conditions, land use, farm income, farm structure and rural and regional development (Table 5.1). Also, some background indicators have been selected which primarily derive from the indicators presented in Table 5.1. This set of background indicators is aimed at supporting hypotheses formulated on the indicators. They also provide more detailed information on the indicators presented in Table 5.1, and may support more detailed investigations across farming types and economic activities. The group of background indicators also has been classified according to the biophysical conditions for agriculture, utilization of land, farm income, farm structure and rural and regional development (Table 5.2). No detailed investigation has been made on the operationalization of background indicators which reflect rural and regional development. The indicators mentioned in Table 5.2 merely present options to operationalize the various stages of rural and regional development.

The available information originates from the Farm Structure Survey (FSS) of Eurostat, the Farm Accountancy Data Network (FADN) of the Commission of the European Communities (CEC) and the regional data bank (REGIO) of Eurostat. FSS is periodically conducted in order to collect data on the structure of farms. FSS data refer among other things to the composition of the agricultural labour force, the number of full-time and part-time farmers, land use and the number of livestock per farm. In this report the results of FSS of 1989/90 have been used, primarily to get information about farm structure and land utilization. A distinction is made between 424 sub-regions across EU 12.

FADN contains farm level data on the structure of the farm (economic size, labour input, agricultural area and livestock population), total output, intermediate consumption, a balance sheet account and a profit and loss account. FADN is based on the annual accounting results of a sample of commercial farms in the EU Member States. Commercial farms are farms that are large enough to provide a main activity for the farmer and a level of income sufficient to support the farmers' family (CEC, 1989; 4). Farms are classified as 'commercial' when they exceed a minimum economic size, measured in European Size Units (ESU). Because of the different farm structures in the European Union, thresholds applied for the economic size of farms vary among Member States. The farms in the sample are rather heterogeneous. FADN stratifies farms according to region, economic size and farming type in order to reflect the heterogeneity adequately. FADN distinguishes 91 regions in the EU. In this report a division of the EU into 87 regions is used. FADN has been used in order to assess farm income. It has to be taken into account that the small farms are less represented by FADN. Only farms above the economic size thresholds and which supply a main activity of the farm holder are represented. So, also part-time farmers are less represented. The selection procedure to FADN also implies that marginal farms may be highly underrepresented in the sample. The assessment in this chapter however is to explore a tool to assess marginalization at regional level rather than at farm level.

Eurostat's data bank REGIO covers the principal aspects of the economic and social life of the EU, such as demography, economic accounts, employment etc. at a regional level. REGIO has been used to get insight into rural and regional development across the European Union.

Table 5.2 Description of the background indicators [1) 2)]

Indicator	Year	Source	Regions	Sub-regions
BIOPHYSICAL CONDITIONS				
Precipitation deficit	.	SC-DLO	.	.
Soil quality	.	SC-DLO	.	.
LAND USE				
Utilized Agricultural Area (1,000 ha)	1989/90	FSS	87	424
Share of forest land in area agricultural land and forest land (%)	'1987'	REGIO	87	-
FARM INCOME				
FFI/FWU by farming type (ECU)	1990/91	FADN [3)]	87	-
Share of direct subsidies in FFI/FWU by farming type (%)	1990/91	FADN [3)]	87	-
FFI/FWU in Mountain areas, other Less Favoured Areas and in other areas (non-LFA) (ECU)	1990/91	FADN [3)]	87	-
FARM STRUCTURE				
Economic farm size in SGM per farm by farming type (ECU)	1989/90	FSS	87	424
Economic farm size in SGM per hectare UAA by farming type (ECU)	1989/90	FSS	87	424
Economic farm size in SGM per Annual Work Unit (ECU)	1989/90	FSS	87	424
Distribution of farm holders with work time of an AWU by class (0-50, 50-100, 100) (persons)	1989/90	FSS	87	424
Distribution of farm holders by age class (< 35, 35-44, 45-54, 55-64, > =65) (persons)	1989/90	FSS	87	424
Density of grazing livestock (number of LU grazing livestock per ha of forage crops)	1989/90	FSS	87	424
RURAL AND REGIONAL DEVELOPMENT				
Share of rural population in total population (%)		OECD	87	303
Density of highways (m/km2)	'1989'	REGIO	87	-
Share of agriculture in total employment (%)	'1990'	REGIO	87	424
Share of labour force (persons > =15 - <65 years) in total population (%)	'1990'	REGIO	87	-
Share of persons employed in total labour force (%)	'1990'	REGIO	87	-

1) The background indicators are not published in tables or maps. They are described in the report.
2) For a description of the abbreviations see LIST OF ABBREVIATIONS.
3) FADN-CCE-DG VI/A-3; adaptation LEI-DLO.
'1987' average of the years 1986 - 1988.
'1989' average of the years 1988 - 1990.
'1990' average of the years 1989 - 1991.
1990/91 accounting year 1990/1991.

5.3 Biophysical conditions

Biophysical conditions (e.g. soil quality and water availability) are major determinants of land utilization. Biophysical conditions are important to assess suitability of land to grow agricultural crops. FAO (1976) for example identified various conditions to evaluate the suitability of land for among other things, agriculture, forestry and nature conservation. Land qualities that are important for growing crops include nutrient availability, salinity and alkalinity of soils, soil toxicity, resistance to soil erosion. Climatic conditions such as temperature and precipitation are important as well. Land productivity can therefore be based on soil quality characteristics and climatic conditions. Annual precipitation deficit and soil conditions for example are important in this respect. Crop production may be largely limited in regions with high levels of precipitation deficit unless these areas are irrigated. Annual precipitation deficit exceeds 500 mm/year in most of Spain, Italy, Greece and Portugal (Reinds et al., 1992).

The occurrence of marginalization may be high in regions with natural handicaps (e.g. altitude and slope). Such conditions are partly reflected by the share of Less Favoured Areas (LFA) in total Utilized Agricultural Area (UAA), and this indicator is therefore introduced as a proxy to biophysical conditions in Europe.

LFA may include Mountain Areas or Other LFA, and generally include areas where agriculture is hampered by permanent natural handicaps. The LFA Directive (75/268), which was introduced in 1975, was the first common instrument of regional agricultural structural policy.

Farmers in LFA may receive specific support because production costs are higher and productivity poor compared to farming under normal conditions. The main objective of the LFA Directive is the continuation of farming in LFA and thereby maintaining a minimum level of population or conserving the countryside. Three types of areas are distinguished in Directive 75/268 on mountain and hill farming in certain LFA:

- Mountain areas which are characterized by a considerable limitation of the possibilities for using the land and an appreciable increase in the cost of working on it. It includes regions where latitude, altitude and slopes reduce the vegetation period and the possibilities for the use of machinery (Article 3.3 of Directive 75/268);
- LFA in danger of depopulation and characterized by land with poor productivity and low incomes (Article 3.4 of Directive 75/268);
- LFA with specific handicaps (small surface areas, hydrographic problems, regular flooding, etc.) and where maintaining agricultural activity is necessary to preserve the landscape (Article 3.5 of Directive 75/268).

LFA presently represent approximately 55% of total UAA of the European Union (Brouwer and Van Berkum, 1996). The share of LFA in total UAA in 1989/90 is presented in Figure 5.1. The share of LFA in total UAA exceeds 70% in large areas of the southern part of Europe (France, Greece, Spain, Portugal and Italy), parts of Belgium, Germany, Ireland and of the United Kingdom. Also, the whole

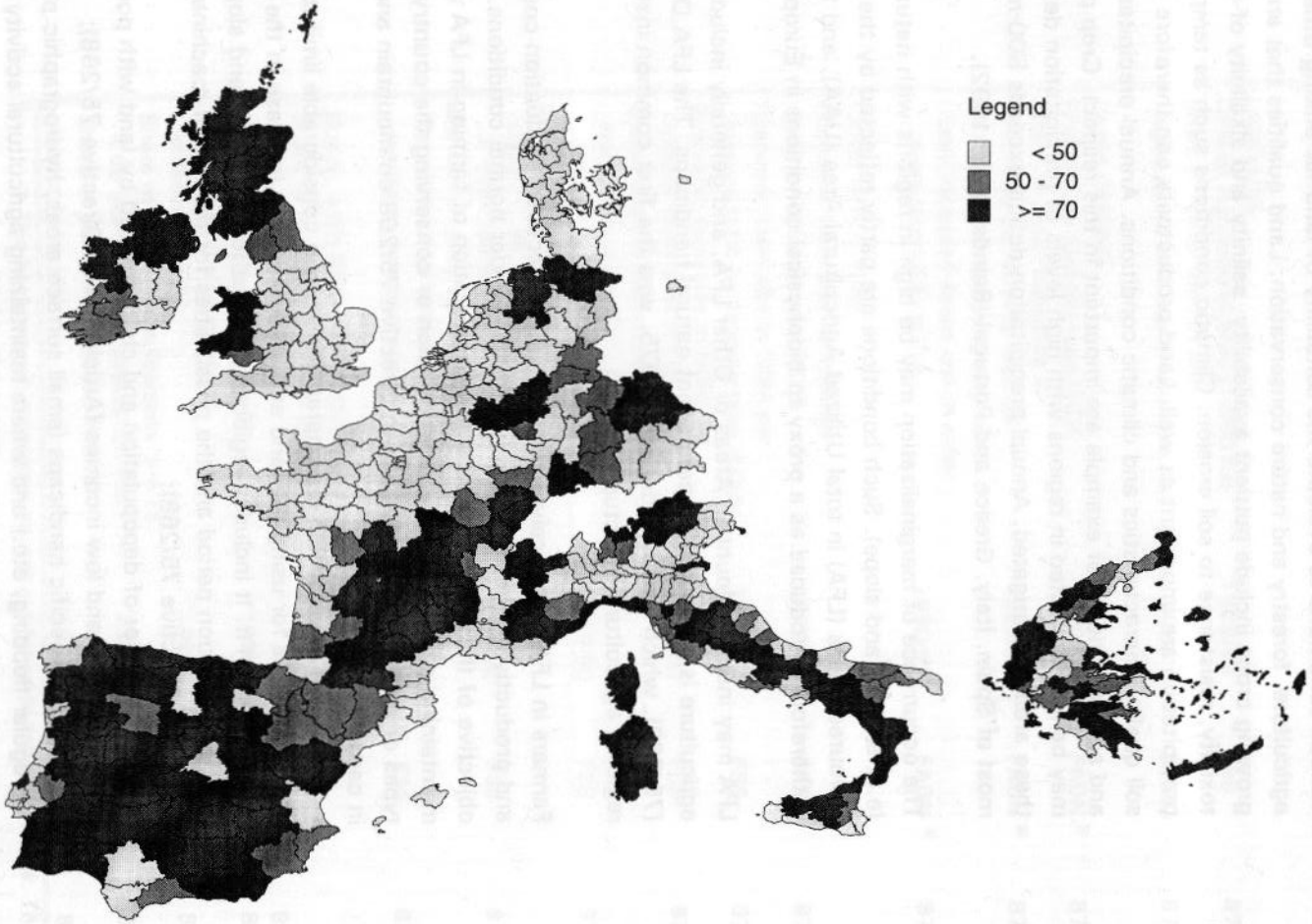


Figure 5.1 Share of Less Favoured Areas in Utilized Agricultural Area (%)

territory of Luxembourg is identified to be part of the LFA Scheme. It needs to be mentioned that the LFA Scheme is not applied in Denmark, and very limited in the Netherlands. The scheme for example, only applies to 3% of the agricultural holdings in the Netherlands, covering in total some 110,000 ha of land.

5.4 Land use

UAA shows a decreasing trend over time. Large areas of agricultural land have been transformed over the past decades to land used for non-agricultural purposes, mainly for the development of infrastructure, urban areas, industries and recreational facilities. This trend is observed across a large part of the Union in response to a reduction of the number of agricultural holdings and pressure from other economic activities in order to withdraw land which was originally used agriculturally. This could be considered as a kind of non-planned abandonment of agricultural land which however is not necessarily due to marginalization processes of agricultural land. Regional differences across the European Union are large on the change of UAA during the past decades. Total size of UAA showed a decrease across EU 12 during the period 1975-1989/90. UAA decreased by at least 5% in Belgium, Denmark, Ireland, Luxembourg and large parts of Germany, France, Italy and Greece. It decreased by more than 10% in parts of Germany (Saarland, and the urban area which includes the cities of Hamburg, Bremen and Berlin), part of Greece (Thessalia), part of France (Provence-Alpes-Côte d'Azur), Ireland, and parts of Italy (Liguria, Toscana, Lazio, Campania, Calabria, Sicilia and Sardegna) (Figure 5.2). A substantial decrease of UAA could result from abandonment of agricultural land which was marginal in the past due to a combination of factors including economic, social and political development. UAA however showed an increasing trend in large parts of Spain (period 1983-1989/90) and Greece and Portugal (period 1979-1989/90). The data of these regions reflects a shorter period than has been the case in the other Member States.

Forestry is an important activity of agricultural holdings in parts of Europe, and it could be an option to increase viability of agriculture in regions with processes of marginalization. The share of forests in total area of agricultural and forest land indicates the present importance of forests in land utilization. It might reflect processes of marginalization in case land becomes less viable. However, forestry also might be an alternative to farmers, and an additional source of income to agriculture. This share exceeds 30% (average of EU 12) in Belgium, Germany, Spain, France, Luxembourg and Portugal. More than half of total agricultural and forest area is covered by forests in parts of Germany (Hessen, Rheinland-Pfalz, Saarland), Spain (Galicia, Asturias, Cantabria, Pais Vasco), France (Aquitaine, Provence-Alpes-Côte d'Azur) and Italy (Trentino-Alto Adige, Liguria).

The price of land could largely reflect viability of farming because this indicator derives from the output achieved from agriculture and economic return from alternative activities. This indicator may therefore reflect pressures to withdraw land from agriculture for other purposes. The price of land on a per hectare basis

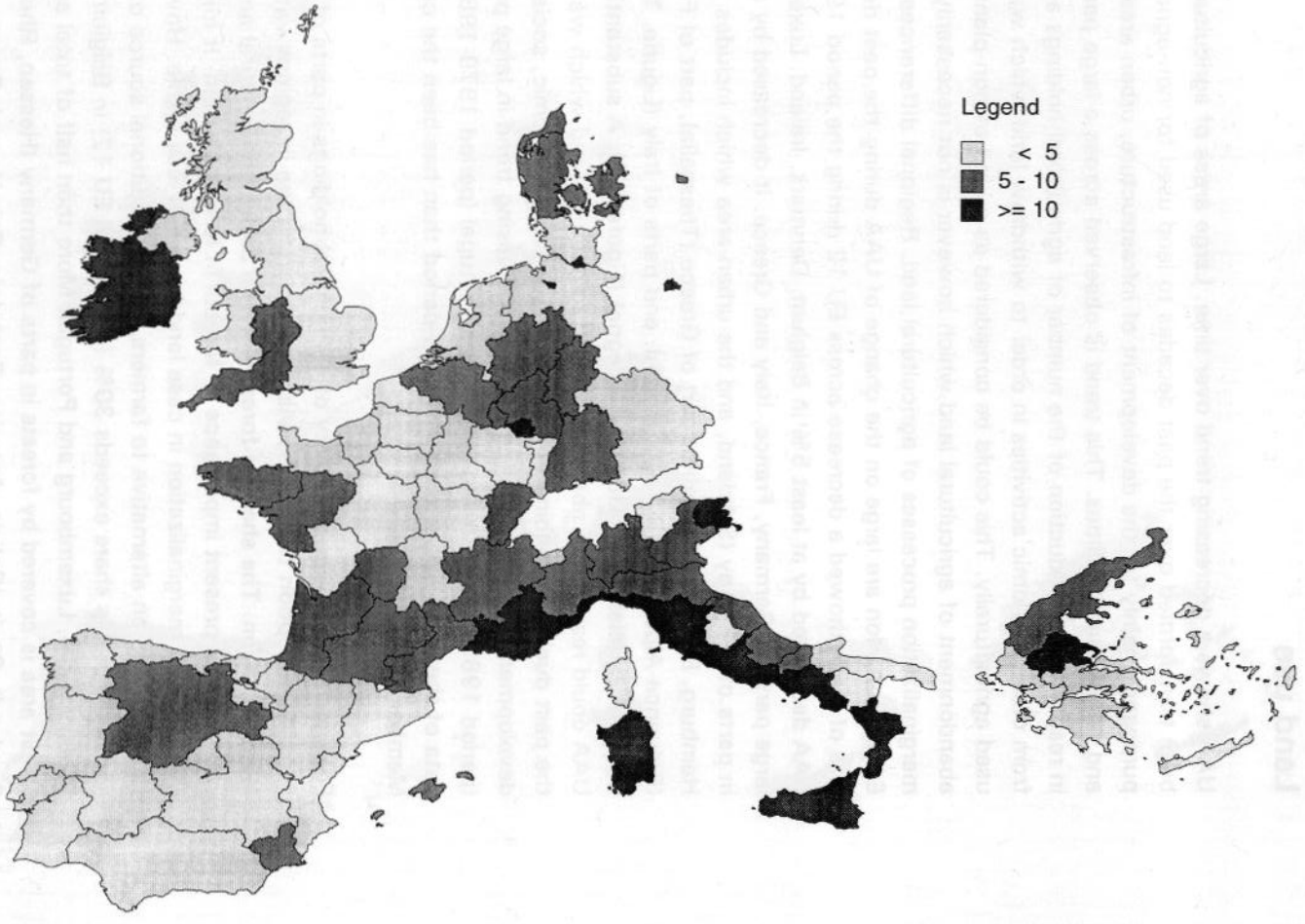


Figure 5.2 Decrease in Utilized Agricultural Area (%)

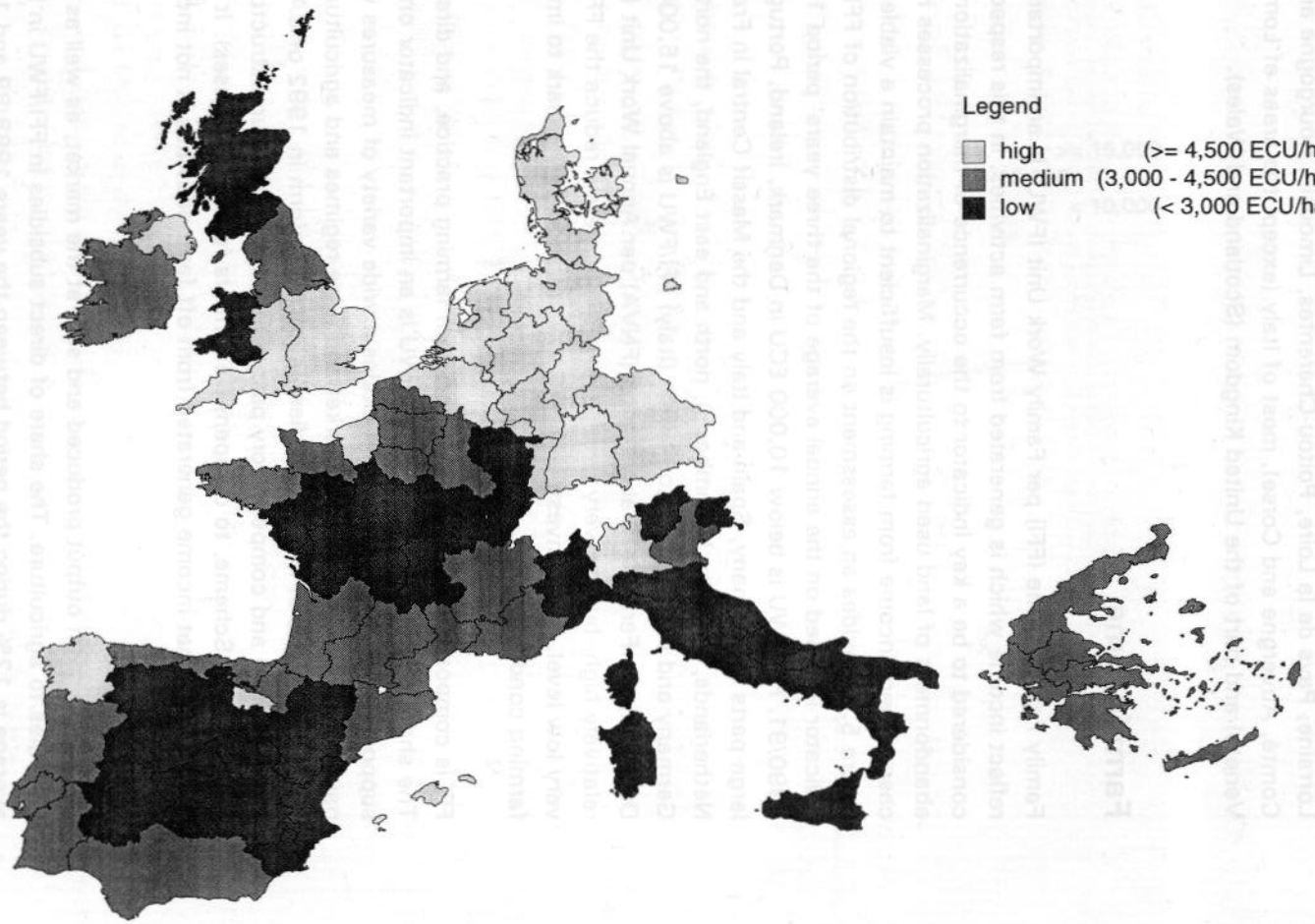


Figure 5.3 Price of land per hectare (classes)

is highest (over 4,500 ECU) in the northern part of Europe, including Denmark, Germany, the Netherlands, Belgium, Luxembourg and the southern part of England. Contrary to this it is lowest in regions with low economic returns from agriculture (Figure 5.3). It is below 3,000 ECU per hectare (category 'low') in the central parts of Spain (regions of Aragon, Castilla-Leon, Madrid, Castilla-la Mancha, Comunidad Valenciana, Murcia and Extremadura) and France (Centre, Lorraine, Pays de la Loire, Poitou-Charentes, Limousin, Bourgogne and Franche-Comté, Auvergne and Corse), most of Italy (except the areas of Lombardia and Veneto) and part of the United Kingdom (Scotland and Wales).

5.5 Farm income

Family Farm Income (FFI) per Family Work Unit (FWU) is an important indicator to reflect income which is generated from farm activities. In this respect it is considered to be a key indicator to the occurrence of marginalization and abandonment of land used agriculturally. Marginalization processes may start in cases where income from farming is insufficient to maintain a viable agriculture. Figure 5.4 provides an assessment on the regional distribution of FFI/FWU. The indicator is based on the annual average of the three years' period 1988/89 - 1990/91. FFI/FWU is below 10,000 ECU in Denmark, Ireland, Portugal, Greece, large parts of Germany, Spain and Italy and the Massif Central in France. In the Netherlands, Belgium, Luxembourg, north and east England, the northern part of Germany and France, and Lombardia (Italy) FFI/FWU is above 15,000 ECU. In Denmark, the Farm Net Value Added (FNVA) per Annual Work Unit (AWU) is relatively high, but the very high costs of paid interest reduce the FFI/FWU to a very low level. Major investments have been made in Denmark to improve farming conditions.

FFI is composed of output generated from farming practice, and direct subsidies. The share of direct subsidies in FFI/FWU is an important indicator on government support provided to farming. It includes a wide variety of measures with direct payments which derive from market and price regimes and agricultural structure policy. Examples of direct subsidies before the reform in 1992 of CAP were the ewe premium and compensatory payments under agricultural structure policy (e.g. the LFA Scheme, to compensate farmers for income losses). It needs to be emphasized that income generated from off farm activities is not included in this figure.

FFI derives from output produced and sold at the market, as well as from direct subsidies to agriculture. The share of direct subsidies in FFI/FWU in EU 12 on average is 12% during the period between the years 1988/89 and 1990/91, which is before the reform in 1992 of CAP. It is at least 10% in Denmark, Germany (excluding the region of Hamburg, Bremen and Berlin), Greece, parts of Spain (Pais Vasco, Navarra, Aragon, Castilla-Leon), most of France (except the northwestern part of the country and Alsace), Ireland, parts of Italy (Valle d'Aosta, Toscana, Calabria, Puglia, Basilicata, Sardegna), Luxembourg, Portugal and the United Kingdom (Figure 5.5). The share of direct subsidies in FFI/FWU is

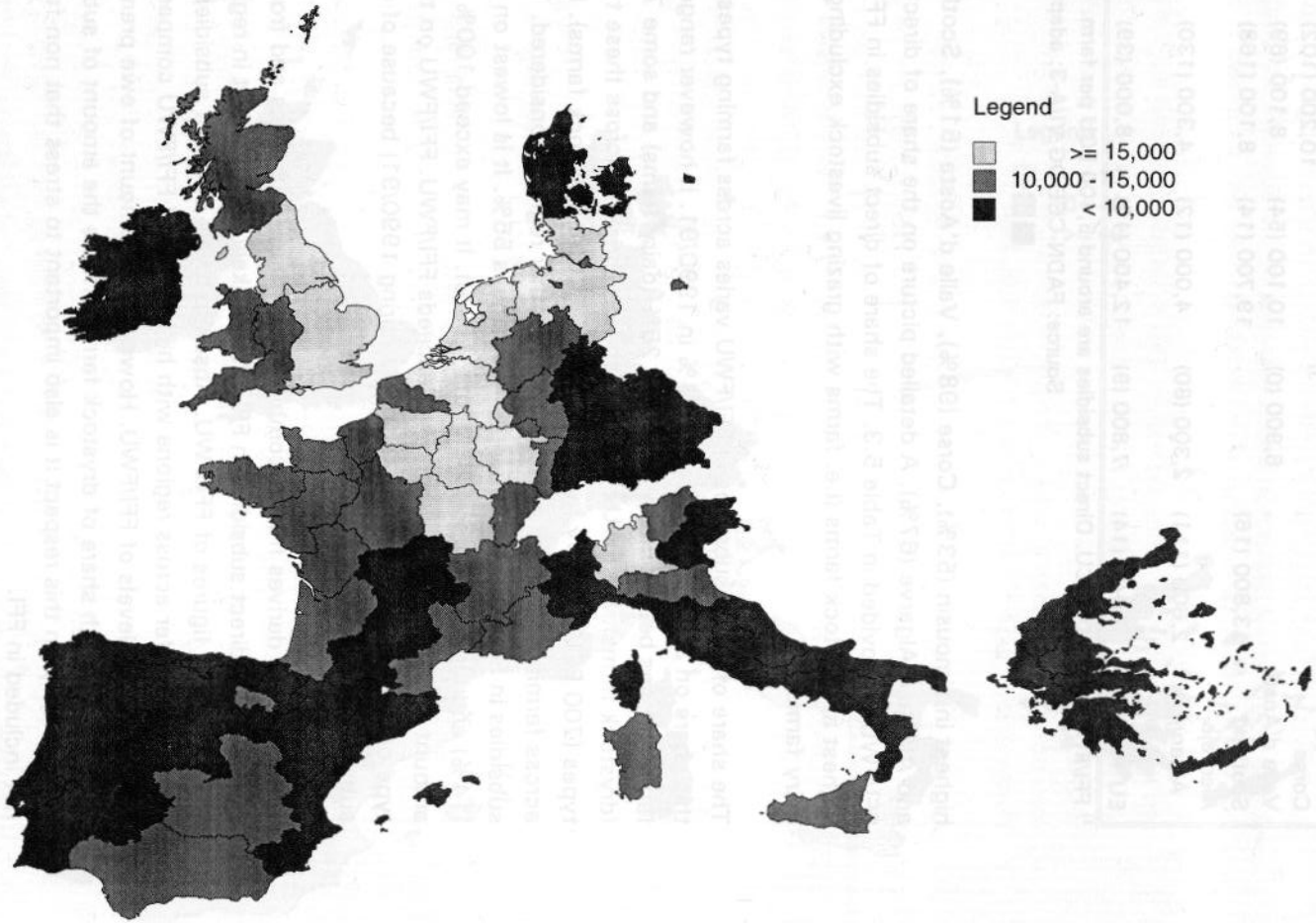


Figure 5.4 Family Farm Income per Family Work Unit (ECU)

Table 5.3 FFI/FWU (ECU) and share of direct subsidies in FFI/FWU (between brackets, %) by farming type in 1990/91

Region	Cereal farms	Permanent crop holdings	Dairy farms	Drystock farms	All farms
Limousin	.	.	11,700 (26)	9,800 (71)	10,000 (64)
Corse	.	[1]	.	10,200 (102)	5,600 (132)
Valle d'Aosta	.	8,900 (0)	10,100 (54)	8,100 (69)	9,200 (56)
Scotland	13,800 (16)	.	19,700 (14)	8,100 (168)	14,500 (55)
Alentejo-Algarve	2,600 (111)	2,300 (80)	4,000 (12)	4,300 (130)	2,000 (120)
EU 12	7,100 (14)	7,800 (9)	12,400 (12)	8,000 (39)	9,200 (13)

[1] FFI/FWU is -5,400 ECU. Direct subsidies are around 5,400 ECU per farm.

