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A Comparison of Agri-Environmental Schemes in Great Britain and Germany

Implementation of EU-Regulation 2078/92

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A Comparison of Agri-Environmental Schemes in Great Britain and Germany

(Implementation of EU-Regulation 2078/92)

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an den
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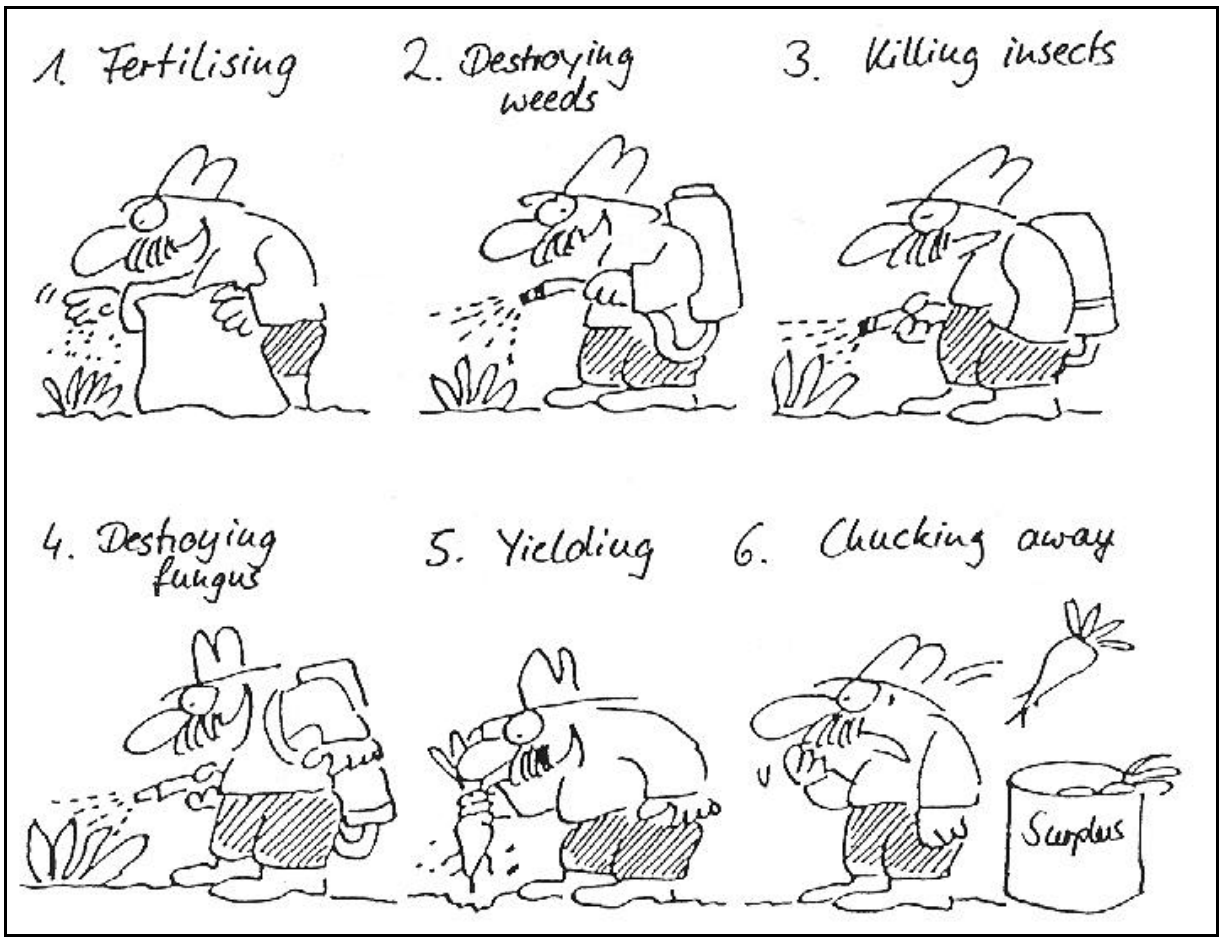


Source: Renate Ald (Prüter and von Nordheim, 1992, p.2, English C.R.)

Foreword

The idea to write the thesis about agri-environmental schemes arouse during a stay at the Institute of Terrestrial Ecology (ITE) Monks Wood. It resulted in a co-operation between Owen Mountford (ITE) and the Geographical Institutes Bonn.
I am very grateful for the advice and assistance of Prof. K.-A. Boesler and Owen Mountford, both supported the work in crucial moments. Furthermore I am very grateful to my parents and to my friends, Tanja Schwinn and Ulrike Haßler (†), they have been very important for the endurance, which the writing of the thesis demanded. I am extremely grateful to Klaus Schäfer who forced me to work more structured by his questioning.
And I greatly appreciate the "all-round" support of Markus Eggers who encouraged and helped through the whole period.

1. Introduction

The theme of the study "A comparison of agri-environmental schemes in Great Britain and Germany – Implementation of Regulation 2078/92" has been developed out of the idea to work out the strategies of agri-environmental schemes in different countries.

With the 1992 reform of the Common Agricultural Policy (CAP) environmental aspects were incorporated for the first time. Being part of the "Accompanying Measures", Regulation (EEC) No. 2078/92 applies to "agricultural production methods compatible with the requirements of the protection of the environment and the maintenance of the countryside" (BALDOCK & BEAUFOY, 1992, p. 2). The Regulation has been introduced in all Member States of the European Community (EC, now European Union (EU)) through agri-environmental schemes and builds the basis for the thesis leading to its fundamental question:

In which way do Great Britain and Germany implement Regulation 2078/92?

To answer the question of the study the concentration is directed to selected agri-environmental schemes in the two countries:

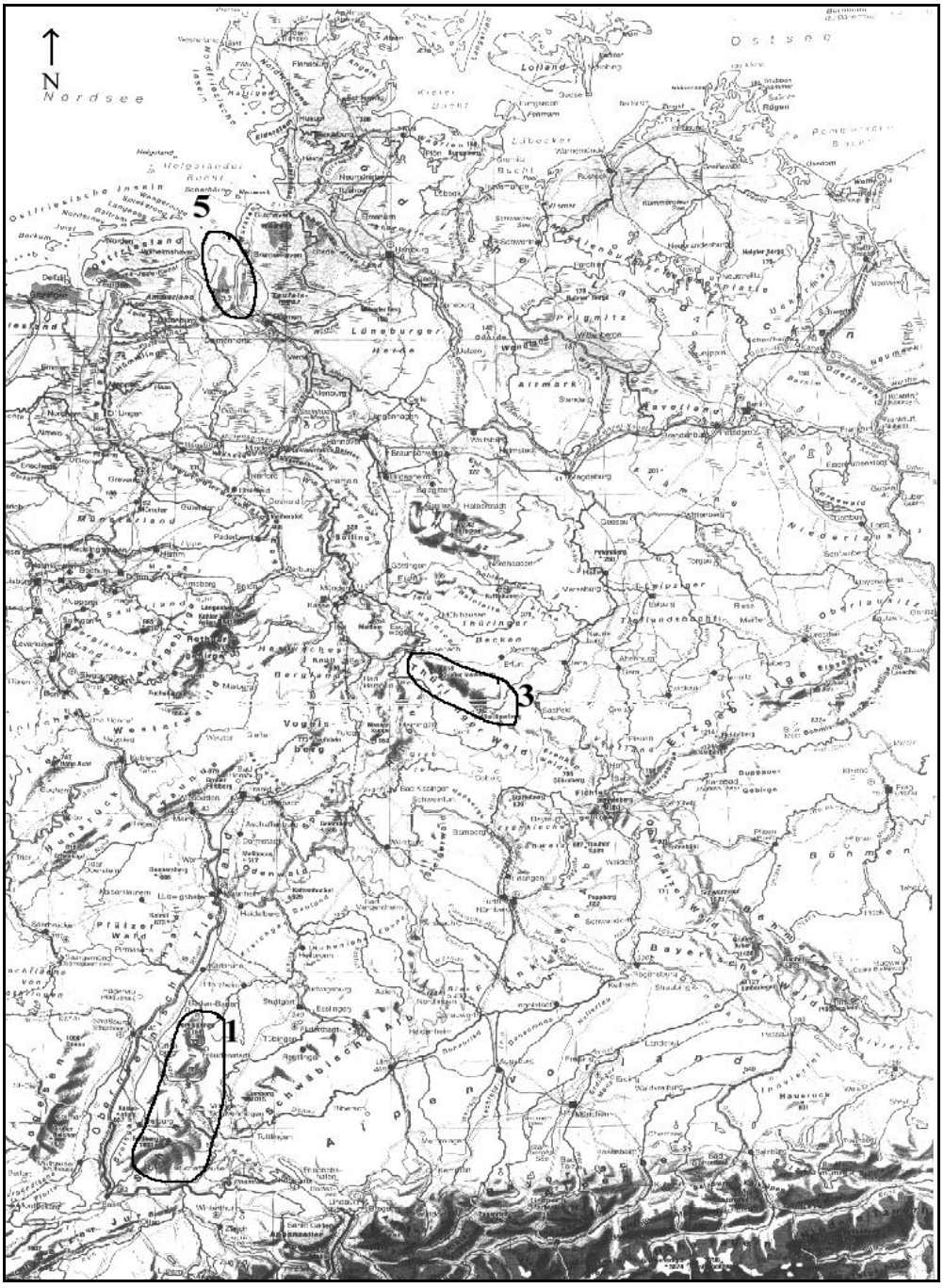
- In Germany, the implementation of Regulation 2078/92 is carried out at the level of the 16 Bundesländer. Three Bundesländer are chosen to reflect the German situation, namely Baden-Württemberg, Lower Saxony and Thuringia.
- The Ministry of Agriculture, Fisheries and Food (MAFF) co-ordinates the agri-environment program in Great Britain, though the agricultural departments of England, Scotland and Wales have developed their own schemes. The choice for the case studies fell on two English ESAs, the ESA Broads and the ESA Pennine Dales; therefore stress is put on the introduction of the English situation.

As in both countries the main stress of the schemes is put on grassland, this study is focussed on grassland, too.

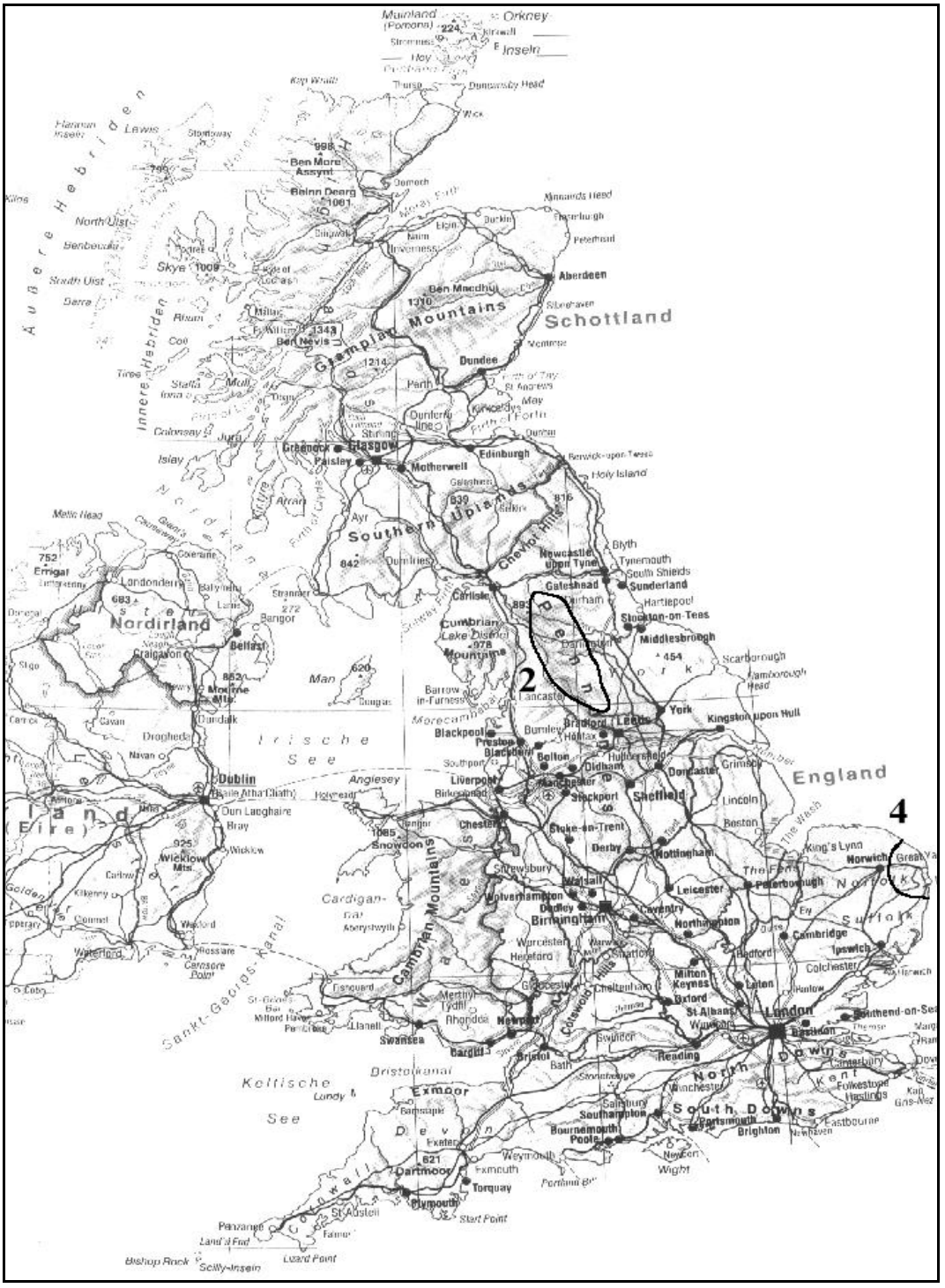
The choice of the schemes has been determined by the first aim of discovery, namely the ***comparison of agri-environmental schemes carried out in similar natural regions.*** So there will be a direct contrasting of:

- ESA Pennine Dales (No. 2 on the maps) with the schemes of Baden-Württemberg (1) and Thuringia (3), and
- ESA Broads (4) with the schemes of Lower Saxony (5).

Obviously there is an irregularity under the first point: two German schemes are faced with only one ESA. By choosing two German schemes the different situation in the East and West after the reunification in 1989 is taken into consideration. All five areas are depicted on the maps.



Source: WESTERMANN, 1996, p.14



Source: WESTERMANN, 1996, p. 90

The second aim of discovery is to ***work out focus, strengths and weaknesses of each scheme***. For this reason four main components of a scheme have been divided:

1. Subject of support;
2. Prescriptions;
3. Payment; and
4. Area of the scheme.

The approach of the investigation can be twofold, from the side of the agricultural authorities offering the schemes or from the side of the farmers who carry out the schemes. Here the focus lies at the implementation of the schemes through the farmers, though the level of the agricultural authorities is considered, too.

The study does neither claim to be representative nor to gather as many opinions as possible but to work out the focus, strengths and weaknesses of the schemes. Bearing this in mind, a qualitative approach is considered to be the appropriate method to carry out the investigation.

Theoretically the study seeks to investigate the implementation of the "open formula of spatial ordering" (EU-Regulation 2078/92 respectively). According to WIEK (1980, p. 190) the open formula provides a legislative framework which gives scope for action at the level of implementation (implementation of the Regulation in the two Member States). In this context legislation of the EU can be considered as "Raumwirksame Staatstätigkeit" (governmental activities affecting space, BOESLER 1983, p. 199), to see in which way the Regulation influences different regions in the two Member States.

The comparative policy analysis has been considered to be an appropriate measure to investigate the implementation. According to SCHUBERT (1991, p. 12) a policy analysis deals with the actual contents, determinants and effects of political actions. A comparative policy analysis has been described by DIERKES (1987, p. 14 f.) as follows:

"Comparative research can fill important gaps in knowledge about how other countries deal with similar situations, about background and effects of alternative strategies for solving common problems (or avoiding their emergence in the first place). Structured comparison provides a framework for determining those aspects of a situation which are due to unique circumstances, and those which are more generally applicable – and therefore possibly appropriate to consider transferring them to other contexts."

The comparative policy analysis is relevant for Geography as differences and similarities in comparative expenses under the same policy framework become obvious. In this study it has been used to show how the open formula of Regulation 2078/92 is implemented in Great Britain and Germany.

Concerning the course of the investigation there are six parts, of which the introduction builds the first one. The second chapter provides the background of the agricultural policy of the EU, Great Britain and Germany with regard to environmental aspects and Regulation 2078/92. Part three deals with the agricultural background introducing grassland management and the extensification of grassland. In chapter four the course and method of the study are described and part five deals with the implementation of the selected five schemes. They are introduced, analysed and discussed individually and conclusions derived from the discussion of each scheme are placed here, too. The actual comparison of the schemes and the two countries with its conclusions for Regulation 2078/92 follows in chapter six.

For two reasons the whole thesis is more extensive than intended. Firstly, fundamental subjects of the study are agricultural policy and agricultural connections, both fairly complex themes, which are crucial for the comprehensibility of the study and thus have to be introduced. Secondly, the conception of the work with the investigation of five schemes is quite substantial and demands its right.

2. Agricultural policy background

2.1 Reform of the CAP and Regulation 2078/92

The first part of this chapter gives a view over the development of the Common Agricultural Policy (CAP) followed by the problems derived from this development and the way of integrating environmental concerns into the CAP. The needs for the introduction of Regulation 2078/ 92 as part of the reform of the CAP in 1992 are described, too. Finally a brief outlook on Agenda 2000 is given. In the second part of the chapter Regulation 2078/92 is introduced.

2.1.1 Development of the CAP

When the CAP was first announced in 1953 in the Treaty of Rome its objectives were to increase agricultural productivity, to ensure a fair standard of living for the agricultural community, to stabilise markets, to ensure the availability of supplies and to ensure that supplies reach consumers at reasonable prices (COUNCIL FOR THE PROTECTION OF RURAL ENGLAND, WWF, 1996, p. 23).

There were three main principles to implement these objectives:

- free trade of agricultural products within the EC;
- price advantages of EC agricultural products compared to agricultural products produced outside the EC; and
- financial solidarity among the EC(completion of the common price policy through a common financing) (BADER et al 1992, p. 123).

Agricultural market

The common policy of the agricultural market and -prices started at the beginning of the sixties. Agricultural income was separated almost completely from the development of the agricultural market since prices of the products were fixed and guaranteed in advance. Thus farmers could produce as much as they were able to. This interventionist policy worked very well when there was need to encourage farmers to increase their production due to a lack of agrarian products on the Community market. Additionally the market was protected by duties on cheaper non-Community products. In theory this protectionism was meant to gain money through raising import duties on the generally cheaper world market products and spend this

money again by subsidising export products of the Community. In other words this measure aimed to encourage the development of Community production and to discourage imports.

On the farmers side the guaranteed price system and technological advances led to an enormous progress in intensifying the production. Consequently this development speeded up the process of filling up the market. Things started to become difficult when the European market was self-sufficient and when food surpluses were produced. The Community was forced to buy the products to the guaranteed prices, store them and try to sell them on the world market where the price level was much lower.

As food surpluses increased the expenses of the Community exploded due to:

- a further increase of production;
- high storage expenses; and
- higher expenses on exports than import incomes.

Between 1975 and 1991 the expenses of the EC budget (EAGGF - the European Agricultural Guidance and Guarantee Fund) increased from 4.5 to 31.5 thousand million ECU (respectively 11.5 thousand million ECU, considering the prices of 1975. (GANZERT 1994, p. 48)). Meanwhile the agricultural production increased by ca. 30% (DIXON et al, 1993, p.2).

The reaction of the EC was to lower guarantee prices for the farmers, who had in turn to increase their production even more in order to keep their income stable.

In 1984 there was a first attempt to limit this explosion of expenditures by the introduction of the milk quota. Every dairy farmer was guaranteed a fixed price for milk up to a certain quota and drastic price reductions for additional milk. Another measure to limit expenditures has been introduced in 1988, the so-called „agricultural guideline“. This guideline sets a ceiling on expenditures of the EAGGF Guarantee Section every year adjusted to the general economical development. In addition to this enormous internal financial pressure the CAP price-support mechanisms came also under external pressure. From 1980 onwards the EC felt a strongly increased external political pressure in favour of freeing the system, mainly caused by negotiations of the General Agreement on Tariffs and Trade (GATT).

According to DIXON (et al, 1993, p. 2) there was a real agricultural income loss of ca. 20% despite of the enormous financial efforts of the EC. Therefore „if the income per capita is to be maintained it can only be achieved by reducing the number of farmers.“

Agricultural structural policy

Agricultural structural policy started later than the market policy but soon became to an important tool in supporting and influencing agriculture.

In 1972 the revised version of the Mansholt-Plan aimed to support only developable and viable full-time farms with incentives for investments. All other farmers should be enabled to find jobs outside agriculture or retire early. Having described the intentions of the first years of the agricultural structural policy it is no surprise that most of the support went to favoured agricultural areas and to the big farms. Subsequently this policy resulted in increased regional and income disparities (compare BADER et al, 1992, p. 125). However, in 1975 subsidies were also available in mountain regions and less favoured areas with the EC Directive on Mountain and Hill Farming and on Less Favoured Areas. In 1985, Regulation (EEC) No 797/85 on improving efficiency of agricultural structures changed the policy towards giving more farmers financial support for investments and a special support for young farmers was introduced, too (VON URFF, 1995, p. 67).

At present agricultural structure is supported by the EAGGF in defined regions which are determined by the following objectives:

1. Objective 1: Regions whose development is lagging behind;
2. Objective 5 (a): agricultural structures in all regions;
3. Objective 5 (b): Rural development in certain limited areas;
4. Objective 6: Nordic Regions (EUROPEAN COMMISSION DG VI, 1998 c, p. 6).

2.1.2 Greening of the CAP: Regulation 797/85

According to the EUROPEAN COMMISSION (DG VI, 1998 b, p. 1) new political awareness came up at the 1972 Paris Summit, when the Heads of State and Government declared that economic growth was not an aim in itself. This was the basis of the first Environmental Action Programme, a political document setting up the principles and objectives in the field of environment. „In the agricultural policy sector this new attitude was one of the reasons inspiring the adoption of the Directive on Less Favoured Areas in 1975." (EUROPEAN COMMISSION DG VI, 1998 b, p. 1). It was in the eighties when environmental schemes concerning agriculture were first launched by the EC. Prior to that environmental laws addressed agriculture as a cause of environmental problems only indirectly (BRUCKMEIER et al, 1996, p. 3). In 1980 the EC Drinking Water Directive 80/778 was introduced, setting maximum for concentrations of both nitrates and pesticides in water supplied for human

consumption. It paved the way for the green book „Common Agriculture Policy Perspectives“ in 1985, where environmental problems caused by agriculture are acknowledged. Environmental issues were also taken into account in the legislation of the EC with Regulation (EEC) No 797/85 on improving efficiency of agricultural structures. This Regulation included a set of measures for environmental protection. Additional national aid in environmentally sensitive areas was taken into account in Article 19 which authorises Member States „to introduce their own aid scheme for the support of appropriate agricultural practices in areas which are particularly environmentally sensitive. Schemes should aim at contributing to the introduction or maintenance of farming practices compatible with the protection of the environment and natural resources or landscape and countryside requirements.“ (HAIGH, 1992, p. 9.6-2). In 1991 the Nitrate Directive 91/676 followed, which seeks to prevent water pollution arising from agricultural sources, including inorganic fertiliser and manure. By 1993, Member States were obliged to specify nitrate “vulnerable zones”, although not all have done so. Also in 1991, the EC launched Regulation 2092/91 supporting organic farming. The species and habitats Directive 92/43 was introduced in 1992 and aims to establish a coherent pan-European ecological network of sites of Community importance, known as Natura 2000. Not only must these sites be protected, Member States must establish the “necessary conservation measures”, including management plans. This implies the need to maintain either traditional farming practices or other forms of management akin to traditional farming on many semi-natural habitats (BALDOCK, 1995, p. 155).