Source: FADN-CCE-DG VI/A-3; adaptation LEI-DLO.

highest in Limousin (53%), Corse (98%), Valle d'Aosta (51%), Scotland (52%) and Alentejo-Algarve (67%). A detailed picture on the share of direct subsidies in FFI/FWU is provided in Table 5.3. The share of direct subsidies in FFI/FWU is highest at drystock farms (i.e. farms with grazing livestock excluding specialist dairy farms).

The share of direct subsidies in FFI/FWU varies across farming types. In Limousin this share on average amounts to 64% in 1990/91. It however ranges across farming types between approximately 25% (dairy farms) and some 70% (drystock farms). FFI/FWU shows much less variation across these two farming types (700 ECU on dairy farms and 9,800 ECU on drystock farms). Differences across farming types are also large in the other regions considered. The share of subsidies in FFI/FWU in Scotland on average is 55%. It is lowest on dairy farms (14%) and highest on drystock farms (168%). It may exceed 100% in case the amount of direct subsidies received exceeds FFI/FWU. FFI/FWU on that farming type only remains positive (8,000 ECU during 1990/91) because of direct subsidies.

This indicator derives from a combination of direct subsidies and from FFI/FWU. The share of direct subsidies in FFI/FWU is likely to be lowest in regions with relatively high figures of FFI/FWU. Absolute levels of direct subsidies do not necessarily differ across regions with high levels of FFI/FWU compared to the ones with low levels of FFI/FWU. However, the amount of ewe premiums in areas with a high share of drystock farms affects the amount of subsidies considerably. In this respect it is also important to stress that non-farm income is not included in FFI.

The share of direct subsidies in FFI/FWU may be considerably affected by the 1992 reform of CAP. A further investigation of direct subsidies after the reform in 1992 of CAP, and their relevance to FFI is provided in Chapter 6 of the report.

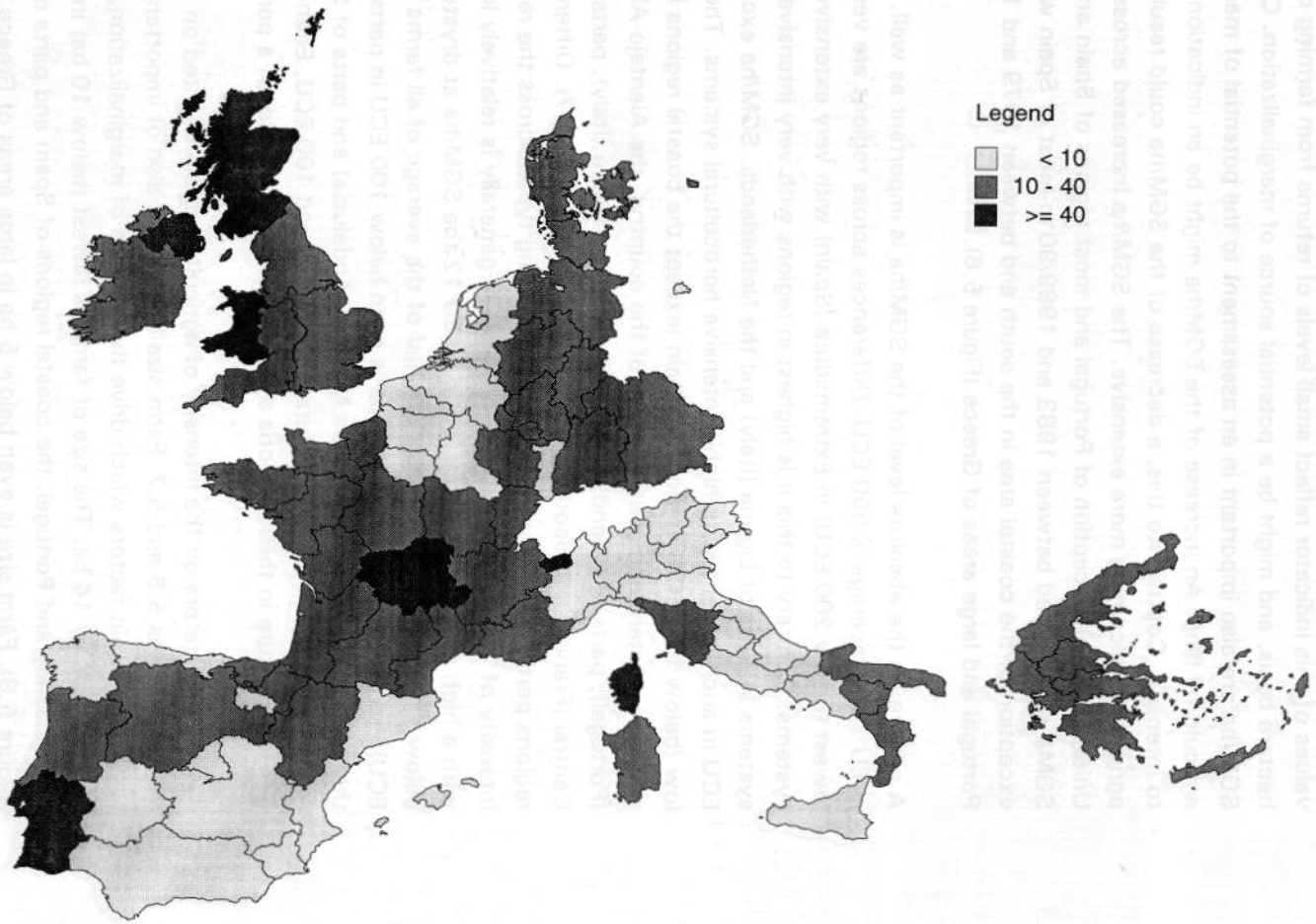


Figure 5.5 Share of direct subsidies in FFI/FWU (%)

5.6 Farm structure

The Standard Gross Margin (SGM) per hectare of UAA is an indicator on the intensity of agricultural production. It reflects the economic size of the different species of land use and livestock population which belong to a holding. Low values of this indicator reflect small levels of returns from farming on a per hectare basis, and might be a potential source of marginalization. Changes in SGM/ha are also important in an assessment to the potential of marginalization of agricultural land. An increase of the SGM/ha might be an indication of agriculture to intensify. Contrary to this, a decrease of the SGM/ha could result from agriculture becoming more extensive. The SGM/ha increased across the whole Union, with the exception of Portugal and most regions of Spain and Greece. The SGM/ha decreased between 1983 and 1989/90 in most of Spain with the exception of the coastal area in the south and between 1979 and 1989/90 in Portugal and large areas of Greece (Figure 5.6).

A picture on the absolute level of the SGM/ha is important as well. The SGM/ha in EU 12 on average is 960 ECU. Differences across regions are very large. It is lowest (below 200 ECU) in Extremadura (Spain) with very extensive agricultural systems. Contrary to this it is highest in regions with very intensive agricultural systems in parts of Liguria (Italy) and the Netherlands. SGM/ha exceeds 5,000 ECU in such regions with highly intensive horticultural systems. The SGM/ha is low (below 500 ECU) in most of Spain (except the coastal regions in the northern, eastern and southern part of the country), the Alentejo-Algarve region (Portugal), parts of Ireland, the region of Valle d'Aosta (Italy), parts of the Massif Central (France) and Scotland (United Kingdom) (Figure 5.7). Differences across regions partly result from the prevailing farming types across the regions. The intensity of agricultural practice for example generally is relatively low in regions with a high share of drystock farms. In EU 12 the SGM/ha at drystock farms is below 400 ECU, which is less than half of the average of all farms in EU 12 (960 ECU). SGM/ha of that farming type is even below 100 ECU in parts of Spain (in the regions of Aragon, Castilla-la Mancha, Andalucia) and parts of Scotland. Also, in the region of Extremadura it is only around 100 ECU. Economic returns from agriculture in these regions are very low, if measured on a per hectare basis.

The two indicators on the intensity of agriculture are presented on a per hectare basis in Figures 5.6 and 5.7. Farm size is however also of importance to the analysis of main factors which drive the process of marginalization. On average in EU 12 it is only 14 ha. The size of farms is lowest (below 10 ha) in Greece, large areas of Italy and Portugal, the coastal regions of Spain and parts of Belgium (Figure 5.8). Farm size is even below 5 ha in large areas of Greece, parts of Spain (Galicia, Comunidad Valenciana and Canarias), Italy (Liguria, Veneto, Lazio, Campania, Calabria, Puglia and Sicilia) and Portugal (Norte-Centro and Açores-Madeira) and exceeds 200 ha in the Highlands of Scotland.

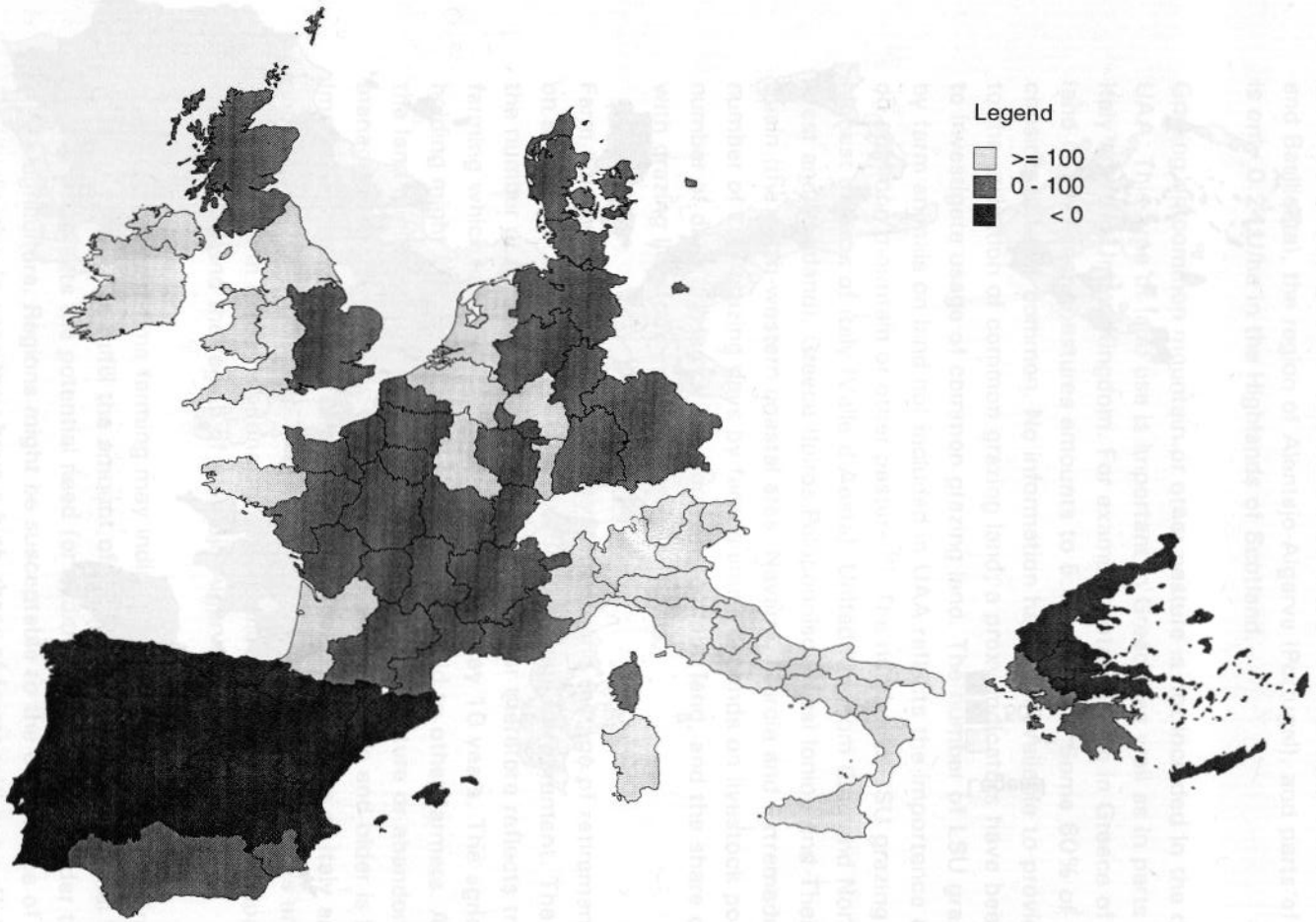


Figure 5.6 Change in Standard Gross Margin per ha UAA (%)

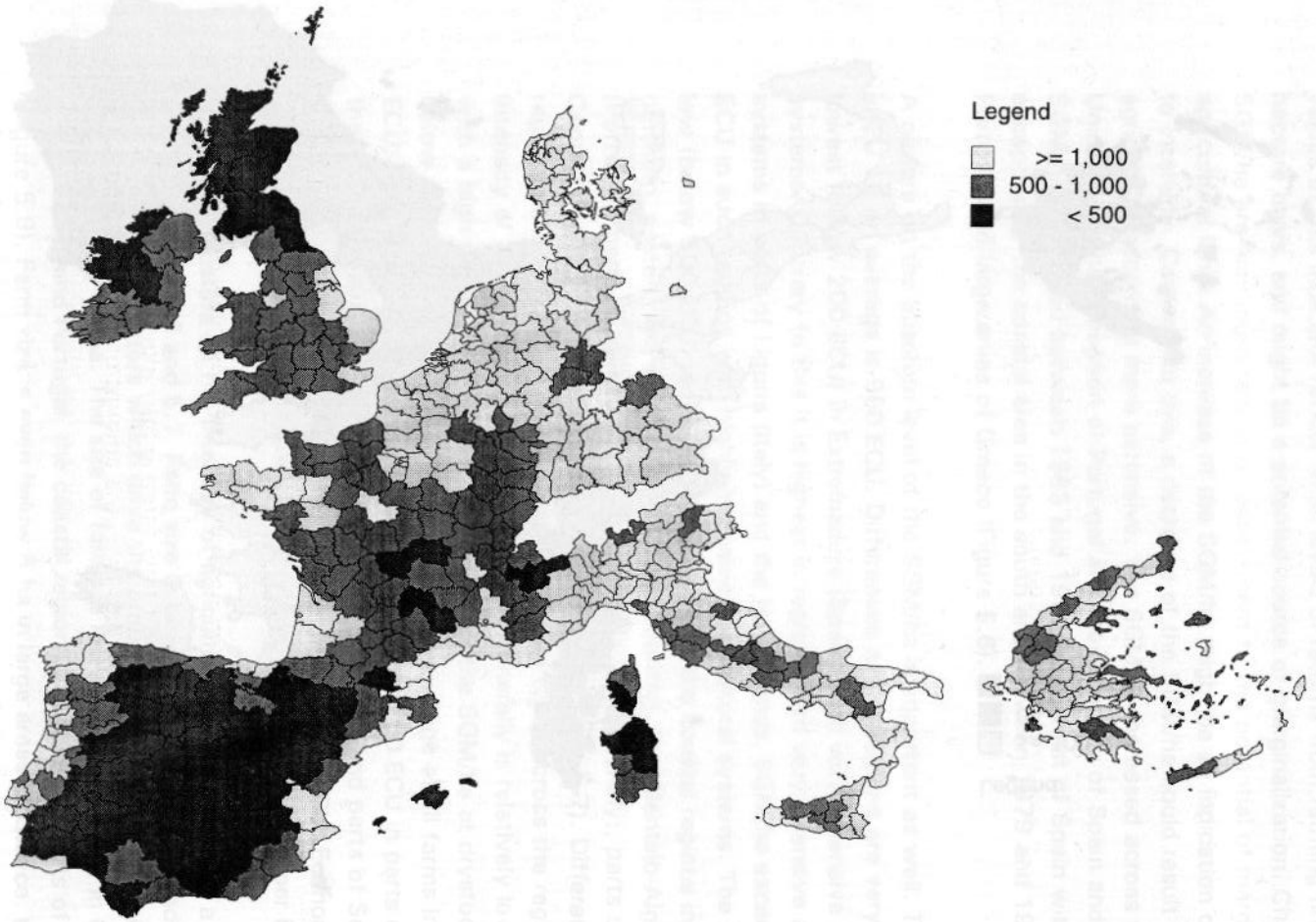


Figure 5.7 Standard Gross Margin per hectare UAA (ECU)

Stocking density of livestock population is an indicator to reflect the intensity of farming practice. Low levels of livestock density reflect extensive ways of farming. Stocking density of grazing livestock (number of Livestock Units (LU) per hectare of forage crops) in EU 12 is 1.1 LU/ha. It is below 0.5 LU/ha in parts of Spain (e.g. Navarra, Aragon, Castilla-La Mancha, Extremadura and Andalucia), the region of Languedoc-Roussillon (France), parts of Italy (Valle d'Aosta, Liguria and Basilicata), the region of Alentejo-Algarve (Portugal), and parts of Scotland. It is only 0.2 LU/ha in the Highlands of Scotland.

Grazing on common mountain or other pasture is not included in the definition of UAA. This type of land use is important in Greece, as well as in parts of Spain, Italy and the United Kingdom. For example, total surface in Greece of grazing land or permanent pastures amounts to 5.1 million ha. Some 60% of that land is considered to be common. No information has been available to provide insights to the utilization of common grazing land, a proxy indicators have been explored to investigate usage of common grazing land. The number of LSU grazing days by farm animals on land not included in UAA reflects the importance of grazing on common mountain or other pasture [1]. The number of LSU grazing days is highest in parts of Italy (Valle d'Aosta), United Kingdom (England North, England West and Scotland), Greece (Ipiros Peloponnisos Nissi Ioniou and Thessalia) and Spain (the north-western coastal area, Navarra, Murcia and Extremadura). The number of LSU grazing days by farm animals depends on livestock population, number of days grazing by livestock on common land, and the share of farms with grazing livestock in total number of farms.

Farm holders decide on leaving their farm around the age of retirement. Decisions on succession of farming are taken around the age of retirement. The share of the number of holders aged of 55 years and older therefore reflects transition of farming which is to be expected in a period of say 10 years. The agricultural holding might be taken over by successors or sold to other farmers. Alternatively, the land might be used for activities other than agriculture or abandoned of management. The share of farm holders of age 55 years and older is highest (more than 60%) in parts of Portugal and Spain, large areas of Italy and small parts of Greece (Figure 5.9). The share of farm holders of 65 years and older exceeds 30% in Ipiros Peloponnisos Nissi Ioniou (Greece), Galicia (Spain), large areas of Italy and the region of Alentejo-Algarve (Portugal).

The extent of part-time farming may indicate the occurrence of holdings with insufficient work to fulfill the amount of work required for an Annual Work Unit (AWU). It reflects the potential need for additional activities in order to maintain a viable agriculture. Regions might be susceptable to the occurrence of marginalization in case they have a high share of farms without sufficient other gainful activities that also have insufficient activities to meet the requirements to fulfill the standards on AWU.

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1. The LSU grazing day is a unit equivalent to one day's grazing by one dairy cow, one bovine animal or one horse more than two years old. The grazing days for cattle and horses less than two years old, goats and sheep are converted into grazing days per LSU by applying the coefficients 0.5, 0.2 and 0.15 respectively.

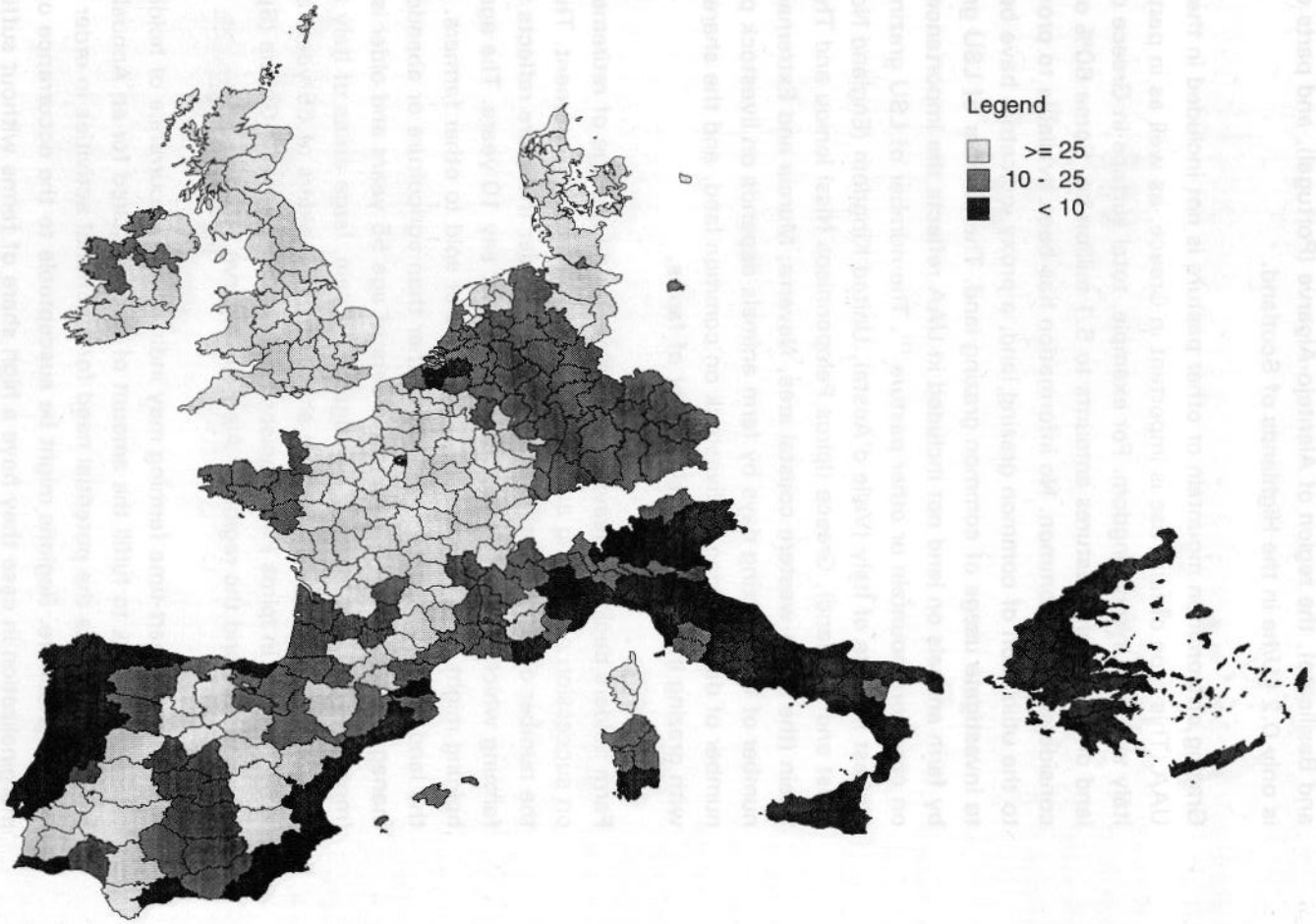

Figure 5.8 Utilized Agricultural Area per holding (ha)

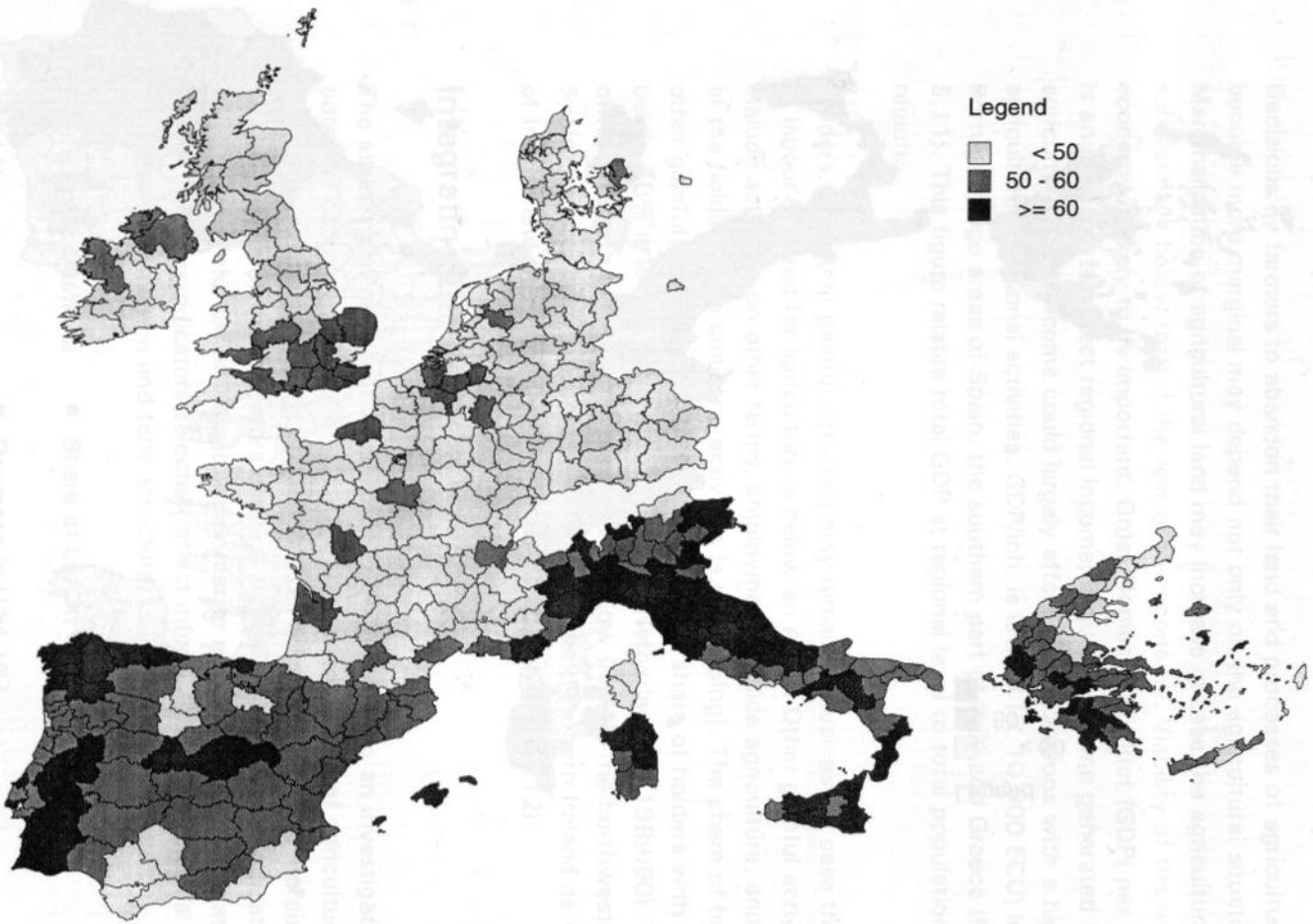

Figure 5.9 Share of farm holders of age 55 years and older (%)