2.1.3 Reform of the CAP

Intensive agriculture over large areas resulted in problems described by the COUNCIL OF EUROPE (1992, p. 18) as the following:

a) The continual simplification of agrarian ecosystems by successive technical stages and specialisation on the part of producers have resulted in recent years in the extinction of numerous species, the elimination of biotopes, the proliferation of certain parasites, the disappearance of natural predators, dysfunctions in the food chain, and the increasing vulnerability of environments.

b) The poorly controlled use of chemical substances such as artificial fertilisers and plant protection products is polluting the environment, particularly underground water, soil and the air. Heavy metals, nitrates and biocides are damaging to flora and fauna and even threaten human health.

c) Intensive stock-farming and the use of chemical substances raise problems of an ethical value, as well as causing pollution and the threat to human foodstuffs.

d) The increase in size of farms and major infrastructure work (amalgamation of fields, drainage, restructuring of holdings, straightening of watercourses, construction and ballasting of paths, landholding improvements, etc.) are transforming age-old landscapes and reduce the diversity and wealth of biotopes. Soil erosion and compaction appear on the one hand. Marginalisation leads to a degradation of infrastructures and the abandonment of land on the other hand.

e) Intensive uniformisation and selection which make it possible to obtain high yields have dangerously reduced the genetic foundation of a large proportion of modern food production. Stock breeds are also at risk.

Additionally one can say that „the trend in agricultural farming systems is towards enrichment of habitats through an increase of the nutrient supply of these areas. The result is that threatened species are mostly those that depend on low nutrient biotopes." (DIXON et al, 1993, p. 13). Low nutrient biotopes are either likely to become abandoned since the yield gained from these areas is very poor or they get improved by input of fertiliser and consequently loose their state as low nutrient biotopes.

The environmental problems described above are caused by agriculture and here it is not really the individual farmer who is to blame because he only operates within a framework which is set by policy-makers. More important are the structural changes in agriculture. At individual farm-level these changes are concentration as well as specialisation and intensification of the production. At regional and sectoral level there is a severe tendency towards regional polarisation. Furthermore disparities between regions on the one hand and uniformity within regions on the other hand are increasing (DIXON et al, 1993, p. 14).

Putting together agricultural market policy, agricultural structural policy and environmental policy within the CAP, the change of direction of the CAP which had started in the eighties finally led to its reform in 1992 and was greatly motivated by environmental problems.

The EUROPEAN COMMISSION states (DG XI, 1997, p. 16): „For many decades, support for the agricultural sector has been provided through the CAP. The main objectives of CAP prior to 1992 were income support, price stability and food security. This subsequently resulted in the following problems:

- Overproduction of food products;
- Over-dependence of farmers´ incomes on subsidy payments;
- Excessive cost of financing the CAP;

- Changes in agricultural practices;
- Environmental degradation and pollution;
- Loss of traditional landscapes, key habitats and species diversity."

Those problems, the Uruguay Round of GATT negotiations (this far reaching multilateral agreement covers all farm products: It requires a 20% reduction in domestic support for agriculture over a six-year period, a reduction of 36% in budget spending on export subsidies and a 21% cut in the quantity of subsidised exports (EUROPEAN COMMISSION DG VI, 1998 a, p. 3)), and the Maastricht Treaty (requiring the integration of environmental issues into other policy areas) were addressed in the MacSharry proposals which resulted in the reform of the CAP in 1992 (EUROPEAN COMMISSION, 1997, p. 16).

There are four main elements of the CAP reform:

1. To break the link between production levels and farm incomes by reducing indirect price support for cereals, oilseeds, protein crops, beef and sheep meat.
2. To introduce a shift towards direct compensatory payments to farmers as a social measure.
3. To require specific controls aimed at reducing production for example semi-mandatory set-aside for large, arable farms, and
4. the introduction of **accompanying measures** i.e. the agri-environment programme (2078/92), the early retirement (2079/92), and the forestry measures (2080/92) (EUROPEAN COMMISSION, 1997, p. 16).

With this shift of the CAP - away from the indirect price-supporting system towards direct payments to farmers - the EU aims to achieve a market relief (i.e. to reduce agricultural production). Beside market relief the integration of environmental aspects into the CAP is another important innovation of the reform and responses to environmental and structural problems within the EU. „As the 1994 Interim Review of Implementation of the Fifth Programme [COM(94) 453 final] made clear, agri-environmental measures constitute a first and very positive step towards full integration of environmental consideration into agricultural policy. However, the pace and extent of integration must be strengthened in future adjustments of the CAP." (EUROPEAN COMMISSION DG VI, 1998 d, p. 1).

2.1.4 Regulation 2078/92 and objectives

As mentioned in the previous chapter, Regulation 2078/92 stands for the agri-environment programme of the CAP reform of 1992. It is mandatory for all Member States who are obliged to implement it throughout their territory, since a Regulation in the context of the European Community (respectively EU since 1993, passed by the Maastricht Treaty in 1991) lays down exactly the same law throughout the entire Community and applies to all Member States (EUROPEAN COMMISSION 1992, p. 5).

The EUROPEAN COMMISSION (1998 f, p. 1) points out the objectives of the Regulation:

- to combine beneficial effects on the environment with a reduction of agricultural production; and
- to contribute to agricultural income diversification and rural development.

The Member States are required to implement a programme of measures listed in the box below.

Figure 1: Measures under Regulation 2078/92

Measures under Regulation 2078/92

a) Reduction of the amount of fertilisers and/ or plant protection products or promotion of organic farming;

b) Promotion of more extensive forms of crop production or the conversion of arable land to extensive grassland;

c) Reduction of livestock densities;

d) Encouragement of other farming practices compatible with the protection of the environment and the maintenance of the countryside or the rearing of animals of local breeds in danger of extinction;

e) Ensuring the upkeep of abandoned farmland or woodland;

f) Removal of farmland from agricultural production for at least 20 years for environmental purposes;

g) Management of land for public access and leisure.

h) Promotion of courses and demonstrations on environmentally friendly farming practices.

Sources: AGRICULTURAL COMMITTEE, 1997, p. 2; AMTSBLATT DER EG (Nr. L 215/ 87, 1992)

Out of this set of measures Member States have to prepare zonal programmes which should take into account not only environmental and natural conditions but also the structure of local agriculture and current farming practices. The length of a programme has to be at least five years (or 20 years in the case of long-term environmental set-aside). When submitting their programmes for Community co-financing, Member States are obliged to provide information such as the area concerned, an estimate about the annual total expenditure and a description of the environmental and agricultural characteristics of the area concerned (NYCHAS, 1995, p. 5).

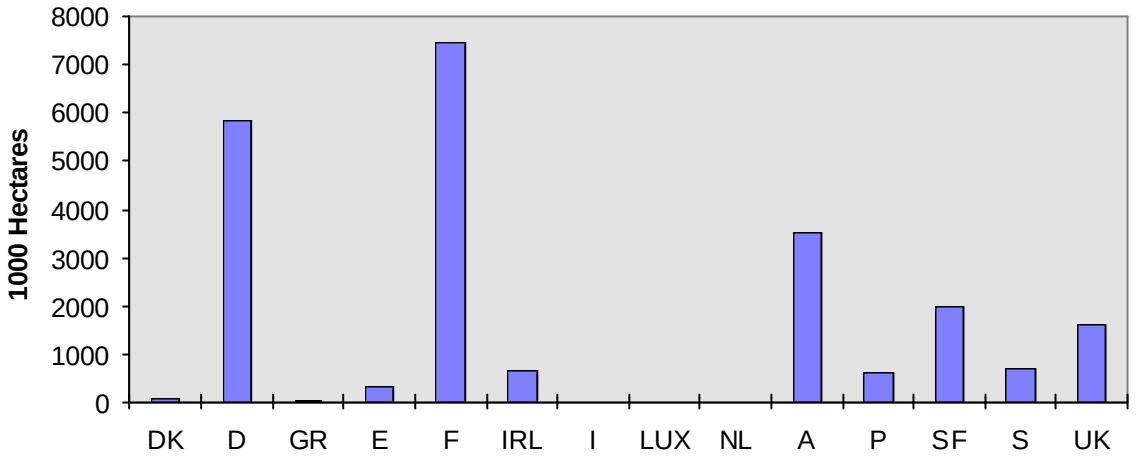
As well as the zonal schemes mentioned above it is also possible for Member States to prepare a general framework of one or more measures as horizontal measures throughout their territory.

The payments made to farmers under the Regulation are shared between the EU and the Member States at a rate of 75 % in Objective 1 areas and 50 % elsewhere. They are based on the income foregone and on the costs incurred by farmers as a result of their participation in the schemes. Costs of administration, monitoring, field inspections etc. are not co-financed by the EU. Therefore it lays within the interest of each Member State to rationalise the administrative processing. The expenditures under the Regulation for the period 1993 - 1997 is about 5 billion ECU (EUROPEAN COMMISSION, 1998 f, p. 2).

All schemes are working on a voluntary basis. Farmers with eligible land can apply to enter into a formal agreement. They have then to abide by the management rules of the scheme in return for an annual payment (AGRICULTURE COMMITTEE, 1997, p. 2).

To give an idea of the area concerned the following diagram shows the hectares approved in the years 1994 - 1996:

Figure 2: Agricultural area under Regulation 2078/92 in 1996



Source: own diagram, data from EUROPEAN COMMISSION DG VI, 1997 b, 3.5.7.7

According to the EUROPEAN COMMISSION (1998 f, p. 4) the year 1994/95 and 1995/96 have been the first years of full implementation. Commission and Member States are now reflecting on the best ways to monitor and evaluate the schemes. For this purpose the Commission launched Regulation (EC) No 746/96 concerning the implementation of Regulation (EEC) No 2078/92. Beside evaluation and revision, the new Regulation also contains the advice to Member States to administer the schemes in accordance with the Integrated Administration and Control System (IACS). This is a computer based system aiming to improve and ease the administration of all kinds of payments to farmers.

2.1.5 Further Outlook: Agenda 2000

After careful assessment of the impact of the 1992 reform, the direction of the reform has been considered to be broadly favourable. The Commission proposes „further shifts from price support to direct payments, and to develop a coherent rural policy to accompany this process." (EUROPEAN COMMISSION DG VI, 1998 e, p.1).

An important role will be given to agri-environmental instruments in order to support a sustainable development of rural areas as well as to respond to the increasing demand of the society for environmental services. The agri-environmental measures should be reinforced and encouraged through increased budgetary means and possibly higher co-financing rates (EUROPEAN COMMISSION DG VI, 1998 e, p.3).

2.2 Initial situation of the two countries

Prior to Regulation 2078/92 it was up to individual Member States to implement agri-environmental programs. Thus, after an introduction of the agricultural situation, the way of integrating environmental issues into agricultural policy (including precursors of agri-environmental schemes) up until 1992 is outlined for both countries. Finally the chapter describes the general implementation of Regulation 2078/92 in England and Germany.

2.2.1 Situation in Germany

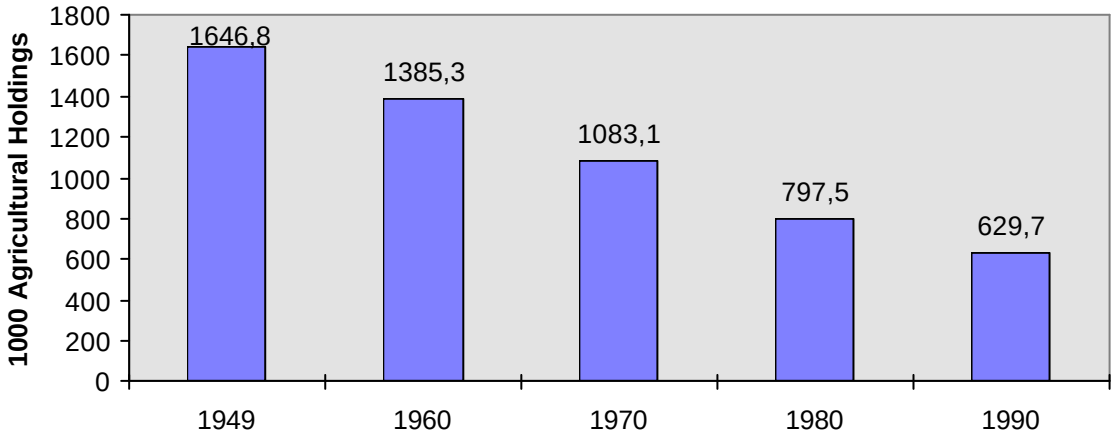
2.2.1.1 Agriculture in Germany

Development in the Federal Republic of Germany

After the foundation of the Federal Republic of Germany (FRG) in 1949 an interventionist policy - based on subsidies for basic food products, fodder and fertilisers - was introduced in the agricultural sector. With the Agricultural Act of 1955 help was provided to adjust the income of people working in agriculture to that of comparable work sectors, which was largely achieved by the mid 1970s (see BML, 1996 a, p. 3 and SCHULZE, 1995, p. 186 ff.).

Since the direction of the CAP with its interventions into the market had been in accordance with the policy of the FRG, the further development lead to the same features as described in chapter 2.1.1 „Development of the CAP“. As in other European countries, the number of agricultural holdings declined steadily from 1949 to 1990:

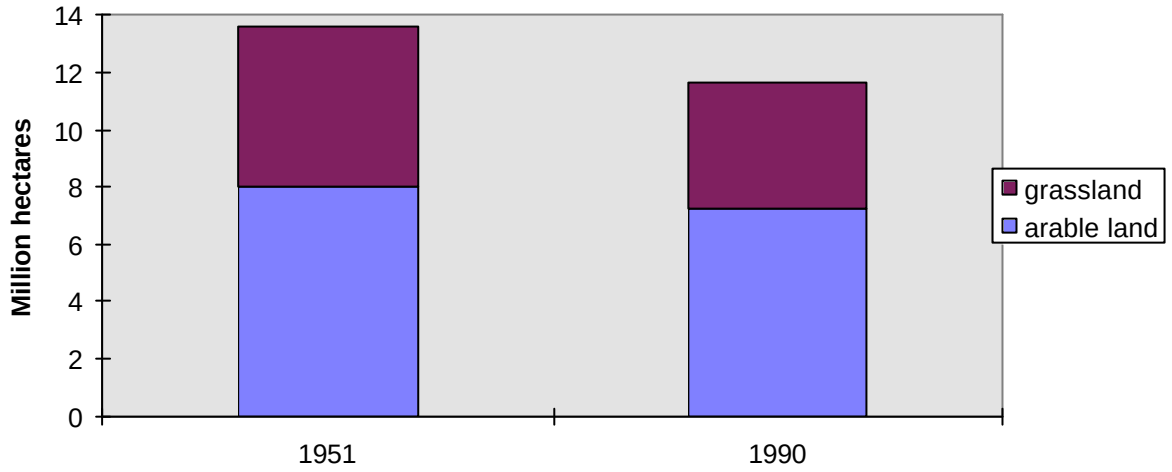
Figure 3: Agricultural Holdings in the FRG from 1949 to 1990



Source: own diagram, data from SCHULZE, 1995, p. 207 (note: data for 1990 without GDR)

Beside the reduction of the number of farms the intensification of agricultural land under the CAP also had effects on the total agricultural land. In Figure 4 below one can see a decrease in the total agricultural area (AA). Due to strong market forces marginal agricultural land fell out of use and was given up in favour for buildings, roads etc. Despite this decline in total AA, the arable land remained nearly stable whereas great losses of grassland were noted. New techniques enabled farmers to convert grassland to arable land. Consequently the overall reduction of agricultural land was mainly on the expenses of grassland areas.

Figure 4: Agricultural land in the FRG from 1951 – 1990



Source: own diagram, data from SCHULZE, 1995, p. 199.

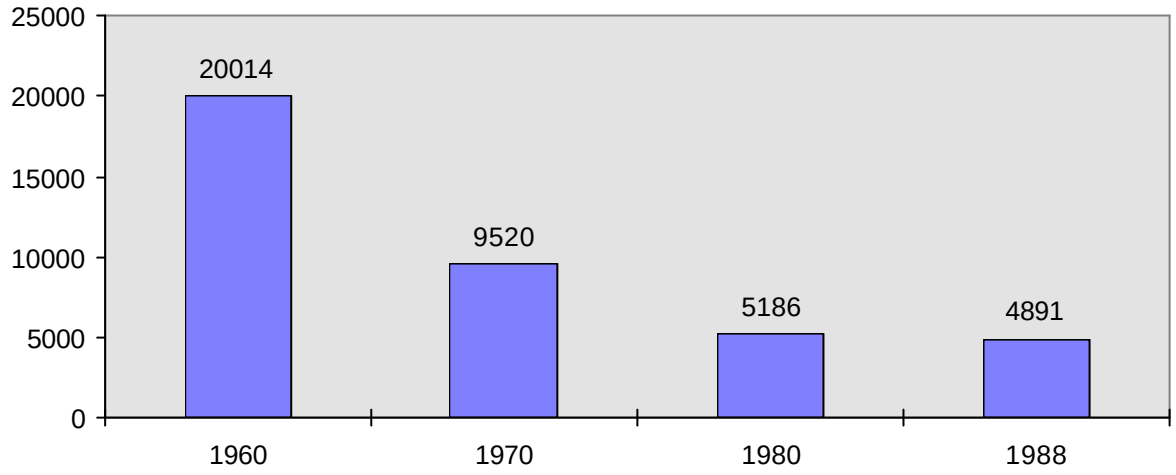
Development in the German Democratic Republic

In the former German Democratic Republic (GDR) the traditional farming structure was dismantled in the 1950s with a reform of the ground where expropriation and the new distribution of land took place. According to SCHULZE (1995, p. 219) three periods of the agricultural policy of the GDR can be differentiated:

1. The establishment of large production units - the so-called „LPGs“ (Landwirtschaftliche Produktionsgenossenschaft) - in the 1950s. Initially this lead to an enormous reduction of agricultural holdings in the GDR until 1960 and continued in the following time, as depicted in Figure 5.
2. The period of a shift towards industrial scale production followed by the introduction of huge arable- and domestic farms. Since the cost of agricultural production in general could be reduced only slightly the yields stagnated during the 1970s.

3. In the 1980s an attempt was made to regulate the direction of the previous agricultural policy by bringing arable- and domestic farm units closer together. This approach resulted in increasing yields during the 1980s.

Figure 5: Number of agricultural holdings from 1960 – 1988



Source: own diagram, data from SCHULZE, 1995, p. 207

For two main reasons the total AA of the former GDR did not decrease as much as in the FRG (only by 5.8% from 1959 to 1990):

1. The government`s aim of self sufficiency kept marginal agricultural land in use;
2. There was no fragmentation of landscape due to individually owned housing (SCHULZE, 1995, p. 229).

Development after the reunification

The reunification had no great effects on agricultural policy of the former FRG but brought substantial changes for the agriculture in the former GDR. Agricultural land, which had been mainly owned by the State, was taken over by the Treuhand (the organisation for the administration of state properties until they are sold to private or juristic persons). In many cases the property rights have remained unclear so far and cause problems due to a lot of movement of the land. Farmers who were able to establish a farm in the first place now have to deal with many shifts of their own or rented land. According to SCHULZE (1995, p. 242) by 1992 there have been 12 600 agricultural holdings (re-)established. Because of privatised and

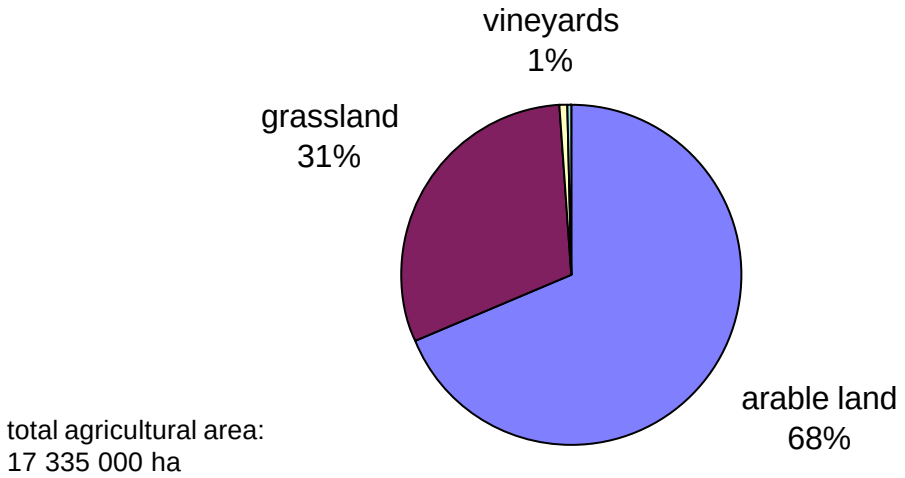
newly structured farms this number is much higher than the number of holdings in 1988, which means that the average size of the farms has been reduced. Owners are now either families or farms are organised as agricultural enterprises.

Apart from re-structuring land the agricultural market suffered great losses. SCHULZE (1995, p. 244) points out a major decline of the total AA, about 900 000 ha arable land (including set-aside) and 360 000 ha grassland fell out of production. There was also a drastic reduction of domestic animals, the number of livestock units (LU) went down by ca. 45% from 1989 to 1993. Consequences of this severe reduction of arable- and livestock production were substantial income losses. However, according to BML (1996 b, p. 4) the reduction of domestic animals has reached a minimum and is now increasing again.

With the reunification in October 1990 East Germany became part of the EC. From then on the CAP determined agricultural life.

At present German agriculture is dominated by intensive arable farming generally in areas at lower altitudes, e.g. in the fertile plains of north and east Germany or the plains of Baden-Württemberg alongside the Rhine. Grassland is largely found in higher and/or wetter areas, where climatic conditions do not allow arable farming, e.g. the marshes in north Germany and many of the valleys of the low-mountain region as well as on the foothills of the Alps. Figure 6 depicts the breakdown of agricultural land use in 1996.

Figure 6: Agricultural land use in Germany in 1996



Source: own diagram, data from STATISTISCHES BUNDESAMT DEUTSCHLAND, 1998

2.2.1.2 Integrating agricultural and environmental policy until 1992

Environmental policy in Germany applies to the federal structure and mainly lays under the responsibility of the 16 Bundesländer, whereas agriculture is determined by the development of the CAP.

Among the German Bundesländer Bavaria lead the way to integrate environmental issues into agriculture. In 1982 Bavaria started to offer contracts on nature protection to farmers, who got compensated for the restrictions (HEIßENHUBER et al, 1994, p. 87). At federal level it was not until 1985 that environmental damages caused by agriculture became an issue of policy and public due to a special study of the Sachverständigenrat für Umweltfragen (Council of Environmental Advisors, SRU). The SRU classified the majority of farming as clearly causing environmental damage. Also in 1985, article 19 of Regulation 797/85 on improving efficiency of agricultural structures (see chapter 2.1.2 “Greening of the CAP: Regulation 797/85”) provided a first basis for the integration of environment and agriculture.

It can be seen as a consequence of this development that from the mid 1980s on more Bundesländer offered contracts on nature protection to farmers. The objectives of this promotion of more extensive forms of agriculture were to maintain typical plants and wildlife as well as various habitats and landscapes (WISSENSCHAFTLICHER BEIRAT BEIM BML, 1996, p. 17 f.). From 1989/90 to 1992/93 the BML implemented Regulation 797/85 at federal level by providing a framework for the individual Bundesländer in the Common Task „Verbesserung der Agrarstruktur und des Küstenschutzes“ (Improving Agricultural Structure and Coastal Protection, GAK). It entailed the less intensive management of agricultural land on a voluntary basis. The objective was to reduce overproduction of certain products rather than environmental protection (WISSENSCHAFTLICHER BEIRAT BEIM BML, 1996, p. 18).

Concerning the integration of environmental and agricultural matters in Non-Governmental Organisations (NGOs), HÖLL AND MEYER (1996, p. 72 f.) pointed out that the Deutscher Bauernverband[1] (German Farmers` Union, DBV), together with the agri-food and the agri-chemical industry has been denying or playing down environmental impacts of farming for a long time. The debate revolved mainly around income and competitiveness losses. Environmental considerations were only acceptable when a voluntary participation and the compensation of income foregone was guaranteed for the farmers. On this basis the DBV began to open for agri-environmental policy and even promoted the important role of farmers for nature conservation. Important nature conservation NGOs, such as the Bund für Umwelt- und Naturschutz Deutschland[2] (Friends of the Earth - Germany, BUND), or the Naturschutzbund Deutschland (BirdLife Germany, NABU) who argue for a better integration

[1] Germany´s most important farmers` organisation.

of agricultural and environmental policy could not gain enough policy support for a long time. However, at the level of the Bundesländer they play an important advisory role in elaborating agri-environmental schemes (compare BLÜHDORN, 1995, p. 171).

Finally it has to be noted that German environmental policy has been developed in the past mainly as a policy of prescriptions. Unless there is an urgent need for environmental protection or nature conservation - for instance to keep groundwater clean in areas where drinking water is gained - the participation in environmental schemes is voluntary (BML, 1992, p. 22).

2.2.1.3 General implementation of agri-environmental schemes

Scheme of the Federal State

The Federal Ministry (BML) provides the Bundesländer with a horizontal framework, available throughout the country (BML, 1996 c, p. 118). This framework, the so-called „markt- und standortangepaßte Landbewirtschaftung“ (farming methods adapted to market and localities) is part of the Common Task „Verbesserung der Agrarstruktur und des Küstenschutzes“ (Improving Agricultural Structure and Coastal Protection, GAK) since 1994 and is the further development of GAK´s implementation of Regulation 797/85 (see chapter 2.2.1.2 “Integrating agricultural and environmental policy up until 1992”). It covers:

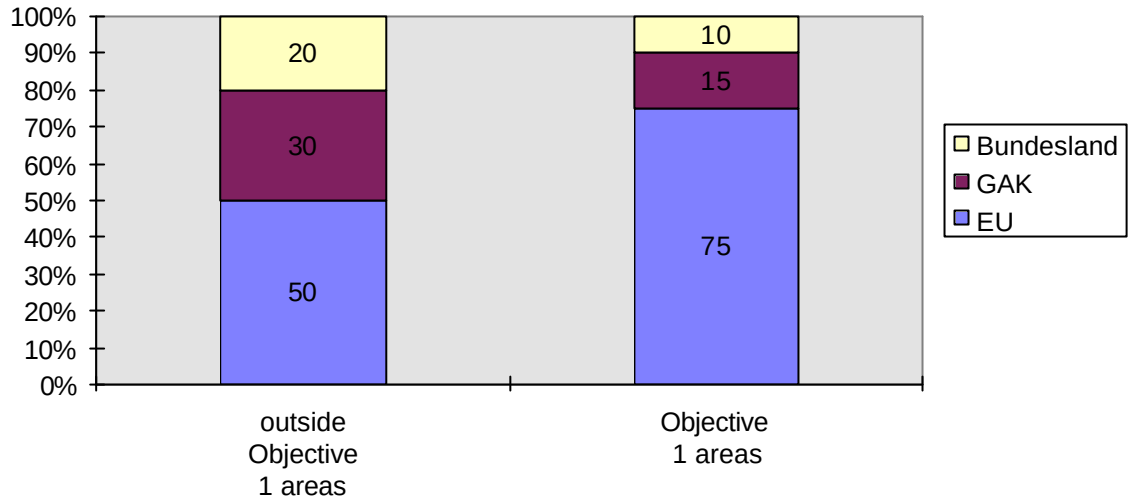
1. The extensification of production methods on arable land and permanent crop;
2. The extensification of grassland management; and
3. Organic farming (BML, 1997, p. 34 ff.).

However, the GAK does not include the whole range of measures suggested under the European Regulation. The 16 German Bundesländer have the choice whether they make up their schemes under Regulation 2078/92 or under the GAK or a mixture of both, due to the co-existence of EU-Regulation 2078/92 and the GAK. Those Bundesländer which adapt their agri-environmental schemes - or parts of it - to the framework of the GAK are co-financed by the Federal State with 30% of the expenditures (15% in Objective 1 regions respectively), see Figure 7 below. Beside the additional GAK support it is also possible for the Bundesländer to design their schemes outside the framework of the GAK, receiving 50% co-funding from the EU outside and 75% in Objective 1 regions. Of all German Bundesländer only Baden-Württemberg, Bavaria, Rheinland-Pfalz and Saxony have chosen to offer their schemes

[2] Germany´s largest environmental NGO.

without GAK support. This enables them to design the schemes outside the requirements of the GAK.

Figure 7: Financial support of agri-environmental schemes in Germany



Source: OSTERBURG, 1997, p. 8

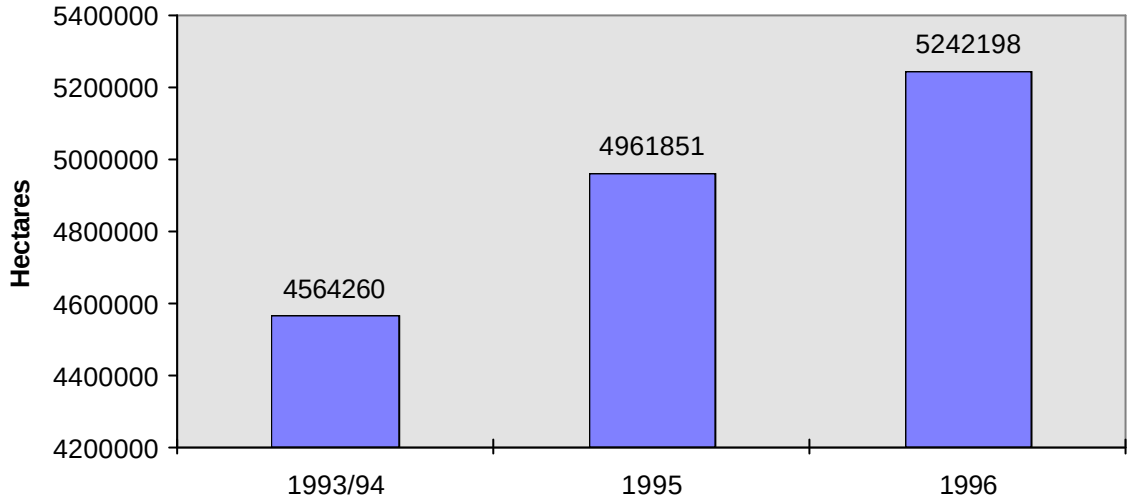
Schemes of the Bundesländer

The Bundesländer offer various schemes which are tailored to the special regional circumstances. The BML (1995, p. 2 f.) notes remarkable differences in the schemes of the Bundesländer because of differences in:

- Structural agricultural and environmental conditions;
- Environmental problems;
- Agri-environmental policies;
- Knowledge gained from previous schemes, and
- Limited budgets for the agri-environmental schemes.

The diagram below shows the area managed under agri-environmental schemes in Germany:

Figure 8: Area under Regulation 2078/92 in Germany



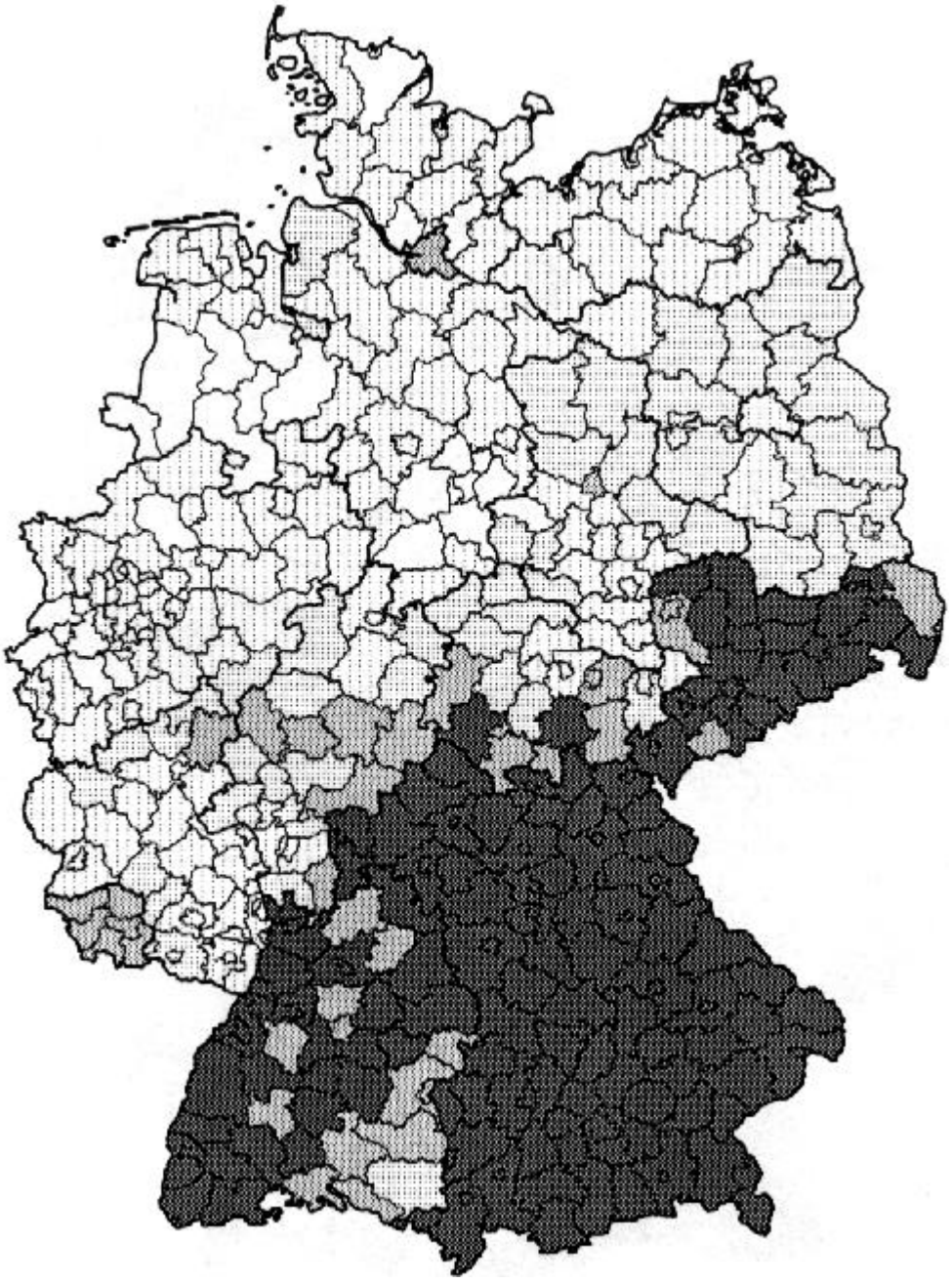
Source: own diagram, data from BML, 1998 and BML, 1995

In 1996 the area covered by agri-environmental measures reached 30% of Germany´s total AA. According to the BML (1998, p. 105) extensification of grassland is the dominating measure undertaken in Germany under Regulation 2078/92, in 1996 about 23% of the permanent grassland in Germany were supported.

Total expenditure under Regulation 2078/92 has been 6060.34 million ECU[3] in the period from 1993 to 1997, of which 3308.28 million ECU have been reimbursed by the EAGGF, Section Guarantee (NIENDIEKER, 1998, p. 124).

[3] All original data in DM are converted into ECU by the exchange rate of the 18. September 1998 of the Deutsche Bank: 1 ECU = 1,9665 DM).

Expenditure per hectare agricultural area are depicted on the map below:



Proportion of agri- environmental measures on the agricultural area in %

0 - < 1 (30 Kreise)
1 - < 10 (155 Kreise)
10 - < 20 (62 Kreise)
20 - < 50 (40 Kreise)
>= 50 (152 Kreise)

Note: German “Kreise” roughly correspond to British “districts”
Source: OSTERBURG, 1997, Anhang1, p. 4

Administration and monitoring

Administration and monitoring of the schemes lays mainly under the responsibility of the Bundesländer and studied in the three case studies. Additionally the BML works out evaluation reports on the agri-environment program in Germany for the European Commission.

2.2.2 Situation in Great Britain

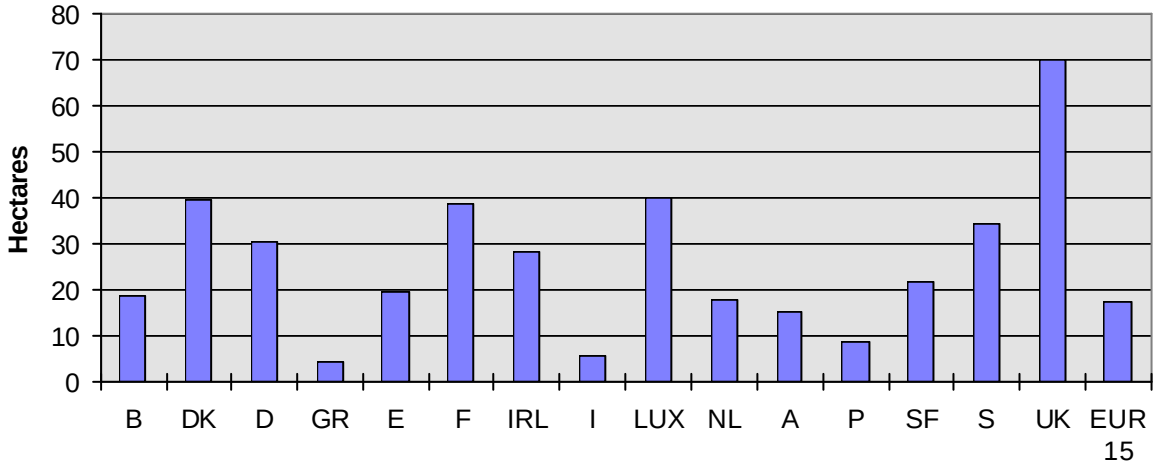
2.2.2.1 Agriculture in Great Britain

To show the agricultural situation in Great Britain one has to fall back on information of the United Kingdom (UK), in order to synchronise the chapter with the German situation and to provide a basis for the comparison of both countries.

After the Second World War British agriculture had been influenced by an interventionist policy as well as by a major technical revolution. This twofold development resulted in a great influence on the way of production and on the economic role of agriculture in rural areas. From 1971 a downward fluctuation of farm income was noticeable, due to falling real prices for agricultural products on the one hand and rising costs to produce them on the other hand. Reaction on farmers´ side was a slow decline in the number of farms, which allowed „aggregate income to be shared amongst fewer people." (WHITBY et al, 1994, p. 3).

This points to a significant difference of all other European Member States, namely UK´s outstanding average farm size of 70.1 hectares. The diagram below shows the average farm sizes in the EU:

Figure 9: Average farm sizes in the EU in 1995



Source: own diagram, data from EUROPEAN COMMISSION DG VI, 1997 a, 2.0.1.2

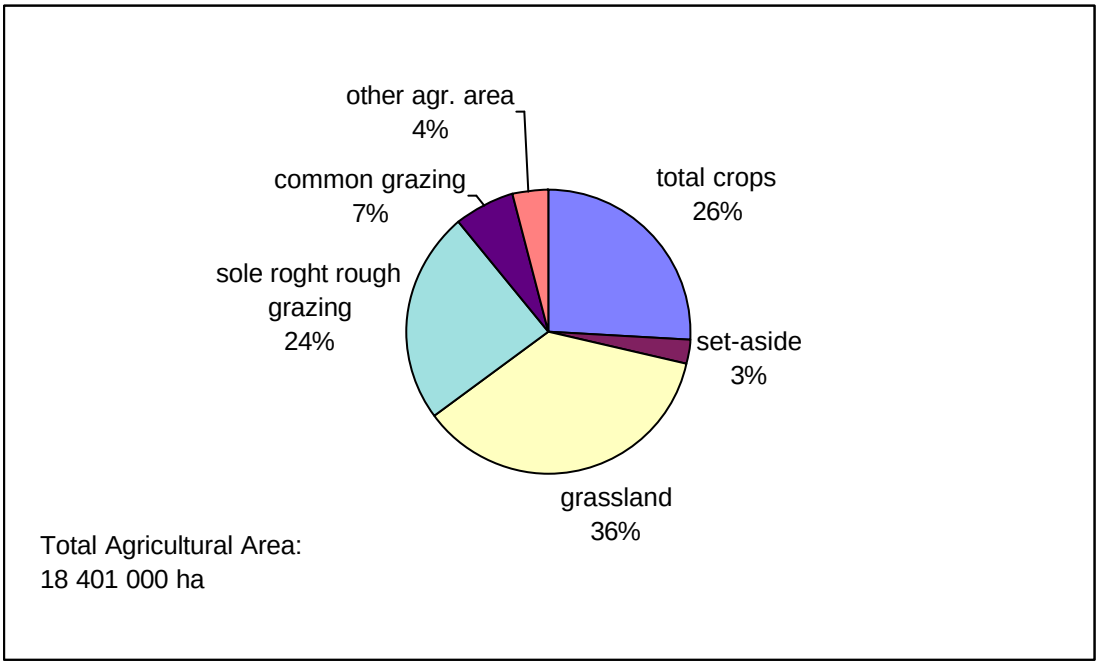
The reason for this enormous average farm size in the UK is threefold. Firstly, particularly in Northern Ireland and Scotland there is still an ownership of large estates to record. Secondly, the heritage right over the past centuries said to give the eldest son the entire holding and

thirdly BADER & MAY (1992, p. 126) point out that Britain's agriculture had already shrunk enormously during the period of colonialism.

The UK entered the EC in 1973 and British agriculture became part of the CAP, although it has to be mentioned that Britain's former orientation towards the Commonwealth resulted in a special status of the UK within the CAP for the first few years (HENRICHSMEYER, 1998, own transcript). However, according to BALDOCK (1993, p. 49) the CAP resulted „in a significant increase in cereal prices in the UK providing an incentive to convert some grassland into arable and providing an economic return on drainage projects which otherwise would not have been undertaken."

To get an idea about agricultural land use in the UK, the following diagram shows the situation in 1996:

Figure 10: Agricultural land use in the UK in 1996



Source: own diagram, data from MAFF, 1998

The diagram shows that 2/3 of the total AA are grazing land, compared to Germany this is a very high percentage (31%). This is due to vast areas of upland agriculture, e.g. of the Cambrian Mountains, the Pennine Dales and the Lake District in Britain whereas in comparable areas in Germany the amount of woodland is much higher. There is an important distinction between two farming systems, namely the Upland and the Lowland agricultural system:

- Agriculture in the Uplands is defined farming land lying above enclosed or fenced land, at altitudes of 240 m above sea level or more. According to BALDOCK (1993, p. 48) the rough grazing comprise „grassland, patches of blanket bog, and tracts of heather and bilberry moor." Farming in these areas is primarily devoted to livestock production.
- Since the climate and soils favour the growth of grass in the warm and moist western lowlands, intensive dairy and arable farming both take place here, i.e. a great part of the Midlands, East Anglia and the south of the country, but also parts of Scotland. It is here where the longer growing season than in the uplands, the better environmental „equipment" for agriculture and technological innovations have resulted in a remarkable decline in mixed farming, „which traditionally maintained a patchwork landscape of hedgerow, hay-meadow, wet pasture and arable land." (BALDOCK, 1993, p. 48).

2.2.2.2 Integrating agricultural and environmental policy until 1992

Agriculture in the UK is largely a matter of MAFF in England with equivalent authorities in Scotland, Wales and Northern Ireland and the CAP. Separately environment lies under the responsibility of the Department of Environment (DoE), now the Department of Environment, Transport and the Regions (MAFF, 1997 c, p. 43). The DoE has Scottish, Welsh and Northern Ireland Offices which protect the environment in their own areas as well as statutory nature conservation agencies[4].

In 1979 the Countryside Commission (CC) complained a reluctance of MAFF to co-operate with environmentalists: "Over the years we have regularly had cause to regret a lack of regard for conservation and recreation in Ministry policy and practice: we have tended to make more progress with the private and farming landowning organisations directly." (in WHITBY, 1996, p. 7).

In fact, the Country Landowners Association (CLA) and the National Farmers Union (NFU) have discussed with environmental groups after having been criticised (WHITBY, 1996, p. 7).

BALDOCK (1990, p. 149) points out the role of the Royal Society for the Protection of Birds (RSPB), by the early 1970s Britain's largest wildlife organisation. This NGO gradually expanded its traditional role of owning and managing bird reserves to play a more pronounced role in national land-use policies.

With the introduction of the Wildlife and Countryside Act of 1981 the government responded to the increasing concerns among the NGOs and to the agricultural damage to the

[4] For England those are English Nature (EN), Countryside Commission (CC) and English Heritage. In Scotland there is the Scottish Natural Heritage (SNH) and in Wales the Countryside Council (HAIGH, 1992, p. 9.1 – 1).

environment. This first legislative instrument strengthened the protection of Sites of Specific Scientific Interest (SSSI´s) since „farmers had to consult the NCC[5] before undertaking certain potentially damaging farming operations; and authorised the NCC to offer compensatory payments to farmers." (WATERS, 1993, p. 5). In a revision of the Wildlife and Countryside Act in 1985 the Parliamentary Environment Committee stated: „The illogicality of one part of government (MAFF) offering financial inducement to do something which another part of government (DoE and related bodies) then has to pay him not to, is clear." (in WHITBY, 1996, p. 9).

This revision and the UK governments proposal for Article 19 in EC Regulation 797/85 on improving efficiency of agricultural structures (see chapter 2.1.2 "Greening of the CAP: Regulation 797/85") resulted in the Agricultural Act of 1986, which introduced an environmental objective on Ministers of Agriculture (WHITBY, 1996, p. 190 f.). The Agricultural Act stands for a new emphasis of agricultural policy since shortly after its introduction the first round of Environmentally Sensitive Areas (ESAs) had been designated by the end of 1987. Those ESAs of the first round covered parts of the country where landscape and ecological balance were threatened by agricultural change and where farmers were offered an annual premium if they continued farming in a traditional manner. Their introduction marked a major shift of the British agricultural policy, called the „flagship of agri-environmental policy" (WHITBY, 1996, p. 9).

From 1987 on, the number of designated ESAs and also re-designations after a five-years period followed, as well as the introduction of other agri-environmental schemes, which will be introduced in the following chapter (2.2.2.3 „General implementation of agri-environmental schemes").

British environmental policy is generally not comparable to many other industrial countries, where detailed and unified environmental standards are defined by law. In Britain the absence of a formal environmental policy framework at national level has meant considerable differences from one local authority to another (COMMISSION OF THE EUROPEAN COMMUNITIES DIRECTORATE-GENERAL FOR ENVIRONMENT, NUCLEAR SAFETY AND CIVIL PROTECTION, 1993, p. 172). This gives the opportunity to take local conditions and financial aspects into consideration. It is a very pragmatic way of environmental policy but allows more flexibility in many cases (INTERNATIONALES INSTITUT FÜR RECHTS- UND VERWALTUNGSSPRACHE, 1978, p. 34).

[5] Nature Concervancy Council, precursor of English Nature and its scottish and welsh synonyms.

2.2.2.3 General implementation of agri-environmental schemes

Schemes of the UK

MAFF is responsible for the general co-ordination of agri-environmental policy in the UK. The four Agricultural Departments (England, Scotland, Wales and Northern Ireland) have developed their own programmes to reflect their different environmental conditions as well as different agricultural structures, although the structure of the schemes is fairly similar throughout the UK (AGRICULTURAL COMMITTEE, 1997, p. 3). Liaison between MAFF and other agriculture departments happens regularly in order to ensure a consistent approach throughout the UK on common problems and themes.