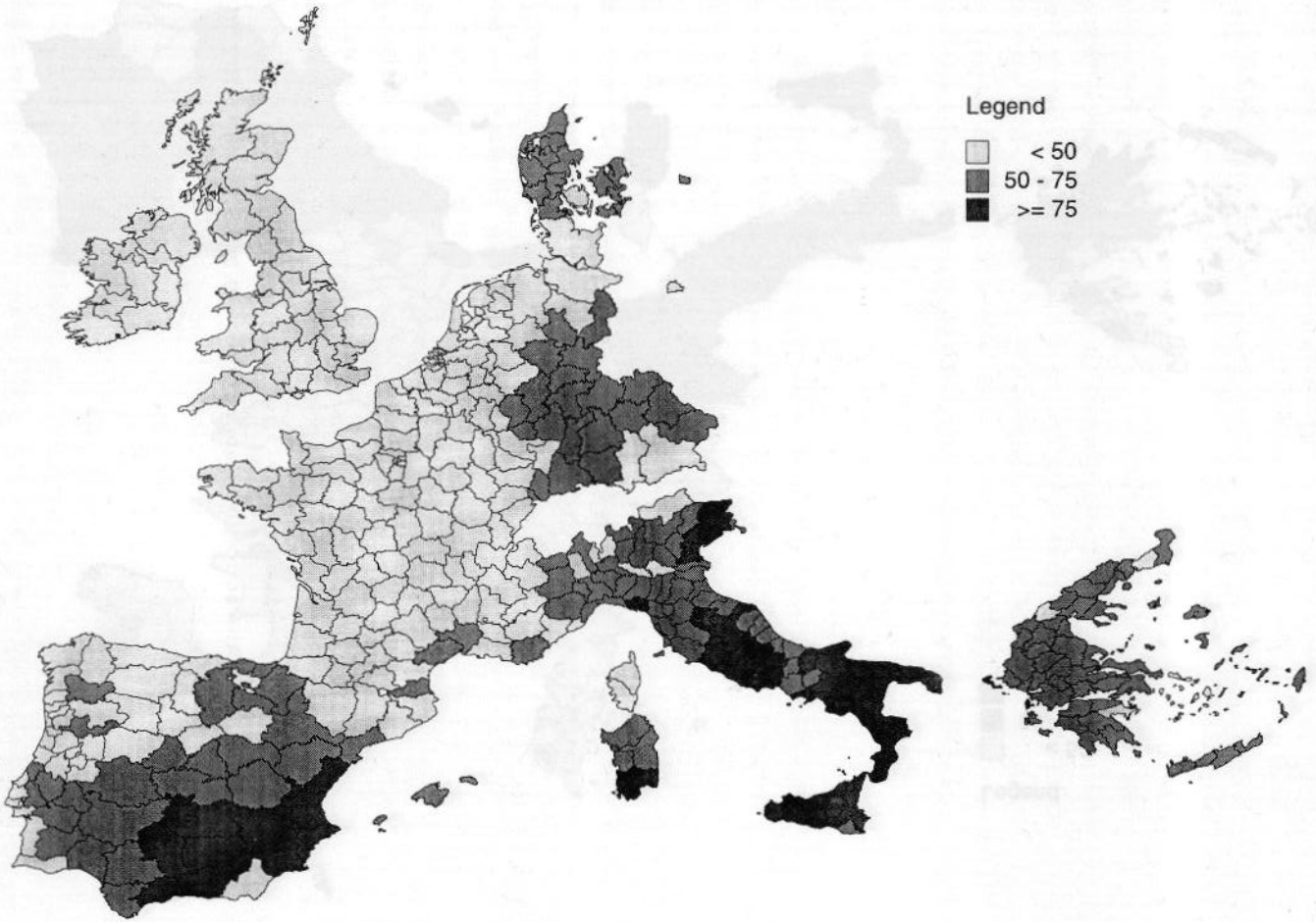

Figure 5.10 Share of farm holders with work time below 50% of Annual Work Unit (%)

The share of the number of holders with work time below 50% of AWU is highest (more than 75%) in parts of Spain (Comunidad Valenciana, Murcia and Andalucia) and in large parts of Italy (Figure 5.10).

5.7 Rural and regional development

Decisions by farmers to abandon their land and processes of agricultural land to become more marginal may depend not only on the agricultural situation. Marginalization of agricultural land may increase in case the agricultural income is substantially below that of the rest of the economy. Viability of the rest of the economy is likely to be important. Gross Domestic Product (GDP) per inhabitant is an indicator to reflect regional income, including income generated from agriculture. Farm income could largely affect GDP in regions with a high share of agriculture in regional activities. GDP/inh. is lowest (< 10,000 ECU) in Ireland, Portugal, large areas of Spain, the southern part of Italy and Greece (Figure 5.11). This figure relates total GDP at regional level to total population in that region.

Holders with other gainful activities may remain in business in case the amount of labour required for agriculture is below an AWU. Other gainful activities may include activities on other farms, employment outside agriculture, and activities at the holding from non-farm activities (e.g. camping). The share of holders with other gainful activities may be low because the share of holders with work time below 50% is low as well (e.g. 15% in the Netherlands in 1989/90). The share of holders with other gainful activities is below 25% in the northwestern part of Spain, parts of Italy and Greece, most of France, Northern Ireland as well as parts of Ireland and the Netherlands and Luxembourg (Figure 5.12).

5.8 Integrating the indicators

The assessment of indicators is aimed at contributing to an investigation of the potential occurrence of marginalization and abandonment of agricultural land in Europe. A cluster analysis is applied in order to group regions according to their characteristics of the indicators used. A limited number of key indicators was selected from the set of indicators in order to allow for the interpretation of results. The key indicators selected reflect information on biophysical conditions, land use, farm income and farm structure:

Biophysical conditions	• Share of LFA in UAA (%)
Land Use	• Decrease in UAA (%)
Farm Income	• FFI/FWU (ECU)
Farm Structure	• SGM/ha (ECU) • UAA per holding (ha) • Share of farm holders of age 55 years and older (%)

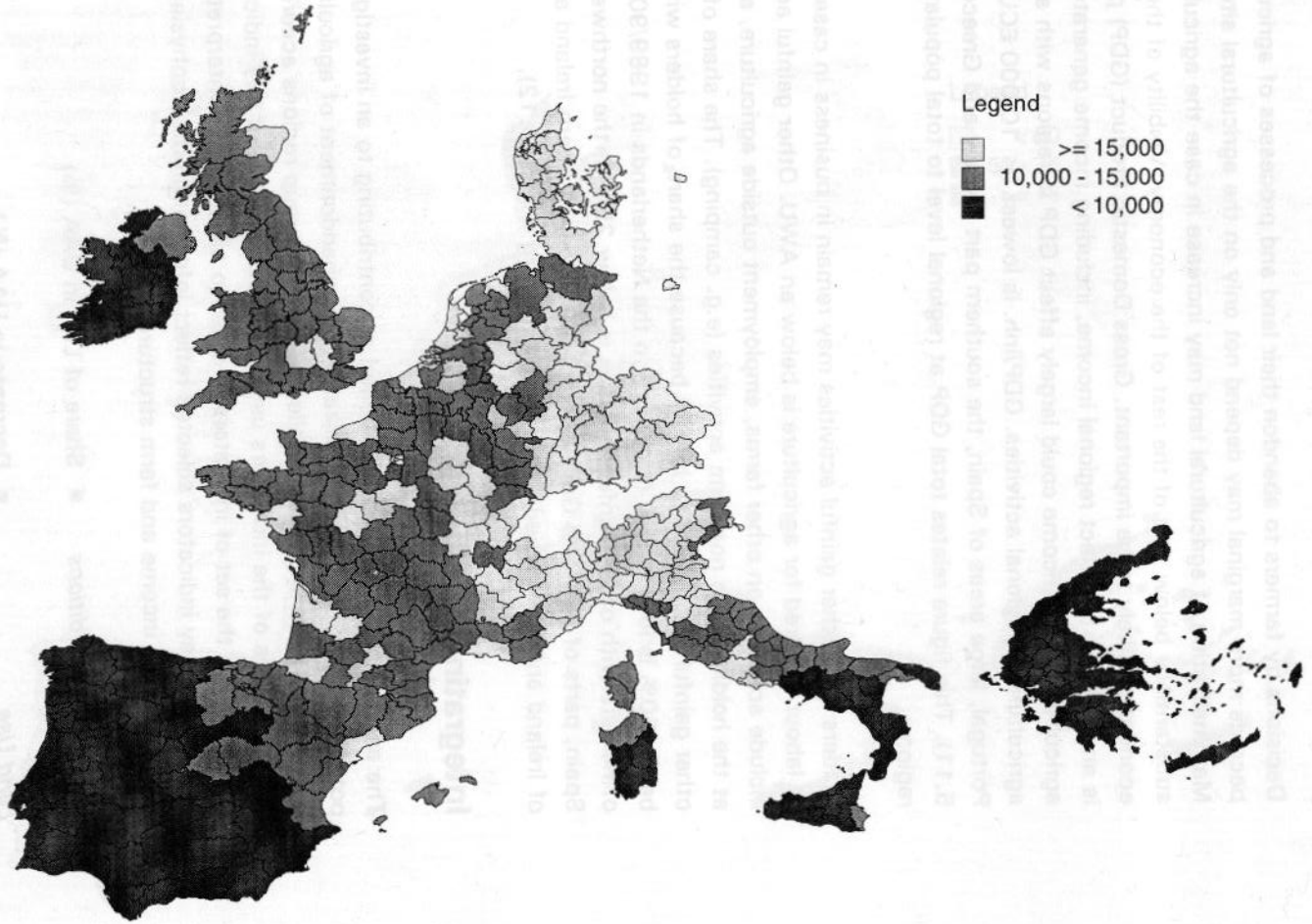

Figure 5.11 Gross Domestic Product per inhabitant (ECU)

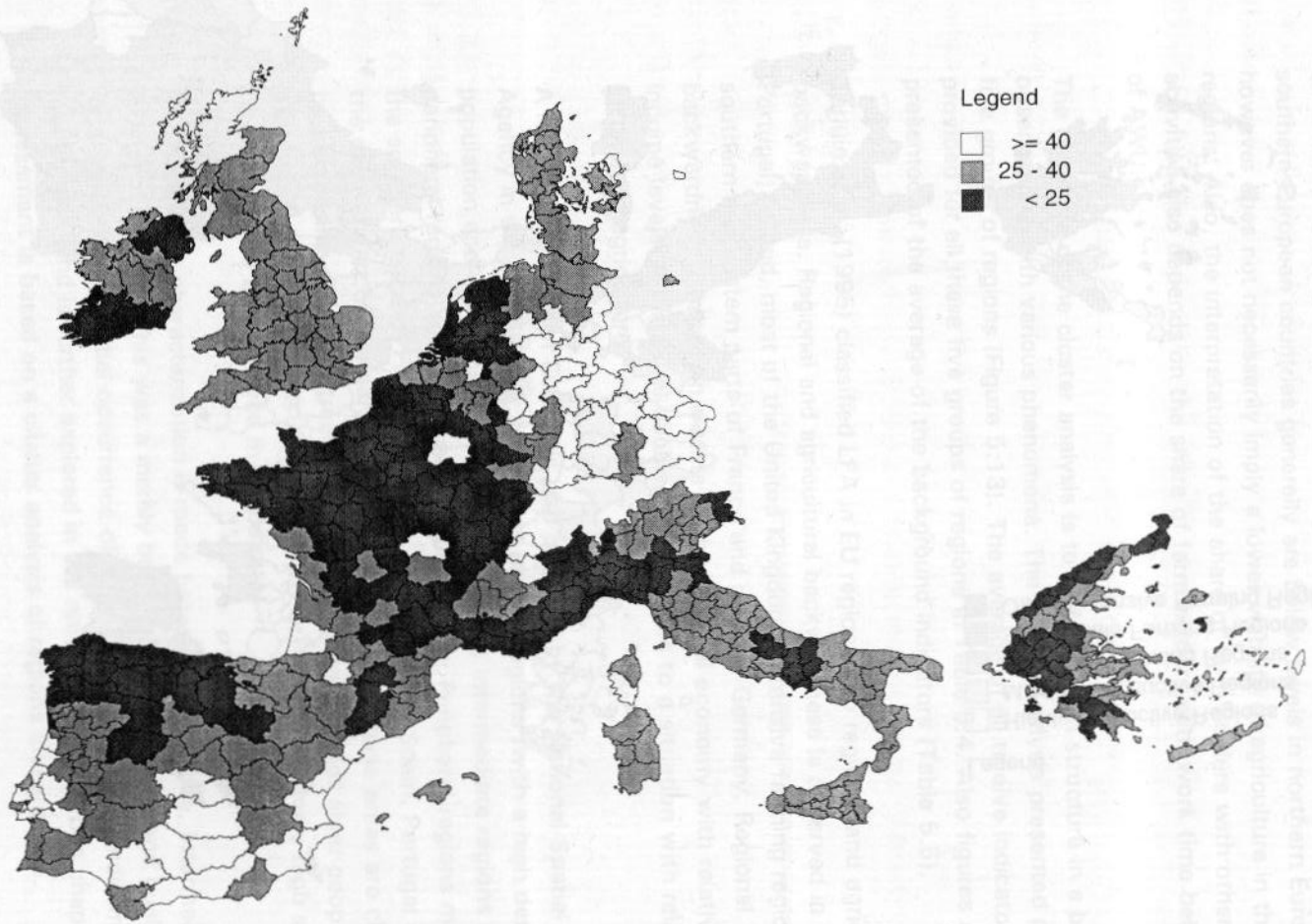

Figure 5.12 Share of farm holders with other gainful activities (%)

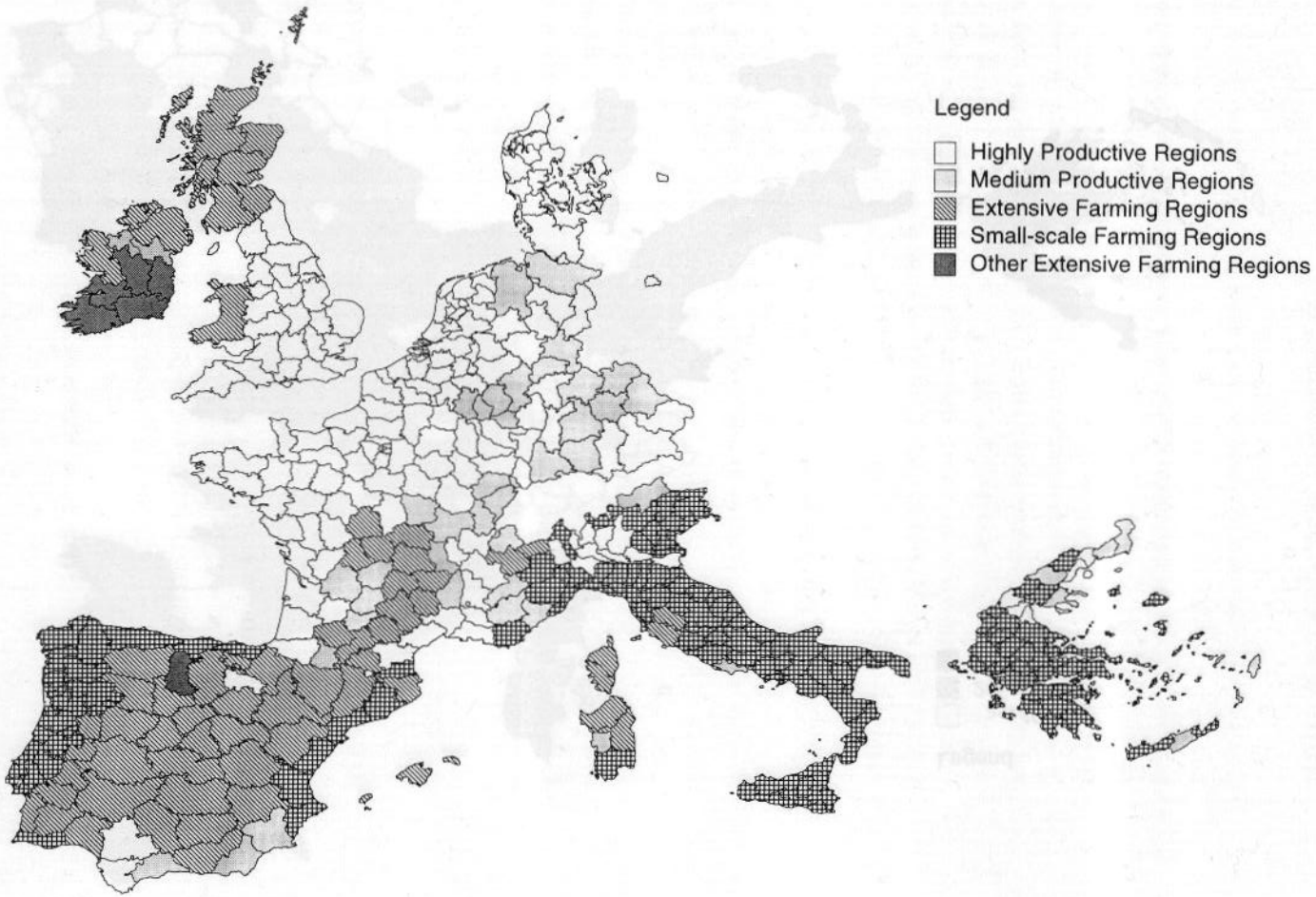

Figure 5.13 Classification of regions according to the cluster analysis

The cluster analysis is applied on 424 sub-regions. Data on decrease in UAA and on FFI/FWU however only are available for 87 regions. The assumption was made that data of 87 regions also apply to the more detailed regionalization. No indicators were selected from the group of indicators that reflect rural and regional development. A major problem in this respect arises because of differences between northern and southern European regions. GDP/inh. in southern European countries generally are below levels in northern Europe. This however does not necessarily imply a lower viability of agriculture in these regions. Also, the interpretation of the share of farm holders with other gainful activities also depends on the share of farm holders with work time below 50% of AWU.

The objective of the cluster analysis is to find a certain structure in a broad set of observations with various phenomena. The cluster analysis presented provides five groups of regions (Figure 5.13). The average of all twelve indicators is provided for all these five groups of regions in Table 5.4. Also figures are presented of the average of the background indicators (Table 5.5).

Terluin et al. (1995) classified LFA in EU regions into regional and agricultural backwardness. Regional and agricultural backwardness is observed in Greece, Portugal, Ireland, most of the United Kingdom (extensive farming regions), the southern and eastern parts of France and parts of Germany. Regional backwardness is based on a state of the regional economy with relatively low income levels. Agricultural backwardness refers to a situation with relatively low incomes in agriculture.

A regional typology of Europe is also provided by the National Spatial Planning Agency in the Netherlands. It includes central regions (with a high density of population and low rates of population growth), intermediate regions and peripheral regions with a low population density. Peripheral regions mainly include the southern parts of France and Italy, large areas of Spain, Portugal and Greece, the eastern part of Germany, Scotland and Ireland. These areas are characterized by decreasing polulation trends and an increasing share of elder people. Economic structures of these regions are relatively poor, with a relatively high share of labour force to be employed in agriculture.

In Chapter 3 a characterization is made between Productive, Intermediate and Marginal Regions. This was a merely based on a conceptual and qualitative approach. The potential occurrence of marginalization and abandonment of agricultural land is further explored in the remaining part of this chapter. The assessment is based on a cluster analysis of regions investigated.

Some charactertistics of the five clusters are provided in the following. It is to identify regions which are potentially vulnerable to the occurrence of marginalization.

Highly Productive Regions

This group of regions includes agriculture in Highly Productive Regions. It includes almost 40% of total UAA in EU 12 and approximately 20% of the agricultural holdings. The group is characterized by relatively high levels of FFI/FWU (16,000 ECU), and a high intensity of production since the SGM/ha equals almost 1,750 ECU. The intensity of production also increased substantially during the period between 1975 and 1989/90. GDP/inh. is also high as it exceeds 15,000 ECU, but it is below FFI/FWU. UAA decreased by some 4% between 1975 and 1989/90. The share of LFA in UAA is only 16%, which is far below that in the other groups of regions identified. This group of regions therefore has limited handicaps from natural conditions.

Medium Productive Regions

Agriculture in this cluster is much more extensive than in the previous cluster of regions. This group includes Medium Productive Regions of EU 12. The SGM/ha on average amounts to 1,000 ECU, which is around the average of EU 12. This cluster is also characterized by a high share of LFA in UAA (83%). This group of regions has a small share of farm holders of age 55 years and older (42%).
This group of regions performs relatively well from a regional economic perspective. Firstly, because GDP/inh. is relatively high. Also, more than a third of farm holders do have other gainful activities in this group of regions. The future perspective of agriculture in this group of regions remains relatively good, despite the high share of natural handicaps.

Extensive Farming Regions

This group of regions can be characterized by Extensive Farming Regions, with low intensity of farming on a per hectare basis since the SGM/ha is less than half of the average of EU 12. The share of LFA in UAA is very high (85%). The share of direct subsidies in FFI/FWU is high (28%), more than double that of the average of EU 12. The increase over time in SGM/ha has been small.
The extensive nature of farming is also reflected by the observation that this group of regions cover about a third of total UAA in EU 12 and approximately 16% of all agricultural holdings. This cluster includes many relatively big farms, since farm size is more than double that of the average in EU 12. The extensive nature of agriculture is also reflected by low density of livestock population. Stocking density of grazing livestock is very low (0.6 LU per hectare of forage crops).

Small-scale Farming Regions

This cluster is characterized by Small-scale Farming Regions, with relatively small farms (an average of 5 hectare) and rather intensive farming practice. They only cover 17% of UAA in EU 12. The SGM/ha is relatively high (1,650 ECU), but FFI/FWU is low (6,500 ECU), and still substantially below GDP/inh. in that group of regions (9,500 ECU). The intensity of farming is only slightly below that in the

Table 5.4 Average of the indicators for the five clusters of regions [1]

Indicator	Highly Productive Regions	Medium Productive Regions	Extensive Farming Regions	Small-scale Farming Regions	Other Extensive Farming Regions
Key indicators used to cluster regions					
Share of LFA in UAA (%)	16	83	85	65	38
Decrease in UAA (%)	4	5	-2	-1	11
FFI/FWU (ECU)	16,200	10,300	8,700	6,500	9,500
SGM/ha (ECU)	1,730	980	430	1,660	530
UAA per holding (ha)	33	19	37	5	33
Share of farm holders of age 55 years and older (%)	46	42	51	60	43
Other indicators					
Price of land per hectare (classes)	Medium	Medium	Low	Medium	Medium
Share of direct subsidies in FFI/FWU (%)	11	17	28	12	18
Change in SGM/ha (%)	90	69	29	77	116
Share of farm holders with work time below 50% of AWU (%)	36	47	49	65	18
GDP/inh. (ECU)	15,100	12,800	10,400	9,500	9,400
Share of farm holders with other gainful activities (%)	25	36	31	29	24

[1] For a description of the abbreviations see LIST OF ABBREVIATIONS.

Sources: FADN, Eurostat; adaptation LEI-DLO.

Highly Productive Regions, although farm size is far below that in all other groups of regions. This group of regions include more than half of all agricultural holdings in EU 12, and about 40% of them belong to the farming types of permanent crops (including vineyards) The share of farm holders of 55 years and older is about 60%, which is above that in the other regions. The age distribution of farm holders is rather uneven, since about a third of all farm holders are at the age of more than 65 years. Also, only 6% of all farm holders in this cluster are younger than 35.

Other Extensive Farming Regions

This group includes a small number of regions with extensive agriculture and a low share of LFA in UAA. It is referred to as Other Extensive Farming Regions. It only includes 1% of the total number of agricultural holdings in EU 12. More than half of all farms in this group are drystock farms. GDP/inh. (9,400 ECU) is low. FFI/FWU is around GDP/inh. SGM/ha more than doubled during the 15-years period between 1975 and 1990.

Table 5.5 Average of some background indicators for the five clusters of regions [1)]

Indicator	Highly Productive Regions	Medium Productive Regions	Extensive Farming Regions	Small-scale Farming Regions	Other Extensive Farming Regions
Share of cluster in total UAA in EU 12 (%)	38	11	31	17	3
Share Mountain area in UAA (%)	4	24	34	45	2
Share Other LFA in UAA (%)	11	59	52	20	36
Standard Gross Margin (ECU)					
- per holding	39,200	15,900	13,600	7,200	17,300
- per AWU	25,700	14,100	13,000	8,800	12,900
Stocking density of grazing livestock (LU/ha forage crops)	2.1	1.6	0.6	2.0	1.4
Distribution of farm holders with work time of an AWU by class (%)					
- < 50% of AWU	35	47	49	65	18
- 50-100% of AWU	14	15	20	19	17
- 100% of AWU	51	38	31	16	65
Distribution of farm holders by age class (%)					
- < 35	11	13	10	6	14
- 35 - 44	20	20	17	13	20
- 45 - 64	53	53	51	50	47
- > = 65	16	14	22	31	19
Number of holdings (x 1,000)	1,580	850	1,250	4,050	120
Share of cluster in total number of holdings in EU 12 (%)	20	11	16	52	1
Share of total number of farms (%)					
- cereal farms	8	6	12	8	7
- general cropping farms	21	19	19	26	4
- horticultural holdings	4	4	2	2	0
- vineyards	7	6	6	8	0
- permanent crop holdings	5	17	20	33	0
- dairy farms	17	14	5	4	28
- drystock farms	19	15	24	8	56
- granivore farms	3	1	1	1	0
- mixed farms	15	16	11	11	5
SGM/ha by farming type (ECU)					
- cereal farms	750	550	340	690	390
- general cropping farms	1,280	950	570	1,490	650
- horticultural holdings	17,830	18,060	5,600	13,240	4,440
- vineyards	3,320	3,090	780	1,760	80
- permanent crop holdings	6,080	4,870	1,500	2,520	3,590
- dairy farms	1,420	1,270	1,030	2,180	960
- drystock farms	990	650	270	1,030	350
- granivore farms	10,120	8,290	5,520	13,340	4,800
- mixed farms	1,310	810	470	1,250	520

[1)] For a description of the abbreviations see LIST OF ABBREVIATIONS.

Source: Eurostat; adaptation LEI-DLO.

The cluster analysis provides two types of regions that are susceptible for marginalization. One type which is mainly characterized by extensive agriculture (Extensive Farming Regions), the other one which mainly includes small scale farming (Small-scale Farming Regions). FFI/FWU in these regions on average is rather low, and below GDP/inh. Also, the SGM in these regions is relatively low, either on a per hectare basis (Extensive Farming Regions) or on a per farm basis (Small-scale Farming Regions). The share of farm holders of age 55 years and older exceeds 50% in both groups. This implies that the decision to take over farming may have to be taken in a short time for a large number of farms in these regions. Other gainful activities already are important in Extensive Farming Regions, where about half of farm holders have work time which is below 50% of AWU. In Small-scale Farming Regions, the share of farm holders with work time below 50% of AWU is 65%, while the share of holders with other gainful activities is only half of it.