Summarising the area of all agri-environmental schemes under Regulation 2078/92 of the UK, they make some 6% of the total AA. Compared to Germany, where 30% of the AA are managed under the Regulation, a drastic difference between the two country becomes obvious.

The structure of the schemes run by the four Agricultural Departments is fairly similar thus representative for the national agri-environment program the English agri-environmental schemes will be introduced in the following.

English agri-environment program under Regulation 2078/92

In England the Government´s programme for implementing agri-environmental schemes gave priority to „areas, features and resources that:

- Are valuable to the rural environment but are in decline or under threat;
- Have significant potential to add new value, creating new opportunities where there are currently few;
- Are in need of positive management to maintain and enhance their value.“ (MAFF, 1995, p.4).

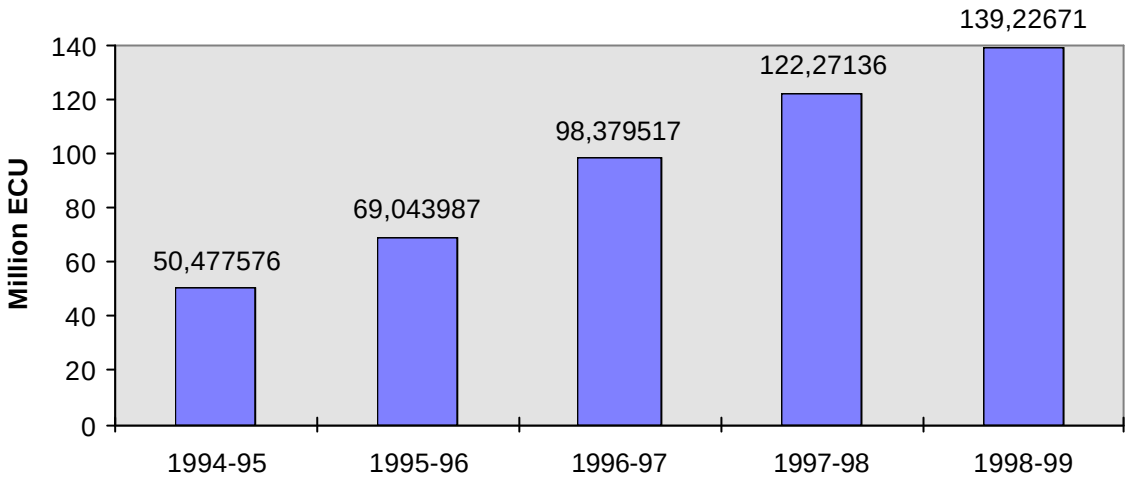
According to Regulation 2078/92 the programme covers all objectives set out there, except for the upkeep of abandoned farmland and woodlands and the protection of rare breeds. Those two items were not seen as significant problems in England (AGRICULTURAL COMMITTEE, 1997, p. 2).

A National Agri-Environment Steering Group has been created and has been meeting quarterly since October 1995. In this group officials from MAFF, the DoE, the Countryside Commission, English Heritage and English Nature participate, advise MAFF on objectives

and priorities, on the most effective development of the schemes, and on the monitoring and evaluation of the schemes (MAFF, 1995, p. 26).

The following diagram shows the rise of expenditures under England's agri-environment program from 1994-95 to 1998-99:

Figure 11: Expenditure on the agri-environment program in England[6]



Source: own diagram, data from AGRICULTURAL COMMITTEE, 1997, p. 5

These expenditures are spent on the following agri-environmental schemes available in England (MAFF, 1998 b and AGRICULTURAL COMMITTEE, 1997, p. 3):

- ***Countryside Access Scheme (CAS)***

  This scheme was launched in 1994. It aims to increase the benefits from land which is set-aside under the Arable Area Payments Scheme by offering incentives to farmers to increase public access opportunities on the best located sites.

- ***Countryside Stewardship Scheme (CS)***

  Countryside Stewardship operates throughout England outside ESAs and aims to protect, enhance, restore and re-create targeted landscapes, their wildlife habitats and historical features, and to improve opportunities for public access. Payments are made for changes to land management practices which produce conservation benefits or improved access to the countryside. It was launched by the CC in 1991 as a pilot scheme and transferred in 1996 to the government.

[6] All original data in £ are converted into ECU by the exchange rate of the 18. September 1998 of the Deutsche Bank: 1 ECU = 0,6920 £).

- ***Environmentally Sensitive Areas (ESA)***

  ESAs cover parts of the country of particularly high landscape, wildlife or historic value which are threatened by changing farming practices. Incentives are offered to farmers to adopt agricultural practices which will safeguard and enhance the rural environment and create improvements in public access. The first five ESAs were launched in 1987 and MAFF has now designated a total of 22 in England, covering some 10% of agricultural land.

- ***Habitat Scheme***

  Launched in 1994, this scheme offers incentives to farmers to create or improve valuable wildlife habitats over 10 or 20 years. It is targeted on land coming out of the former voluntary Five Year Set-Aside Scheme, land suitable for conversion to saltmarsh, and along watercourses and lakes in 6 pilot areas.

- ***Moorland Scheme***

  This scheme aims to protect and improve the moorland environment by encouraging upland farmers outside ESAs to graze fewer sheep where this will improve the condition of heather and other moorland vegetation. Farmers joining the scheme will receive an annual payment for the number of ewes removed from the flock. The scheme was launched in 1995.

- ***Nitrate Sensitive Areas (NSA)***

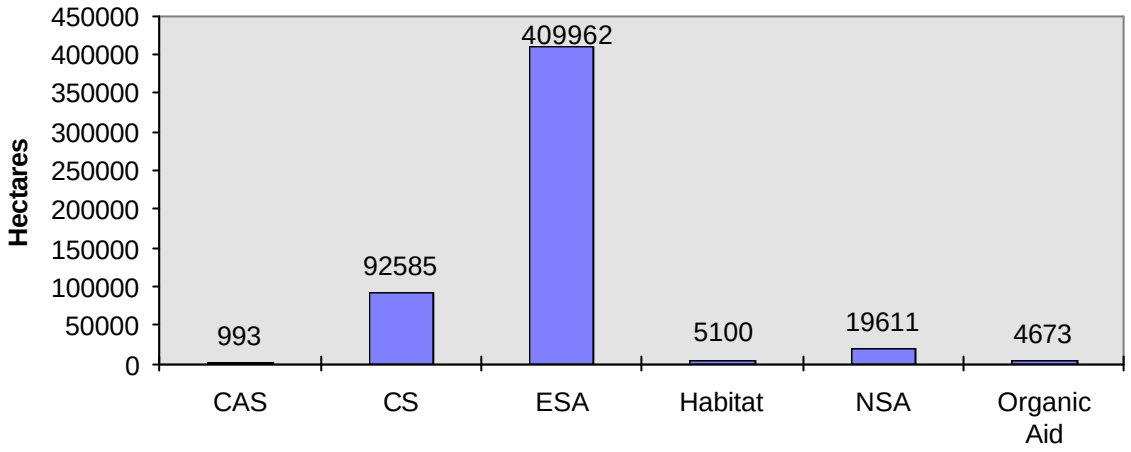
  NSAs are carefully selected areas covering groundwater sources used to supply drinking water. Incentives are offered to farmers to undertake significant changes in agricultural practices which reduce nitrate leaching, thereby helping to stabilise or reduce nitrate levels. At present there are 22 NSAs in England, of which the first ten were launched in 1990, followed by the rest in 1994.

- ***Organic Aid Scheme***

  This scheme is available to farmers throughout England who wish to convert to organic production in accordance with the rules of the UK Register of Organic Food Standards (UKROFS). The scheme was launched in 1994.

Figure 12 depicts the total area under the english agri-environment program in 1996:

Figure 12: Area under the agri-environment program



Source: own diagram, data from AGRICULTURAL COMMITTEE, 1997

The Moorland Scheme is not included in the diagram, since the payment refers to the number of ewes removed from the flock.

The diagram clearly shows the importance of the ESA scheme in England which is the reason for the author to choose this scheme for the two case studies.

Administration of the schemes

In England the schemes are administered by MAFF´s nine Regional Service Centres with professional support from the statutory side of the Farming and Rural Conservation Agency (FRCA). The latter is a new organisation established in 1997 when the Government privatised the commercial operations of ADAS (Agricultural Development and Advisory Service). ADAS is now responsible for the monitoring work whereas the FRCA has taken over statutory and regulatory functions (MAFF, 1997 c, p. 9).

According to the AGRICULTURAL COMMITTEE (1997, p. 6) the Regional Service Centres have to ensure the processing of applications, field inspections and the payments. The position of MAFF Regional Service Centres is between MAFF´s headquarter on the one side and the FRCA project officers on the other side. A close co-operation and liaison with both sides can be noted. The FRCA operates with project officers who are responsible for the implementation of the schemes effectively on the ground. A project officer has clear responsibilities for a specific area and is a direct contact to the farmers in this area. Because of the different natures of the various schemes and of the different environmental conditions of the areas concerned, the precise role of the project officers varies from scheme to scheme

(AGRICULTURAL COMMITTEE, 1997, p. 6). A matter of great importance is that the FRCA provides technical advice to MAFF headquarters on the development and operation of the schemes, for instance whether existing prescriptions of the scheme are adequate to meet the scheme's objectives.

Monitoring

The AGRICULTURAL COMMITTEE (1997, p. 6) points out that the monitoring programmes have been a long standing feature for ESAs, NSAs and Countryside Stewardship. For all other agri-environment schemes monitoring programmes have been put in place or are planned.

3. Agricultural background: Grassland management and extensification of grassland

This chapter aims to give an introduction to grassland and its extensification. Characteristics, problems and extensification potential are outlined for the categories of grassland management (livestock, grassland management in a closer context, cultivation of grassland, fertilisation, plant protection products, water Regulation and landscape elements), which have been classified after studying the schemes.

3.1 Definition and classification

Grassland is defined as a permanent sward, built of numerous plant species (VERBAND DER LANDWIRTSCHAFTSBERATER IN BAYERN E.V., 1992, p. 447).

Most of the vast grassland areas we find in Europe today have developed under human influence. Clearing and burning of mixed woodlands, the original natural vegetation in temperate Europe, and grazing of the woodlands created them. In contrast, natural grassland is restricted to areas above the tree line in the Alps, around lakes developed under the process of silting up and to swamps and to regularly flooded areas. Grassland management has always been on a low intensity and brought along a great variety of different habitats. Flora and fauna have adapted perfectly to the different physical site conditions.

Technical innovations after the Second World War changed the face of the grassland. „Improving" grassland through drainage, levelling, ploughing up, fertilisation and the amalgamation of fields led to uniform looking grassland. Better sites - in the sense of higher productivity - were converted to arable land whereas large areas of formerly marginal grassland were improved and provided higher yields. The result was a drastic reduction of grassland flora and fauna (NITSCHE & NITSCHE, 1994, p. 12).

In general, grassland is divided into permanent and temporary grassland (VERBAND DER LANDWIRTSCHAFTSBERATER IN BAYERN E.V., 1992, p. 448). Permanent grassland is found in areas where local physical conditions do not allow arable farming, e.g. in areas of high precipitation, short growing seasons, very steep slopes etc.. Temporary grassland can either be used as grassland or as arable land. In most cases it has been converted to arable land, only in some cases lack of labour prevented a conversion. The site factors which determine the use of agricultural land as grassland are listed in the box below.

Figure 13: Site factors of grassland

Site factors of grassland

- The ***depth of the ground water table***: if the water table is less than 50cm below the surface, the grassland has to be used as meadow. High water tables restrict the use as pastures, because poaching becomes very likely.
- ***High precipitation*** (more than 1000mm annual rainfall) allows only grassland.
- The ***distribution of precipitation*** over the year determines which plants grow. If the need of plants for rainfall not congruent with actual rainfall the use as grassland becomes more appropriate.
- ***Height above sea level***: increasing height above sea level shortens the growth period and lowers the mean annual temperature whereas the mean annual precipitation is increasing. When the height above sea level becomes too restrictive for arable farming, the land is used as grassland or woodland.
- ***Soils*** of the grassland are minor productive soils such as podsols, gleys, alluvial flood plains, marsh soils and soils of bogs and fens. Apart from podsols (which are very poor soils) they are all likely to be very wet.
- ***Steep slopes***: when slopes become too steep for the use of machinery they are used as pastures.
- The use of machines is restricted by ***uneven land***. Through levelling of uneven land many of these areas have been converted to arable land.
- ***Amalgamation of fields***: the amalgamation of fields resulted in a uniform use of large fields suitable for the use of big machines. When there are no other restrictions those fields are used for arable farming.

Source: VERBAND DER LANDWIRTSCHAFTSBERATER IN BAYERN E.V., 1992, p. 450 f.

Plants of the grassland

The composition of a grassland sward is of grass species, legumes and herbs.

According to the VERBAND DER LANDWIRTSCHAFTSBERATER IN BAYERN E.V. (1992, p. 452) important grass species are for example Cocksfoot (*Dactylis glomerata*), Couch grass (*Agropyron repens a.k.a. Elytrigia*), Rye-grass (*genus Lolium),* Mat grass *(Nardus stricta),* Meadow fescue *(Festuca pratensis),* Meadow foxtail *(Alopecurus pratensis),* Reed fescue

(Festuca arundinacea), Tall oat-grass *(Arrhenaterum elatius ssp. elatius)* and Timothy grass *(Phleum pratense)* .

Relevant legumes are Bird´s foot (*Lotus corniculatus*), Hop clover (*Medicago lupulina*) and White clover (*Trifoliuum repens*).

Important herbs on grassland are for instance Cabbage thistle (*Cirsium oleracem*), Common dock (*Rumex obtusifolius*), Cow parsnip (*Heracleum sphondylium*), Daisy (*Bellis perennis*), Dandelion (*genus Leontodan*), Meadow knap weed (*Centaura jacea*), Snake-weed (*Polygonum bistorta*) and Cow parsley (*Anthriscus sylvestris*).
Grass species can be further divided into top grass and bottom grass. Bottom grass has short stalks and relatively large leaves and dominates on pastures. The sward is very dense through the effects of treading and grazing. It stands in contrast to top grass, which is a result of cutting and therefore mainly occurs on meadows. Cutting leads to high growing, massy grasses with long stalks and big rhizomes in relation to small leaves. The sward of meadows becomes gappy and loose due to the lack of compaction.
Beside grass there is also reed grass such as rushes and sedges, which grows on very wet sites and on litter meadows in particular (VERBAND DER LANDWIRTSCHAFTSBERATER IN BAYERN E.V., 1992, p. 452). Legumes have the important and special ability to absorb nitrogen (N) from the air and combine it to the plant's protein. Therefore they build an important natural N store of the grassland.
Many of the herbs improve grassland fodder through their contents of crude proteins, trace-elements and flavouring. However, some herbs contain toxic substances and should not be on the grassland in large quantities (VERBAND DER LANDWIRTSCHAFTSBERATER IN BAYERN E.V., 1992, p. 452).

Soil conditions

Most authors (e.g. BRIEMLE et al, 1991; JEDICKE et al, 1996; NITSCHE & NITSCHE, 1994; SNAYDON, 1987, p. 81; VERBAND ZUR FÖRDERUNG EXTENSIVER GRÜNLANDWIRTSCHAFT, 1994) classify grassland biotopes by the following soil conditions:

- The amount of ***moisture***: there is a decrease of productivity when the soil of the grassland is too dry (e.g. dry grassland) or too wet (wet grassland, reedbeds, bogs, fens, flood plains, etc.).
- The grade of ***acidity***: this criteria also determines the productivity of the grassland as well, too basic conditions (e.g. mat-grass meadow, generally a true calcifuge) and too acid conditions (e.g. heather areas) result in nutrient-low grassland.

- The supply with ***nutrients*** depends on the natural physical conditions as well as on the input of nutrients by humans. Poor or nutrient-low meadows are for example nutrient-low chalk meadows yielding only little in contrast to rich grassland which is very productive.

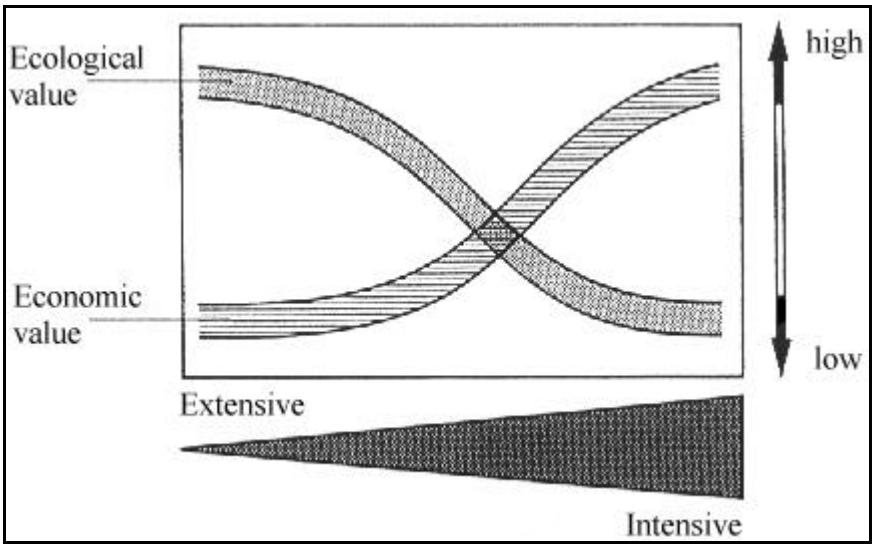
The amount of moisture in particular determines the intensity of utilisation. Wet grassland does not sustain heavy machinery or heavy animals since this would damage the sward.

In most cases combinations of two or all three criteria occur on grassland. When taken as scales of moisture, acidity and nutrient-supply, productive grassland biotopes generally occur in the middle positions of the scales. Technical measures such as drainage (regulating the moisture), liming (regulating the acidity) and fertilisation (regulating the nutrient-supply) helped to improve the grassland in many cases and created a uniform sward consisting of a small variety of plants. Towards the top- and down- ends of the scales the productivity decreases and the biotopes become more interesting for nature conservation.

In addition to the species composition affected by the soil conditions the productivity of the grassland is determined by the management (i.e. use of fertiliser, grazing/ cutting etc.), too. According to SNAYDON (1987, p. 86) the management „has a much greater effect on productivity than does changing the pasture composition".

3.2 Conventional management and extensification potential

Figure 14: Connection between management intensity and ecological or economic value on permanent grassland



Source: PRÜTER AND VON NORDHEIM, 1992, p. 3

The general meaning of extensification is the reduction of output on agricultural areas (GREINER & GROSSKOPF, 1990, p. 527). As depicted in Figure 14 above the economic value of grassland is high under an intensive management and decreases under extensive forms of management. The ecological value, however, stands in contrast to this. Derived from this connection the objectives of grassland extensification are:

1. To relieve the environment by a reduced contamination of soil, water and air and to reduce the contamination of the human food chain;
2. The protection of species and habitats;
3. A structured cultural landscape with landscape elements such as hedges, burns, river margins etc.;
4. To achieve market relief by reducing meat-, milk- and wool production in the EU is the major objective of agricultural policy (NITSCHE & NITSCHE, 1994, p. 14).

3.2.1 Livestock

The effects of livestock on grassland (respectively pastures) are through grazing, treading and distributing manure. They depend on the kind of livestock and on the stocking rate.

Characteristics

The kind of livestock kept can indicate the farming intensity. Heifer, suckler cows or rare breeds usually point to an more extensive form of management whereas dairy and beef farming tend to be intensive forms.

The stocking rate, given in livestock units (LU) per ha AA, is the key measure for the intensity of management. Livestock Units are generally determined by weight and age of different domestic animals. There are a number of different schemes in use for calculating LU, hence a comparison of LU between different schemes can be tricky.
As this study applies to an EU-Regulation the stocking rates refer to the Livestock Units of the EU (AMTSBLATT DER EG, Nr. L 215/87, 30.7.92):

- Cattle older than 2 years: 1.00 LU
- Cattle 6 months to 2 years: 0.60 LU
- Ewes: 0.15 LU

Beside the stocking density the grassland is affected by grazing, treading as well as the distribution of manure. The *grazing effects* on the sward are very irregular compared to the cut of a meadow when all plants are cut at the same time and height. Some plants on a pasture can develop undisturbed and others get grazed and sprout again. Frequent grazing supports a very dense and close to the ground growing sward (NITSCHE & NITSCHE, 1994, p. 80). *Treading or trampling* of domestic animals has effects on the compaction of the soils and the composition of the sward. The process of frost heaving during the winter cancels out the compaction through treading. Changes of the sward occur as the sensitivity of plants to treading is different, for instance rye-grass and red fescue are adapted to it very well and easily overgrow other species, (NITSCHE & NITSCHE, 1994, p. 78). *Excreta and urine* on the pasture are dispersed by accident on the one hand and concentrated at resting places on the other hand. With urine there is a high nitrate and potassium input into the soil. Cattle in particular prefer the fodder growing from these sites. The sward suffocates under excreta and the fodder growing after a the degradation of manure is disliked by domestic animals. Those places are called cattle latrine sites (NITSCHE & NITSCHE, 1994, p. 82 ff.).

Problems

In Regulation 2078/92 the extensification of grassland sticks to a maximum stocking rate of 1.4 LU and a minimum rate of 0.3 LU per ha AA. However, common local practice and sustainability of the grassland must be taken into consideration, i.e. a stocking rate of 1.4 LU per ha AA may express an extensive form of livestock management if the common local practice and the sustainability of the grassland allow a higher stocking rate. Otherwise it cannot be considered as a tool for extensification of grassland.

Poaching can be caused by grazing under too wet conditions. Depending on the weight of the animals the sward is partly destroyed and consequently threatened by erosion or weed infestations (NITSCHE & NITSCHE, 1994, p. 78).

Extensification potential

An extensive use of pastures with livestock has to prevent over- or undergrazing as well as poaching in order to maintain the pasture. The stocking density has to be adapted to the productivity and sustainability of the grassland. Hence a reduction of the stocking rate has to go along with a reduction of the productivity which is mainly achieved by limited fertilisation. Keeping less intensive livestock (e.g. heifer, suckler cows) supports the extensification. Additionally rare breeds prevent the further decrease of the genetic pool.

3.2.2 Pastures

Characteristics

Pastures depend greatly on stocking rate, kind of domestic animals and distribution of manure as well as on site factors of the area.

As mentioned above the plants on pastures are adapted to the treading of the animals and grow to a dense sward. There is also a direct return of excrements by the animals.

However, grazing is not the same throughout the growing season since the growth of the plants goes through different phases. MORRISON (1987, p. 63) points out that „in temperate conditions, growth in spring is initially slow; it accelerates to a peak in early summer, declines sharply to a midsummer trough, increases in July and August and then declines slowly after August." That means that pasture management has to be adapted to seasonal differences in order to avoid undergrazing in early summer and overgrazing during the midsummer. The kind of pasture management has to be adapted to the growth cycle as well as to environmental conditions (NITSCHE & NITSCHE, 1994, p. 76 f.):

- *controlled grazing*: is the most intensive form of rotational grazing where livestock stays on a part of the field for a short time until it gets moved to the next part of the field.
- *rotational grazing*: Livestock stays on the pasture from one to 14 days, afterwards the pasture can recover. The intensity depends on the time of grazing, the size of the alloted area and the input of fertiliser. The longer the periods and the larger the area the less intensive the use of the pasture becomes.
- *set stocking*: Livestock stays on one pasture for the entire growing season. It is an extensive form of pasture management requiring a low stocking density and little effort.
- *shepherding*: shepherded grazing is adapted to the natural conditions very well since the grazing period as well as the grazed area depend on the actual growth. It is per se an extensive pasture form mainly with sheep, involving labour to shepherd livestock.