The sub-regions in which the case studies in this research project are located are, except for Finland and Waterland (the Netherlands), located in the Extensive Farming Regions. More detailed figures about the indicators in these sub-regions are placed in the Boxes. No information is available on Finland and the Waterland region in the Netherlands. They are therefore excluded from the boxes.

Indicators for the sub-regions in which the case-study areas are located [1]

Indicator	Lozère	Extremadura		Valle d'Aosta	Grosseto
		Badajoz	Cáceres		
Key indicators used to cluster regions					
Share of LFA in UAA (%)	100	84	100	100	59
Decrease in UAA (%)	6	-7	-7	-1	11
FFI/FWU (ECU)	12,900	5,500	5,500	7,900	7,300
SGM/ha (ECU)	220	210	190	370	950
UAA per holding (ha)	66	33	31	13	13
Share of farm holders of age 55 years and older in 1989 (%)	36	52	54	58	61
Other indicators					
Price of land per hectare (classes)	Medium	Low	Low	Low	Low
Share of direct subsidies in FFI/FWU (%)	23	6	6	51	14
Change in SGM/ha (%)	75	-22	-22	93	115
Share of farm holders with work time below 50% of AWU (%)	19	70	71	58	64
GDP/inh. (ECU)	13,500	5,600	7,900	18,800	12,100
Share of farm holders with other gainful activities (%)	18	39	39	24	27

[1] For a description of the abbreviations see LIST OF ABBREVIATIONS.

Sources: FADN, Eurostat; adaptation LEI-DLO.

Some background indicators for the sub-regions in which the case-study areas are located[1)]

Indicator	Lozère	Extremadura		Valle d'Aosta	Grosseto
		Badajoz	Cáceres		
UAA (1,000 ha)	256	1,623	1,313	96	215
Share of sub-region in UAA of region (%)	25	55	45	100	23
Share Mountain area in UAA (%)	100	6	14	100	18
Share Other LFA in UAA (%)	-	79	86	-	41
Standard Gross Margin (ECU)					
- per holding	14,500	6,700	5,800	4,700	12,800
- per AWU	12,000	10,800	9,200	5,100	14,100
Stocking density of grazing livestock (LU/ha forage crops)	0.4	0.3	0.3	0.3	0.6
Distribution of farm holders with work time of an AWU by class (%)					
- < 50% of AWU	19	70	71	58	64
- 50-100% of AWU	34	13	14	19	14
- 100% of AWU	47	17	15	23	22
Distribution of farm holders by age class (%)					
- < 35	22	8	8	6	5
- 35 - 44	23	16	15	13	13
- 45 - 64	42	55	54	52	50
- >=65	13	21	23	29	32
Number of holdings (x 1,000)	4	49	43	7	16
Share of total number of farms (%)					
- cereal farms	-	16	5	-	11
- general cropping farms	3	22	18	4	31
- horticultural holdings	-	2	1	0	1
- vineyards	-	7	1	5	7
- permanent crop holdings	4	24	29	8	25
- dairy farms	25	1	2	18	1
- drystock farms	60	12	27	46	10
- granivore farms	1	1	1	0	0
- mixed farms	8	14	17	19	14
SGM/ha by farming type (ECU)					
- cereal farms	.	260	300	.	640
- general cropping farms	520	340	880	1,100	1,080
- horticultural holdings	.	1,160	1,140	14,400	14,740
- vineyards	.	340	280	1,570	1,380
- permanent crop holdings	1,240	300	310	1,580	1,500
- dairy farms	300	640	560	340	1,360
- drystock farms	180	100	110	330	560
- granivore farms	2,400	560	1,300	1,200	7,990
- mixed farms	350	170	170	760	670

[1)] For a description of the abbreviations see LIST OF ABBREVIATIONS.

Source: Eurostat; adaptation LEI-DLO.

Figures in the boxes are sub-regional averages, which may show large differences within sub-regions across farming types. UAA per holding in Extremadura on

average is some 32 ha. This average however ranges largely across farming types. UAA on average is around 100 ha at drystock farms.

The sub-regions of Lozère, Badajoz, Cáceres and Valle d'Aosta are characterized by extensive farming practice with low intensity of farming (SGM/ha is below the average of the group of Extensive Farming Regions). It is around 950 ECU in the sub-region of Grosseto. Extremadura includes two sub-regions for the cluster analysis. The intensity of agricultural production is very low. SGM/ha is around 200 ECU and the stocking density of livestock population is only 0.3 LU/ha forage crops.

5.9 Conclusions

- In Chapter 3 processes and consequences of marginalization are described in a more qualitative way. This research is mainly based on diverse small-scale case-study research work (partly done within this research project; see Chapter 2) and proposed a conceptual and qualitative characterization of EU regions in Productive, Intermediate and Marginal Regions.
- In this chapter a more quantitative way has been followed to identify EU regions which are vulnerable for marginalization. Statistical indicators which give a clear picture of the factors which drive marginalization are not available. So some rough indicators are developed to get grips with the processes of marginalization.
- It is important to realise that the indicators are used for 424 sub-regions in EU 12. So the indicators try to give insight in the process of marginalization on a sub-regional level. However marginalization takes place on different spatial levels (see Chapter 3). The results of this chapter have not the pretension to say anything on the process of marginalization on local, farm and parcel level.
- On the basis of the indicators selected, most of which relate to the late 1980s, a distinction was made between five different groups of regions within EU 12, using a cluster analysis:

  (i) *Highly Productive Regions*
  a set of regions with highly productive agriculture, covering almost 40% of the Union's UAA and about 20% of the agricultural holdings. They cover most of the northwestern part of the EU, excluding Ireland and parts of the UK, notably Scotland and Wales;

  (ii) *Medium Productive Regions*
  regions with medium productivity, covering about 10% of the total UAA and accounting for about 10% of all farm holdings. This group covers large areas of Germany and parts of France;

  (iii) *Extensive Farming Regions*
  regions dominated by extensive farming. They cover about 30% of the

UAA but only around 15% of the agricultural holdings. They include most of Spain, sizeable areas in the southern part of France, parts of the UK, Ireland and Italy;

(iv) *Small-scale Farming Regions*
regions where small-scale farming dominates. These account for more than half of all the holdings in EU 12 and about 15% of the UAA. These regions cover most of Portugal, Italy and Greece;

(v) *Other Extensive Farming Regions*
a small residual group where agriculture is more extensive than the average in the EU. This group covers only about 1% of the holdings in EU 12, but accounts for 3% of the UAA, mainly in Ireland but also in small parts of Spain.

- The typology, based on the cluster analysis, partly fits with the abovementioned characterization of EU regions in Chapter 3.

Qualitative characterization	Quantitative characterization
Productive Regions	Highly Productive Regions
Intermediate Regions	Medium Productive Regions Other Extensive Farming Regions
	Extensive Farming Regions Small-scale Farming Regions
Marginal Regions	

- The regions which are most susceptible to marginalization can be expected to be found in the groups of the Extensive Farming Regions and the Small-scale Farming Regions. They could be identified on the border of the Intermediate and Marginal Regions. Based on the indicators it is not to say they are intermediate or marginal. However they could be susceptible for marginalization. Further investigations would be necessary to draw the conclusion that they are marginal or not.

6 FARMING SYSTEMS IN POTENTIALLY MARGINAL AREAS AND CHANGES IN CAP POLICY

6.1 Introduction

It is widely anticipated that large tracts of agricultural land will become marginal and that significant areas will leave agriculture altogether by the year 2000, 2010 or soon after. A number of studies have attempted forecasts of the scale of land likely to be 'released' from agriculture, although some of the first of these over-estimated the scale of prospective land-use change rather seriously, mainly because of the assumptions adopted.

In the UK, studies following various different approaches have shown a potential surplus of between 2 and 4 million ha (10-25% of the agricultural area) by the year 2000, usually based on projections of current production and consumption patterns (see for example Burnham et al, 1987). In France, a study by the Conseil Général du Génie Rural des Eaux et des Forêts in 1986 predicted the abandonment of 4.5 million ha of French farmland by the year 2000 (see Moati, 1987).

In Sweden, continued abandonment is expected, especially in northern regions and in the forest regions of the south and centre. More than 1 million ha (one third of the currently farmed area) may become available for other uses (Johnsson, 1992).

Warnings that the area of arable land is in danger of exceeding national requirements in Finland can be dated back to the late 1950s and by 1967 it was estimated that Finland had around 400,000 ha of surplus arable land. A more recent assessment suggests a surplus of approximately 1 million ha. While measures have been adopted to reduce the area of land, including incentives for set-aside and afforestation, the areas involved have been substantially smaller than this (Selby, 1995).

Although its purpose was not to make quantitative predictions, the Netherlands Scientific Council for Government Policy did set out four detailed theoretical scenarios in its report *Ground for Choices* (Netherlands Scientific Council for Government Policy, 1992). In each scenario, the area of land required for agriculture in the then EU 12 was found to be very much lower than the current Utilized Agricultural Area (UAA). The proportion of the UAA taken out of production by the year 2015 under these scenarios ranges from a high of about 75%, when agriculture is concentrated onto a limited area, to about 45% under a 'regional development' scenario roughly equating to current EU policies.

Where massive readjustments in land use have been predicted, these are often based on rather theoretical and sometimes extreme scenarios which are unlikely to transpire in practice, at least in the foreseeable future. Many of these

scenarios assume a continuation of current high-input production methods in most regions remaining in agricultural use. Alternative approaches to cutting production which do not imply land withdrawal, such as the introduction of quotas, or other amendments to policy, tend to be given less consideration. This helps to explain why some of the forecasts have proved so wide of the mark, as discussed in Section 3.4.2.

Without attempting to make fresh predictions, the remainder of this chapter is concerned with potential developments and prospects up to the year 2000. The investigation of the major potential indicators of marginalization and abandonment of agricultural land, described in the previous chapter, was based on historical data. It reflected conditions before the reform of the Common Agricultural Policy (CAP) in 1992. Regions which are distinguished as susceptible to marginalization in the previous chapter are divided into Extensive Farming Regions and Small-scale Farming Regions. The future of these regions must be considered alongside developments in agricultural policy since the 1992 reform of CAP, which recognized the need for '... contributing to an environmentally sustainable form of agricultural production and food quality and formalizing the dual role of farmers, as food producers and guardians of the countryside (CEC, 1992: 36). In this chapter the focus will be on several components of CAP, including the price and market support, regimes of support under the Less Favoured Areas (LFA) Scheme, and the agri-environment Regulation agreed as Accompanying Measures to the reform of CAP in 1992.

The analysis in this chapter builds upon the regions identified in the previous chapter. It starts with a review of the kind of agricultural activities in the group of regions which are identified as being susceptible to change (Section 6.2). It will address the following related questions:

- what is the share of production and UAA, within the EU 12 of the group of regions identified as potentially marginal? One of the objectives of CAP reform is to control production. In principle, production could increase in marginal regions in response to a reform of agricultural policy involving lower prices which are compensated by payments made on a per hectare basis, and subsequently to counteract the objectives of CAP;
- what are the dominant farming types and their structural characteristics in the regions which have been identified as being susceptible to change? Appendix 6 of the report provides information on characteristics of farms in the regions selected in the years around 1990. The share of subsidies in Family Farm Income (FFI) is examined. This effort is to allow for an examination of CAP reform and their impact of future subsidies.

The cluster analysis provided in Chapter 5 was based on a large number of regions (424 sub-regions). However, the analysis provided in this chapter is based on 87 larger regions in EU 12 derived from the Farm Accountancy Data Network (FADN). The number of regions in FADN is a limiting factor in this respect. We therefore assumed that any FADN region belongs to the group of Extensive Farming Regions if more than twothirds of the UAA within it is made up of areas (parts of the 424 sub-regions) which belong to the cluster group of

Extensive Farming Regions. Similarly, any region is considered to belong to the group characterized by Small-scale Farming Regions if the areas which belong to this group amount for more than two thirds of the UAA of the larger region. All other regions are classified as Other Regions.

6.2 Agricultural production in and direct agricultural subsidies to regions susceptible for change

Some more detailed figures will be presented in this section on the regions which have been identified as being susceptible to marginalization. A distinction is made between regions with extensive farming systems and regions with small-scale farming. Agricultural production in Extensive Farming Regions covered 26% of total UAA in EU 12 in 1987-1991. This is equivalent to a total of 33 million ha. The extensive nature of agricultural production in these regions is reflected by the rather low share of these regions in final production of EU 12. This share was only 9% (Figure 6.1). Regional shares of final production of several regions of Spain and the United Kingdom are only a third of their shares in area of EU 12, including Castilla-Leon, Castilla-La Mancha and Extremadura (Spain) and Scotland (United Kingdom) (Appendix 6, Table A6.1). Regions which are characterized by small-scale farming covered 17% of total UAA in EU 12; their share in final

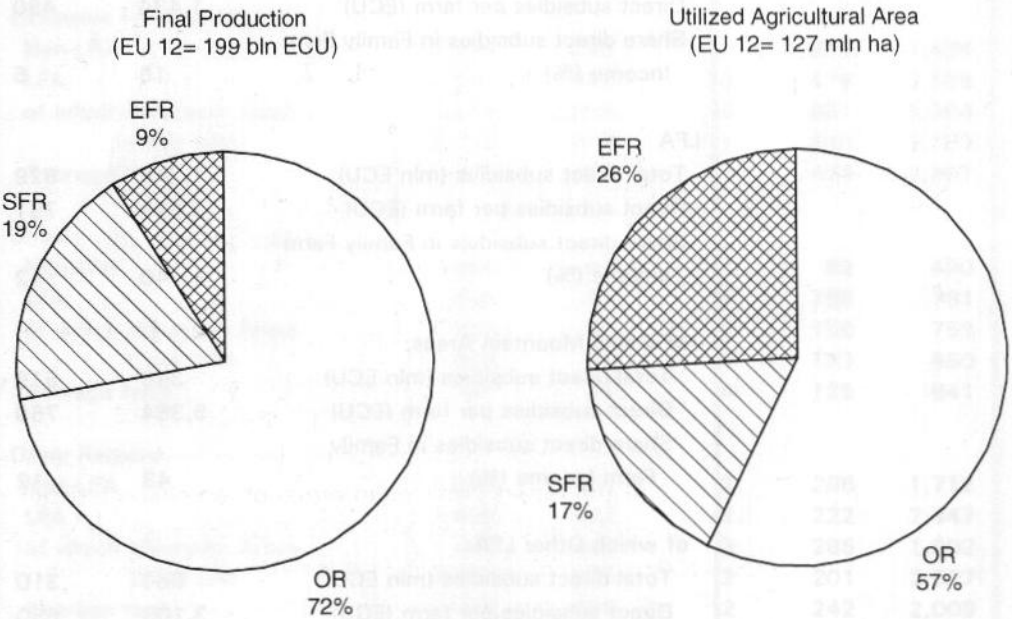

Figure 6.1 Agricultural production in the EU 12 by group of regions [1] (average 1987-1991)

[1] Group of regions as discussed in Section 6.1.
EFR Extensive Farming Regions
SFR Small-scale Farming Regions
OR Other Regions

Source: Eurostat REGIO; adaptation LEI-DLO.

production of EU 12 was slightly higher (19%). Regional shares of final production exceed their shares in regional area of EU 12 in large areas of Italy (Appendix 6, Table A6.4).

Direct subsidies in regions with extensive farming systems have been very important compared to the group of other regions [1]. About 20% of all direct subsidies in EU 12 were directed towards this group of regions in 1990/91, although their share in final production is only 9% of total final production in EU 12 (Table 6.1). Direct subsidies in this group of regions on average are about

Table 6.1 Direct CAP agricultural subsidies by group of regions [1] (1990/91)

	Extensive farming regions	Small-scale farming regions	Other regions	Total
Average farm				
Total direct subsidies (mln ECU)	1,380	1,335	3,830	6,545
Direct subsidies per farm (ECU)	2,991	641	2,009	1,471
Share direct subsidies in Family Farm Income (%)	34	8	12	13
Non-LFA				
Total direct subsidies (mln ECU)	170	506	1,944	2,620
Direct subsidies per farm (ECU)	1,434	490	1,712	1,146
Share direct subsidies in Family Farm Income (%)	16	5	8	8
LFA				
Total direct subsidies (mln ECU)	1,210	829	1,886	3,925
Direct subsidies per farm (ECU)	3,529	791	2,447	1,815
Share direct subsidies in Family Farm Income (%)	40	12	22	22
of which Mountain Areas:				
Total direct subsidies (mln ECU)	346	519	366	1,231
Direct subsidies per farm (ECU)	5,364	759	1,902	1,308
Share direct subsidies in Family Farm Income (%)	43	12	17	17
of which Other LFA:				
Total direct subsidies (mln ECU)	864	310	1,520	2,694
Direct subsidies per farm (ECU)	3,103	850	2,627	2,206
Share direct subsidies in Family Farm Income (%)	39	13	24	25

[1] Group of regions as discussed in Section 6.1.

Source: FADN-CCE-DG VI/A-3; adaptation LEI-DLO.

1. Direct subsidies are grants and subsidies which have been granted from public funds and have resulted in a specific receipt.

a third of FFI. They were almost 3,000 ECU per holding, which is about double that of the average of all farms in EU 12. The share of direct subsidies in FFI exceeds 50% in several regions, including Corse (France), Valle d'Aosta (Italy), Alentejo-Algarve (Portugal), Wales, Scotland and Northern Ireland (United Kingdom) (Appendix 6, Table A6.2). Direct subsidies for drystock farms exceed 10,000 ECU in several regions of France (Midi-Pyrénées, Auvergne and Corse) and of the United Kingdom (Wales and Scotland).

The share of direct subsidies in Family Farm Income was only 8% within the group Small-scale Farming Regions (Table 6.1). They amounted to an average of 640 ECU per farm. Among the Small-scale Farming Regions identified this share is highest in Norte-Centro and Lisboa-Vale do Tejo (Portugal) (Appendix 6, Table A6.5). The share of direct subsidies in FFI is only 15% on drystock farms in the Small-scale Farming Regions, compared with 70% in Extensive Farming Regions. The average for all drystock farms in the EU 12 is almost 40%.

Table 6.2 Direct CAP agricultural subsidies by group of regions [1] in 1990/91 (ECU per holding)

	Subsidy				
	Animals and products	Costs	Purchase of animals	Invest-ments	Total
Extensive Farming Regions					
Non-LFA	1,010	206		217	1,434
LFA	2,207	836	10	476	3,529
of which Mountain Areas	2,519	2,208	6	631	5,364
Other LFA	2,135	518	11	440	3,103
Average farm	1,900	674	7	409	2,991
Small-scale Farming Regions					
Non-LFA	365	41	1	83	490
LFA	556	63	6	166	791
of which Mountain Areas	528	67	8	156	759
Other LFA	609	55	3	183	850
Average farm	461	52	4	125	641
Other Regions					
Non-LFA	1,093	361	2	256	1,712
LFA	1,800	422	2	222	2,447
of which Mountain Areas	1,049	565	3	285	1,902
Other LFA	2,050	375	2	201	2,627
Average farm	1,379	386	2	242	2,009
Total					
Non-LFA	760	209	1	176	1,146
LFA	1,262	314	5	235	1,815
of which Mountain Areas	771	316	7	215	1,308
Other LFA	1,640	312	4	250	2,206
Average farm	1,004	260	3	205	1,471

[1] See Table 6.1.

Source: FADN-CCE-DG VI/A-3; adaption LEI-DLO.

In the European Union, direct subsidies in the different categories of farms considered are in the range between around 1,100 ECU per farm (general cropping farms and permanent crop holdings) and 7,500 ECU per farm (drystock farms). Direct subsidies to drystock farms may even exceed FFI in Wales, Scotland and Northern Ireland (United Kingdom), Alentejo-Algarve (Portugal) and Corse (France).

In 1990/91 direct income subsidies under CAP were comprised of subsidies (i) on animals, particularly headage payments, and products, (ii) on costs (e.g. labour and machinery; farming overheads; land charges and interest paid), (iii) on purchase of animals, and (iv) on investments. Subsidies on livestock and products contributed the largest share of total direct subsidies, with the exception of subsidies on costs provided to farmers in Mountain LFA in regions with extensive farming systems (Table 6.2).

Direct subsidies can have a considerable impact on the viability of farms in marginal areas as well as affecting the management of land, crops and livestock. In many of these areas large groups of farmers remain dependent on the various forms of direct payments available under CAP, including LFA compensatory payments. Consequently, they are vulnerable to changes in policy. The importance of subsidies is also shown by a recent analysis of agricultural income in LFA (Terluin et al, 1995). Farm income data from the period 1987/88 - 1989/90 were examined in a set of different geographical groups of regions within the Community, derived from a typology based on the relationship of regional Gross Domestic Product (GDP) per inhabitant and Farm Net Value Added (FNVA) per Annual Work Unit (AWU). In Table 6.3, both FFI and subsidies per Family Work Unit are shown for the different groups of regions for a more recent year (1990/91). A distinction is made between LFA and non-LFA farms. The relatively high dependence on subsidies in LFA farms emerges clearly. The table also underlines the differences between the regions and the farming types, both with respect to income levels and subsidy payments.

There are large differences between drystock farms inside and outside LFA regions. Direct subsidies for drystock farms on average are 3,350 ECU per FWU if they are located outside LFA regions but around 2,050 ECU in LFA regions (Table 6.3).

Since the late 1980s there have been considerable changes in CAP, not least the Mac Sharry reforms of 1992, which increased the range and level of direct payments. Furthermore, the European Agricultural Guidance and Guarantee Fund (EAGGF) expenditure on LFA compensatory payments, most of which take the form of headage payments per Livestock Unit (LU), have increased substantially. However, this increase in support has been distributed very unevenly within the EU. While payments in France, Ireland and Luxembourg more than doubled, they fell in Portugal, Spain and Greece. Naturally, there are variations between years but it is clear that the system of LFA compensation payments is making only a modest contribution to the viability of holdings in several Member States including Italy where the small size of many farms has excluded them from the

Table 6.3 Income characteristics by farming type and group of regions [1] in 1990/91

Region/farming type	FFI/FWU (ECU)		of which subsidies/FWU (ECU)		Share of farming type in number of holdings (%)	
	Non-LFA	LFA	Non-LFA	LFA	Non-LFA	LFA
Extensive Farming Regions						
Cereal farms	9,100	6,000	950	880	25	17
General cropping farms	9,500	7,100	900	1,270	32	22
Horticultural holdings	5,100	700	460	750	2	1
Vineyards	10,900	14,100	2,040	1,210	0	1
Permanent crop holdings	4,100	4,600	950	1,160	7	8
Dairy farms	16,900	10,700	2,320	2,720	7	10
Drystock farms	7,300	9,300	3,360	6,810	14	27
Granivore farms	25,100	15,000	480	960	2	2
Mixed farms	10,500	6,800	1,780	2,260	10	14
All types	9,800	8,000	1,540	3,230	118,000	343,000
Small-scale Farming Regions						
Cereal farms	5,800	4,900	890	1,420	5	5
General cropping farms	6,300	4,300	360	480	39	28
Horticultural holdings	14,100	9,000	330	110	3	1
Vineyards	10,300	6,900	200	420	10	4
Permanent crop holdings	8,100	4,900	560	670	28	18
Dairy farms	12,400	6,400	350	380	3	9
Drystock farms	8,900	5,300	590	1,050	4	12
Granivore farms	22,200	14,900	280	110	0	0
Mixed farms	6,900	3,200	350	440	8	21
All types	7,800	4,700	420	580	1,033,000	1,048,000
Other Regions						
Cereal farms	9,900	5,300	860	1,190	8	5
General cropping farms	13,100	5,800	1,100	740	25	22
Horticultural holdings	17,200	15,200	540	160	5	3
Vineyards	27,400	10,900	910	1,230	7	2
Permanent crop holdings	11,700	11,600	830	710	6	10
Dairy farms	16,600	10,100	1,380	2,110	21	24
Drystock farms	10,100	8,500	2,570	4,050	8	18
Granivore farms	29,600	11,900	720	850	3	1
Mixed farms	13,200	8,900	1,610	2,130	18	15
All types	15,100	8,700	1,280	1,930	1,136,000	771,000
Total						
Cereal farms	8,500	5,400	880	1,160	7	7
General cropping farms	9,100	5,100	660	640	31	25
Horticultural holdings	16,000	11,300	470	160	4	2
Vineyards	19,100	8,100	570	650	8	3
Permanent crop holdings	8,900	6,600	630	720	16	14
Dairy farms	16,100	9,000	1,280	1,630	12	14
Drystock farms	9,500	7,500	2,050	3,520	6	17
Granivore farms	28,700	13,800	670	640	2	1
Mixed farms	11,200	5,100	1,230	1,090	13	18
All types	11,800	6,600	920	1,420	2,287,000	2,162,000

[1] See Table 6.1.

Source: FADN-CCE-DG VI/A-3; adaptation LEI-DLO.

support system in the past. The LFA Scheme is only applied to part of the area in case large areas are under Objective 5a (Brouwer and Van Berkum, 1996). Objective 5a is applied in large areas of Italy. Support to farmers is also

Table 6.4 The application of the LFA Directive in 1994 (EU 12)

Country	Compensatory allowances granted for LFA			Share of holdings with compensation (% of total) (ECU/LU)
	Number of holdings	Amount paid per holding (ECU)	Allowance per LU	
Belgium	6,873	1,329	86	8
Denmark	[3]	[3]	[3]	0
Germany	231,275	2,163	93	35
Greece [1]	190,262	521	61	22
Spain	183,561	447	36	12
France [1]	139,435	2,127	70	15
Ireland	105,619	1,575	88	62
Italy [2]	39,056	689	57	1
Luxembourg	2,515	4,437	113	63
Netherlands	3,901	884	104	3
Portugal	89,510	410	54	15
United Kingdom	60,912	2.419	47	25
EU 12	1,052,919	1,310	67	13

[1] Provisional data for the year 1994; [2] Not complete; [3] Not available.

Source: CEC, DG VI-F-II.1.

channeled through other instruments, including Objective 1 and 5b. Although the number of holdings receiving payments is relatively high in Greece and Spain, both the level of support per LU and the average allowance per holding is low (CEC, 1995a).

The allowances which were paid to EU 12 Member States in 1994 amount to 1.38 billion ECU in total, which also includes the national contributions. The amount paid per holding ranges between less than 500 ECU (Spain and Portugal) and more than 4,000 ECU (Luxembourg). The allowance per LU is lowest (36 ECU) in Spain and highest (113 ECU) in Luxembourg (Table 6.4). About one quarter of all the farms located in LFA in the EU receive compensation under the LFA Scheme. Participation rates in the southern Member States are below those in the northern Member States, primarily because about half of all LFA holdings in these countries are smaller than the minimum size for eligibility which is 3 ha (2 ha in the Italian Mezzogiorno, the French overseas departments, Greece and Spain, 1 ha in Portugal and 0.5 ha in Madeira) (Terluin et al., 1993). This is especially the case in Italy where 29% of the farms are less than 1 ha in size.

6.3 Price support given under CAP

Community expenditure on CAP is financed by the EAGGF. This Fund consists of two sections: the Guarantee section and the Guidance section. In broad terms, common expenditure on market and price policy is paid by the Guarantee section

and common expenditure on structural policy by the Guidance section. About 95% of the EAGGF is spent on the Guarantee section, the remainder being spent on structural policy. For a long period these figures were rather stable over time (Terluin, 1992). However, more recently the share of expenditures on structural policy has been increasing trend. The Guarantee Section of EAGGF in 1994 amounted to 33 billion ECU, and the Guidance Section to 3 billion ECU (CEC, 1995a).

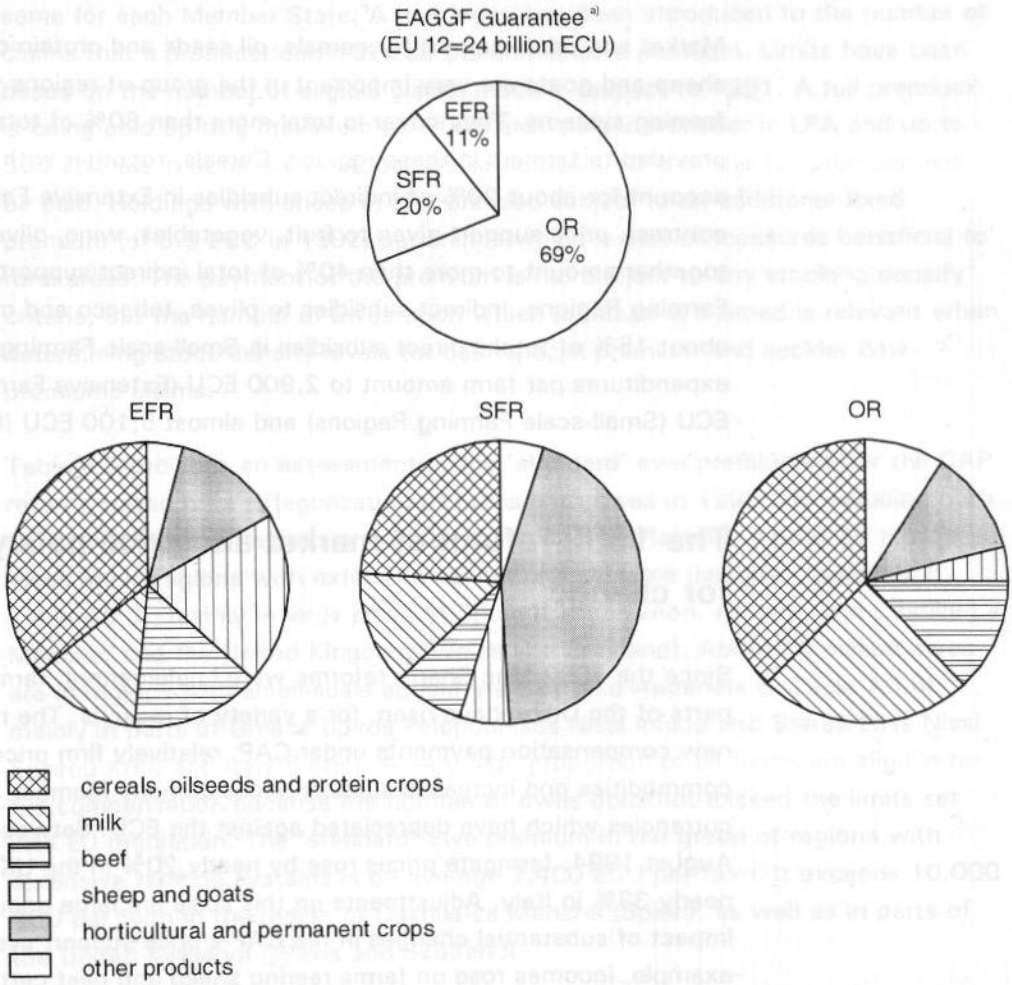

Figure 6.2 Regional distribution of EAGGF Guarantee expenditure per product group by group of regions [1] in '1990'

[1] See Table 6.1.
EFR Extensive Farming Regions
SFR Small-scale Farming Regions
OR Other Regions

[a] Total EAGGF Guarantee expenditure refers to the products covered in the table; total expenditure inclusive of omitted items was 26,454 million ECU in '1990'.

Sources: FADN-CCE-DG VI/A-3 (1990/91); Eurostat; Terluin, 1992; adaptation LEI-DLO.

The distribution of the Guarantee section expenditure in '1990' has been assessed in relation to the groups of regions identified in Chapter 5 (Figure 6.2). Total indirect subsidies to Extensive Farming Regions amounted to 2,670 million ECU. It amounted to 4,650 million ECU in Small-scale Farming Regions. Their share of total indirect subsidies corresponds broadly to this group's share of total EU 12 production (about 23%). Extensive Farming Regions have a 11% share of indirect subsidies, which is slightly above their share in total final production of the EU 12. However, this group of regions represents some 26% of total UAA in the EU 12.

Market and price support for cereals, oil seeds and protein crops, milk, beef, sheep and goats are very important in the group of regions with extensive farming systems. They cover in total more than 80% of total indirect subsidies provided to farmers in these regions. Cereals, together with sheep and goats account for about 20% of indirect subsidies in Extensive Farming Regions. In contrast, price support given to fruit, vegetables, wine, olives and tobacco together amount to more than 40% of total indirect support in Small-scale Farming Regions. Indirect subsidies to olives, tobacco and milk all account for about 15% of total indirect subsidies in Small-scale Farming Regions. EAGGF expenditures per farm amount to 2,900 ECU (Extensive Farming Regions), 1,200 ECU (Small-scale Farming Regions) and almost 5,100 ECU (Other Regions).

6.4 The 1992 reform of market and price policy and prospects for change

Since the 1992 Mac Sharry reforms were implemented, farm incomes in many parts of the Union have risen, for a variety of reasons. The reasons include the new compensation payments under CAP, relatively firm prices for several commodities and increased support prices in many Member States with 'soft' currencies which have depreciated against the ECU. Between July 1992 and August 1994, farmgate prices rose by nearly 20% in the UK, 26% in Spain and nearly 33% in Italy. Adjustments on this scale are large enough to override the impact of substantial changes in the CAP's price support system. In the UK, for example, incomes rose on farms rearing sheep and beef cattle and the government has frozen or reduced the level of LFA compensation payments in some recent years on the grounds that support prices have been sufficiently generous to maintain a viable farming sector in the uplands and mountains with a smaller LFA compensation payment.

In addition to the overall level of support available under CAP and the anticipated price of key commodities, the process of marginalization will be affected by more specific aspects of agricultural policy. It has not been possible to study these systematically but some can be identified from a preliminary review, particularly the new rules applying to the livestock and cereal support regimes since 1992.

The sheepmeat regime

Since 1980 there has been a common market organization for sheep and goat meat. The core element of that policy has been an ewe premium based on compensating farmers for market returns lower than target herds set by the Community. For many years the regime was rather complex as the Union was divided into several regions. Each region had its own compensation level. In Great Britain the system at work was even different compared to other countries (a variable slaughter premium). Since the CAP reform of 1992 the regime is the same for each Member State. A restriction has been introduced to the number of claims that a producer can make on the annual ewe premium. Limits have been based on the number of eligible claims made in respect to 1991. A full premium is being paid up to a maximum of 1,000 animals per producer in LFA and up to 500 animals in other areas. Above these numbers 50% of the full premium will be paid. Holdings with sheep in LFA are also subject to an additional fixed premium (of 5.5 ECU in 1992) per animal which is part of measures beneficial to rural areas. The payment of the premium is not subject to any stocking density criteria, but the number of ewes upon which premium is claimed is relevant when determining stock density levels for beef special premium and suckler cow premiums claims.

Table 6.5 provides an assessment of the 'standard' ewe premiums after the CAP reform, based on a categorization of farms with ewes in 1990/91, including both Extensive Farming Regions and Small-scale Farming Regions. About 26 million ewes are in regions with extensive agricultural systems (see also Appendix 6, Table A6.3), mainly in large areas of Spain (Castilla-Leon, Aragon, and Castilla-La Mancha) and the United Kingdom (Wales and Scotland). About 10 million ewes are in regions with small-scale agriculture (see also Appendix 6, Table A6.6), mainly in parts of Greece (Ipiros Peloponnisos Nissi Ioniou and Sterea Ellas Nissi Egaeou Kriti) and Italy (Lazio). A very high proportion of all farms are eligible for full compensation because the number of ewes does not exceed the limits set into EU regulation. The 'standard' ewe premium in the group of regions with extensive farming systems is on average 7,400 ECU per farm. It exceeds 10,000 ECU per farm in the region of Castilla-La Mancha (Spain), as well as in parts of the United Kingdom (Wales and Scotland).

Table 6.5 'Standard' ewe premiums after 1992 on farms with ewes according to the new CAP regime by group of regions [1] (1990/91)

	Extensive farming regions	Small-scale farming regions	Other regions	Total
Number of represented farms (x 1,000)	114	227	194	536
Number of ewes per farm	223	44	121	110
Normative ewe premiums per farm (CAP reform) (ECU)	7,404	1,495	3,926	3,638
Regional number of ewes (x 1,000)	25,578	10,095	23,491	59,164
Regional normative ewe premiums (CAP reform) (mln ECU)	848	340	762	1,949

[1] See Table 6.1.

Sources: FADN-CCE-DG VI/A-3; adaptation LEI-DLO.

The development of the market support regime for meat from sheep and goats is of particular importance in many more marginal areas where livestock grazing predominates. Prior to 1992, the number of breeding ewes was expanding rapidly in some regions including Ireland and parts of the UK and Spain. However, production was less profitable in some traditional regions and the number of breeding ewes and goats was stable or falling in parts of France and Greece. Since 1992 and the introduction of a ceiling on the number of ewes per farm eligible for the annual premium, numbers have stabilized. The European Commission expects the total number of sheep and goats to remain around its present level of approximately 98 million head and the pattern of trade between EU countries is likely to remain broadly as it is now (CEC, 1995b). The right to rear sheep and goats and claim an annual premium has itself acquired a value, and is saleable, as are milk quota in several Member States. This will provide some more marginal farms with a new asset and affect management decisions in the short and long term. Some producers may be reluctant to dispose of a potentially valuable asset and may continue to farm for longer than they otherwise would have done. Others may lease quota rights and try to keep open the option of a return to production. In general, the rate of structural change can be expected to be slower than otherwise would have occurred, although many farmers may still have an incentive to concentrate stock on better land and reduce the level of grazing on outlying areas and semi-natural vegetation where management is a priority from an environmental perspective.

The CAP sheep and goat meat regime also allows Member States to restrict the transfer of production quota out of 'sensitive' areas, often defined as LFA. This may help to prevent a future decline in the area grazed in the regions concerned and may reduce the rate of marginalization. By the same token, the modified support system will make it more difficult for farmers without quota to set up production and will make it more costly to reintroduce stock into areas of previously abandoned land where the sheep annual premium will not be available. The system also creates a barrier for new entrants into sheep or goat farming because they need to obtain a quota in order to commence production if they wish to claim the premium, which is likely to be essential for the great majority of farmers.

In effect, the system will artificially prolong the distribution of sheep and goats on holdings where they were present in the early 1990s. It introduces a rigidity which may slow down certain aspects of the marginalization process but will also have a variety of secondary effects, some of which will hinder environmentally sensitive forms of management on marginal land. In particular, farms which are currently over-stocked will have a strong incentive to maintain current livestock numbers and it will become more difficult to establish new grazing patterns in areas where livestock have disappeared.

The beef regime

Similar comments apply to the beef sector. The change in rules introduced in 1992 has had the effect of increasing the importance of direct payments for beef

cattle and reducing the reliance of producers on market intervention. At the same time, upper limits have been placed on the number of beef cattle for which farmers can apply for the Suckler Cow Premium, which is an important form of support. In the short run, there was an incentive for farmers with beef cattle to increase the size of their herds and many did so in the period 1992-1993. Prior to the BSE crisis, the overall number of suckler cows is now likely to stabilize at around the current level in the EU since farmers who have established a right to Suckler Cow Premium have a strong incentive either to maintain current numbers or to sell the premium right to other producers. As with sheep, this will tend to slow down any geographical redistribution of stock, with a variety of environmental consequences.

Even before the widespread crisis of confidence in British beef throughout Europe, it was difficult to forecast the future balance on the EU beef market or the prospects for producers. Since March 1996 many beef producers have suffered a significant fall in income, although some compensatory policies have been introduced at the EU and national level. The Uruguay Round agreement of the GATT introduces strict limits on the volume of subsidized beef exports from the Community and this limits the possibility of exporting the surpluses which are building up rapidly on the European market. In the autumn of 1996, when this report was going to press, the future prospects for beef producers were clouded in uncertainty. The European Commission proposed a number of changes to the CAP beef regime in the summer but these have yet to be agreed and it seems likely that further changes to the regime may be made before the end of the century.

The arable crop regime

In the arable sector, the 1992 Mac Sharry reform had the effect of reducing prices for cereals and oilseeds and compensating farmers with a new system of direct payments per hectare. At the same time, larger producers were required to set-aside a proportion of their arable area, initially 15%, but subsequently reduced. The availability for the direct payments may have prolonged the viability of marginal arable farms in some areas, particularly where both commodity price levels and direct payments have been at a higher level than anticipated because of currency depreciation. During the drought which has affected significant areas of Iberia, many farmers on very dry land have experienced crop failure or extremely low yields and have benefited considerably from the availability of direct payments. On the other hand, the set-aside obligation has altered the management regime on some farms and seems to have disadvantaged some extensive producers. Furthermore, direct payments are based on historic yields and farmers in low yielding, marginal areas receive smaller payments per hectare than those in more intensively farmed parts of Europe. Thus, the system benefits intensive producers, rather than those who may be responsible for greater environmental benefits.

Extremadura. Marginal olive and arable cultivation, maintained by CAP.

Photo by G. Beaufoy.

Succession

In several Member States, statistics are collected indicating the number of farmers who are older than 55 years and have no apparent successor. The large numbers in this category in many more marginal regions suggests a further contraction in the number of holdings, as discussed in previous chapters. Some surveys of farmer attitudes and intentions reinforce this impression. For example, in Paltamo in Finland 46% of a sample of 91 farmers asked about their likely plans for a five year period beginning in 1993 suggested that they would cease farming altogether and 30% suggested that they would afforest poor or marginal fields on their land (Selby, 1995).

In many marginal regions in southern Europe, the farming age structure is perhaps the most important consideration. As Louloudis et al. (1994) remark of the situation in Greece: 'Many of the extensive systems are associated with elderly farmers without successors, often adopting a new management logic - to receive a pension and retire. Management strategies adopted by those expecting retirement cannot be used as future models for extensive systems.' Cultural, economic and legislative obstacles hinder the take-over of abandoned holdings by neighbouring farmers in many of these regions and a considerable amount of land can be expected to be released as a result.

Land use

However, the evidence of changes in land use is more difficult to interpret. While the position varies considerably between regions, the available statistics seem to indicate that, for the EU as a whole, farmland abandonment and conversion to other uses slowed down during the 1980s and early 1990s as compared with the 1960s. This can be explained partly by support levels under CAP. Although the statistics do not permit a thorough analysis of trends in land use since 1992, they point to a relative stability in the area of land under agricultural management. In some areas of Member States which joined the Community during the 1980s, such as Spain, certain types of land which may have been on the point of abandonment before accession appear to have been kept in production thanks to the support of CAP in sectors such as livestock, olives and arable crops.

Regulation 2078/92

A more recent measure which may assist the viability of marginal farms in some of the more environmentally sensitive regions of the EU is Regulation 2078/92, requiring all Member States to introduce an agri-environment programme for a five year period. Member States submitted 158 programmes to the CEC for approval under this Regulation, the great majority of which had been approved for partial reimbursement from EAGGF by the autumn of 1995. The EAGGF budget for implementing the Regulation has been extended and is expected to reach approximately 3.7 billion ECU over the five year period for the original twelve Member States. The total cost of the programmes, including contributions, is expected to be around 6.5 billion ECU over the period 1993-1997 (De Putter, 1995).

Member States have included a very wide range of different measures in their programmes. Some are aimed mainly at intensive production regions, such as schemes to compensate farmers for reducing their level of fertilizer and pesticide inputs. Others are more widely applicable and some are aimed specifically at marginal areas. A few of these include schemes to improve the management of abandoned farmland. Figure 6.3, taken from an analysis undertaken by LEI-DLO and the Ministry of Agriculture, Nature Management and Fisheries in the Netherlands, gives a broad indication of the overall objectives of more than 90 programmes which were considered by the research team (De Putter, 1995). Few Member States were reported to be including schemes for the upkeep of farmland or woodland or long term set-aside in their programmes.

With many schemes only coming into operation in 1996 it is too soon to estimate the area of land affected or the extent to which schemes under the Regulation will assist the viability of farms in marginal areas or promote environmentally sensitive practices. In principle, farms in an area of over 4 million ha in Spain, 6.7 million ha in France, 1.4 million ha in Italy, 1 million ha in Ireland and 800,000 ha

Figure 6.3 Analysis of the measures proposed by Member States under Regulation (EEC) 2078/92 and their objectives

Measure	Market organization; reduction of surpluses	Environment; less pollution and protection of natural resources	Landscape preservation	Prevention of agricultural decline and hazards
Reduction of inputs (Article 2.1.a)	■	■		
Organic farming (Article 2.1.a)	■	■		
Extensification (Article 2.1.a)	■	■	■	
Convert arable into grassland (Article 2.1.b)	■	■		
Reduction of livestock density (Article 2.1.c)	■	■		
Environmental practice (Article 2.1.d)	■	■	■	■
Maintenance of landscape (Article 2.1.d)			■	■
Rearing animals in danger (Article 2.1.d)		■		■
Upkeep of abandoned land (Article 2.1.e)		■	■	■
20 year set-aside (Article 2.1.f)	■	■	■	■
Manage land for public access (Article 2.1.g)			■	
Training and demonstration projects (Article 2.2)	■	■	■	■

Source: De Putter, 1995: 13.

in Portugal will be eligible to participate in a scheme of some kind (De Putter, 1995). However, the actual level of take-up is likely to be lower than this and many schemes are designed primarily to compensate farmers for adopting or maintaining a practice which is desirable environmentally rather than to support farm incomes (see Chapter 7). In practice, overall returns may increase but further research is required to establish the impact on marginal farming systems.

Prospects up to 2000

So long as the maintenance of acceptable levels of farm income remains a central objective of CAP, the abandonment of large areas of farmland is unlikely to occur other than in the most marginal regions. Significant reductions in the farmed area are more likely to arise from the types of policy mechanism summarized in Section 3.3.7. Indeed, the CAP set-aside scheme introduced in 1992 effectively takes a large area of land out of arable production each year; the total amounted to approximately 6 million ha in 1993-1994. Sizeable areas of land also could be converted to forest as a direct result of policy interventions.

Until now, support for agriculture has been maintained at a relatively high level and certain aspects of CAP, including the direct payments introduced after 1992 provide farmers with an incentive to keep land in production. In practice, very severe reductions in the current levels of agricultural support might be required in order to produce a large-scale abandonment of agricultural land; this is unlikely to be socially or politically acceptable, as emphasized by the European Commission in the 1995 CAP strategy paper (CEC, 1995c). A more gradual reduction of price/income support may produce only limited changes in the total area of farmland. Although an increasing number of farmers would go out of business, those continuing to farm could be expected to take over unprofitable holdings in an attempt to maintain economic viability through increased economies of scale (De Veer, 1992).

Nevertheless, the possibility of gradually reduced levels of income support in future as the EU attempts to reduce production further whilst controlling the CAP budget does raise the question of 'uncontrolled' land abandonment in regions with the least favourable natural, economic and social conditions for agriculture. Furthermore, even though the total abandonment of farmland may continue to be a relatively small scale and localized phenomenon, significant changes in agricultural land use may result from the process of marginalization in the most disadvantaged areas. Some of these changes are already evident.

6.5 Conclusions

1. Agricultural policy plays an important role in maintaining the viability of farming in regions which are susceptible for change. Direct subsidies may even exceed Family Farm Income in some Extensive Farming Regions in the European Union. This applies mainly to drystock farms in Wales, Scotland and Northern Ireland (United Kingdom), as well as in Alentejo-Algarve (France) and Corse (France).
2. These regions have a limited share of the EU 12's total output. Changes in support measures may therefore have a limited impact on total production in the European Union. Their share in UAA however is substantially higher.
3. Compensatory payments per Livestock Unit under the LFA Scheme are lowest in Spain (36 ECU) and highest in Luxembourg (113 ECU). The relative dependence on subsidies of LFA farms is rather high. Direct subsidies are highest on drystock farms within LFA.

7 MANAGEMENT OPTIONS AND PUBLIC POLICIES FOR MARGINAL AGRICULTURAL LAND WITH HIGH NATURE VALUES

7.1 Introduction

Although the scale and distribution of marginalization over the coming decades is uncertain, a substantial area of land in Europe is likely to be affected by changes of management indicative of increasingly marginal farming. The rate of change may accelerate, particularly during a period in which a significant number of farmers are approaching retirement and it is possible that the current array of supports provided through the Common Agricultural Policy (CAP) could be scaled back significantly.

In this chapter some of the options for managing marginal agricultural land in a way compatible with environmental objectives are considered, and a set of policies which may be available to promote appropriate forms of management is reviewed with a particular focus on policies incorporating nature conservation objectives.

7.2 Management changes

It is worth recapitulating the kind of change which can be expected in marginal areas, based on past experience, before considering some of the options for mitigating potentially damaging environmental impacts or enhancing the more beneficial results of marginalization.

Marginalization processes on farmland result in a range of different changes in management, depending on the locality, but those of particular concern from an environmental perspective include:

- changes in farm structure and enterprise type, for example from mixed production to specialist grazing, from dairy farming to sheep;
- intensification and extensification of established farming systems, often occurring within the same farm or region, for example where livestock is concentrated on more fertile pasture and grazing of less palatable semi-natural vegetation ceases. Both processes can have adverse environmental effects;
- the decline or abandonment of traditional forms of management, particularly those which are labour intensive. Some of the practices being abandoned, such as hay making, shepherding and long established crop rotations have a particular environmental value. For example, many farmers in dehesa areas in

Spain have ceased to manage the tree cover in a way that ensures regeneration, saving labour costs but altering the balance of the system (Beaufoy, 1995). If transhumance is eliminated, the traditional summer pastures in mountain areas may no longer be grazed by domestic livestock;

- grubbing up of permanent crops, including vineyards, orchards and olives - usually in response to an incentive scheme financed by the EU. There is little data available about the alternative uses of land where such crops have been removed. In Portugal, about 30,000 ha of older plantations have been removed under an EU funded farm modernization scheme, known as PEDAP, of which about 7,000 ha is thought to have been replanted with new trees (Fialho, 1996);

- fairly small-scale abandonment of individual fields, steep hillsides and other patches of land in areas where the majority of farmland remains in production and management may be increasingly intensive;

- the amalgamation of holdings to create a smaller number of larger farms. Often this is associated with changes in management, greater mechanization and sometimes the removal of field boundaries and semi-natural features. However, it may be the only way of securing the viability of farming, particularly in areas with fragmented holdings;

- the sale, lease or short-term rent of part of all of a holding may be chosen as a way of raising income or reducing liabilities. However, it is not always achievable; options may be limited by multiple ownership of the farm, local legislation, market conditions or other factors. In many regions the number of farms is declining rapidly while the overall area of land in agricultural use is retreating more slowly or is relatively constant;

- diversification of income sources - which often depends on the availability of off-farm employment or other forms of income. This can increase the management choices open to a farming family. For example, it may allow the continuation of farming, reduce the pressures for intensification or precipitate a reduction in management effort. Subsequent changes in the farm enterprise may then be necessary to adjust to a new pattern of work and a possible reduction in overall labour input. In some regions, new sources of employment may give rise to marginalization, rather than following from it, as farmers seek better incomes off the holding;

- in some areas there may be a demand for recreational uses such as camping, horse riding or management for game. Not all forms of diversification require a change in land use; the provision of tourist accommodation on the farm may not entail any changes in land management for example. Where building is possible on farmland, this may be the most profitable option. If owners anticipate that land may be used for housing or urban development, they may cease farming some time before a change in use occurs;

- afforestation, usually occurring in areas where subsidies are available for planting, or natural regeneration, sometimes supplemented by aid to compensate farmers for withdrawing land from agriculture;

- abandonment of large areas of land, including whole farms. This occurs in the most marginal localities and generally leads to the growth of scrubby vegetation, which in most parts of Europe will develop into woodland in the longer term.

To some degree, it is possible to predict the principal factors which will influence decisions of this kind within a particular region and to attempt a forecast of future trends in the number of holdings, in total agricultural employment and in the area of land remaining in production. Nonetheless, as noted in Chapter 3, some of the national and European forecasts which have been published in the past have proved inaccurate.

It is more difficult to forecast precisely which areas of farmland will be affected by developments of this kind or the likely scale of change over the next decade. In certain regions, including many more remote mountainous areas, several of these trends can be identified as occurring simultaneously. In more intensively farmed areas, marginalization may be most apparent in the form of small patches of abandoned land, the rapid concentration of farms into larger units and, in certain localities, the degeneration of management on the fringes of larger towns. Afforestation can occur in a wide variety of regions and is not necessarily a symptom of marginalization.

7.3 Setting environmental priorities

There is no simple formula for determining the optimal management of land to meet environmental concerns in any given region, still less at a European level. Appropriate management should reflect local conditions, taking account of ecological, agronomic and socio-cultural factors. Nonetheless, there are a number of general objectives which are likely to apply in most High Nature Value (HNV) areas where marginalization is occurring. These are explored further in this chapter.

Marginal agricultural land can be divided into two broad categories. First, those areas of HNV which include semi-natural habitats such as species-rich grassland, heather moorland, areas of wetland, maquis and dehesa. Second, other habitats and areas of more limited conservation value, most of which have been subject to a more intensive form of management.

On those areas of marginal farmland of particular conservation value management objectives are often rather precise. For example, continuity of management is essential for the maintenance of many semi-natural grasslands where the species composition has developed over a long period and depends on the continuation of an appropriate level of grazing or cutting. If grazing is terminated, species

Finland. Willow is a common pioneer species on wetter soils. Advancing on poorly drained agricultural land some 20 to 30 years after abandonment.

Photo by A. Selby.

composition can change quite rapidly. Within a period of a few years before scrubby vegetation has taken over, many species of conservation interest may be lost because of the increasing dominance of a relatively limited number of coarse herbaceous species (Van Dijk, 1995). To reverse this process can be extremely difficult and costly.

Within the EU, there is an obligation on Member States to protect and secure the appropriate management of a range of habitats of European importance which are listed in the Habitats Directive, and also to protect the habitats of species which are listed in the Directive. A growing area of land, a significant proportion subject to a form of agricultural management in marginal zones, will be designated as Special Areas of Conservation (SAC) as the Directive is fully implemented over the next few years. In some Member States, sites protected under the Birds and Habitats Directives, to be known as *Natura 2000*, may occupy as much as 10-20% of the land area. Landowners and managers will be placed under an obligation, not only to protect the sites, but to maintain the appropriate form of management for the species or habitats involved. In some cases the main management requirement may be relatively simple, involving the maintenance of grazing and removal of trees or invasive vegetation from time to time. However, several species have highly specific requirements; for example,

being sensitive to the particular pattern of livestock grazing and the level of nutrients applied.