Problems

Problems on pastures generally occur under wet conditions and when the stocking density is not adapted to the sustainability of the grassland. Then the sward is likely to become gappy and threatened by weed infestations. Intensive forms of pasture management usually require input of mineral fertiliser, which is described in chapter 3.2.5 "Fertilisation".

Extensification potential

Extensification of pastures is given through the form of pasture management, for example long rotation periods, set stocking or shepherded livestock. Obviously extensive pasture management is associated with extensive livestock management.

3.2.3 Meadows

Using grassland as meadows becomes necessary when green fodder is needed for the winter. In mild oceanic climate conditions (e.g. in England) the growth period of grassland is very long. Therefore the grassland can be used as pastures. Meadows are of minor importance since the necessary amount of winter fodder is not that high. In contrast to that in a more continental climate with a shorter growth period more grassland has to be used as meadows in order to produce enough winter fodder (VERBAND DER LANDWIRTSCHAFTSBERATER IN BAYERN E.V., 1992, p. 460).

Characteristics

Meadows are characterised through the removal of the crop at the same time and height. In contrast to pastures only a minor amount of leaves, important for assimilation, stays on the meadows. Top grass dominates with a relatively small proportion of leaves to stalks and rhizomes and the sward is likely to become loose (VERBAND DER LANDWIRTSCHAFTSBERATER IN BAYERN E.V., 1992, p. 460).

Meadows generally stand for the production of green fodder, the quality of which closely depends on the cutting date and the frequency of cuts. The right cutting date is between the emergence of the inflorescence and the start of the flowering because of the high amount of energy and the good digestibility. The energy content in the fodder declines during growth due to an increasing amount of crude fibre, a declining amount of crude protein and decreasing digestibility (VERBAND DER LANDWIRTSCHAFTSBERATER IN BAYERN E.V., 1992, p. 458). An early cut provides well digestible nutrient rich fodder. Hence the tendency of conventional farmers towards an early cutting date is understandable. The first cutting time also determines the frequency of the cuts during the growing season. Depending on the site factors five cuts are not unusual on intensively used meadows. However, it has to be mentioned that intensively used meadows described above always go along with the application of fertiliser.

Concerning the conservation of the cut grass three forms are commonly distinguished: Hay, silage and hay-lage. Hay-making is characterised by cutting the grass and leaving it on the field until it is dry. Wilting and turning the hay supports the process of drying which usually

takes four consecutive dry days. Compared to the other two methods hay-making involves a relatively high effort. When making silage the cut grass is removed straight from the field and put together in silage containers where the grass ferments. Hay-lage stays between silage and hay-making: the cut grass lies on the fields to dry out for about one or two days and is then wrapped into foil where it starts to ferment.

Problems

On dry and wet meadows an early cut is usually impossible, since this would alter the composition of the sward and result in an infestation of weeds. In general the soil tends to be wetter in the spring. On wet meadows the use of machines is likely to be impossible at that time. Subsequently wet meadows are mainly used as litter meadows and cut later than improved grassland (VERBAND DER LANDWIRTSCHAFTSBERATER IN BAYERN E.V., 1992, p. 457 f.).

Extensification potential

Prescriptions for the extensive use of meadows usually comprise a late cutting date in the spring and restrictions on the amount of fertilisers. Using less or even no fertiliser at all slows down spring growth remarkably and makes an early cut impossible. As mentioned above this has consequences on the frequency of cuts over the year: Extensive meadows usually have an average of one or two cuts per year. Alterations of the botanical composition of the sward bring along a higher flexibility of utilisation, i.e. the cut can be three to six weeks later without loosing quality. This is because of an increasing amount of herbs, which show - compared to grasses - a much slower decline in digestibility. However, as a consequence of the less intensive use the sward becomes more loose and weeds may occur (KÜHBAUCH, 1988, p. 18).

Another potential can be seen in a cutting regime adapted to the needs of wildlife. This can be realised by cutting from the centre of the field towards the fringes and not vice versa, as this enables wildlife to escape from the field. Generally it is desirable to cut in small parts in order to create a mosaic pattern instead of cutting large units resulting in a uniform landscape.

The frequency of cuts has to be adapted to the objectives. In general it has to be maintained in areas threatened by abandonment of farmland or reduced in more intensive regions.

Concerning nature conservation a greater variety of plants occurs on extensive meadows. Because of a later cutting date many plants can flower and seed, invertebrates have a habitat for a longer time which enables them to complete their period of development and meadow birds can breed and raise their breed (NITSCHE & NITSCHE, 1994, p. 97).

In terms of nature conservation it is important that the cut grass looses its seeds to ensure a natural regeneration of the sward. This is provided by hay-making and partly by hay-lage. Silage is no conservation method in favour of nature conservation.

3.2.4 Cultivation of grassland

This chapter deals with maintaining the grassland through appropriate measures. Maintenance of grassland primarily aims to keep an intact sward and usually comprises pasture-topping, rolling, levelling and harrowing, ploughing up and improving grassland.

Characteristics

Pasture-topping, to cut pastures after a grazing period, is the most important measure to maintain a good quality sward. It evens out cattle latrine sites and preferences for certain plants, the grass is easier to digest after a cut and the surplus of the first growth does not overmature.

In winter the process of frost heave breaks through grass roots and lifts the upper soil. The parts of the grass on top dry out quickly at the beginning of the growing season and may result in a gappy sward. However, this process is less common in oceanic climate in Britain than in Germany. *Rolling* in the spring prevents this by pressing the sward down again. It also helps to level the fields which become uneven during the summer due to wheel tracks and poaching. The best time for rolling depends on the amount of soil moisture. It should be neither too wet to cause irreversible damages nor too dry to have no effect at all. However, not all soils need to be rolled, for instance rolling on water saturated soils would cause damage in the permeability of the soil.

During the growth period of the previous year the surface becomes uneven by treading effects or the use of machines under too wet conditions. *Levelling* of the sward during spring evens out those irregularities and ensures that the land does not become unsuitable for the use of machinery.

According to GALLER (1989, p. 96) *harrowing* aims to level out molehills and to spread out dung as well as slurry. It is carried out in the spring, too.

Ploughing up grassland is either done in combination with an alternate use of the land as arable land or as a measure to improve grassland. This can be done by spraying non-selective herbicide killing all the plants of the old sward. A mixture of seeds for the new sward is applied on the ploughed land which provides a sward without weeds but productive grass species.

Re-seeding (to incorporate the seeds into the soil) and *surface-seeding* (spreading out the seeds on top of the sward) are suitable measures to improve the grassland by choosing seeds of productive grass species (VERBAND DER LANDWIRTSCHAFTSBERATER IN BAYERN E.V., 1992, p. 513).

Problems

Nests of meadow birds are destroyed by rolling, levelling and harrowing because it is particularly in spring when meadow birds start to breed on grassland.

Ploughing up grassland has a strong negative impact on the flora and fauna on the grassland as well as on the ground water due to the mandatory application of plant protection products.

Re- and surface-seeding is a tool to control the number of plant species on the grassland, since seeds of productive grass species may suppress the growth of other plants (which is wanted in the case of weeds). Hence the measure can prevent the application of plant protection products on the one hand and foster the growth of productive species on the other hand.

Extensification potential

From a nature conservation point of view there are no objections against pasture-topping since the measure aims to maintain the sward and thus prevents the application of plant protection products. Later dates of maintenance measures would give most of the meadow birds an opportunity to finish breeding and provide a basis for their protection. Ploughing up grassland is basically counterproductive to an extensification of grassland and not acceptable.

Re- and surface–seeding works towards a uniform sward on the one hand and might prevent the application of plant protection products on the other hand. Its impact on the environment must be considered individually.

3.2.5 Fertilisation

A definition of fertilisers is given by FINCK (1989, p. 12): fertilisers are substances to support the growth of crop, increase their yield or improve their quality. They can be divided after various criteria, e.g. development (natural/ artificial) or origin (farm yard manure/ commercial fertiliser).

Characteristics

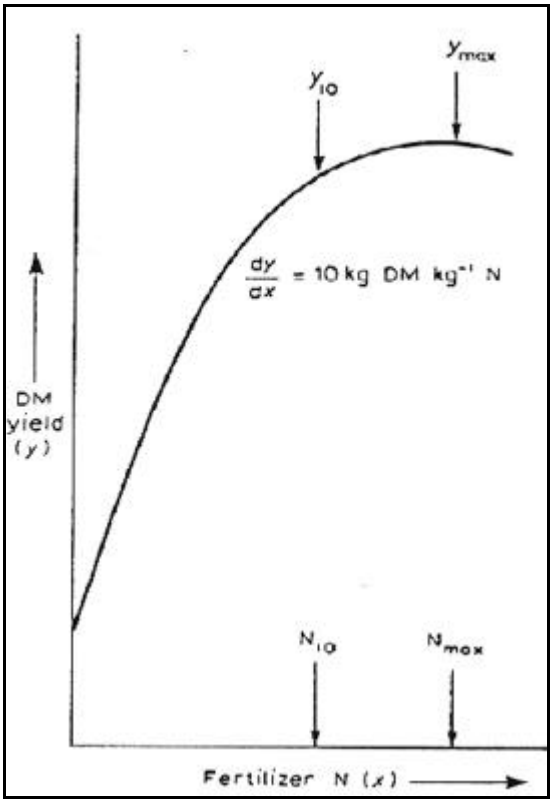
The effect of fertilisation depends on the amount of fertiliser, time and frequency of application, technique of fertilisation and weather (NITSCHE & NITSCHE, 1994, p. 99). Most

important factor is the amount of fertiliser applied as it determines the nutrient supply and hence the productivity of the sward.

Main reason for the necessity of fertilisation is the extraction of nutrients. It is little on pastures due to the return of nutrients in excreta and high on meadows as nutrients are removed from the field. The most important substances for nutrient supply of grassland are Nitrogen (N), Phosphate (P) and Potassium (K).

According to KÜHBAUCH (1996, p. 89) the effect of N as the main nutrient of plants is growth induction by the acceleration of the cell division. It also speeds up spring growth and subsequently enables the earlier use of the grassland in some regions. Additionally, the application of N causes a „biological amelioration“ because the sward takes more advantage of the soil water. This alters formerly wet sites to moist sites which allow growth of more productive grasses. Consequently N changes the botanical composition of the sward. As depicted in Figure 15, the use of N shows better effects at low N applications reaching a maximum yield and declines at very high rates of application. However, the effects of N decrease under wet soil conditions (NITSCHE & NITSCHE, 1994, p. 102).

Figure 15: Response curve of grassland to nitrogen fertiliser



Source: MORRISON, 1987, p. 62

The other two substances, P and K, are also important for growth and yield of grassland. They are usually applied in proportion to the amount of N (MORRISON, 1987, p. 61). A lack of P and K slows down growth and results in a change of the botanical composition, e.g. by driving out legumes (KÜHBAUCH, 1996, p. 100).
Putting together the effects of N, P and K, they accelerate growth, increase yields and change the botanical composition of grassland towards more productive species.

Problems

KÜHBAUCH (1996, p. 91 ff.) points out three main negative effects of N:

1. Damage of the sward, if too much fertiliser (slurry in particular) is applied;
2. An increased infestation of docks and other N dependant species; and
3. The reduction of legumes, i.e. the N in the air does not get absorbed from the air.

A major problem of fertilisation is leaching of N into the ground water. It is caused by the application outside the growing season, by fertilising with too much N and by uneven spread of slurry with local places of over-fertilisation (ELSÄßER, 1993, p. 67). In general N dependant species and drive out nutrient-low species (HABER et al, 1992, p. 66).
To get an idea about the amounts of N fertiliser used, table 1 below illustrates the average use on temperate grassland in selected European countries:

Table 1: Average use of nitrogen fertiliser (kg N/ ha and year) in 1980

The Netherlands	265
United Kingdom	120
Germany	100
Belgium	120
France	30

Source: MORRISON, 1987, p. 61

Apart from the composition of the sward fertiliser affects also soil, ground- and surface water as well as the air (SRU, 1985, p. 3 ff.).

Soil is influenced by fertiliser in the first place by the improvement of its structure, bringing along enhanced biotic life (FINCK, 1989, p.249). After a longer period of application, however, the soil becomes more acid resulting in a deterioration of its structure. The microbial decrease again and add to the deterioration of the soil. The SRU (1985, p. 24 f.) also notes an increase in heavy metals such as Cadmium.
Inevitably soil leaches some nutrients to the water running through it. Particularly the application of slurry leads to an enrichment of nutrients to the ground water. Because slurry management enables farmers to keep more livestock in some regions, more slurry is produced and applied on the soil resulting in a regional N-threat to ground water. In regions of intensive livestock management and soils with a low capacity of re-sorption or with ground water close to the surface, leaching of N to the surface water causes eutrophication and threatens life in it (WERSCHNITZKY, 1987, S. 200 f.).

Using fertiliser, especially slurry, has also great effects on the air by emission of ammonia. The emission is particularly high during and after the application of farm yard manure (PAAß, 1993, p. 7).

Extensification potential

A reduction of fertiliser is the main tool to reduce the productivity of the grassland. A closer look reveals on the one hand that the sustainability of pastures is limited, demanding lower stocking densities. On the other hand the first cut on meadows is delayed and leads to the reduction of the overall frequency of cuts. Therefore the reduction of fertiliser indirectly affects the categories „Livestock“, “Pastures” and “Meadows”.

On the ecological side a slow adaptation to the reduced nutrient supply and limited or no leaching to the ground- and surface water can be seen.

Reducing the N-supply of the soil produces an increased growth of legumes which partly compensates for the „lack“ of fertiliser. MORRISON (1987, p. 66) claims that, „on average, grass-clover swards receiving no nitrogen fertiliser yield about the same as grass receiving 150 to 200kg N/ha (...)“.
Intensive grassland management with a high input of fertiliser in large areas may stimulate calls for nature conservation to impoverish grassland in order to provide habitats for flora and fauna depending on nutrient-low conditions.

3.2.6 Weeds and plant protection products

Characteristics

Plant protection products or pesticides aim to destroy weeds (herbicides) and certain insects (insecticides) if weeds and/or insects affect the productivity of grassland (NITSCHE & NITSCHE, 1994, p. 16 f.).

Insects threatening grassland are e.g. marsh cranefly (*Tipula paludosa*) - usually on wet grassland - and cockchafer larva (VERBAND DER LANDWIRTSCHAFTSBERATER IN BAYERN E.V., 1992, p. 509). Infestations are treated with specific insecticides.

The VERBAND DER LANDWIRTSCHAFTSBERATER IN BAYERN E.V. (1992, p. 505) considers plants on permanent grassland as weeds, if:

- They are toxic or harmful (e.g. tall buttercup (*Ranunculus acris*), meadow saffron (*Colchicum autumnale*), marsh horstail (*Equisetum palustre*));
- They are relatively unproductive but need much space and nutrients (e.g. dock); and
- They run riot all over valuable species (e.g. dandelion (*genus Leontodon*), milfoil (*Achillea millefolium*)).

The following list gives an overview over commonly occurring weeds:

Table 2: Common weeds on permanent grassland

Couch grass	*Agropyron repens*	nettle	*genus Urtica*
common dock	*Rumex obtusifolius*	plantain	*genus Plantago*
creeping thistle	*Cirsium avernse*	rush	*Juncus ssp.*
curled dock	*Rumex crispus*	sorrel	*Rumex acetosa*
Dandelion	*genus Leontodon*	wild chervil	*Anthriscus sylvestris*
marsh horsetail	*Equisetum palustre*		

Source: LANDWIRTSCHAFTSKAMMER WESER-EMS, 1990/91, p. 180 ff.

Infestations of those weeds are caused by mismanagement and damages to the sward. The weed seeds start to sprout immediately when the sward becomes gappy or loose so that there is enough light to grow. GALLER (1989, p. 8 f.) points out a reduced intensity of the grassland use as one of the main causes of weed infestations, since a reduced frequency or late utilisation supports the growth of top grass and hence loosens the sward. Weeds may also

occur if the intensity of use is increased by application of too much slurry as well as increasing the stocking rate. Beside mismanagement or a gappy sward dry periods in the summer may alter the composition of the flora substantially because particularly couch grass, dandelion and docks are able to mobilise their reserves under dry conditions.

The application of plant protection products can be either with selective herbicides applied on single plants or with non-selective herbicides or insecticides on the whole field. The latter will require re-seeding the field.

Problems

The effects of plant protection products have been described by REUS (et al, 1994, p. 3) as follows: „After introduction into environment pesticides can undergo different processes which determine their ultimate fate, such as degradation, leaching, volatilization, drift and run-off. Some of the emission may be due to careless or illegitimate use of pesticides, but use of pesticides according to good agricultural practice[7] can also lead to contamination of the environment." Furthermore pests may become resistant to pesticides and therefore enforce further treatment (REUS et al, 1994, p. 12).

The use of pesticides has direct and indirect effects on flora and fauna, soil, ground- and surface water as well as on the air. Non-target flora and fauna can be affected by pesticides directly, if they are present on the sprayed field, or indirectly, if pesticides are transported by water, air or animals outside the targeted area (REUS et al, p. 17). The consumption of contaminated organisms by animals may lead to an introduction of pesticides into the food chain (KELLER, 1991, p. 74).

Plant protection products are subject to degradation, the rate of which depends on the properties of the chemical and environmental conditions. Some chemicals are persistent and highly mobile and may leach into the ground water, others may accumulate in the soil. They may cause toxic effects on soil organisms other than soil-born pests and diseases, e.g. on earthworms (REUS et al, p. 14). The SRU (1985, p. 26) points out heavy metals contained in some plant protection products which accumulate in the soil and result in a degradation of the soil. Heavy metals can also be mobilised under acid soil conditions and then reach the food chain. The contamination of ground- or surface water is either caused by point sources or diffuse sources. Point sources are generally a result of incorrect use, whereas a diffuse

[7] The „Codes of good agricultural practice" and the german pendant „ordnungsgemäße Landwirtschaft" are not exactly defined. They refer to a farming practice where a certain degree of resource protection without financial compensation has to be kept (HEIßENHUBER, 1994, p. 118).

contamination can be the result of drift, run-off, leaching and atmospheric deposition (REUS et al, p. 11).

Substantial losses of plant protection products appear by evaporation during and after the application. According to REUS (et al, 1994, p. 16) losses of pesticides into the environment due to volatilisation may amount to 40 to 80% of the applied dose. In the atmosphere they are subject to transport, degradation and deposition.

Extensification potential

Generally the application of plant protection products is not desired on extensive grassland. However, in case of weed infestations spot spraying is tolerable after other measures have been carried out without success.

3.2.7 Water regulation

Characteristics

Water regulation on grassland mainly comprises drainage whereas irrigation is generally not worthwhile. Reasons for drainage measures are water surplus on grassland, supporting the growth of unproductive plants such as rushes and sedges, and regular flooding, which may cause infestations of parasites (VERBAND DER LANDWIRTSCHAFTSBERATER IN BAYERN E.V., 1992, p. 503).

Drainage measures aim to lower the water table to 0.8 - 1.2 m below the surface which is primarily achieved through establishing inclines as well as an efficient main drain. Therefore, drainage measures often include the conversion of watercourses resulting in an increased run-off rate.

Problems

The Organisation for Economic Cooperation and Development (OECD, 1991, p. 179) states that „increased run-off rates may overstrain the capacity of the arterial system to shift water at times of heavy rainfall or snow melt, and thus lead to flooding in urban areas or on other agricultural land."

Extensification potential

In the sense of extensification water regulation on grassland is not desirable since it supports an intensive and uniform use of grassland as described in chapter 3.1 „Definition and Classification".

3.2.8 Landscape elements

Under this point measures such as the restoration of ponds or certain habitats, the maintenance of hedges, drystone walls or other features of the traditional agricultural landscape (e.g. extensive orchards) are put together. Usually those measures help to create a diverse landscape as well as providing habitats for flora and fauna and are therefore crucial for nature conservation.

3.3 Summary

Putting together all different categories of grassland management the following table shows the key aspects of the categories.

Table 3: Key aspects of grassland categories

Category	Aspects
Livestock	• Stocking rate • Rare breeds
Pastures	• Kind of pasture • Grazing frequency
Meadows	• Cutting date • Cutting frequency • Cutting regime • Conservation of the crop
Cultivation of the grassland	• Pasture-topping • Rolling, levelling and harrowing • Ploughing up • Re- and surface-seeding
Fertilisation	Amount of fertiliser
Plant protection products	Spraying (nothing/ spot treatment/ blanket spray)
Water regulation	Drains
Landscape elements	Creation or maintenance of landscape elements

Source: own table

4. Method and course of the study

4.1 Method

4.1.1 Interviews

As mentioned in the introduction the study pursues a qualitative approach and surveys data by interviews. According to ROTH (1993, p. 154) this allows to adapt arrangement and formulation of the questions to the interviewee and gives the possibility to deepen certain aspects.

The most practical technique for the interviews was considered to make notes during the interview and to write a transcript directly afterwards. The transcript has been sent back to the interviewee to ensure the correctness of the information[8]. This method provides reliable information which is a major advantage although spontaneous answers got lost in some cases, illustrated by the following example:

One of the farmers stated in the interview under the point „Fertilisation“: „Die maximal zugelassene Menge von 60 kg N/ ha ist nicht ausreichend, Wunsch wäre mindestens die doppelte Menge“ (the permitted ceiling amount of fertiliser of 60 kg N/ ha is not sufficient, twice of the amount would be desirable). The additive comment of the desire to fertilise twice of the permitted amount was deleted in the revised version of the transcript. The example shows that the interviewee used the transcript to moderate the statement made during the interview. In this study the revised versions of the transcripts are generally taken for the analysis. However, in case of diverting comments made during the interview and comments of the revised versions of the transcripts, which are clearly not misunderstandings, the author will be free to point out the divergence of the statements.

All interviews were orientated along a loose basic course as rough guideline for the talks. They were carried out in the period between March and June 1998.

4.1.2 Validity

The interviews at the level of the agricultural Ministries/ Project Officers did not reveal any secrets and there is no reason why the interviewees should give wrong information.

Concerning the level of the farmers the validity of the statements seems to be good, too. Most of the farmers expressed critical comments on the schemes or in some cases even admitted

[8] Two interviewees did not send back the transcript.

breaches of the requirements of the schemes. This clearly shows that the interviewees relied on the loyalty of the interviewer and did not conceal relevant aspects.