However, within Europe, there are substantial areas of marginal grassland which are of diminished conservation value. Usually, this is because they have been subject to significant applications of inorganic fertilizers or have been ploughed and reseeded in the relatively recent past. Such land can be found in parts of Finland, France, Ireland and the UK for example. In these areas, continuity of management is less likely to be essential and the development of a less intensively managed landscape may be beneficial for a number of species. As discussed in Chapter 4, the combination of open fields, shrubby vegetation and woodland may be desirable in certain areas. Afforestation is likely to be more acceptable on this land than on farmland of high nature value but some areas are important for landscape protection or water management and intensively managed arable land may be the preferred site for afforestation.

Over sizeable areas it is preferable to retain an open landscape rather than to permit the replacement of agriculture with woodland and high forest. In some regions, the preference for open landscapes arises from concern about potential environmental hazards following the transformation of fields or terraces into shrubs and woody vegetation. These hazards may include forest fires and the danger of avalanches in some mountain regions, especially those subject to heavy snowfall. Elsewhere, as in Finland, it is the objective of protecting established cultural landscapes which is the primary argument in favour of retaining open fields and other features associated with agriculture. These environmental objectives may be reinforced by social and cultural concerns and the possibility that the area may become less attractive for recreation and tourism if farmland is replaced by forest. Aesthetic and cultural preferences may be linked to sensitive local issues such as property prices, opportunities for recreation and the loss of traditional grazing rights. In some Mediterranean areas newly afforested land has been burned deliberately - a potent form of social protest against the closure of open landscapes.

It is also possible to identify particular zones where it would be desirable for agricultural management to be withdrawn, either in large part or entirely. These include land under arable or permanent crops which is subject to severe soil erosion, sites where the expansion of woodland is a priority and zones particularly suited to the recreation of new habitats, such as reedbeds. Where grazing is not appropriate, some species, such as the bear and wolf, require sizeable areas of continuous woodland cover to survive and a planned network of well located and appropriately managed forest could provide an important element in a species recovery plan.

In summary, there are significant areas of land where the maintenance of open agricultural landscapes, or at least some level of grazing or cutting, is the prime environmental concern. In addition, there is a sizeable area of low intensity farmland of particular conservation value where it is important to secure an appropriate form of management, perhaps 10 million ha in Spain alone (Beaufoy

et al., 1994). In the latter zones the mere continuation of agriculture is not sufficient. Thirdly, there is a group of other areas where abandonment or afforestation are likely to be beneficial, provided that it occurs in the right location and the management is appropriate.

This analysis suggests that there are powerful nature conservation arguments for maintaining a form of traditional agricultural management, or practices which are similar, on high nature value farmland. Frequently these areas are also of significant landscape value.

On the larger areas where conservation interest is diminished but the maintenance of cultural landscapes and more open land is a priority, the precise form of management is usually less important. Often the maintenance of cultural landscapes will require the continuation of a form of agricultural management, usually involving livestock. In principle, some landscapes could be maintained without the continued presence of farmers - mowing, fencing and other activities could be undertaken by local authorities, contractors, nature conservation organizations, woodland owners or others. However, it is debatable whether there are many areas where this would be feasible or cost effective in practice without significant political and institutional changes.

It could be argued that sizeable areas of marginal farmland of high nature value should be transformed into nature reserves or wilderness over the next decade or so in order to protect them during an era of agricultural change. However, in practice this is not likely to occur because of the potentially large areas involved, the lack of interest among farmers in selling land for this purpose and insufficient resources available to conservation authorities or NGOs to purchase or manage it. Few nature conservation authorities have the staff, budget or wider institutional capacity to become managers of more than a small proportion of the marginal HNV farmland which could be threatened by major changes in management, afforestation or abandonment in the next few years. Many authorities already are concerned about the potential effort and resources required to meet their obligations to manage SAC under the Habitats Directive and are hoping to utilize agricultural policy mechanisms such as Regulation 2078/92 as a means of maintaining appropriate farming practices on protected sites. Where land is available for the creation of planned 'wilderness' for nature conservation purposes, like the Oostvaardersplassen in the Netherlands, this could contribute valuable new habitats over a period of time but it is not a substitute for the maintenance of large areas of HNV agriculture (Tubbs, 1996).

Both for SAC and the large number of other areas of conservation importance the maintenance or re-establishment of an appropriate form of farming practice is likely to be the preferred means of management over the coming decade or more. Consequently, most of this chapter is concerned with policy options which might permit sizeable areas of high nature value marginal farmland to remain under a form of agricultural management suited to the land in question (Section 7.4).

However, continued agricultural management is not always possible or desirable environmentally and a number of alternative options, including afforestation, are reviewed in Section 7.5. This discussion includes some options which may be applicable on only a small scale at present but which conceivably could have greater importance in future.

7.4 Maintaining agricultural management

For public authorities seeking to influence the process of agricultural marginalization and its environmental outcome various levels of intervention can be envisaged, ranging from a broadly laissez-faire approach to substantive initiatives aimed at altering some of the fundamental trends in agricultural development. The focus of policy initiatives will vary from the EU level to small areas of particular environmental, cultural or social interest within which the most appropriate form of management can be specified in detail. Here, the emphasis is primarily on the European level.

Agriculture is a dynamic form of land management and there will be changes in practice, even on farms which maintain broadly the same production system over a long period. For this reason, merely maintaining agricultural land use may not be a satisfactory objective from a nature conservation perspective, although it may be sufficient to protect cultural landscapes.

A variety of policies can be put in place to try to ensure some continuity of agriculture in marginal regions, even if the number of farms and total agricultural employment declines. Indeed, to ensure the viability of agriculture as a land use, it may be necessary to enlarge the size of holdings and reduce employment, recognizing that this will be accompanied by environmental change in many cases. Policies which aim at retaining management in a particular area may include:

Market policies

The data presented in Chapter 6 showed that many forms of marginal agriculture are heavily dependent on support available under the CAP market regimes, especially the livestock headage payments for producers of beef cattle, sheep and goats. Small-scale dairy farmers in marginal areas are also likely to be more dependent on the support provided by CAP than producers in more productive regions. In several Member States, including France for example, milk quotas are allocated on a regional basis and there are mechanisms to prevent the quota from 'migrating' from Less Favoured Areas (LFA) to regions where production costs are lower. Consequently, there is a high probability that high nature value farmers in marginal areas are more dependent on the current pattern of CAP market support subsidies than producers in the EU as a whole. If changes are made to these CAP support regimes, they may have a disproportionate effect on marginal farmers and the potential implications need to be examined in advance, with particular attention to vulnerable groups of farmers.

For example, it is expected that the Commission of the European Communities (CEC) will be initiating a discussion on the future of the CAP dairy support regime in 1997 since the current policy is fixed only until the year 2000. Already some Member States are advocating radical change, for example that quotas should be phased out over time (Agra Europe, 28.6.96). Potentially this could have major implications for marginal dairy farmers in regions such as Cantabria in northern Spain and in mountainous and upland regions in many other parts of Europe. If quotas were to be eliminated entirely, attention would need to be given to designing special measures to permit the continuation of more traditional forms of milk production in HNV areas. Individual quotas or special premiums may be appropriate for this purpose.

The current system of headage payments for producers of beef cattle, sheep and goats has contributed substantially to the viability of farms in many marginal areas but it has also provided an economic stimulus for intensification and environmentally undesirable changes of practice in many regions. Livestock numbers have built up in several marginal areas which are vulnerable to overgrazing. In La Serena in Spain, for example, a low intensity farming area of importance for several species protected under the Birds Directive, a combination of headage payments under the CAP sheepmeat regime and LFA subsidies has permitted a large increase in the number of sheep. This has caused overgrazing and increased pressure on steppe land birds (Beaufoy, 1996).

At present producers of beef cattle qualify for an additional premium if the total stock numbers carried on a farm are below the threshold of 1.4 Livestock Units (LU) per ha, as measured by a formula set out in the relevant Regulations. In practice, many producers who would not be considered extensive in the normal sense of the word qualify for this aid so it does not appear an effective means of targeting producers in HNV areas. However, it would be possible to amend the rules which govern this premium so as to target it more precisely on farmers employing more extensive systems, including HNV farmers. For example, it would be to lower the 1.4 LU threshold as proposed by the CEC in July 1996. Another approach might be to alter the formula for deriving total livestock density on a farm. A third option would be to introduce rules specifying the type of forage which would need to be grown on the farm in order to qualify for premium. Rules on forage crops could be devised in such a way as to aid farmers reliant mainly on grass or other semi-natural vegetation and to reduce or withdraw the premium from those growing significant areas of maize. In the sheep sector, the present 'rural world' supplementary premium, for which producers in all the LFA are eligible, could be converted in to a payment targeted more precisely at HNV areas. This would require the introduction of new criteria and might necessitate appropriate rules to allow some flexibility according to variations in regional conditions.

There are arguments for converting support for livestock producers from headage payments to annual area payments, following the general principle now established in the CAP cereals' regime. Payments per hectare could vary considerably from region to region depending on the policy formula adopted. In

principle, area payments could reduce the incentives for over-stocking and could allow simple environmental rules to be attached to a premium, again taking account of varying regional circumstances. For example, it would be desirable to encourage farmers to maintain appropriate grazing pressure throughout the holding, rather than to permit a concentration of land use, with heavy stocking on some land and abandonment elsewhere. However, it may be difficult to design such a scheme in a way that is enforceable in practice and does not result in a large fall in income for many producers and perhaps for some regions. There are other difficulties too such as those encountered in making payments to producers who graze common land or areas which they do not own themselves. More detailed studies of the potential implications of different support mechanisms for sheep and beef producers could play a valuable part in helping to identify the most appropriate measures for delivering aid to producers in this sector. Some studies are now in progress but there is as yet limited information for a well informed policy debate at a European level.

Cross-compliance

The term 'cross-compliance' refers to the attachment of environmental conditions to agricultural support payments made to farmers. In the Union, most of these payments originate from the CAP market regimes and so the main potential application of the policy would be at EU level. Environmental conditions could be applied more readily to direct payments, such as the Arable Area Payments and the Livestock Headage Premiums, than to other forms of CAP support such as the system of dairy quotas. The UK is the only government now experimenting with the application of cross-compliance to CAP livestock headage payments for beef cattle and sheep, with the main purpose of preventing overgrazing (Baldock and Mitchell, 1995). This is a potentially useful policy mechanism but it raises questions about the precise definition of overgrazing and the ability of officials at a local level to convince farmers that a particular level of stock production is essential to avoid severe vegetation or soil damage. If officials face entrenched hostility from farmers it is hard for them to enforce the measure effectively. Overgrazing on common or collectively owned land is often particularly difficult to control.

There are no reliable figures on the extent of overgrazing in the EU but there are examples of this problem in many marginal areas. Adequate control of overgrazing would help to prevent environmental damage and may contribute to a redistribution of livestock to areas with a greater carrying capacity. In principle, this might release quota rights which could be transferred to areas where undergrazing is a severe environmental problem. In practice, economic pressures are likely to result in stock being transferred to more productive lowland regions if they are displaced from over-grazed marginal land unless there are strong incentives to reintroduce sheep, goats, cattle or horses onto undergrazed areas. A redistribution of livestock would be difficult to achieve by a cross-compliance mechanism alone but it may be possible if there is a concerted use of different policy instruments.

Food quality and regional labels

There are opportunities to integrate environmental concerns into the system of regional food labels so as to ensure that appropriate forms of production are required of farmers benefiting from a premium for traditional local products. Closer linkages between environmental and regional labels would help to build consumer confidence as well as directing additional income from the sale of identifiable regional products to farmers utilizing environmentally sensitive methods. Many of the regions associated with special labels are in the LFA, including many mountainous areas. However, as the use of special labels increases, it becomes more essential that the claims they make can be authenticated. This necessitates a system of clear rules and a method of enforcing them at the local level. Precisely this approach has been applied to organic farming for which there is an Regulation setting standards for crop production (2092/91) and national procedures for verification. At present, there is no equivalent EU measure setting standards for organic livestock production, although this is likely to be more relevant for many marginal regions. Organic farming may help to increase the value of farm products in high nature value regions, as well as improving or maintaining environmental management. It can be encouraged through measures such as Regulation 2078/92 discussed below.

The case studies suggested that the higher price obtainable for locally produced foods of a high quality had played an important role in the survival of marginal farms in both the Cévennes and Grosseto. In Italy, where approximately 42% of total milk production from cows is used to make cheese from a Protected Designation of Origin (PDO), it appears that farmers in the regions concerned have a higher income per labour unit than in areas where the cheese does not benefit from a PDO label. In Lombardia, for example, milk production is reported to have declined because little milk has been used for the manufacture of PDO cheeses (De Roest, 1995). It is also reported that mountain dairy farmers in Italy are able to produce milk of a relatively high quality throughout the summer and thus gain a premium on the normal price. This is not available to most farmers on the plains who are unable to meet quality standards such as a minimum protein content of 3.2% (De Roest, 1995).

These examples suggest that the quality and consumer acceptability of products from marginal areas may be an important determinant of the survival of the farming systems. At present, the European legislation on the protection of PDO products, Regulation 2081/92, is concerned primarily with the protection of geographical indications and designations of origin. For several of the products concerned, it may be appropriate to insist on environmentally sensitive methods of production for products qualifying for the label. For others, there may be value in a special label to indicate products arising from high nature value agriculture to distinguish them from others originating from the same region but produced relatively intensively.

Aid for Less Favoured Areas

In the 15 EU Member States there are now 78 million ha of less favoured farmland, of which about a third are mountainous areas. The principal form of support is the annual compensatory allowance payable per animal or per hectare, which was paid to about 1.05 million farmers in the EU 12 in 1994 (Brouwer and Van Berkum, 1996). Other forms of support which Member States can make available include investment aid for modernization and land improvement and additional headage payments for suckler cows and ewes. However, many farmers are excluded from support by their national governments or because their holdings are too small (see Chapter 6).

The analysis in Chapter 5 suggests that most marginal farming areas are likely to be found within the LFA, although only part of this now large area could be categorized as high nature value farmland. The headage payments and other support measures have contributed to the viability of farms which have been eligible for assistance and are likely to have played a role in maintaining farming in some marginal areas. However, they are not designed to provide an incentive for environmentally appropriate management practices. Indeed, the system of headage payments provides a direct incentive to maximize the number of stock on a holding up to the limit of 1.4 LU/ha and there is no method of relating these payments to the carrying capacity of the farm.

It would be possible to refine the LFA support measures so that they were more discriminating in their application. For example, certain simple conditions could be attached to the payments to encourage good environmental management, drawing on lessons learned from agri-environmental schemes. Indeed, it would be possible to integrate the system of support for LFA with the agri-environment Regulation 2078/92, adopting more comprehensive zonal programmes, to vary LFA payment levels according to different zones so as to provide increased aid for farmers in locations where the continuation of grazing was ceasing to be viable but was important for nature conservation or landscape reasons. Areas of low intensity land with particular nature conservation or landscape value could be eligible for higher payments than those where grassland had been improved but conservation interest had diminished. There may also be arguments for converting headage payments into area payments, as discussed above.

Agri-environment policies

As the Member States increase their expenditure on agri-environment schemes, most of which now fall within the ambit of Regulation 2078/92, they are becoming a more significant source of support for high nature value farming systems in marginal areas. A comprehensive inventory of the schemes approved by the CEC is not yet available so it is premature to analyse the geographical distribution of national schemes under the Regulation or to assess their precise impact on the viability of farms in the regions concerned.

Some Member States have introduced schemes designed specifically to combat marginalization. In the Box about Management requirements for farmers joining the Ariège ESA (Pyrénées), an example is given of the management requirements set out in a mountain Environmentally Sensitive Area (ESA) in France, originally designated under Article 19 of Regulation 797/85. It is an intermediate upland zone of about 18,000 ha where the aim is the maintenance and protection of the upland pastoral landscape. Grant aid is available for only about 3,700 ha and the budget is limited to 1.2 million FF per year. It shows the kind of management requirements that might apply in many other areas as well.

At present the primary purpose of agri-environment schemes is to compensate farmers for agreeing to maintain or adopt practices which are desirable environmentally but may not result in the highest economic return. Regulation 2078/92 is not intended to provide farmers who sign agreements with significant income support over and above the compensation required to maintain environmentally sensitive practices. In Article 9 of Regulation 746/96, which lays down detailed rules for the application of the agri-environment Regulation, there is an explicit rule on the level of aid which Member States can offer farmers. The aid should be based on 'objective criteria' and should not exceed 20% of the loss of income and additional costs incurred in signing the agreement 'except in the case of specific undertakings where a higher rate proves to be indispensable for the effective implementation of the measure'. Where higher rates are offered, 'these must be duly substantiated, having regard to all the objectives of Regulation (EU) 2078/92'.

Management requirements for farmers joining the ariège esa (pyrénées)

Requirement	Payment/ha/year (FF)
Tier 1	200
Respect maximum and minimum stocking densities for cattle, sheep, goats and horses	
Maintain animals in fields during the spring and autumn	
Install pens and enclosures during the summer and rotate pastures	
Tier 2	500
As Tier 1 plus:	
Mechanical or manual removal of encroaching scrub on pasture lands	
Maintenance of stream beds	
No pesticide or herbicide use	
Tier 3	800
Mechanical or manual removal of encroaching scrub and woodland on pasture lands	
Conversion of cleared scrub to hay meadow	
Annual grass cutting for the duration of the contract	
Maintenance of stream beds	
No pesticide or herbicide use	

Source: Boisson and Buller, 1996.

In practice, Member States have some discretion in setting payment levels and they may choose to provide some incentive for farmers to enter schemes, as well as simply compensating them for the restrictions imposed. Indeed, this may be essential to persuade them to embark on the process of negotiation and form filling and to commit themselves for several years ahead. These 'transaction costs' can be quite high. A number of schemes offer farmers several different tiers of agreement. The basic tier may comprise obligations which are not onerous to farmers employing fairly extensive measures, for example a requirement to limit fertilizer use, accept a maximum livestock density and maintain landscape features such as hedges and ditches. A significant number of farmers may be able to meet these obligations with little or no change to their farming system; in such cases the payment, even if modest, represents a form of income aid. However, the farmer is prevented from adopting more intensive practices and so there is a clear benefit for society, provided that the management rules are appropriate, even if there is little change in management. In effect, it is a payment for producing 'environmental services'. Higher tiers of the scheme may offer substantially greater payments for more onerous measures such as reducing stock densities, converting arable to grassland, complete cessation of fertilizer use, recreation of degraded habitats, etc.

This two tier approach has the potential to offer both a modest level of income support and more targeted and substantial nature conservation benefits on a limited area. The design of schemes is critical; if the incentives for the higher tiers of an agreement are inadequate, there may be little take-up by farmers. Rules for the basic tier need to be designed to prevent intensification or other environmentally damaging changes occurring on one part of the farm, while restrictions are adhered to on another part.

In France, the government has introduced a large-scale basic scheme of this kind, known as the *prime à l'herbe*. This is available to all farmers with 3 ha or more of Utilized Agricultural Area (UAA) able to support at least 3 LU with a general ceiling of 1.0 LU/ha, rising to 1.4 in certain places. Farmers have to continue existing livestock husbandry practices to maintain features such as hedges, copses and streams and the total grassland area of the holding, and to undertake some grass cutting. There is a relatively modest subsidy. Initially it was set at 250 FF/ha with a ceiling of 20,000 FF per annum. In 1995 this was raised to 300 FF/ha with a ceiling of 30,000 FF per annum. The scheme has been very popular, with 5.7 million ha enrolled by March 1994. By this date over 100,000 farmers had signed agreements with a concentration in the Massif Central (Boisson and Buller, 1996). There has been some scepticism about the initiative because so many farmers qualify for aid and there appears to be little evidence of the environmental conditions being enforced. There may also be adverse effects in some areas with low stocking rates. In the Haut-Jura, for example, where stocking rates have been around 0.5 LU/ha, farmers have had an incentive to intensify in order to reach the minimum level qualifying for payment - 0.6 LU/ha (Bruneel, 1995).

However, a basic measure of this kind with simple but carefully considered rules and an effective system of enforcement could provide a significant source of aid for an important group of producers, including many marginal farms. Indeed, a scheme like this could be integrated with the existing system of aid under the LFA Directive to result in a single area-based payment, offering more generous support in return for compliance with uncomplicated but regionally appropriate environmental obligations.

Few agri-environmental schemes have been subject to rigorous evaluation and it is too soon to analyse their impact on the viability of farms in target areas. A recent evaluation of a pilot scheme in Wales, known as Tir Cymen, investigated effects on farm income and the local economy on the basis of a survey of 131 participant farmers and 35 local small businesses. The scheme offers farmers a basic annual area payment supplemented by much higher payments for specific habitat management measures and capital grants for investments in hedges, stonewalls, the planting of woodland, etc. On average, the farms interviewed were receiving £1,547 per year as a basic whole-farm payment, a further £2,510 a year for more specific management measures and a capital grant of £11,006 spread over ten years. It was estimated the scheme more than compensated farmers for the environmental constraints imposed on them and the net effect was to increase average farm income by £1,616 per annum. Participating farmers maintained full-time and part-time employment on their holdings during a period when there was a national reduction and casual employment rose by 98% in the sample farms. This and other evidence suggests significant benefits for the local economy, many of them stemming from the investment aid (ADAS, 1996).

Most agri-environment schemes are based on management agreements signed by individual farmers and applying to land which they own or rent. Relatively little progress has been made in developing schemes which are applicable to groups of farmers or organizations able to act on behalf of the farming community. In some parts of Europe, small and often fragmented farm structures and the prevalence of land owned collectively, or controlled by institutions such as the church limits the usefulness of individual management agreements. In some cases, land is owned by the commune or local authority. Such bodies are not eligible for reimbursement from the European Agricultural Guidance and Guarantee Fund (EAGGF) under Regulation 2078/92 so they have little motive to participate in schemes. There are arguments for altering the rules of the Regulation so that it can apply to owners and managers of land other than farmers, provided that there are safeguards to prevent abuse of the system. Pilot projects to experiment with different approaches to village-based or collective management agreements also would be valuable.

At present, agri-environment schemes do not apply everywhere and there are several areas where they do not offer an effective alternative incentive to afforestation (see also Section 7.5). Consequently, there can be a bias in the use of EU funds towards afforestation rather than continued grazing, especially where stocking densities are very low - often areas of high conservation value.

Investment aid and early retirement schemes

Investment aid can be financed with a mixture of national and EU funds. Such aid can assist traditional and marginal systems to increase their efficiency and reduce production costs. In Valle d'Aosta, for example, the regional authorities have provided support for buildings and infrastructure required to modernize the system of alpine cattle grazing and encourage local tourism at the same time. Such investments may carry an environmental cost and in some cases will lead to changes in management which are deleterious for nature conservation, such as increased stocking density on species-rich grassland. Environmental safeguards are required before aid is provided but it may be necessary to make a compromise between the viability of the farming system and the ideal form of management from a nature conservation perspective.

Investment aid may be essential to permit improved environmental management on the farm. For example, it may be important to reestablish field boundaries in order to control stock movement. There may be areas of woodland on a farm subject to overgrazing which can only be managed effectively if they are protected by a new boundary such as a fence. Similarly, old buildings may need to be repaired or new ones erected in order to support the continuation of more traditional farming systems. Such aid can be made available through schemes open to all farmers, for example under Regulation 2328/91. It may also be incorporated in an agri-environment scheme and tied closely to the management practices promoted by the scheme. In either case, selective investment aid is often an important complement to a system of annual payments.

Another approach to increasing the viability of farms in marginal areas is to provide a direct incentive for elderly farmers to retire early and transfer their land to another holding, potentially increasing the income obtainable from larger units. In the EU there have been a number of measures designed for this purpose, most recently Regulation 2079/92, which provides Union funding for national programmes encouraging early retirement by full-time farmers and agricultural workers aged 55 years or over. This measure is voluntary for Member States and the level of implementation varies considerably. The most active programmes have been in France, where 57,000 farmers enroled in the scheme during the first three years, in Greece where 50,000 farmers have been affected over five years and Spain and Italy where participation rates have been lower (Brouwer and Van Berkum, 1996).

In the absence of specific monitoring work on the effects of these schemes, it is difficult to evaluate their impact on the environment. The Regulation insists that 'released land transferred to farming transferrees must be farmed for not less than five years, in harmony with the requirements of environmental protection' (Article 6.4). Land transferred outside agriculture, for example to forestry, must be used 'in a manner compatible with protection or improvement of the quality of the environment and of the countryside'. In principle, these stipulations should help to prevent environmentally damaging changes in management which can follow farm enlargement, for example the introduction of new machinery,

removal of hedges and field boundaries and overall intensification of the holding. How they are enforced in practice is less clear. In many areas larger units seem essential if agriculture is to remain a competitive land use.

Rural development initiatives

There is a growing appreciation within the EU that environmental objectives can be incorporated into rural development policies and that the traditional emphasis on increasing output and intensification is no longer appropriate in many areas (Bandarra, 1995). In Objective 5b regions a new generation of single programming documents applies during the period 1994-1999 and some contain environmental measures, including aid for low intensity agriculture. It is not possible to evaluate the significance of such measures in either Objective 5b or Objective 1 areas because of a lack of information about their contents. However, it is clear that the survival of agriculture in marginal areas does not depend solely on the economic returns from farming. Other measures to improve the rural infrastructure, education, health, alternative job opportunities and quality of life may have an important impact on the viability of traditional agrarian communities. The provision of effective training and agricultural extension services is poor in many marginal areas and improvements may be amongst the most urgent rural development priorities. As older farmers reach the point of retirement, their successors are likely to be concerned not only with prospective income and the workload involved in farming, but also with the quality of rural life as a whole. In more remote areas, where basic facilities such as education, health services and public transport are often poor, these factors can be particularly important.

This report is not the place for a wider discussion about the most appropriate form of rural development in different marginal areas. Nonetheless, it must be emphasized that marginal agriculture cannot be seen in isolation from rural society and that the agricultural support measures, which have been the focus of this chapter, are only one element in the array of public policies required to achieve a balance and sustainable form of rural development.

7.5 Alternative management options

There are likely to be some areas of land where the continuation of agriculture is not the preferred option and others where it may be desirable environmentally but not achievable in practice. There are a range of alternative options for the management of this land. While these will vary from place to place, some of the main options can be summarized briefly.

Management of abandoned land

Often the principal concern on abandoned land is to control shrubby vegetation, whether for nature conservation purposes or the prevention of fire, and to restore an appropriate form of semi-natural vegetation. The reintroduction of livestock,

for example goats, hardy cattle and sheep, often is the best means of controlling unwanted vegetation on abandoned land. It may also be the best form of management for meeting nature conservation goals. However, there are some circumstances where it is chosen to remove shrubs and trees mechanically or by hand. It is not always practical to reintroduce livestock, particularly if there is a lack of skilled labour or there are problems with access or water supplies. Most cattle, sheep and goat production systems are now heavily dependent on direct subsidies under CAP and these are subject to limits on the number of animals eligible for support payments. This can inhibit the reintroduction of stock on abandoned land. Farmers are unlikely to wish to use their entitlement to quota for cattle which are grazing on rough vegetation since the economic returns are likely to be relatively low and they could earn more by keeping quota rights for cattle grazing better pasture.