4.2 Survey

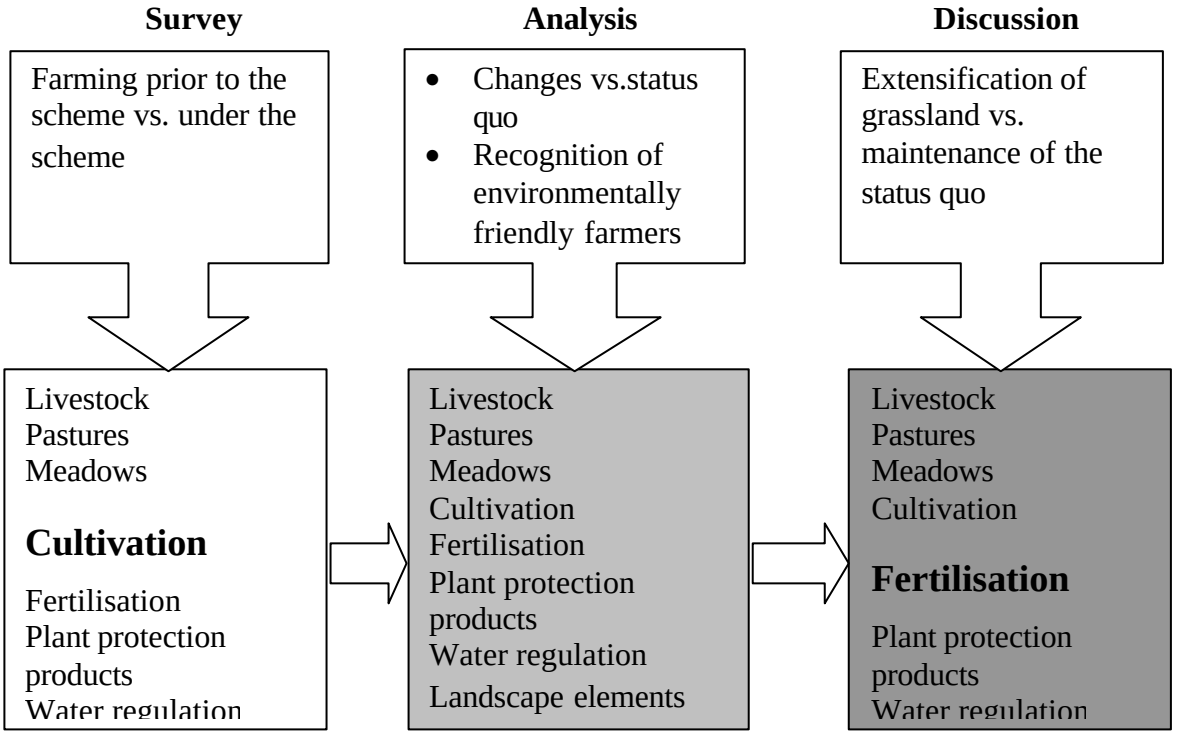
At the level of the agricultural ministries/ Project Officers the particular scheme is introduced with the components subjects of support, prescriptions and the area concerned. Payment rates are not studied here as they become interesting at the actual comparison of the schemes. Elements such as monitoring, administration, information, field inspections as well as strengths and weaknesses of the scheme are considered. The information reported in this part is from official information material and personal expert interviews with the persons responsible for the scheme. The interviews consist of a general part and a part with comprehensive questions. The general part is analysed for each scheme and taken into consideration at the comparison of the schemes. The second part, however, is not analysed individually but is used for the correct survey over the schemes.
At the individual farm level three farmers have been interviewed for each scheme. Since the second aim of the study is to work out the main stress, the strengths and weaknesses this number of farmers was considered to be sufficient. The addresses of the farmers were gained from the according Project Officer or Ministry respectively. In Germany the Ministries asked the according agricultural authority of the region of interest (Baden-Württemberg: Schwarzwald, Lower Saxony: Wesermarsch and Thuringia: Thüringer Wald) for the addresses of the farmers. The local authorities of the southern part of the Schwarzwald and the Wesermarsch passed on three addresses of farmers. The agricultural authority of the Thüringer Wald sent a list, of which the author accidentally choose three farmers.

The interviews comprised two main parts:

- In the first part of each interview issues such as motivation, administration, information and facts about the farm were asked. This enabled the author to put the interviewee at their ears (compare ROTH, 1993, p. 158) and to see whether the statements of the farmers match up with the statements from the agricultural or environmental authority.
- The second part dealt with the grassland categories livestock, grassland management, grassland conservation, fertilisation, plant protection products, water regulation and landscape elements. The aim of this part was to find out about actual management changes through the scheme and whether farmers had already managed their land extensively

before. Therefore it was tried to work out the present management and the previous management respectively the assumed management without the scheme.

Survey, analysis and discussion of the schemes follows the same pattern of grassland categories in all three steps as depicted in the model below:



4.3 Analysis

According to MAYRING (1991, p. 210 f.) selecting and categorising of information are relevant steps in qualitative analysis. Following this the information gained from the interviews is selected since not all information is relevant for the objectives of the study. It is categorised under the different tiers as well as under the different grassland categories.

The interviews of the agricultural Ministries/ Project Officers are analysed individually concerning the general aspects administration, field inspections, information and monitoring.

At the level of the farmers all three interviews of a scheme are analysed together. At first, the general part is analysed , followed by the analysis of the individual tiers of each scheme. The tiers are analysed according to the classification of the grassland categories introduced in chapter 3. “Agricultural background: Grassland management and extensification of grassland”.

The analysis of some enhancement tiers of the schemes studied must be limited as those tiers often entail individual prescriptions of the responsible environmental authority which are difficult to summarise.

As mentioned above, the objective of the analysis is twofold:

1. To work out farming changes due to the agri-environmental scheme, and
2. To recognise those farms where the farming practice prior to the scheme already met the objectives of the agri-environmental schemes.

With regard to these two objectives each grassland category with its elements is considered individually.

The statements of the farmers concerning the other objectives of grassland extensification (see objectives of grassland extensification in chapter 3.2 “Conventional management and extensification potential”) or the other objectives of regulation 2078/92 (to reduce production and provide an income support for farmers) are compared under “Results of the scheme”.

4.4 Discussion

The discussion at the level of the agricultural ministries/ Project Officers is shifted to the chapter 6.3 “Comparison of the schemes at the level of the Ministries/ Project Officers”

Subject to the discussion of the schemes at the level of the farmers are administration and the eight grassland categories. The latter is implemented with the help of a credit point system which evaluates both, farming changes due to the scheme and maintenance of extensive farming practices. This twofold approach of the discussion has been chosen to cope with three types of farmers interviewed:

- The “conventional” farmer takes part in the scheme for the additional income support and tries to manage as much land as possible under the basic tiers of the scheme.
- The “convinced” farmer takes part since the objectives of the scheme apply to his/ her conviction.
- The “agricultural businessman”, who designed the farm exactly according to the requirements of the scheme.

Farming changes under the schemes are likely to occur on the farms of the “conventional” farmer, whereas the maintenance of an existing extensive farming tends to occur among

"convinced" farmers. Extensive farming can also be noted for the "agricultural businessman" though the development after ceasing of the schemes is unclear.

Therefore the evaluation has to regard both aspects, de facto farming changes as well as the maintenance of extensive farming practices. The intention of the discussion is to work out the ecological extensification potential under the schemes, divided into the protection of the biotic and non biotic resources. Since it is difficult to find out about the direct protection of biotic resources (it would require a study by itself), the potential protection of biotic resources is regarded, i.e. the provision of a basis for the protection. In contrast, a reduced input of fertilisers and/ or plant protection products protects non-biotic resources directly.

Credit point system

The credit point system aims to ensure clarity over farming changes under the different tiers of each scheme as well as under the comparison of the schemes. Thus it is kept simple and divided into three degrees:

1. Maintenance of the status quo and no extensive farming practice is generally put down with "O";
2. "+" for slight farming changes and slight extensive farming practices; and
3. "++" for drastic changes or the maintenance of valuable extensive farming practices.

Farming changes towards a more extensive use of the grassland and maintenance of existing extensive farming practices are generally considered to be beneficial for the environment.

The division into slight and drastic farming changes of *"conventional"* farming is worked out specifically in the discussion of the schemes. There are no specific criteria to evaluate farming changes though the assessment divides "soft" and "strong" measures.

Strong measures are management tools which drastically reduce the productivity of grassland, e.g. radical limitation of mineral fertiliser, drastic reduction of the stocking rate, cutting dates which delay the cut for two weeks and more, prevention of ploughing up grassland, substantial modification of the existing drainage system as well as some measures specifically adapted to objectives of the scheme, e.g. the prevention of any mechanical interventions on grassland during the breeding season of meadow birds. Those measures are credited with two points. Soft measures concern crop conservation, cutting regime, re- and surface seeding etc.. They do not greatly effect the productivity of the grassland but supplement the other measures and are credited with one point.

Extensive farming practices of *"convinced"* farmers or *"agricultural businessmen"*, which deviate from the general farming practice of the region are credited according to the extensification objectives of the scheme.

Having evaluated the grassland categories of each tier of a scheme, the tiers are summarised in the column "Extensification potential", showing the extensification potential of the individual schemes.

4.5 Comparison of the schemes

With regard to the first aim of research the comparison of the schemes follows the division into similar natural regions, thus the MEKA (Baden-Württemberg), KULAP (Thuringia) and the ESA Pennine Dales are compared and the ESA Broads is faced with the Wet grassland protection scheme (Lower Saxony). The comparison of the schemes refers to their specific extensification potential worked out in the discussion and thus reveals focus and weak points.

Beside the focus of the schemes revealed in the study other important aspects of agri-environmental schemes are taken into account:

- Flexibility for the farmers, i.e. to have several options under a scheme;
- "Whole-farm approach" or "single-field approach", the latter means flexibility for the farmer but generally reduces the overall extensification of the farm;
- Take-up rate of the scheme;
- Consideration of regional circumstances;
- Encouragement of market relief;
- Compensation for production loss, income support;
- Comparability of the payment rates.

This comprehensive account of the schemes is furthermore supplemented with the comparison of the general statements at the level of the Ministries/ Project Officers.

Finally British and German similarities and differences of the implementation of regulation 2078/92 are worked out on the basis of this comparison.

5. Implementation of the schemes

5.1 Baden-Württemberg: MEKA

The Black Forest is a mountain range reaching ca. 1000 m above sea level in the northern and more than1400 m in the southern part. It developed through the structural depression of the upper Rhine resulting in the elevation of the west side of the mountain range, gently declining in the east. Geologically the bedrock, mainly occurring in the western and central parts, consists of granite and gneiss whereas on the escarpment in the east various sandstones dominate. The Black Forest is subdivided into the northern, central and southern part (MOHR, 1993, p. 169 f.). The latter is characterised by deep incised valleys due to the high amount of local relief. In the exposed west of the mountain range the annual precipitation is very high, up to 2000 mm per year is not unusual whereas the eastern parts lay in the rainshadow and yearly receive up to 1100 mm, most of it falling in winter and spring whereas the summer remains fairly dry. Annual mean temperatures oscillate around 6°C (BORCHERDT, 1991, p. 103 ff.).

Most of the area studied is covered by woodland. The agricultural area comprises about 1/3 arable land in the lower parts and 2/3 permanent grassland (STATISTISCHES LANDESAMT BADEN-WÜRTTEMBERG, 1996, p. 25 ff.). According to the European Commission (EUROPÄISCHE KOMMISSION GD XVI, 1997) the area is disadvantaged and belongs to the Objective 5b Region (Rural development in certain limited areas, for details see chapter 2.1.1 “Development of the CAP”).

5.1.1 Introduction of MEKA - scheme of Baden-Württemberg

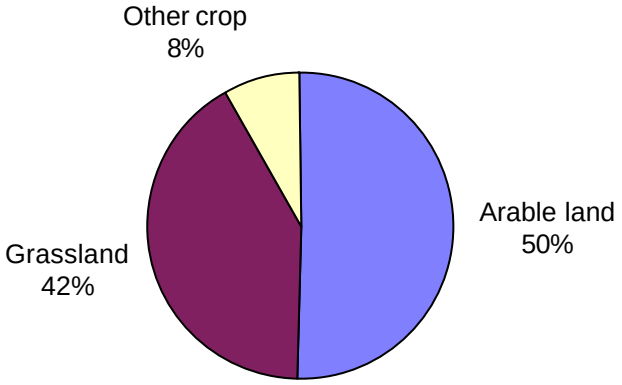
The agri-environment program of Baden-Württemberg includes two schemes:

1. The „Marktentlastungs- und Kulturlandschaftsausgleich“ (MEKA, scheme for the compensation of market relief and cultural landscape, MLR, 1995); and
2. The „Landschaftspflegerichtlinie“ (Landscape Conservation Guideline).

The MEKA - scheme covers the whole agricultural area of the Bundesland whereas the Landschaftspflegerichtlinie is directed towards the enhancement and development of certain habitats. In the following the MEKA is investigated as the approach of the study is not suitable for including the Landschaftspflegerichtlinie.

The total agricultural area of Baden-Württemberg is used by 57% as arable land, 40% as permanent grassland and 3% is used for the growth of other crop. Looking at the area farmed under the MEKA - scheme (see Figure 16 below), which amounts to 56% of the total agricultural area of Baden-Württemberg, half of the area managed under the MEKA is arable land, 42% is grassland and the remaining 8% comprise extensive orchards and permanent crop. This comparison reveals that the breakdown of the MEKA into the three farming branches roughly mirrors the agricultural land use of the Bundesland (data from STATISTISCHES LANDESAMT BADEN-WÜRTTEMBERG, 1996, p. 25 ff. and MLR, p. 3).

Figure 16: Breakdown of the MEKA into the three different farming branches in 1996



Source: own diagram, data from MLR, p. 3

Without changing the scheme only few new applicants can be taken under contract as the high take-up rate of 56% means that the financial resources are nearly all allocated by now. Only young farmers, farmers who want to join organic farming and farmers with valuable habitats on their farmland are eligible for the MEKA scheme.

According to the Ministerium Ländlicher Raum (MLR, p. 6) the overall expenditures for the scheme have been rising during the period from 1992 to 1996 from 53 million ECU to 89 million ECU. They are co-financed by the EU with 50%.

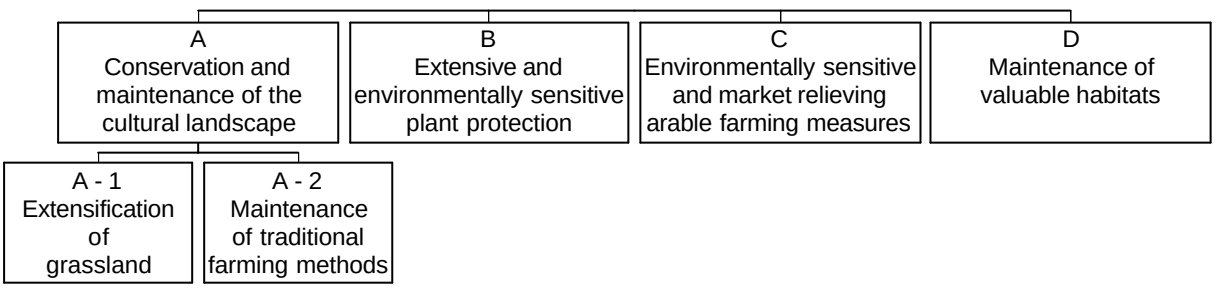
The objectives of the MEKA are to compensate farmers for:

- Keeping the status quo and maintaining the cultural landscape;
- Farming practices suitable for the protection of the environment;
- Farming practices suitable to achieve market relief.

In addition the MEKA aims to sustain a sufficient number of agricultural holdings in order to maintain the cultural landscape.

The MEKA consists of four parts, as depicted in Figure 17 below:

Figure 17: MEKA - scheme



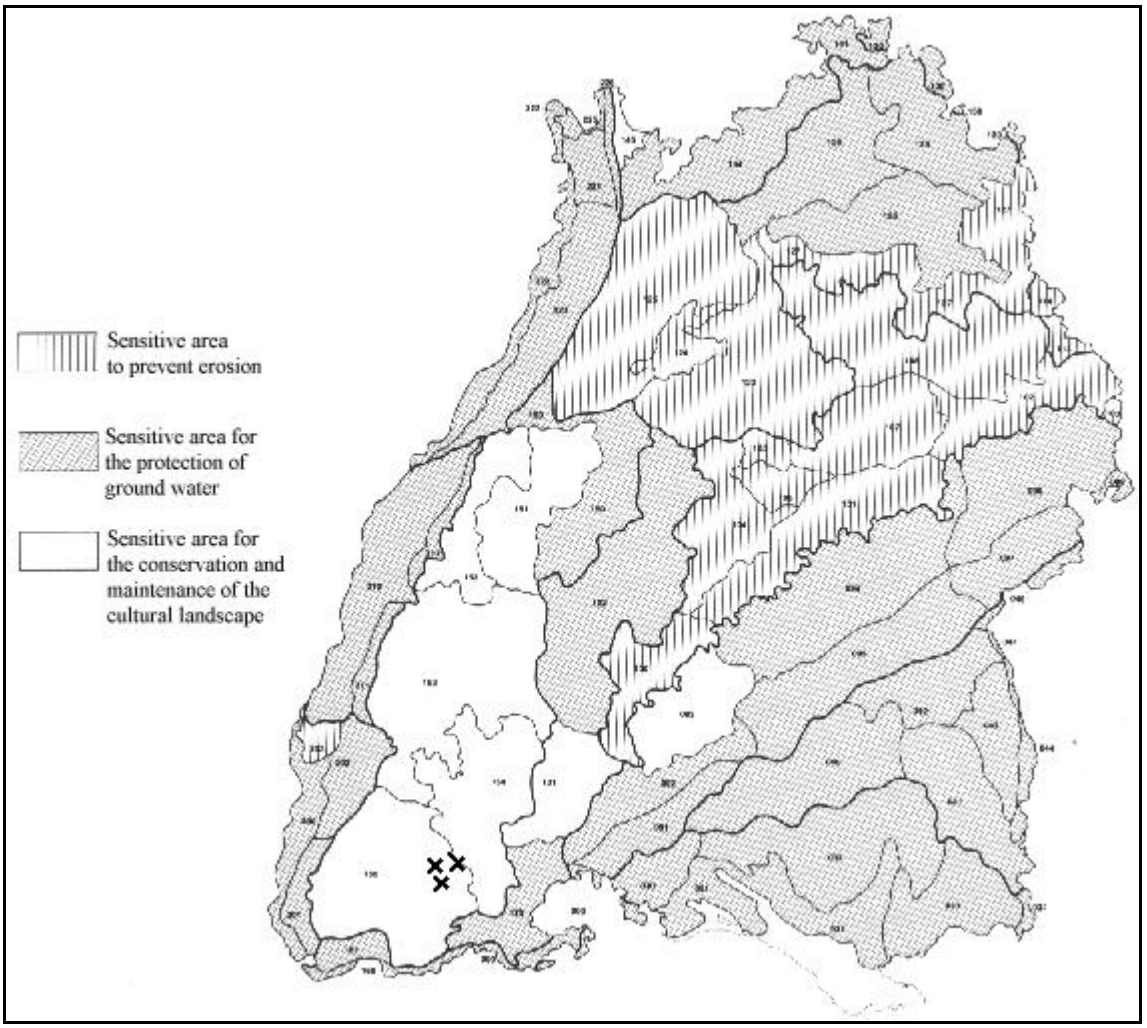
Source: own diagram

Part A is the relevant one for this study. It comprises two tiers, namely the extensification of grassland (tier A-1) and the maintenance of traditional farming measures (tier A-2).

The whole Bundesland has been classified into three sensitive areas with different objectives, depicted on the map below:

- Sensitive areas threatened by erosion;
- Sensitive areas for ground water pollution;
- Sensitive areas for the conservation and maintenance of the cultural landscape. (In regions dominated by forests are meadows and pastures typical features of the cultural landscape.) Maintenance of grassland despite of the unsatisfactory income situation is the objective of the tier in this area.

Mapping the sensitivity of grassland determined the three areas. The management prescriptions of tier A-1 (see Appendix 1) are adapted to the demands of the three areas.



Note: The three crosses on the map roughly mark the location of the farms.

Source: MLR, 1995, p. 6

Tier A-2 aims to maintain the following traditional farming measures (MLR, 1992). Farmers who take part in one or more of the measures have to abide to the prescriptions of the according sensitive grassland area.

- Management of steep grassland:

  Division of sensitive grassland into two groups, with an inclination of 25 - 50% and more than 50% inclination.

  Steep grassland is very likely to be abandoned due to the higher effort demanded hence the objective of this measure is to maintain its management. This conserves the

open structure of the cultural landscape - traditionally a mixture of forest and grassland – and encourages tourism.

- Introduction/ conservation of an extensive grassland management:

  The grassland is divided into three groups, with a maximum of two utilisations (cuts or grazing periods or a mixture of both) per year, one utilisation per year and management of moist and wet grassland.

  Extensive grassland management maintains the cultural landscape and conserves a diverse flora and fauna. It also helps to relieve the market. The objective is to maintain this kind of less profitable farming.

- ***Conservation of extensive orchards**:*

  Extensive orchards are a traditional and ecologically valuable feature of Baden-Württemberg`s landscape. Their lack of economic competitiveness is compensated by the scheme.

- ***Conservation of steep vineyards**:*

  The management of steep vineyards with dry stone walls and stone heaps is another traditional farming method in Baden-Württemberg. Ecological value as well as the importance to the cultural landscape stands in contrast to economic interests. Therefore the high labour effort is compensated by the MEKA.

- ***Keeping of rare breeds:***

  Old local domestic breeds are adapted notably well to the environmental conditions but do not yield as much as highly productive breeds. The objective of the measure is to support those breeds for cultural, landscape conservation and breeding reasons.

Apart from the prescription not to plough up grassland on the entire holding all other grassland measures apply to individual fields and might be cumulated on fields, too. This gives every farmer the opportunity to tailor the scheme exactly to the farm and to experiment with measures. Furthermore farmers can accustom themselves to nature conservation and maintenance of the cultural landscape gradually since they do not have to change the entire holding to a different and new farming practice. The scheme's acceptance is based on the continuity of farming.

Farmers who join the scheme are obliged to follow the management rules listed in Appendix I-1 for five years. The compensation payments are worked out on the basis of a point system. For each measure a number of points is available, one point equalling 20 DM (10,17 ECU).

5.1.2 Implementation and discussion of the MEKA

5.1.2.1 Level of the MLR

According to the MLR (1998, personal interview) the administrative effort for the MEKA is reasonable. In Baden-Württemberg there is one joint application for all agricultural schemes which is adapted to the IACS-system of the EU. Therefore the processing of the applications is standardised and involves limited effort.

However, the performance and administration of the three different grassland areas is difficult. There used to be only two areas but the EU demanded the introduction of another area (sensitive area for the protection of ground water). Under the next revision the MLR will try to reduce the sensitive areas again. Currently the scheme is reviewed by the MLR with the help of many groups, including the DBV, Alternative Landbauverband (alternative crop growing union), Landesnaturschutzverband (nature conservation union of Baden-Württemberg), BUND, NABU and science representatives.

Field inspections are managed with the IACS-system, too. According to the requirements of Regulation 746/96, concerning the implementation of Regulation 2078/92 (see chapter 2.1.2 „Regulation 2078/92 and objectives“), 5% of agreement holders get checked every year, chosen by chance and by risk analysis.

The MEKA-scheme has been studied and monitored in 1994, additional press reports provide information about developments and effects of the scheme.

Concerning the information management the MLR had an initial campaign with many information meetings. The farmers are also informed by consultations as well as by the joint application since the MEKA is included there.

5.1.2.2 Level of the farmers

The following box gives information about farm size and area under agreement.

Figure 18: Information about the farms

Farm 1

- AA: 95 ha, 45 ha of which are grassland
- Tier A-1: 45 ha grassland, sensitive area for the protection of ground water
- Tier A-2: Extensive orchards

Farm 2

- AA: 70 ha, 60 ha are grassland
- Tier A-1: 60 ha grassland, sensitive area for the conservation and maintenance of the cultural landscape (1,2 - 1,8 LU/ ha main forage area)
- Tier A-2: Introduction/ conservation of an extensive grassland management:
  - Maximum of two utilisations per year: 21,6 ha
  - Management of moist and wet grassland: 5,9 ha

Farm 3

- AA: 63 ha, grassland only
- Tier A-1: 63 ha grassland, sensitive area for the conservation and maintenance of the cultural landscape (1,2 - 1,8 LU/ ha main forage area)
- Tier A-2: Management of steep grassland: 8,1 ha
  Introduction/ conservation of an extensive grassland management:
  - Maximum of two utilisations per year: 37 ha
  - One utilisation per year: 7,4 ha
  - Management of moist and wet grassland: 8,3 ha
  Keeping of threatened local domestic breeds: Vorderwälder Rind

The agricultural holding has been owned by Baden-Württemberg until 1985 and then been privatised, it lays in a private water protection zone, as water for a brewery is gained here.

The height above sea level of the farms ranges from 700 to 1000 m.

General aspects of the implementation

The three farmers received the information about the MEKA from the agricultural authority. On farms 1 and 2 land has been managed under the scheme from 1991, farm 3 joined it in 1992. As motivation to take part farmers 1 and 2 mentioned the financial support demanding no great farming changes. The land of farm 3 includes a private water protection zone of a brewery which prevents intensive farming anyway. Hence the MEKA is only an additional financial source. Prior to the MEKA the farm was managed under the preceding extensification scheme.

Administering the MEKA meant a high initial effort for all three farmers especially to prove the utilisation of the included fields. After this initial phase the effort has been reasonable for farmers 1A and 3 whereas it has still been high for farmer 2. No problems have occurred with the agricultural authority so far, supervision seems to be working well.

Putting together the general aspects of the scheme the financial support was the decisive criterion for the three farmers to take part in the scheme. All three farmers were informed about the MEKA through the agricultural authority which matches the statement of the MLR. Concerning the administration of the scheme the farmers pointed out the high initial effort which could be reduced to a reasonable effort for two of the farmers. On the side of the MLR the administrative work for the scheme remains in the bounds of reason due to the joint application form, so the administrative processing of the MEKA seems to be effective.

Tier A-1: Extensification of grassland

On the three farms studied the entire grassland is managed according to the management rules of the relevant sensitive area: farm 1 is situated in the sensitive area for the protection of ground water, farms 2 and 3 are in the sensitive area for the conservation and maintenance of the cultural landscape.

Livestock

- *Sensitive area for the protection of ground water:*

  At present there is a stocking rate of 1.4 LU/ ha main forage area on farm 1 which is the maximum rate allowed in this sensitive area. Although the farmer did not have to change the stocking rate when entering the scheme he considers the maximum stocking density as the only real restriction. Consequently the prescription on the minimum stocking rate of 0.3 LU/ ha main forage area does not affect the farmer.

- *Sensitive area for the conservation and maintenance of the cultural landscape (1.2 - 1.8 LU/ ha main forage area:*

  When entering the scheme both farmers (2 and 3) did not have to change their livestock numbers to meet the allowed stocking rate, being between 1.2 and 1.8 LU/ ha main forage area. At present the stocking density of 1.4 LU/ ha main forage area is increased on farm 3.

Primarily the MEKA did not result in changes of livestock management as the stocking rate on all three farms could be maintained when entering the scheme. Even though the maximum stocking rate of 1.4 LU/ ha main forage area demanded in the sensitive area for the protection

of ground water corresponds to a fairly intensive livestock management the prescription prevented a further intensification of livestock management. Therefore it is put down with one credit point. Although the stocking rates in the sensitive area for the conservation and maintenance of the cultural landscape correspond to an intensive livestock management, too, they did not affect the farmers and even allowed an increasing number of livestock in one case.

Pastures

- *Sensitive area for the protection of ground water:*

  Farmer 1 manages the steeper grassland, unsuitable for the use of machinery, as extensive pastures. Set stocked heifer grazes the pastures as all other forms of pasture management would require too much effort.

- *Sensitive area for the conservation and maintenance of the cultural landscape (1.2 - 1.8 LU/ ha main forage area:*

  The scheme requires the use of the grassland at least once a year and pasture-topping. On farms 2 and 3 steep grassland is used for rotational pastures, pasture-topping does not take place since the land is unsuitable for the use of machinery, hence the two farmers ignore the second prescription of the MEKA[9].

Permanent grassland of both sensitive areas has to be used (cut/ grazed) at least once per year under the MEKA targeting the prevention of abandonment of farmland. In the sensitive area for the conservation and maintenance of the cultural landscape pasture-topping is required additionally but neither of the prescriptions led to any management changes on pastures and meadows. Abandonment of unproductive grassland has not been a real issue on the farms studied thus pasture management lays entirely under the responsibility of the individual farmer and cannot be credited.

Meadows

- *Sensitive area for the protection of ground water*

  The meadows get cut three times per year at most, the first cut being around the end of May for silage, the second for hay. The management requirement under this tier is to use permanent grassland at least once per year; there was no necessity of management changes of the farmer.

[9] These statements indicate the good validity of the interviews, see chapter 4.1.2 „Validity“.

- *Sensitive area for the conservation and maintenance of the cultural landscape (1.2 - 1.8 LU/ ha main forage area*

  Most of the grassland is used for meadows to grow enough crop for winter fodder. The first cut of the meadows on farm 2 is around mid to end of May, in total the grassland gets cut three to four times per year on this farm. On farm 3 the first of the three cuts per year is at the beginning of June. The prescription on utilising the grassland at least once per year did not alter the farming practice of the two farmers.

The management of the meadows with cutting dates, frequency of cuts, cutting regime as well as the conservation of the crop lays entirely under the responsibility of the individual farmer. A more extensive use of the meadows comprising late cutting dates, less frequent cuts etc. is not promoted under the scheme. Summarising the MEKA-guidelines under the category „Management“, changes towards a more extensive management cannot be noted.

Cultivation

- *Sensitive area for the protection of ground water:*

  Prior to the scheme ploughing up grassland was carried out on farm 1 though it is not considered to be necessary for its maintenance. Pastures are not specifically maintained as it would require too much effort but meadows get levelled at the end of march, harrowed at the beginning - mid April and re-seeded. The scheme demands in this area not to plough up grassland, to avoid damages of the sward and to maintain the sward by regular surface- or re-seeding. Farmer 1 applies to these requirements: apart from not to plough up any more the prescriptions did not cause changes of his farming practice.

- *Sensitive area for the conservation and maintenance of the cultural landscape (1.2 - 1.8 LU/ ha main forage area:*

  The prescriptions concerning the cultivation of grassland in this area demand to maintain grassland without ploughing it up and pasture-topping.

  Prior to the MEKA fields were ploughed up on both farms. Farmer 2 did it every four to five years and considers it as a restriction not to be allowed to do so as it limits the yields of the grassland by ca. 25%. On farm 3 one hectare was ploughed up every year and replaced by re-seeding under the scheme.

  Farmers 2 and 3 do not carry out any maintenance measures including pasture-topping on the pastures as they are not suitable for the use of machinery. The meadows on farm 2 are levelled in the spring, re-seeded and partly aftermath grazed. Aftermath grazing with horses and mulching of even meadows are cultivation measures carried out on farm 3.

Referring to the statements of the farmers a major advantage of the scheme becomes obvious in both areas: prior to the MEKA all three farmers ploughed up permanent grassland. As this is regarded as a drastic intervention into the biotic life of the grassland its prevention can be taken as a very positive aspect. Applying non-selective herbicides becomes pointless either - consequently the prescription means a drastic farming change on the one hand and works towards extensification on the other hand, subsequently it is regarded with two credit points. The prescription of not ploughing up grassland applies to the whole farm and is the only restriction under the scheme. Other interventions on permanent grassland such as harrowing, rolling, levelling, especially in spring, and pasture topping are not affected by the management prescriptions of both areas and are still carried out by two of the farmers. They do not work towards an extensive use of the grassland.

Fertilisation

- *Sensitive area for the protection of ground water:*

  Farmer 1 fertilises 140 kg N/ ha and farm yard manure on the meadows. The MEKA requires not to exceed the application of farm yard manure produced by 1.4 LU. Since the farmer considers the maximum stocking rate as restrictive, the measure indirectly prevents the application of more farm yard manure.

- *Sensitive area for the conservation and maintenance of the cultural landscape (1.2 - 1.8 LU/ ha main forage area:*

  Farmer 2 applies farm yard manure and 300 kg NPK-fertiliser/ ha on the meadows in the period from end of March until end of October. The fields of farm 3 receive only farm yard manure in the period from April 20 until end of September/ beginning of October. On both farms the fertilisation of the fields is performed after the results of soil examinations. The MEKA demands in this sensitive area not to exceed farm yard manure as 1.5 LU could produce or to prove a balanced nutrient regime to the agricultural authority and to apply the fertiliser between 1. March and 30. November.

In the sensitive area for the protection of ground water the requirements concerning fertilisation seem to meet the general farming practice and do not include any restrictions on mineral fertiliser although the application of more organic fertiliser is prevented due to the maximum stocking rate. In this case the amount of organic fertiliser is kept on the status quo and can be credited with one point as the further intensification is prevented.

In the other sensitive area there is a diverting situation: in one case the productivity of the grassland and the input of fertiliser into the ecosystem is not limited which hampers a more

extensive use of the permanent grassland. In the other case the requirements of the scheme are surpassed by far since no mineral fertiliser is applied at all, thus the objective "protection of the environment" is met in this case. The evaluation becomes difficult here, as stricter prescriptions would not affect and simultaneously financially reward the farmer of the second case, but prevent the use of high amounts of mineral fertiliser in other cases. This is the decisive argument for not crediting the category "Fertilisation" in this sensitive area.

Plant protection products

The prescription concerning the application of plant protection products applies to all three sensitive areas and is: Weed control with chemical measures is allowed if other measures are not successful and if fodder value deteriorates remarkably. An application must be approved by the agricultural authority.

Farmers 1 and 2 are troubled by dock and spot spray without applying to the agricultural authority, farmer 2 even blanket sprays in extreme cases without approval. On farm 3 dock and wild chervil occur and are controlled by early cuts, herbicides are not applied as the farmer rejects the application of plant protection products. Summarising the statements of the three farmers they either ignored the prescription of the scheme[10] or went beyond the requirement.

Thus the requirement of the MEKA remained ineffective as two farmers ignored the prescription according to which they would have to apply plant protection products only with the permission of the agricultural authority. The other farmer does not apply any herbicides on principle and again surpasses the requirements of the scheme and meets the objective "Protection of the environment". Likewise category "Fertilisation", stricter prescriptions or checking farmers would be tenable since the third farmer would still be financially rewarded for his environmentally sensitive farming practice. However, as the actual design of the category "Plant protection products" does not entail stricter prescriptions it is not credited.

Water Regulation

- *Sensitive area for the protection of ground water:*

  Farmer 1 plans to maintain existing drains shortly although the scheme in this sensitive area requires not to carry out any amelioration measures.

[10] These statements prove the good validity of the interviews, see also chapter 4.1.2 „Validity".

- *Sensitive area for the conservation and maintenance of the cultural landscape (1.2 - 1.8 LU/ ha main forage area:*

  Prior to the scheme fields on farms 2 and 3 have been drained. Farmer 2 noted that some sites become wet now. Both farmers apply to the prescription of the scheme not to install new drains.

Under the category „Water regulation" the prescriptions slightly vary for the two sensitive areas: amelioration measures should not be carried at all out in the sensitive area for the protection of ground water and new drains should not be installed in the sensitive area for the conservation and maintenance of the cultural landscape. However, the farmer of the first sensitive area intends to undertake amelioration measures by clearing the drains whereas the two farmers of the second area do not maintain existing drains. In fact, this reverse situation of the two sensitive areas brings along possible positive effects for the flora and fauna of the sites which become wet, though not in the intended area. Therefore the measure is not credited in the sensitive area for the protection of ground water but for the other sensitive area with one point.

Landscape elements

All three farmers maintain hedges and trees on their farmland although it is not explicitly demanded for the sensitive area for the conservation and maintenance of the cultural landscape.

Despite no actual farming changes occurred due to the management prescription of the MEKA it might prevent the clearance of landscape elements in other cases and financially supports the maintenance of traditional landscape elements for which the category is put down with one point.

Tier A-2: Maintenance of traditional farming measures

Introduction/ conservation of an extensive grassland management: Maximum of two utilisations per year

Grassland of farms 2 and 3 is managed under this measure and experienced a reduction of one cut. On farm 2 a later first cut and a drastic reduction of fertilisation took place under the measure. Farmer 3 would aftermath graze these fields without the scheme.

The maximum of two utilisations per year reduced the production by one cut and lowered the grazing frequency. In one case a limited input of fertiliser accompanied the measure. Positive

effects on flora and fauna as well as on non-biotic resources are likely under this measure. Cutting and grazing frequency as well as fertilisation do not require drastic farming changes but work towards a gentle extensification for which the three elements are credited with one point each.

Introduction/ conservation of an extensive grassland management: One utilisation per year

Farmer 3 manages land under this measure namely a meadow which has been used very extensively in the past as it lays on the private water protection zone. Hence it has not been fertilised and cut very late in the year (end of July/ beginning of August) which paved the way to manage the meadow under this tier.

Although the farming practice has not changed under the participation of this tier this includes to refer to another aspect of evaluation, namely meeting the objectives which can be stated for the farm. The element cutting date is credited with two points as it is likely to be particularly beneficial for meadow birds as well as for the natural regeneration of the sward. One point is given for the reduced cutting frequency as the measure more generally targets the extensive use of grassland.

Introduction/ conservation of an extensive grassland management: Moist and wet grassland

Moist and wet grassland occurs on farms 2 and 3 . On farm 2 it used to be grazed more intensively and more fertiliser used to be applied, whereas no fertiliser is applied at present. Farmer 3 had no farming changes on moist and wet grassland.

As moist and wet grassland are unproductive types of grassland the incentive might prevent the cause for a more intensive use. The measure is regarded to be fairly soft, as it lacks any specific management prescriptions and the actual degree of extensification depends on the individual farmer. However, the tier prevented from a more intensive use in one case, accompanied by possible beneficial effects of the biotic and non-biotic resources, and is put down with one point for the reduced grazing frequency and fertilisation.

Extensive orchards, management of steep grassland, keeping of threatened, local domestic breeds

Neither of those measures actually altered the management of the farms concerned (farm 1: extensive orchards, farm 3: management of steep grassland, keeping of threatened, local domestic breeds). Farmer 1 stated that the management of the extensive orchards under the scheme was a pure income support as the orchard would be maintained in any case.

Although actual farming changes cannot be noted under the measures extensive orchards, management of steep grassland and keeping of rare breeds, the maintenance of traditional landscape elements and a greater variety of the genetic pool is ensured through the incentive. As those measures are regarded to be beneficial for the cultural landscape in particular they are credited with on point each.

Table 4: Survey of the MEKA - scheme

		Ground water[11]	Cultural landscape[12]	Traditional farming[13]	Ext. potential[14]
Livestock	Stocking rate	+	O		+ / O
	Rare breeds	O	O	+	+
Pastures	Kind of pasture	O	O		O
	Grazing frequency	O	O	+	+
Meadows	Cutting date	O	O	+ +	+ +
	Cutting frequency	O	O	+	+
	Cutting regime	O	O		O
	Crop conservation	O	O		O
Cultivation	Pasture-topping	O	O		O
	Rolling, levelling, harrowing	O	O		O
	Ploughing up	+ +	+ +		+ +
	Re- and surface-seeding	O	O		O
Fertiliser	Amount of fertiliser	+	O	+	+
Plant protection products	Input of plant protection products	O	O		O
Water regulation	Drains	O	+		O / +
Landscape elements		+	+	+	+

[11] Sensitive area for the protection of ground water.
[12] Sensitive area for the conservation and maintenance of the cultural landscape.
[13] Maintenance of traditional farming measures. For reason of clarity the measures investigated are put together, the detailed information about the measures is recorded above.
[14] Extensification potential.

5.1.3 Results of the scheme

Aspects concerning the results of the scheme are reduced yields, utilisation under the scheme as well as the composition of the sward.

Farmers 1 and 3 did not experience reduced yields under the MEKA, farmer 3 even enlarged the number of livestock. Farmer 2 produces ca. 25% less under the MEKA, mainly because ploughing up grassland is not allowed.

Imagining the scheme would not exist, the three farmers would generally manage their land in the same way. However, farmer 1 would perhaps cease farming on some unproductive fields, farmer 2 would manage all fields but without the restrictions, i.e. he would plough up the grassland. Farmer 3 might grow rye-grass and aftermath graze the fields with two utilisations. In summary intensification and abandonment of land would take place without the scheme.

On farm 1 the composition of the sward did not change under the scheme whereas changes were noticed on farms 2 and 3. Farmer 2 stated that some of the robust grass species had become less spread. On the fields with two utilisations there is an increasing variety of grass species and herbs to note. Farmer 3 pointed out he had noticed a greater diversification of the sward.

5.1.4 Conclusions

The survey above reveals that maintaining the status quo is the main focus of the MEKA. The measures of tier A-1 are suitable to maintain the status quo of the farmland. Apart from the prevention of ploughing up grassland, a drastic intervention on grassland, the measures involve only minor changes of the general farming practice. Concerning the traditional farming measures (tier A-2) carried out by the farmers enhancing effects for the environment can be noted.

Market relief, one of the major objectives of the MEKA, remains very little as two of the farmers studied did not experience any production losses, as farmer 3 states: “MEKA [...] hat aber nicht zur Marktentlastung beigetragen, sondern es wurde aufgestockt, um mehr zu produzieren!” (MEKA did not work towards a market relief as the number of livestock was increased to produce even more!). Tiers A-1 and A-2 apply to individual fields, only ploughing up grassland applies to the entire farm. This structure means flexibility for the farmer on the one hand, since it enables the farmer to tailor the scheme exactly to the conditions of the farm. On the other hand there is scope to intensify the production outside the area under agreement. The traditional farming measures under tier A-2 are neither specifically adapted to their subject, e.g. the management moist and wet grassland does not include special prescriptions, nor co-ordinated between each other. Considering the aspect of regionalisation

the scheme roughly applies to different regional agricultural and environmental conditions through the three sensitive areas. However one of the farmers desired a more specific classification of the sensitive areas.

Taking the high take-up of the MEKA into account (56%), large grassland areas experience the maintenance of the status quo and a only slight extensification of the grassland.

Recommendations

Recommendations derived from the study of the MEKA target the required pasture-topping on grazed fields in the sensitive area for the conservation and maintenance of the cultural landscape. It is not carried out by the farmers as the pastures are not suitable for the use of machinery. As it is not clear whether the prescription refers to pastures or grazed meadows a more elaborated prescription seems to be sensible.

To avoid that more farmers ignore the prescription on plant protection products it should express more explicitly that the agricultural authority has to approve the application of plant protection products. Compliance checks should target the use of plant protection products in particular. Blanket spraying should not be possible under the scheme.

In the case of water regulation misunderstanding the prescriptions might have led to the reverse situation described above. A clearer prescription might prevent this. Furthermore it should be taken into consideration to require no maintenance measures in all three sensitive areas as the measure is likely to have beneficial effects on the flora and fauna of the grassland.

Landscape elements are generally considered to be beneficial for the environment as well as for the maintenance of the cultural landscape. Thus their maintenance should be included in all three sensitive areas.

Does the MEKA meet its objectives?

The MEKA contributes to the maintenance of the status quo of the cultural landscape on the three farms studied. It gives a good future perspective to carry on farming.

If there is an element of protecting the environment due to the scheme, it remains very little as positive aspects of tier A-1 could be noted only in four[18] and two[19] cases respectively. This applies to the achievement of market relief, too, even the farmers themselves (2[20] and 3) doubted whether there was a market relief possible. Further intensification is not impossible

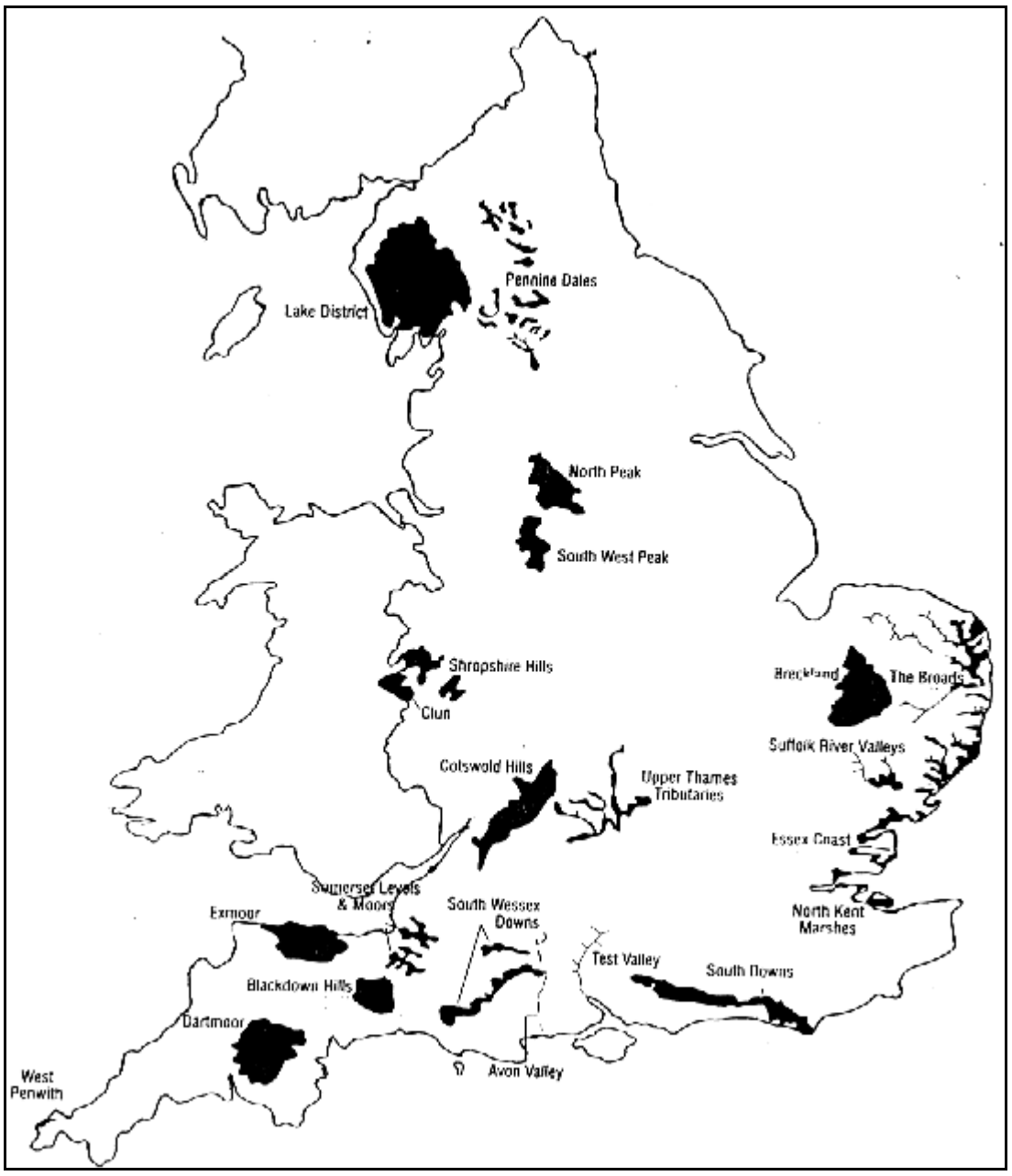
[18] This corresponds to the sensitive area for the protection of ground water.
[19] This corresponds to the sensitive area for the conservation and maintenance of the cultural landscape.
[20] The farmer referred to the arable part of the MEKA.

and the market relief remains very little. Considering the high take-up rate the last objective of the scheme, namely to sustain a sufficient number of agricultural holdings is probably achieved by the MEKA.

5.2 ESA Pennine Dales

Some general aspects about the ESA scheme are introduced beforehand as they are important to understand the Pennine Dales scheme.

As mentioned in chapter 2.2.2.2 „Integrating agricultural and environmental policy until 1992“ the ESA scheme was launched by MAFF in 1987. Since then, the scheme has expanded remarkably to the designation of 22 ESAs, depicted on the map below:



Source: MAFF, 1997 c, p. 15

The ESA scheme is targeted on priority areas aiming „to maintain and enhance the landscape, wildlife and historical value of the area by encouraging beneficial agricultural practices“ (AGRICULTURAL COMMITTEE, 1997, p. 9).