To overcome these barriers to good management, it may be necessary to introduce special incentives for land management, normally by farmers but also by other bodies, such as local authorities, forestry authorities or relevant local associations. In southern Europe, the principal motive for such management may be the control of forest fires, as is the case in Lozère, but this can be combined with other environmental objectives, including nature conservation. If it is essential to use hardy breeds of livestock, such as traditional upland breeds of cattle and sheep, special incentives are likely to be necessary, at least for a period of years. If the reintroduction of management results in improved grazing conditions, eventually it may be possible to generate a commercial return, especially if rents for the land are low. If quotas are not available for farmers willing to graze such land, special measures may be necessary. For example, local authorities could purchase quota and lease it to farmers. Arrangements could be made to establish a national pool of quota which could be distributed to producers in areas selected by environmental authorities as being a priority for increased grazing.

Where management has been reduced to a minimum or ceased entirely, incentive payments for the upkeep of abandoned farmland or woodland can be paid to farmers with reimbursement to national authorities under Regulation 2078/92. Rules for implementing this Regulation are laid down in Regulation 746/96 (OJ L 102, 25.04.96). Under Article 6 farmland is to be considered abandoned if it has not been the subject of any agricultural use or farming activity for at least three successive years. Woodland is considered abandoned if it has not been 'used for any woodland purpose or if no woodland practice that may have been necessary has taken place in the ten years prior to the undertaking, if the condition of the land poses a threat to the environment as a result of a lack of upkeep and if the owner of the land cannot be required to carry out such work'. In exceptional circumstances, where no farmers are available for managing abandoned farmland or woodland, Member States may provide aid to other categories of land manager, although not to public authorities.

While these restrictions may help to prevent the EAGGF budget from being burdened by the cost of works undertaken by local authorities with little direct

relationship to agriculture, they may in practice hinder the effective management of abandoned land. In some situations, local authorities may be the only bodies willing and capable of undertaking the necessary work or of encouraging farmers to do so, for example by overcoming impediments to grazing on common land. Furthermore, public bodies are already eligible for reimbursement of costs associated with woodland management under Regulation 2080/92. As noted above, this can tilt the economic incentives in favour of afforestation, which may not be the best outcome from a nature conservation viewpoint.

Afforestation

Very often forestry is the alternative use promoted in marginal farming areas. In some Member States, including Denmark, Finland, France, Ireland, Portugal, Spain and the UK, incentives for different forms of woodland are in place and are subject to varying degrees of environmental control. Incentives normally are necessary to persuade landowners to invest in productive or conservation forestry although there may be some areas in Europe where it is cost-effective to establish trees without public subsidies. As emphasized above, the environmental acceptability of afforestation depends greatly on local conditions, the type of woodland proposed and the long-term management of the site. At present, Regulation 2080/92 provides a source of EAGGF funding for publicly supported afforestation. Support payments may be higher for broadleaves than for coniferous trees but there are no controls at a European level to ensure that payments are not used for damaging forms of afforestation other than the environmental assessment Directive 85/337. In most Member States environmental assessments are only required for large blocks of new forest.

Two of the more ambitious afforestation programmes under Regulation 2080/92 are in Finland and Spain. In Finland, the proposal is to build up to an annual total of 15,000 ha of afforestation, mainly on marginal land, as shown in Table 7.1. This contrasts with the approach in Sweden where the preference is to keep most of the grazed areas open, as emphasized in the Swedish agri-environment programme. In Spain, the government set a very ambitious target of 800,000 ha of new forest over five years, although there were applications for only about half this area in 1995. In the first year about 90,000 ha of forest were planted instead of the planned 150,000 ha but this is still a very substantial area (Gomez-Jover, 1996).

Table 7.1 Estimate of the areas of arable land in Finland to be afforested annually, ha

	1995	1996	1997	1998	1999	Total
Annual afforestation	10,000	10,000	15,000	15,000	20,000	70,000
Early retirement	2,500	4,000	4,000	4,000	3,500	18,000
Total	12,500	14,000	19,000	19,000	23,000	88,000

Source: Ministry of Agriculture and Forestry, Finland.

There are opportunities for enhancing the landscape, protecting soil and advancing nature conservation objectives by appropriate forms of afforestation. From a nature conservation perspective, it is critical to plan the siting and management of new woodland with care, taking account of both the existing land use and the potential for creating new habitats. In areas where woodland has been reduced to small fragments in a predominantly agricultural landscape, the priority may be to expand the existing patches of woodland and create linkages between them, rather than to establish single new blocks. Indeed, there are areas of Europe where a woodland habitat network could offer significant benefits (Peterken et al., 1995).

Promoting multiple uses of land

Rather than attempting to maintain an exclusively agricultural form of management, public authorities may choose to promote a more varied pattern of land use which might include a role for more woodland, recreational uses, protected landscape areas, water protection zones, etc. None of these different land uses need to be exclusive and different forms of management may be appropriate at different stages of the marginalization process. For example, it may be possible to combine recreation with the continuation of extensive forms of agriculture, particular in areas with heavy visitor pressure. Elsewhere, hunting of game species may be an important management objective, possibly in combination with forestry or conservation. In certain areas, the growth of energy crops, such as short rotation coppice, may be cost effective, particularly if grant aid is available. Inevitably, mixed objectives are likely to result in management choices which are a compromise from an environmental perspective.

Management for nature conservation

There will be some sites where nature conservation, rather than agriculture, can be established as the most important management objective. Much of this land will be in areas already subject to some protection, such as national parks and regional nature parks, or will be in places likely to be designated in future, including candidate SACs under the Habitats Directive. Several different mechanisms can be used for ensuring appropriate management. These include:

- the application of agri-environment schemes, in effect a means of assisting continued agricultural management, as discussed above. Agri-environment measures have several advantages, including the availability of resources from the CAP budget under Regulation 2078/92. However, there are also drawbacks. Since these schemes are usually voluntary for land owners and managers, they do not provide a guarantee that all the target area will be enroled in the scheme. Also, most schemes have a limited life, often five or ten years, after which the future of the site may become uncertain;

- purchase of the land by nature conservation authorities, local authorities or NGOs, where necessary using grant aid from environmental agencies. This provides a more secure form of control over the land in question and may be

more cost effective for the authorities than longterm management agreements involving continuous payments, which are likely to increase over time. The land can be managed directly or leased to farmers, subject to restrictions. Purchase of land for nature conservation is accepted as a useful policy tool in several European Member States, including the Netherlands and Germany, but many other governments are reluctant to adopt this approach other than on a small scale;

- the formation of local partnerships involving farmers and potentially others with land management capabilities, depending on local circumstances. Institutional and financial support may be provided by a local authority or conservation body, such as the regional nature parks in France. Partnerships can be useful to overcome institutional and ownership barriers to appropriate management, for example where land is owned collectively by local communities. Some form of control may be necessary over grazing rights in order to establish an appropriate form of management and to provide the necessary incentives. On some sites it may be appropriate to encourage major changes in management, such as the introduction of hardy breeds of livestock. Financial aid from the EU may be obtainable if projects meet the criteria for support from the Structural Funds, particularly in Objective 1 and 5b areas. Another possible source of aid is the LIFE funding instrument, which is linked closely to implementation of the Habitats Directive.

The laissez-faire approach

This will permit agricultural marginalization to take its course and implies accepting the land-use changes and new forms of management which arise. In selected areas this has occurred on a large scale in the past in the United States, for example on the east coast where millions of hectares of former agricultural land are now mainly secondary forest. This involves minimum cost to the budget although there may be social costs, some falling on the communities affected, others on the national or regional budget. There will also be environmental costs and benefits. A number of policy tools are available to address certain environmental concerns. These include land-use planning procedures, which may prevent inappropriate construction taking place on farmland for example, and support for the control of forest fires which will be a primary concern in many regions in southern Europe. However, the lack of intervention inherent in a laissez-faire approach makes it difficult for the authorities to impose a particular form of management on landowners for environmental purposes, which is a major drawback to this approach.

7.6 Conclusion: a future strategy for marginal high nature value areas

There is still time to devise an integrated EU strategy for the positive future management of areas of farmland which should be retained in agricultural use for environmental reasons. They include species-rich grassland, some stretches of low intensity arable land, certain areas under traditional mixed production systems, and zones where afforestation would have damaging effects on biodiversity or the landscape. To be successful this requires both a topdown and bottomup approach. Much of this chapter has been concerned with European policy measures in agriculture, forestry and related fields designed to influence farmers' decisions, mainly by economic incentives. These are important in their own right and set the framework for more regional and local policies. However, they need to be complemented by the formulation of environmental and land-use objectives at a local level which can feed up into agricultural policy so that change is not driven purely by adjustment in agriculture. Such initiatives need to be developed quite rapidly if they are to be effective during the next decade, when the pressures for marginalization could increase.

At the same time it is important to recognize that marginalization occurs as a result of decisions taken by individual farmers in response to personal circumstances. They are influenced not only by economic incentives but also by their own perception of the future and the alternatives before them and their families. A wide range of social, economic, cultural, health, training and employment issues may impinge on their decisions and those of their potential successors. These concerns stretch beyond agricultural policy to rural life and development in a much wider sense.

8 CONCLUSIONS AND RECOMMENDATIONS

8.1 Introduction

In this study, the question of agricultural marginalization and land abandonment in the EU has been approached primarily from an environmental perspective with particular reference to nature conservation. Two different methods have been used:

- an examination of potential statistical indicators of marginal agricultural areas, drawing on data available at a European level;
- a set of six case studies exploring different aspects of the marginalization processes and some of the environmental consequences in different parts of Europe.

8.2 Marginalization as a process

There is no clearly agreed European definition of agricultural marginalization and several formulations of the concept can be found in the literature. The term is understood in a variety of ways, reflecting the different disciplines which have found it useful and the diversity of conditions found in rural Europe. In essence, it is an economic concept concerned with the process whereby resources, including land and labour, cease to be deployed in agriculture, but it can be interpreted from a social, cultural and environmental perspective as well.

Marginalization on European farms takes a variety of forms and occurs at a range of different scales, from the individual patch of land no longer worth cultivating to sizeable regions. While most forms of marginalization occur progressively over a period of time, not all result in a permanent change in land use and some are purely temporary, occurring for example on farms during a transition from one owner to another. Not only is the process of marginalization itself dynamic, but the concept has taken on different meanings in both the academic literature and the wider political world since it came into use about a decade ago. It may well be that our current conception of marginalization evolves further in the next decade and we should be cautious about forecasting how the process will develop on a European scale.

Local conditions play an important role in determining the path of marginalization and several variants can be observed simultaneously within a relatively small region. Nonetheless, it is helpful to distinguish at least four different processes, each of which can take place at more than one geographical scale:

a) changes in farm management designed to adapt to adverse economic circumstances. These can take several different forms, including simplification or abandonment of traditional systems, a scaling back in the use of labour, concentration of production on part of the holding where more intensive methods may be employed, reduced use of inputs, and possibly abandonment of some areas. Contraction of management effort and a scaling back of labour input is a widespread phenomenon, sometimes referred to as extensification; it can have major environmental implications. This process does not usually entail any transfer of land from agriculture to another use but changes in production systems may occur;

b) the process whereby the number of holdings declines in a region or area as existing farm structures become increasingly uncompetitive, causing loss of employment, but the land remains in agricultural use. This is restructuring, mainly by the enlargement of holdings and sometimes is referred to as 'extensification' in French, although not usually in English. The effect is a form of social marginalization and there may be important environmental consequences;

c) the deliberate transfer of land from agriculture to other uses, mainly forestry. Afforestation is concentrated in areas where returns from farming are considerably below average, where land values are low and where incentives are available. In certain regions, afforestation incentives have been high enough to attract planting on rather more productive land, but usually more marginal areas are affected;

d) the 'classical' situation of outright land abandonment, usually where farming ceases to be viable for economic and often social reasons. It is an extreme form of variant (a) above. It can be distinguished from the deliberate deployment of land to an alternative use which normally involves a continued income or revenue from a lease or sale. Such abandonment may occur within the farm, e.g. where grazing ceases on steeper, more remote patches or may affect the entire holding. It may occur within a relatively small area where conditions are particularly adverse or on a regional scale as well. In the absence of further human intervention the outcome will be a form of natural succession, generally proceeding through a scrubby stage towards a more natural form of vegetation, although frequently containing different species than the original climax. This is an entirely different process from commercial afforestation, as in variant (c) above.

All four kinds of marginalization occur simultaneously within a region.

8.3 Identifying regions where marginalization is concentrated

Many different factors play a part in driving the process of agricultural marginalization. These include geographical and biophysical conditions, farm incomes, farm structure, the age of farmers and social conditions in agricultural

areas. Several national studies which have attempted to identify areas that are marginal or are becoming marginal have relied on indicators covering these different fields. Some have been able to draw on time series data, for example showing changes in the Utilized Agricultural Area (UAA) over a period. When selecting potential indicators of marginalization at an EU level, the range of data available is more limited than in some individual Member States. For many potential indicators consistent time series data is not available and for others it is published only for large geographical areas such as entire countries. Many of the more useful statistical sources, such as the Farm Accountancy Data Network (FADN), are not available for very recent years. Furthermore, FADN data is for 'commercial' farms and excludes some of the smallest holdings, which are a sizeable group in several countries.

On the basis of the indicators selected, most of which relate to the late 1980s, a distinction was made between five different groups of regions within EU 12 derived from the indicators by using a cluster analysis. The five regions identified could be characterized as follows:

(i) a set of regions with highly productive agriculture, covering almost 40% of the Union's UAA and about 20% of agricultural holdings. They cover most of the northwestern part of the EU, excluding Ireland and parts of the UK, notably Scotland and Wales;
(ii) regions with medium productivity, covering about 10% of total UAA and accounting for about 10% of all farm holdings. This group covers large areas of Germany and parts of France;
(iii) regions dominated by extensive farming. They cover about 30% of the UAA but only around 15% of agricultural holdings. They include most of Spain, sizeable areas in the southern part of France, parts of the UK, Ireland and Italy;
(iv) regions where small-scale farming dominates. These account for more than half of all holdings in EU 12 and only about 15% of the UAA. These regions cover most of Portugal, Italy and Greece;
(v) a small residual group where agriculture is more extensive than the average in the EU but a substantial area of land lies outside the Less Favoured Areas (LFA). This group covers only about 1% of holdings in EU 12, but accounts for 3% of the UAA, concentrated mainly in Ireland but including some smaller areas in Spain as well.

The quantitative assessment in this report provides a first attempt to investigate the susceptibility to marginalization and abandonment of land used agriculturally in the European Union. Limitations in the availability of data were an important constraint in drawing up possible indicators of marginalization at an EU level. Good data on biophysical conditions was difficult to find at a European level for example. It was also necessary to exclude the Neue Bundesländer in Germany and the new Member States of Austria, Finland and Sweden. In choosing from the data that is available, considerable weight was given to the Farm Structure Survey (FSS) published by Eurostat and the Farm Accountancy Data Network (FADN) of the Commission of the European Communities (CEC). The information

available from FSS is disaggregated at the level of over 400 regions within the Union. However, the FADN system distinguishes only 91 different regions. Since variables were required from both data sources to construct a reasonable range of indicators, the FADN system was the limiting factor and prevented analysis at a more detailed regional level, although this would be preferable because of the localized nature of marginalization in some parts of the Union.

Within the typology of regions developed for the study those which are most susceptible to marginalization can be expected to be found in the 'extensive farming' and 'small-scale farming' group. In both, average Family Farm Income (FFI) per Family Work Unit (FWU) is rather low and less than average Gross Domestic Product (GDP) per inhabitant. In the extensive farming group the Standard Gross Margin (SGM) per hectare is low, whereas it is relatively low per farm in the small-scale farming group. In both groups more than half the holdings are headed by individuals aged 55 years or more, indicating that important changes in ownership and management may be in prospect for a large number of farms. In both groups, off-farm activities make an important contribution to family income.

While it is useful to try to identify areas particularly vulnerable to marginalization, it is important to avoid a simplistic view. As emphasized in Chapter 3, both marginalization and abandonment can occur in almost any part of Europe. In the more productive and economically developed regions, land can be abandoned because it is unsuitable for intensive production or for other reasons such as competing pressures for space on the urban fringe.

8.4 Distribution of marginal agriculture

Existing information sources give only a rather imprecise picture of the distribution of marginalization in the EU at present. From literature and the case studies it appears to be particularly concentrated in the less fertile and drier zones in the Mediterranean, at higher altitudes in the Alps, Pyrénées, other mountain chains and in parts of Scandinavia, particularly northern Finland. There is some relationship between marginal areas in a very broad sense and the LFA as defined by EU Directives. In several dry and mountainous regions there was large-scale historical abandonment earlier this century but there is little evidence of this occurring at present.

In relatively few regions, land-use statistics suggest a rapid decline in the agricultural land area. By contrast, considerable abandonment seems to be taking place in small patches within regions which are not usually considered marginal, such as Bretagne. It is misleading to focus exclusively on 'vulnerable regions' and to overlook the extent of change throughout the farmed landscape.

In some of the case-study areas there is evidence of land leaving agriculture altogether on a significant scale, particularly in regions with the least advantageous agricultural conditions. There are also areas where land is being

'driven' out of agriculture by afforestation subsidies, including parts of France, Spain, Portugal, Finland, Ireland and the UK.

National and regional policies play an important role in determining whether forestry displaces agriculture in more marginal areas, principally by determining the incentives for afforestation. In Italy, for example, afforestation incentives seem to be less attractive than in some other Mediterranean regions. There is some evidence that land abandonment has slowed down in several regions, including parts of Spain, as a result of the impact of the Common Agricultural Policy (CAP). The position in Greece and Portugal is less clear. However, where farm price levels and direct payments have been maintained by CAP and/or soft currencies, it has been possible to continue farming in many regions, albeit with low returns. Where farmers are facing distinctly lower market returns, as in Finland, the pressures for marginalization are correspondingly stronger.

8.5 Prospects for marginalization

The process of restructuring farm holdings and the associated decline in the rural labour force (variant (b) above) is occurring on a large scale in many parts of the EU, including in most of the case-study areas. Often, but not always, it is accompanied by significant changes in farm management. The process of structural change and concentration of farmland into fewer holdings is widely expected to continue and accelerate in some regions.

Socio-economic factors may be underestimated greatly in many assessments of the potential for marginalization and abandonment. In particular, farming may continue in very 'marginal' regions even when conventional indicators suggest that it is no longer viable. A major factor in this is the lack of alternative employment and the very limited social security payments available for those who give up farming entirely. On the other hand, in a relatively rich region such as Valle d'Aosta, abandonment seems to be continuing despite considerable investment aid and support from the regional authorities. The explanation may lie in the availability of alternative forms of employment and the hardship and physical difficulties of farming in mountainous districts.

The outlook is difficult to forecast. Continuing pressures to lower costs and compete in a wider European market will tend, in the long term, to lead to specialization and concentration of agriculture and to reinforce all four categories of marginalization. The rate of change may be accelerated at certain periods, for example when the current generation of elderly farmers retires, when the next round of CAP reform takes place, when the Central and Eastern European Countries (CEEC) are fully integrated into CAP, and when the special terms for the integration of Portuguese agriculture into CAP expire. On the other hand, some aspects of the CAP support system, including the direct payments to farmers, will help to curb marginalization and new measures, such as the agri-environment Regulation, will have a significant impact in some regions.

8.6 Consequences for nature conservation and the environment

The environmental consequences of the many different forms of marginalization are complex, change over time and depend significantly on specific local conditions. The most urgent priority is to protect habitats which are sensitive to disruptions in management and are likely to be destroyed by scrub invasion or other changes resulting from abandonment. These include several categories of semi-natural grassland and other grazed habitats, such as significant areas of heathland, maquis and agro-pastoral habitats including sizeable stretches of dehesa and montado.

The ecological consequences of marginalization depend greatly on the farming system affected. Unfertilized meadows, for example, are very often of botanical interest and even a short period of abandonment can cause a loss of diversity. By contrast, there are sizeable areas of improved agricultural grassland of relatively little nature conservation value and there might be benefits for biodiversity if this was converted to a more natural form of forest. Where marginal agricultural systems comprise a mosaic of different uses, abandonment or severe marginalization may be more damaging to nature conservation than in simpler systems because a range of different habitat types and established relationships between them will be lost.

Although it is difficult to generalize about the environmental consequences of marginalization and abandonment, the case studies reinforced a number of general observations found in the literature. In particular:

- the environmental impact of marginal agricultural systems is highly variable. There are many farming systems which play a central role in the management of valuable semi-natural habitats, particularly where low input and more traditional practices are followed. At the other extreme, some practices give rise to potentially severe damage, including soil erosion in areas which are unsuitable for arable use, olive groves on excessively steep slopes and overgrazed heath and grassland;

- the environmental consequences of marginalization and abandonment are variable. There are sizeable areas where the continuity of agricultural management is a high priority for nature conservation or for other environmental objectives, including landscape protection and water management. It is important that these semi-natural habitats are clearly identified and the management requirements are understood. This would allow a more precise focus for policies to contain marginalization and support appropriate forms of management where agriculture is in danger of abandonment. At the same time, it would be possible to identify areas where marginalization may result in environmental benefits, particularly if an appropriate form of land management can be established;

- in areas where marginalization is occurring, it may be possible to identify a particular stage in the process of natural succession which contributes most to local or regional nature conservation objectives. For example, some former agricultural habitats support an increased number of species as management is withdrawn. However, the value for conservation may decline if woodland is allowed to develop on the site. There is relatively little experience of managing land at different stages of succession and this is an area where further work and pilot projects are desirable.

8.7 The role of agricultural policy

Conditions vary substantially within Europe, but in several regions the CAP seems to have contributed to maintaining incomes at a sufficient level to encourage farmers to continue production. Producers in extensive farming regions tend to be dependent on direct subsidies for a substantial proportion of their income. Figures from the beginning of the 1990s suggest that, on average, farmers in this group of regions derive some 34% of FFI from direct subsidies, compared with only 8% in regions with small-scale farming. Within this group, direct subsidies within the LFA averaged around 3,500 ECU per farm, compared with around 1,400 ECU outside the LFA boundary which includes many holdings with sheep, goats and cattle reared outside.

The 1992 reform of the CAP includes measures intended to reduce surplus production, to reduce price support and to strengthen the environmental element in agricultural policy. The extensively farmed areas identified in the study account for only 9% of final agricultural production in the EU, although they cover about 26% of UAA. By contrast, the small-scale farming regions have a 19% share of final production on 17% of UAA; this is close to the EU average. The provision of income support on a per hectare basis may contribute to an increase in agricultural production in regions with extensive production systems. However, it is unlikely that this will add significantly to an increase in surplus production.

In the early 1990s, market support for cereals, oilseeds and protein crops, milk, beef, sheep and goats was very important in those regions with extensive farming systems, amounting to more than 80% of the total indirect subsidies which they received. In contrast, support derived from the CAP regimes for fruit, vegetables, wine, olives and tobacco covered more than 40% of the total indirect support received from the CAP in small-scale farming regions. During this period, the average annual level of total indirect subsidies paid to farms from EAGGF amounted to around 2,900 ECU in the extensive farming regions, 1,200 ECU in the small-scale farming regions and 5,100 ECU in the other regions.

Total annual EAGGF Guarantee expenditure during the early 1990s amount to some 24 billion ECU. This was distributed so that approximately 11% was paid to extensive farming regions, 20% to small-scale farming regions and 69% to other regions.

The system of compensatory payments made to farmers within the LFA contributes to their net incomes, although often it will be less important than other direct payments. However, the distribution of LFA payments is skewed. Some Member States with large numbers of holdings and farm families within the LFA, such as Portugal, receive a relatively small proportion of total expenditure from EAGGF. The amount paid per holding in Portugal is around 400 ECU, with an average of EU 12 of around 1,300 ECU.

In many respects it is too early to judge the impact of the reform of CAP on farm management practices in marginal areas. The costs of different forms of management and the appropriate level of incentives for farmers requires more detailed research.

The EU agri-environmental programme, Regulation 2078/92, is an important initiative which could contribute to the viability of farms in environmentally sensitive zones vulnerable to marginalization. However, at this early stage of implementation, it is difficult to judge how far the selection of zones, the schemes offered to farmers and the payment levels available will maintain appropriate forms of management in critical areas. It is clear that only few Member States have chosen to introduce schemes for establishing appropriate management practices on previously abandoned land and so the Regulation seems unlikely to influence the later stages of the marginalization process very much in the next few years. It may be more significant as a means of maintaining grazed habitats of high conservation value. One weakness in the Regulation is the rule which prevents individuals or organizations who are not farmers from receiving EAGGF support for the management of abandoned land. In some cases, local authorities or other bodies with close connections to the farming community may be better placed to take on this task than individual farmers and there is a case for providing support for such initiatives, even if on a limited scale.

The early retirement scheme was reinforced in 1992 under Regulation 2079/92. Land from farmers who participate to this scheme has to be used by other neighbouring holdings. This condition is to improve economic viability of such holdings. Land may also be used for non-agricultural purposes. Environmental conditions however are put to the scheme in order to prevent farmers from land abandonment after retirement.

Incentives for afforestation and woodland management also influence the management of marginal land in some areas. In some regions, including Extremadura for example, these subsidies are set at a more attractive level for farmers than those available under agri-environmental schemes. Initial estimates suggest that implementation of this Regulation is proceeding at a relatively slow process in most Member States. Nonetheless, the CEC has approved programmes with an estimated cost to EAGGF of 1.2 billion ECU over the period 1993-1997. This is about a quarter of the sum allocated to the agri-environmental Regulation but it is sufficiently large to result in significant changes in land use in certain areas.

It is widely expected that production support will be lowered within the next few years if CAP is amended, although compensatory payments may be made, possibly with some environmental conditions attached. It is difficult to forecast the effects on marginal farming systems but the trend towards liberalization is likely to increase the pressures on many farms at the edge of viability, particularly where new investment is not worthwhile. Concentration of production in more favoured regions is likely to continue and will be assisted by developments outside agriculture policy, such as rising transport costs, tighter hygiene standards, the closure of small slaughter houses and food processing facilities, etc. Even if direct payments are increased in such a way as to benefit marginal farms, they will be at variance with underlying trends towards a more concentrated and specialized pattern of agriculture in Europe.

8.8 Recommendations

To develop a strategy for the appropriate management of marginal areas requires both research and political debate. Some of the priorities for research might include:

- detailed evaluation of how farmers in marginal regions and production sectors have adapted to changes in the economic and policy climate since 1992;
- clearer identification of agricultural systems of high nature value in Europe and the particular role of different farming practices in maintaining the conditions required for specific habitats and species;
- studies of the costs of different management regimes, for example the maintenance of extensive grazing by livestock in relation to the cost of measures to control forest fires in areas of vulnerable woodland or scrub;
- further development of indicators of marginalization and abandonment;
- analysis of future market opportunities for the producers of marginal areas and their implications for farm management;
- examination of the potential for greater economic diversification in marginal farming areas while maintaining high nature values;
- advanced studies of the potential effects of possible changes in policy, in the CAP livestock and olive oil regimes for example, in marginal areas.

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LIST OF ABBREVIATIONS

AWU	Annual Work Unit
BSE	Bovine Spongiform Encephalopathy
CAP	Common Agricultural Policy
CEC	Commission of the European Communities
CEEC	Central and Eastern European Countries
COMECON	Council for Mutual Economic Assistance (COMECON or CMEA)
EAGGF	European Agricultural Guidance and Guarantee Fund
ECU	European Currency Unit
ESA	Environmentally Sensitive Areas
ESU	European Size Units
EU	European Union
EU 12	European Union from 1986 until 1995
FADN	Farm Accountancy Data Network
FAO	Food and Agriculture Organization of the United Nations
FF	French Franc
FFI	Family Farm Income
FNVA	Farm Net Value Added
FSS	Farm Structure Survey (Eurofarm) of Eurostat
FWU	Family Work Unit
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
HNV	High Nature Values
IBA	Important Bird Areas
IEEP	Institute for European Environmental Policy
IUCN	International Union for the Conservation of Nature, London (UK)
JNCC	Joint Nature Conservation Committee (UK)
LEI-DLO	Landbouw-Economisch Instituut (Agricultural Economics Research Institute), The Hague, the Netherlands
LFA	Less Favoured Areas
LU	Livestock Unit
NGO	Non-Governmental Organizations
NUTS	Nomenclature of Territorial Units for Statistics
OECD	Organization of Economic Corporation and Development
PDO	Protected Designation of Origin
RA&E	Rural Areas and Europe project of the National Spatial Planning Agency in the Netherlands
RBON	Regeling Beheersovereenkomsten en Natuurontwikkeling (Dutch Management Agreement)
REGIO	Regional data bank REGIO of Eurostat
RPD	Rijksplanologische Dienst (National Spatial Planning Agency), The Hague, the Netherlands
SAC	Special Areas of Conservation
SAFER	Société d'Aménagement Foncier et d'Etablissement Rural
SC-DLO	Winand Staring Centre for Integrated Land, Soil and Water Research, Wageningen, the Netherlands
SGM	Standard Gross Margin
SMI	Surface Minimum d'Installation (Threshold for the minimum size of a holding)
SPA	Special Protection Areas
UAA	Utilized Agricultural Area
UK	United Kingdom

APPENDICES

Appendix 1 Summary of the project 'Rural areas and Europe'

The National Spatial Planning Agency (RPD)
The National Spatial Planning Agency (RPD) is the body of the Ministry of Housing, Spatial Planning and the Environment responsible for national spatial planning policy in the Netherlands. To this end, it conducts research, formulates plans and monitors the coherence of the effects of this policy. Its most recent policy paper is the Fourth Additional Spatial Planning Policy Document (VINEX).

This paper covers subjects such as rural areas in the Netherlands and the international aspects of spatial planning. In this context and as a preparation for a potential new policy document, a research and planning project has been started, entitled 'Rural Areas & Europe' (RA&E). This is one of a number of large-scale projects conducted by the RPD.

Rural Areas and Europe (RA&E)
In RA&E, the RPD analyses the future of the Dutch rural areas in Europe. After all, rural areas will be increasingly influenced by shifts in European spatial planning.

The project's object is:
To explore the development possibilities of rural areas in a European context and to work out a method for co-regional spatial planning at a European level. The insights gained can be used for a better assessment of the perspective of the VINEX in the Netherlands and they can contribute to the development of international spatial planning.

Through RA&E the RPD is working together with planners in other European regions on common themes.

What exactly does the project entail?
The spatial planning policy for rural areas focuses on changing land use. The various development possibilities are outlined in this policy. But these changes are not exclusive to the Netherlands: rural areas throughout Europe are subject to change. This fact prompts the following questions:

- Do international developments have consequences for Dutch policy?
- Is international planning a prerequisite for the success of the Dutch spatial planning policy for rural areas?

Partly due to these problems, the RA&E project focuses on:

- studying the position of the Netherlands in a wider European context;
- comparing Dutch regions with other regions in Europe.

The results
Through the project RA&E the RPD can develop perspectives for the spatial development of the rural areas in European context and find out what the effects are of the European policy on the Dutch situation. The results will be used to

shape the international spatial planning. The final object of the project is to supply the necessary constituents for 'Nederland 2030', the predecessor of a possible subsequent policy document on spatial planning. In short:

- a European agenda for spatial planning;
- input for 'Nederland 2030'.

Information

This appendix provides only brief information on the RA&E project. Should you require more information, please contact:

National Spatial Planning Agency
Rural Areas and Europe Project Secretariat, Ms A. de Waart.
P.O.Box 30940, 2500 GX The Hague, The Netherlands
Telephone: 31 + 70 + 3393266 / Fax: 31 + 70 + 3391329

Here you can also order the reports mentioned on the list of publications.

Appendix 2 Publications from the project 'Rural areas and Europe'

1 Bolsius E. 1993. De Hamvraag. Hoofdstuk 1 Ruimtelijke Verkenningen 1993. Rijksplanologische Dienst, Den Haag.

2 Bolsius E. 1993. Pigs in Space. National Spatial Planning Agency, The Hague.

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4 Klundert A.F. van de, A.G.J. Dietvorst en J. van Os (red.). 1994. Back to the Future. Nieuwe functies voor landelijke gebieden in Europa. Staring Centrum. Rapport 354, Wageningen.

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15 Eck W. van, B. van der Ploeg, K.R. van Poel en B.W. Zaalmink. 1996. Koeien en Koersen. Ruimtelijke Kwaliteit van Melkveehouderijsystemen in 2025. SC-DLO en LEI-DLO. Rapport nr 431.2 Wageningen/ Den Haag (Beknopte versie).

→ 16 Eck W. van, B. van der Ploeg, K.R. van Poel and B.W. Zaalmink. 1996. Future Cow. The spatial Quality of dairy farming systems in 2025. Wageningen/Den Haag (Abridged version in English).

→ 17 Jaksch T. 1996. Agriculture and rural areas in Central and Eastern Europe under the conditions of the transformation process. Z.A.L.F. Müncheberg.

→ 18 Baldock D, G. Beaufoy, F. Brouwer en F. Godeschalk. 1996. Farming at the Margins. Abandonment and redeployment of agricultural land in Europe. Institute for European Environmental Policy and Agricultural Economics Research Institute. London/The Hague.

19 Geodan. 1996. Ruimtegebruik in Europa. SIMulatie, evaluatie en presentatie van EUROpees grondgebruik (SIMEURO). Amsterdam.

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→ 21 Bennett G. 1994. Beleidsonderzoek Extensivering (Policy Research on Extensification) . Gegevens omtrent de belangrijkste EU-fondsen en -programma's. (Voor het overgrote deel in het Engels/Mainly in English). Arnhem.

22 Meeus J., Wijermans M. Parels voor de Zwijnen. 1995. Analyse van Europese Landschappen met veel varkens. Den Haag.

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Appendix 3 Regional division from the EU used in this study

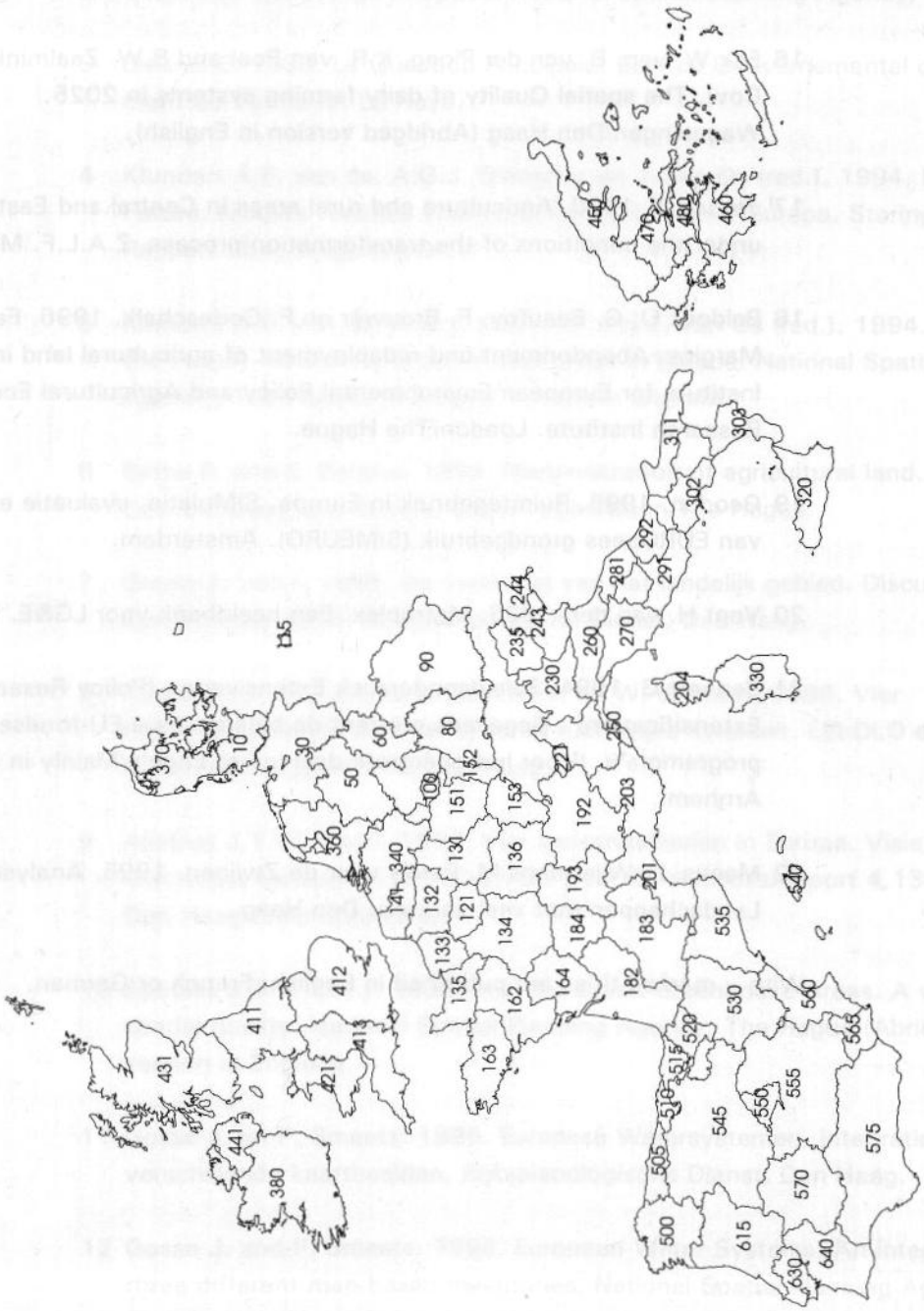

Figure A3.1 Regional division from the EU used in this study

The codes in the map refer to the following EU regions:

GERMANY
010 Schleswig-Holstein
030 Niedersachsen
050 Nordrhein-Westfalen
060 Hessen
070 Rheinland-Pfalz
080 Baden-Wuerttemberg
090 Bayern
100 Saarland
115 Hamburg, Bremen, Berlin

FRANCE
121 Île de France
131 Champagne-Ardenne
132 Picardie
133 Haute-Normandie
134 Centre (F)
135 Basse- Normandie
136 Bourgogne
141 Nord-Pas-de-Calais
151 Lorraine
152 Alsace
153 Franche-Comté
162 Pays de la Loire
163 Bretagne
164 Poitou-Charentes
182 Aquitaine
183 Midi-Pyrénées
184 Limousin
192 Rhône-Alpes
193 Auvergne
201 Languedoc-Roussillon
203 Prov.-Alpes-C. d'Azur
204 Corse

ITALY
221 Valle d'Aosta
222 Piemonte
230 Lombardia
235 Trentino-Alto Adige
243 Veneto
244 Friuli-Venezia Giulia
250 Liguria
260 Emilia-Romagna
270 Toscana
281 Marche
282 Umbria
291 Lazio
292 Abruzzi
301 Molise
302 Campania
303 Calabria
311 Puglia
312 Basilicata
320 Sicilia
330 Sardegna

BELGIUM
340 Belgique-België

LUXEMBOURG
350 Luxembourg

NETHERLANDS
360 Nederland

DENMARK
370 Danmark

IRELAND
380 Ireland

UNITED KINGDOM
411 England North
412 England East
413 England West
421 Wales
431 Scotland
441 Northern Ireland

GREECE
450 Makedonia Thraki
460 Ipiros Pelop. N.Ioniou
470 Thessalia
480 St.Ellas N.Egae. Kriti

SPAIN
500 Galicia
505 Asturias
510 Cantabria
515 Pais Vasco
520 Navarra
525 Rioja
530 Aragon
535 Cataluna
540 Baleares
545 Castilla-Leon
550 Madrid
555 Castilla-La Mancha
560 Comunidad Valenciana
565 Murcia
570 Extremadura
575 Andalucia
580 Canarias (not illustrated)

PORTUGAL
615 Norte-Centro
630 Lisboa-Vale do Tejo
640 Alentejo-Algarve
650 Acores-Madeira
(not illustrated)

Appendix 4 Important European Union regulations and directives

Full titles of the Regulations and Directives considered:

1. Regulation (EEC) 797/85 on improving the efficiency of agricultural structures

2. Council Regulation (EEC) No 2092/91 of 24 June 1991 on organic production of agricultural products and indications referring thereto on agricultural products and foodstuffs.

3. Council Regulation (EEC) No 2328/91 of 15 Juli 1991 on improving the efficiency of the agricultural structures.

4. Council Regulation (EEC) No 2078/92 of 30 June 1992 on agricultural production methods compatible with the requirements of the protection of the environment and the maintenance of the countryside.

5. Council Regulation (EEC) No 2079/92 of 30 June 1992 instituting a Community aid for an early retirement scheme in agriculture.

6. Council Regulation (EEC) No 2080/92 of 30 June 1992 instituting a Community aid scheme for forestry measures in agriculture.

7. Regulation 2081/92 on the Protection of Geographical Indications and Designations of Origin for Agricultural Products and Foodstuffs.

8. Regulation 746/96 laying down detailed rules for the application of Council Regulation 2078/92 on agricultural production methods compatible with the requirements of the protection of the environment and the maintenance of the countryside.

9. Council Directive of 28 April 1975 on mountain and hill farming and farming in certain less-favoured countries (75/268/EEC) (LFA Directive).

10. Council Directive 79/409/EEC (Birds Directive).

11. Council Directive (85/337/EEC) requiring environmental impact assessments of certain public and private projects.

12. Council Directive (91/676/EEC) Concerning the protection of waters against pollution caused by nitrates from agricultural sources (Nitrate Directive).

13. Council Directive (92/43/EEC) on the Conservation of natural habitats and of wild fauna and flora (Habitats Directive).

Appendix 5 Detailed tables accompanying Chapter 4

Table A5.1 Change in butterfly species with abandonment in the olive groves of Grosseto

Butterfly species	Intensive	Extensive	Stage of marginalisation [1]		
			1st stage	2nd stage	3rd stage
Papilio machaon		x	x		
Iphiclides podalirius		x	x	x	
Pieris brassicae		x			
Aporia crataegi			x	x	
Colias crocea		x			
Gonepteryx rhamni			x	x	
Gonepteryx cleopatra			x	x	
Argynnis paphia			x	x	x
Cynthia cardui		x	x		
Aglais urticase		x	x	x	x
Vanessa atalanta		x	x	x	x
Inachis io				x	x
Nymphalis antiopa					x
Limenitis camilla				x	x

[1] The first stage represents the first three years following the end of management, the second stage represents Years 4-8, while the third stage represents the emergence of a woodland structure, likely to occur between the ninth and fifteenth years. A further period of 50-55 years may elapse before a ore mature woodland is established.

Source: Petretti, 1995.

Table A5.2 Changes in species of reptiles with abandonment in the olive groves of Grosseto

Reptile species	Intensive	Extensive	Stage of marginalisation [1]		
			1st stage	2nd stage	3rd stage
Lacerta viridis		x	x	x	
Podarcis muralis	x	x	x		
Podarcis sicula	x	x	x	x	x
Chalcides chalcides		x	x		
Coluber viridiflavus		x	x	x	
Elaphe longissima			x	x	x
Elaphe quaatuorlineata				x	x
Coronella austriaca				x	x
Vipera aspis				x	x
Testudo hermanni				x	

Notes and source: see Table A5.1.

Appendix 6 Detailed tables accompanying Chapter 6

Table A6.1 Agricultural production in Extensive Farming Regions (average 1987-1991)

	Regional final production (mln ECU)	Regional area (1,000 ha)	Share regional final prod. in final prod. of EU 12 (%)	Share regional area in area of EU 12 (%)
Spain				
Navarra	484	658	0.2	0.5
Aragon	1,584	2,649	0.8	2.1
Baleares	234	264	0.1	0.2
Castilla-Leon	3,062	5,657	1.5	4.5
Madrid	250	414	0.1	0.3
Castilla-La Mancha	2,176	4,990	1.1	3.9
Extremadura	1,045	2,404	0.5	1.9
France				
Midi-Pyrénées	2,704	2,662	1.4	2.1
Limousin	592	908	0.3	0.7
Auvergne	1,201	1,604	0.6	1.3
Corse	118	350	0.1	0.3
Italy				
Valle d'Aosta	44	105	0.0	0.1
Portugal				
Alentejo-Algarve	.	1,918	.	1.5
United Kingdom				
Wales	1,138	1,649	0.6	1.3
Scotland	1,969	5,763	1.0	4.5
Northern Ireland	1,131	1,043	0.6	0.8
EU 12 (16 regions)	17,733	33,038	8.9	26.0

Source: Eurostat REGIO; adaptation LEI-DLO.

Table A6.2 Direct subsidies in Extensive Farming Regions (1990/91)

	Total direct subsidies (mln ECU)	Share direct subsidies in Family Farm Income (%)	Direct subsidies per farm by main farming types (ECU)			
			All types	General cropping farms	Permanent crop holdings	Dry-stock farms
Spain						
Navarra	15	23	1,181	339	.	.
Aragon	75	17	1,406	662	803	5,482
Baleares	4	8	566	437	498	.
Castilla-Leon	113	12	853	450	.	2,457
Madrid	1	8	403	.	.	.
Castilla-La Mancha	9	3	202	98	.	184
Extremadura	14	7	392	175	36	1,672
France						
Midi-Pyrénées	245	41	5,279	2,981	3,592	10,056
Limousin	132	64	9,108	.	.	9,655
Auvergne	160	46	6,575	1,150	.	10,028
Corse	12	132	9,311	.	6,791	13,161
Italy						
Valle d'Aosta	21	56	6,934	.	15	7,680
Portugal						
Alentejo-Algarve	98	120	2,887	3,022	1,828	7,253
United Kingdom						
Wales	164	60	10,907	.	.	14,782
Scotland	215	55	11,920	4,265	.	19,367
Northern Ireland	103	73	5,303	.	.	6,115
EU 12 (16 regions)	1,380	34	2,991	1,080	1,113	7,522

Source: FADN-CCE-DG VI/A-3; adaptation LEI-DLO.

Table A6.3 'Standard' ewe premiums after 1992 on farms with ewes according to the new CAP regime in Extensive Farming Regions (1990/91)

	Number of represented farms (x 1,000)	Number of ewes per farm	Normative ewe premiums (CAP reform) (ECU)	Regional number of ewes (x 1,000)	Regional normative ewe premiums (CAP reform) (mln ECU)
Spain					
Aragon	10	259	8,454	2,660	87
Baleares	3	65	2,087	211	7
Castilla-Leon	20	284	9,238	5,655	184
Castilla-La Mancha	8	294	10,143	2,305	79
Extremadura	5	170	5,942	887	31
France					
Midi-Pyrénées	9	172	6,029	1,617	57
Limousin	6	115	4,021	694	24
Auvergne	5	119	4,144	537	19
Portugal					
Alentejo-Algarve	14	80	2,763	1,106	38
United Kingdom					
Wales	12	389	12,672	4,822	157
Scotland	12	309	10,054	3,671	119
Northern Ireland	8	111	3,659	844	28
EU 12 (16 regions)	114	223	7,404	25,578	848

Source: FADN-CCE-DG VI/A-3; adaptation LEI-DLO.

Table A6.4 Agricultural production in Small-scale Farming Regions (average 1987-1991)

	Regional final production (mln ECU)	Regional area (1,000 ha)	Share regional final prod. in final prod. of EU 12 (%)	Share regional area in area of EU 12 (%)
Greece				
Ipiros Pelop. N.Ioniou	2,068	1,009	1.0	0.8
Thessalia	1,057	497	0.5	0.4
St.Ellas N.Egae. Kriti	2,029	1,019	1.0	0.8
Spain				
Galicia	1,580	920	0.8	0.7
Asturias	350	315	0.2	0.2
Cantabria	242	167	0.1	0.1
Comunidad Valenciana	2,166	962	1.1	0.8
Canarias	628	176	0.3	0.1
Italy				
Piemonte	2,739	1,307	1.4	1.0
Veneto	3,692	1,022	1.9	0.8
Friuli-Venezia Giulia	702	321	0.4	0.3
Liguria	613	117	0.3	0.1
Emilia-Romagna	4,844	1,390	2.4	1.1
Marche	1,044	622	0.5	0.5
Umbria	650	462	0.3	0.4
Lazio	1,981	1,012	1.0	0.8
Abruzzi	973	607	0.5	0.5
Molise	291	294	0.1	0.2
Campania	2,848	868	1.4	0.7
Calabria	1,326	813	0.7	0.6
Puglia	3,144	1,607	1.6	1.3
Basilicata	440	677	0.2	0.5
Sicilia	3,262	1,989	1.6	1.6
Portugal				
Norte-Centro	.	1,926	.	1.5
Lisboa-Vale do Tejo	.	850	.	0.7
EU 12 (25 regions)	38,670	20,948	19.4	16.5

Source: Eurostat REGIO; adaptation LEI-DLO.

Table A6.5 Direct subsidies in Small-scale Farming Regions (1990/91)

	Total direct subsidies (mln ECU)	Share direct subsidies in Family Farm Income (%)	Direct subsidies per farm by main farming types (ECU)			
			All types	General cropping farms	Permanent crop holdings	Dry-stock farms
Greece						
Ipiros Pelop. N.Ioniou	147	13	1,128	689	862	3,100
Thessalia	55	12	926	606	331	2,591
St.Ellas N.Egae. Kriti	168	14	1,237	951	1,016	2,329
Spain						
Galicia	10	2	108	.	.	227
Asturias	14	10	505	.	.	727
Cantabria	10	12	787	.	.	799
Comunidad Valenciana	6	1	77		99	.
Italy						
Piemonte	46	4	412	85	633	1,443
Veneto	2	0	16	5	76	
Friuli-Venezia Giulia	10	3	415	159	48	1,118
Liguria	5	1	176	104	502	214
Emilia-Romagna	18	1	226	87	476	.
Marche	23	7	568	493	.	831
Umbria	21	9	925	561	4,399	2,547
Lazio	20	3	228	109	73	557
Abruzzi	15	4	307	281	139	911
Molise	9	7	659	402	516	.
Campania	11	1	70	104	62	14
Calabria	83	18	1,016	659	1,320	722
Puglia	155	16	925	1,566	663	1,150
Basilicata	43	24	1,594	1,300	930	1,125
Sicilia	85	7	528	857	243	882
Portugal						
Norte-Centro	296	27	958	674	1,712	2,171
Lisboa-Vale do Tejo	82	34	1,079	1,169	666	1,938
EU 12 (25 regions)	1,335	8	641	536	593	1,434

Source: FADN-CCE-DG VI/A-3; adaptation LEI-DLO.

Table A6.6 'Standard' ewe premiums after 1992 on farms with ewes according to the new CAP regime in Small-scale Farming Regions (1990/91)

	Number of represented farms (x 1,000)	Number of ewes per farm	Normative ewe premiums (CAP reform) (ECU)	Regional number of ewes (x 1,000)	Regional normative ewe premiums (CAP reform) (mln ECU)
Greece					
Ipiros Pelop. N.Ioniou	34	54	1,826	1,847	63
Thessalia	8	113	3,746	898	30
St.Ellas N.Egae. Kriti	33	67	2,260	2,225	75
Spain					
Galicia	23	14	496	332	12
Asturias	2	49	1,652	104	4
Cantabria	1	43	1,501	61	2
Italy					
Piemonte	2	24	839	38	1
Liguria	1	13	463	12	0
Marche	1	101	3,468	100	3
Umbria	5	37	1,249	179	6
Lazio	12	78	2,504	946	30
Abruzzi	17	26	873	437	15
Molise	1	69	2,422	87	3
Campania	8	17	594	144	5
Calabria	6	50	1,701	294	10
Puglia	2	132	4,304	231	8
Basilicata	7	40	1,385	284	10
Sicilia	4	113	3,770	432	14
Portugal					
Norte-Centro	44	18	614	771	27
Lisboa-Vale do Tejo	15	39	1,278	574	19
EU 12 (25 regions)	227	44	1,495	10,095	340

Source: FADN-CCE-DG VI/A-3; adaptation LEI-DLO.

Table A6.7 Agricultural production by Member State (average 1987-1991)

	Regional final production (mln ECU)	Regional area (1,000 ha)	Share regional final prod. in final prod. of EU 12 (%)	Share regional area in area of EU 12 (%)
Belgium	5,958	1,363	3.0	1.1
Denmark	6,597	2,784	3.3	2.2
Germany	30,839	14,185	15.5	11.2
Greece	7,960	3,930	4.0	3.1
Spain	24,488	27,052	12.3	21.3
France	45,113	30,778	22.6	24.3
Ireland	4,073	5,699	2.0	4.5
Italy	36,352	17,584	18.3	13.9
Luxembourg	179	127	0.1	0.1
Netherlands	15,274	2,005	7.7	1.6
Portugal	3,524	4,859	1.8	3.8
United Kingdom	18,819	18,006	9.4	14.2
EU 12	199,177	126,858	100.0	100.0

Source: Eurostat REGIO; adaptation LEI-DLO.

Table A6.8 Direct subsidies by Member State (1990/91)

	Total direct subsidies (mln ECU)	Share direct subsidies in Family Farm Income (%)	Direct subsidies per farm by main farming types (ECU)			
			All types	General cropping farms	Permanent crop holdings	Dry-stock farms
Belgium	65	4	1,261	1,435	12	3,132
Denmark	82	20	1,008	776	859	.
Germany	1,000	19	2,674	2,169	485	4,174
Greece	520	13	1,044	677	770	2,874
Spain	390	9	564	295	480	1,606
France	1,874	17	3,366	2,032	3,577	7,844
Ireland	397	30	2,830	3,284	.	3,433
Italy	753	5	550	455	559	1,204
Luxembourg	9	15	3,927	.	.	3,493
Netherlands	68	2	725	730	227	1,108
Portugal	493	32	1,099	898	1,337	2,355
United Kingdom	895	30	6,317	3,730	659	11,737
EU 12	6,545	13	1,471	832	687	4,135

Source: FADN-CCE-DG VI/A-3; adaptation LEI-DLO.

Table A6.9 'Standard' ewe premiums after 1992 on farms with ewes according to the new CAP regime by Member State (1990/91)

	Number of represented farms (x 1,000)	Number of ewes per farm	Normative ewe premiums (CAP reform) (ECU)	Regional number of ewes (x 1,000)	Regional normative ewe premiums (CAP reform) (mln ECU)
Belgium	1	26	772	19	1
Denmark	5	14	407	72	2
Germany	7	38	1,263	286	9
Greece	86	73	2,474	6,271	212
Spain	86	175	5,831	15,025	500
France	58	125	4,244	7,288	248
Ireland	47	69	2,250	3,212	105
Italy	92	71	2,365	6,483	217
Netherlands	15	32	959	484	15
Portugal	74	34	1,161	2,495	85
United Kingdom	65	269	8,527	17,530	555
EU 12	536	110	3,638	59,164	1,949

Source: FADN-CCE-DG VI/A-3; adaptation LEI-DLO.