The mountain range Pennines builds the backbone of Britain and constitutes the main drainage divide between the North Sea and the Irish Sea (GOUDIE, 1990, p. 125). The ESA Pennine Dales lies in the mid and north Pennines where the bedrock consists mainly of carboniferous rocks. Erosion and glaciation have exposed the limestone over a wide area which is characterised nowadays by deep valleys and spread karstification (GOUDIE, 1990, p. 125). These valleys, locally known as dales, radiate in all directions from the main Pennine watershed: north to the river Tyne, south and east to the rivers Tees and Ouse and west to the river Eden (ADAS, 1996, p. 1). The mean altitude of the designated area is 228 m above sea level and the upland climate can be harsh with heavy rainfall (more than 1200 mm/ a) in a short growing season. Hence the entire ESA has Less Favoured Area status. The designated area of the ESA is divided into several blocks of land separated by high moorland (ADAS, 1996, p. 1).

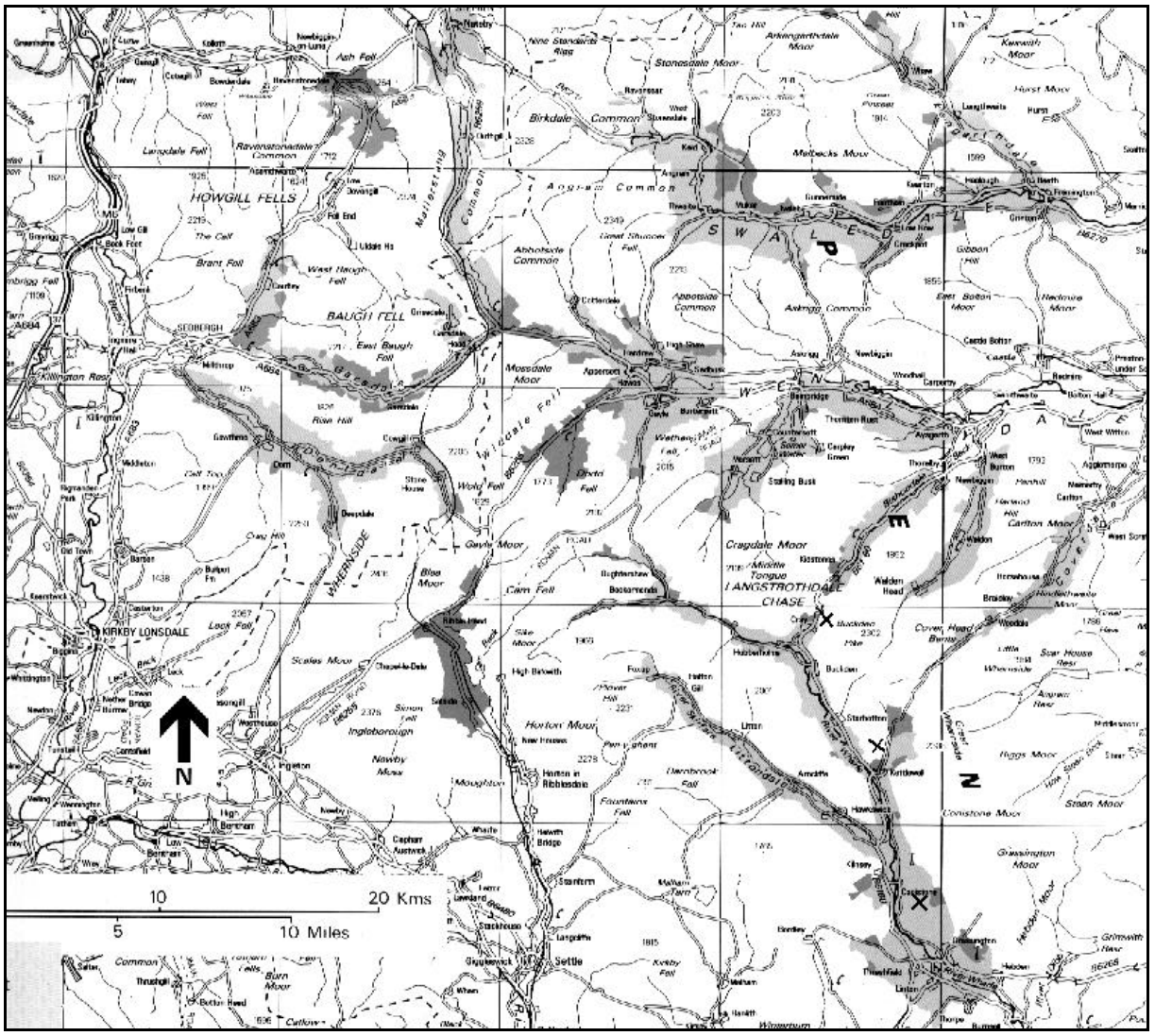
The area of study is the Wharfe Dale, which has been described by KING (1960, p. 3 in Goudie, 1990, p. 128) as „flat-floored and steep-sided“ with a typical U-shape in the upper dale.

A description of the farming practice in the Pennine Dales is given by ADAS (1996, p. 2):

„Present-day agriculture is based on hill sheep and, to a lesser extent, on suckler and store cows, with some dairying. The agricultural system of the area depends heavily on the relatively productive enclosed grassland that makes up the bulk of the ESA. Much of this grassland is managed as meadows with, traditionally, an annual cut of hay taken. Pastures make up the rest of the grassland and are used for grazing stock periodically through the year. [...] these traditionally managed grasslands came increasingly under threat from agricultural intensification. This involved drainage, reseeding, increasing fertiliser applications, and cutting meadows earlier for silage. Intensification was also associated with deterioration or loss of traditional features such as drystone walls or stone built field barns.“

To give a more comprehensive description it has to be mentioned that the Pennine Dales belong to the disadvantaged Objective 5b region of the EU (EUROPÄISCHE KOMMISSION GD XVI, 1997).

The designated area of the ESA Pennine Dales id depicted on the map below, the crosses roughly mark the location of the farms:

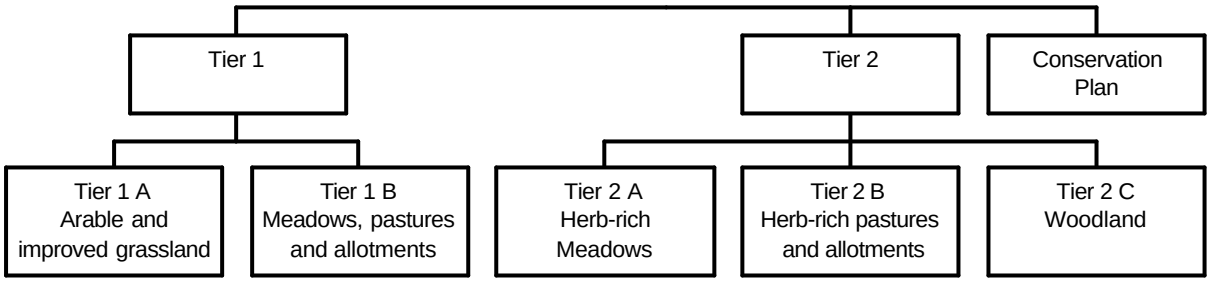


Source: MAFF, 1997 b, p. 2 f.

5.2.1 Introduction of the ESA Pennine Dales

The ESA scheme was established in the Pennine Dales in 1987 and re-launched after revisions by MAFF in 1992 and 1997. The reviews resulted in an extension of the area and the last review also brought new elements into the scheme. Improved grassland under tier 1 A, arable land under 1 B, allotments under tiers 1 B and 2 B, herb-rich pastures under tier 2 B and woodland under 2 C are new elements of the scheme. The survey of the present scheme is shown in Figure 19 below:

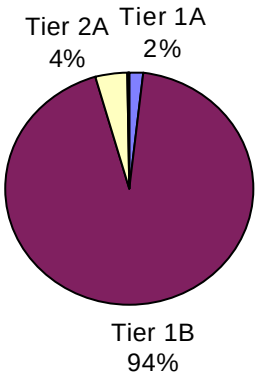
Figure 19: ESA Pennine Dales



Source: own diagram, data from MAFF (1997 b, p. 4)

Since 1997 the designated area of the ESA Pennine Dales comprises 52 000 ha of which 62% are under agreement (32 000 ha). The breakdown of the take-up rates of the tiers is depicted in Figure 20. Arable land under tier 1 B and woodland under 2 C have not been taken up so far.

Figure 20: Breakdown of the tiers [18]



Source: own diagram; data from the Project Officer, personal interview

A more differentiated look at tier 1 B reveals the predominance of pastures: 69% of the area under contract are managed as pastures. Tier 1 B meadows mount to 19% and the allotments of the same tier make up 6% of the total area under agreement.

Herb-rich meadows of tier 2 A make up 4% of the contract area and herb-rich pastures and allotments under tier 2 B remain on a low take-up rate so far, only 40 ha are under agreement. Therefore tier 2 B is not depicted in the figure.

[18] Unfortunately the breakdown of the tiers cannot be compared to the absolute figures of the grassland types included in the figure, since suitable data was not available.

The objective of the ESA is stated by MAFF (1997 b, p. 2) as the protection and, where possible, the enhancement of „the traditional farmed landscape and associated wildlife and historic resources, by encouraging beneficial livestock farming systems."

The agreement between farmers and MAFF is voluntary and valid for ten years with a break clause after five years. Farmers who enter the scheme have to include all their agricultural land within the ESA boundary into agreement. The higher tiers of the scheme are based on the lower ones, for instance managing land after tier 2 A means to follow the guidelines of tier 1 A and B in addition to the ones of tier 2 A.

General conditions for all land managed under the ESA apply to the maintenance of traditional buildings such as field barns, walls and hedges, historic features and woodland.

Tier 1 A „Arable and Improved Grassland" aims to protect features of significant landscape and historic interest such as dry stone walls and field barns on more intensively farmed land (MAFF, 1997 b, p. 6). According to the Project Officer (personal interview) this tier was taken into the scheme to enable farmers with meadows and pastures as well as improved grassland and arable land to enter the scheme. Since a farmer has to enter all of the grassland within the ESA boundary into the scheme, some farmers did not take part in the past because they would not convert their improved grassland into more extensive grassland.

The area managed under tier 1 B - meadows, pastures and allotments - is relatively productive grassland enclosed by walls and hedges lying within the upland dales. It is one of the most important features of the Dales landscape and many nationally important plants grow here. The grassland is valuable habitat for other species, especially upland wading birds found mainly in pastures and allotments. According to MAFF (1997 b, p. 7) the „objective of the tier is to achieve the appropriate agricultural management of these nationally important hay meadows, pastures and allotments, to maintain their conservation interest and landscape value and to protect archaeological features." The Project Officer (personal interview) stated that allotments are defined as enclosed land below the moorland. Most of the land has not been drained, re-seeded, cultivated regularly or treated with fertilisers, lime, slag or pesticides. Allotments contain areas of unimproved or semi-improved vegetation, often with rocky or rushy areas. Some also include areas of agriculturally improved land.

Under tier 2 A „Herb-rich Meadows" traditionally managed hay meadows are taken under contract to support a wide range of plants. The aim is to enhance the nature conservation status of hay meadows by more traditional methods (MAFF, 1997 b, p. 10).

On the „Herb-rich Pastures and Allotments" of tier 2 B very diverse plant communities grow which have developed through a long history of management for grazing livestock. The

objective of the tier is to protect and enhance existing herb-rich pastures and allotments by maintaining or introducing appropriate grazing management systems.

The Wall Renovation Supplement encourages maintenance and re-construction of stockproof walls. The Conservation Plan supports a range of capital works which will enhance the character of landscape, wildlife habitats and protect historic features (MAFF, 1997 b, p. 14).

The detailed guidelines of the tiers introduced above are found in Appendix 2.

5.2.2 Implementation and discussion of the ESA Pennine Dales

5.2.2.1 Level of the Project Officer

Project officers provide expertise advice and assistance with all aspects of the scheme. They are considered to be key to the schemes success, the „success and effectiveness of the scheme depend on their credibility and expertise“ (MAFF, 1997, p. 34).

The Project Officer of the Pennine Dales considers the system with a Project Officer between farmers on the one side and MAFF´s Regional Service Centres on the other side very effective. Project Officers should have more competence, though, as the procedure of recommending certain subjects to MAFF and MAFF contacting the farmers remarkably slows down the whole process. Furthermore the Project Officer considers the scheme`s administration by MAFF too prescriptive and too inflexible.

MAFF is responsible for monitoring reports, Field Officers of the Regional Service Centres perform compliance checks. Farmers are informed about the scheme by local meetings and by phone calls.

According to the Project Officer (personal interview) there is probably an element of intensified agriculture outside the boundaries of the ESA, but not significant. The intention of the ESA is to keep farmers in the dales instead of moving away. However, farmers may have some land further down in the dales to grow more fodder for their livestock. The fields further down in the valleys are traditionally more intensively used than those at the top ends of the valleys.

5.2.3.2 Level of the farmers

The following box entails key elements of the farms and the area managed under the ESA.

Figure 21: Information about the farms

Farm 4

- AA: 533 ha
- Area under agreement: 66 ha
- Area under tier 1 B: 58 ha
- Area under tier 2 A: 8 ha

Farm 5

- AA: 450 ha, half of the total agricultural area is moorland, half of it non-moorland
- Area under agreement: 105.6 ha
- Area under tier 1 B: 103.7 ha
- Area under tier 2 A: 1.9 ha

Farm 6

- AA: 270 ha
- Area under agreement: 82 ha
- Area under tier 1 B: 82 ha

The moorland of the farms is common grazing land.

General aspects of the implementation

Farmer 4 received the information about the ESA on a local meeting and entered the scheme when it was launched in 1987. Prior to the ESA there was an extensification scheme of the North Yorkshire County Council in which botanically interesting meadows were under contract, now managed under tier 2 A. Motivation to take part was the bad situation of intensive agriculture as prices had dropped substantially shortly before the scheme was introduced. On farm 5 the information about the scheme was received through the farming press and a local meeting. The extension of the ESA in 1992 brought the scheme further down the valley so the farm could be included. Motivation for the farmer to join the scheme is the nature conservation orientated landowner who owns half of the farmland. Farmer 6 got

informed about the scheme from MAFF. He entered the scheme in 1987 being motivated by the prospect of more profit under the scheme.

The administrative work demanded seems reasonable for farmer 4 although together with the other schemes it mounts to an enormous effort. Farmer 5 stated a high initial effort which could be reduced to a reasonable extent. For farmer 6 the administration involves very little effort.

Summarising the general issues of the ESA, the scheme provides a good alternative for farming under those harsh climatic conditions. It is attractive to the farmers due to sufficient financial support. One of the farmers also stated the nature conservation orientated landowner as motivation to take part in the scheme. The effort to administer the scheme was generally considered to be reasonable to little, except for a higher initial work stated by one farmer. Since the processing of application forms is carried out by MAFF´s Regional Service Centres nothing can be said about the administrative effort at this point. The Project Officer system is generally welcomed as the Project Officer is a direct contact person for the farmers who has more insight into the problems than the Regional Service Centres. The Project Officer helps to find compromises between productive agriculture and nature conservation in individual cases. His expertise is helpful in reviewing the scheme.

Tier 1 B: Meadows, Pastures and Allotments

As listed in Figure 21 all three farms manage land under this tier.

Livestock

The management guidelines of tier 1 B do not comprise any prescriptions for livestock management and the kind of breeds. In contrast to the allotments where individual stocking rates are set by the Project Officer on meadows and pastures there are no restrictions concerning the number of livestock. All three farmers keep sheep, two farmers sold cattle recently. Farmer 4 keeps cattle and sheep. He did not have to change the number of livestock when entering the scheme as he acquired more farmland. This enabled him to farm more extensively without reducing livestock. At present the stocking rate on his farm is ca. 0.32 LU/ ha. On farm 5 the cattle was sold when the farmer joined the ESA scheme: due to the restriction on fertiliser the crop is reduced and the farmer could not produce enough to feed the cattle. The current stocking rate on the farm is 0.22 LU/ ha. Farmer 6 sold the cattle in

1996 since it became increasingly difficult to handle[19]. After the cattle had been sold the sheep numbers were increased though at present the numbers are reduced again due to the bad weather over the last few years, the stocking rate mounts to 0.42 LU/ ha at present. The farmer had to change the farming practice on the area under the new allotment tier as those fields have been grazed far more intensively than they are now, the present stocking rate on the allotments is 0.48 LU/ ha.

Putting together the statements of the three farmers, livestock changes on meadows and pastures can be noted under the scheme although there is only one explicit prescription. The stocking rate on the allotment is considerably lower than under the previous management. Two farmers actually reduced their stocking rates when they joined the scheme. Although there is no explicit stocking rate demanded for meadows and pastures the ratio of LU per hectare grassland has been reduced under the scheme on two farms which is an indirect effect of the reduced amount of fertiliser. Since this drastically lowered the productivity of the grassland high numbers of livestock cannot be sustained. The stocking rate on the allotments of one farmer has been reduced, too. All in all the stocking rates of the three farms range from 0.22 to 0.42 LU/ ha and are very low though it has to be said that large areas of the farms are moorland which cannot sustain high stocking densities anyway but are calculated into the stocking rates. The reduction of livestock numbers has beneficial effects on the flora and fauna of the grassland and is credited with one point. There are no requirements concerning the kind of breeds to be kept which could be a measure to support traditional farming, too.

Pastures

Sheep grazing on the farms studied follows the same pattern: sheep stay on the moorland and pastures throughout the year apart from the lambing time when they are moved down to the farms and stay either around the farms on the meadows (farms 4 and 6) or inside lambing sheds (farm 5). Lambing takes place around 10th of April until May and during this period pastures and moorland can recover from grazing. The cattle of farm 4 grazes the pastures from mid of May until the end of November on rotational pastures. Sheep are partly set stocked in the summer on farms 4 and 5 and mainly set stocked on farm 6. All three farms are not troubled by over- or undergrazing and poaching which is underlined by the statement of

[19] „We sold the beef cattle in 1996 for management reasons: since the land is split into three blocks the cattle had to be moved right through the village. This was not a problem when everybody had fenced his garden. But the population of the village changed over the years and ”town people” who moved into the village do not fence their gardens. When we moved the cattle many gardens were damaged, and we had to spend our time on gardening and dealing with insurance companies, so we decided to sell the cattle.“

farmer 4: „Because of the harsh climatic conditions we rather leave some grass instead of having bare ground.“ The prescription of avoiding over- and undergrazing and poaching meets the interest of the farmers and is subsequently no restriction.

The pasture management under tier 1 B does not cause any changes of the grazing management. The exclusion of stock required under the scheme applies to the general farming practice of the area. Although the kind of pasture management is not covered by the prescriptions, extensive pastures can be recorded on the three farms. This applies to the objective “beneficial livestock farming systems” (see chapter 5.2.1 “Introduction of the ESA Pennine Dales”) for which the element is credited. Since changing the kind of pasture is a “soft” tool to control grassland extensification, one credit point is put down for the measure.

Meadows

The guideline on the exclusion of stock at least seven weeks before the first cut for hay or silage and by 1st of June the latest is not restrictive for farmers 4 and 6 since traditionally stock has been removed from meadows by that time. Prior to the scheme the exclusion took place about one week earlier on farm 5, the meadows are cleared for a longer time now.

Tier 1 B demands not to cut before 8th of July on the meadows which delayed on all three farms the cutting from two days up to two weeks. For farmer 4 the late cutting date works well with the reduced amount of fertiliser as the spring growth is slowed down anyway. However, he regretted that the fixed cutting date prevents him taking advantage of the season. All three farmers welcomed the change under the new scheme: the August cutting (all meadows must have their first cut in August at least every five years, indication of the proposed August cutting on the agreement map) has been changed to cut meadows by the 22nd of July at least once every five years or at least 20% of the meadows must be nominated to be cut after 22nd of July every year. Now this late cutting date works well for the farmers as they can cut the meadows in one go. The prescription in its new form is not as restrictive as it used to be. Farmer 4 cuts the grass mainly for silage but makes hay, too, depending on the weather. The other two farmers cut mainly for hay-lage but treat it in the same way as hay.

With regard to the two cutting dates clear effects of the meadow guidelines can be noted as prior to the scheme all meadows had been cut earlier. The measure is credited with two points because positive effects on the biotic resources become likely. Beside the late cutting date the conservation of the crop is considered under the tier, too. This gives support to the natural regeneration of the sward. Although the productivity of the grassland is not affected by this measure it is a fine tool to encourage the natural regeneration and diversification of the sward. The other two elements of grassland management, cutting frequency and –regime, are not

covered by the guidelines directly, the late cutting date and the reduced amount of fertiliser indirectly prevent from frequent cuts of the meadows. Although this preventive effect did not change the frequency of cuts it can be credited with one point.

Cultivation

The farmers interviewed did not consider the prescription on maintaining the grassland and not to plough, level or re-seed the land as a restriction since most of the land is not suitable for the use of machinery. Farmer 5 tops the pastures and performs no other maintenance measures, the meadows of farm 6 get chain-harrowed in March. Altered cultivation practice because of the management prescriptions cannot be noted, they seem to correspond to the general farming practice of the region.

As the latter is regarded to apply to an environmentally friendly farming practice the element ploughing up as "strong" measure is credited with two points, the other measures concerned (levelling, rolling, harrowing and re-seeding) are credited with one point each.

Fertilisation

Tier 1 B demands the application of 50 kg NPK-fertiliser at most which has to be applied in one go. This limited the amount of fertiliser of all three farmers remarkably. Prior to the scheme farmer 4 applied ca. 150 kg and farmer 5 even applied 300 kg NPK-fertiliser on the meadows. Both farmers pointed to the slowed down spring growth which goes along well with delay of the first cut. On farm 6 the area to which fertiliser is applied has been reduced from 50 ha to 40 ha and on 6 ha meadow land the amount applied has been reduced from 100 kg to 50 kg NPK-fertiliser. The fertiliser is generally applied on meadows and on the better pasture land whereas rough pastures and moors are not fertilised. The other requirements concerning fertilisation did not result in any farming changes.

The limitation of the amount of fertiliser resulted in drastic production losses on the three farms. Together with beneficial effects on non-biotic as well as possibly biotic resources, the reduction of fertiliser is a striking plus point of the tier and evaluated with two points.

Plant protection products

On all three farms weeds occur of which thistles are the main problem. Prior to the scheme the three farmers blanket sprayed the affected fields. Now farmers 4 and 6 spot spray and farmer 5 contacted the Project Officer to control cow parsley. Farmer 6 stated an increase of weeds since he joined the scheme.

Prior to the scheme grassland weeds were treated on the three farms by blanket spraying. Under the restrictions of tier 1 B spot treatment replaced blanket spraying of infested fields. As this results in a reduced amount of plant protection products applied on the fields, positive effects on the non-biotic resources as well as possible beneficial effects on flora and fauna of the grassland can be expected. However, as a certain amount of plant protection products is still applied, only one credit point for the overall reduction is put down.

Water Regulation

According to the farmers drainage measures are not an issue in the Pennine Dales. On farms 4 and 6 there are old drains in the subsoil which are not maintained. Those drains still work on farm 6 and do not work on farm 4. On farm 5 there are no drains at all. The demands under the scheme not to install new drainage systems or substantially modify any existing drainage system did not lead to any changes.

The prescriptions of the scheme in the category „Water Regulation" did not alter the farming practice of the farmers interviewed. Though they correspond to the general environmentally friendly farming practice, by supporting the biotic life on grassland. Thus the measure is put down with one point.

Landscape elements

After the introduction of the scheme no significant changes of landscape element management could be seen. Farmer 5 maintains walls which has not changed under the requirements of the scheme since the walls have to be maintained anyway.

Various maintenance measures listed under „Landscape elements", such as restoring walls and field barns have not changed. They promote the maintenance of a diverse cultural landscape. Therefore the scheme is credited with one point in this category.

Tier 2 A: Herb-rich meadows

Farmers 4 and 5 have fields under this tier.

Meadows

The prescription under the tier to exclude stock from meadow land by 15th of May is considered as a real restriction by farmer 4 since prior to the scheme these fields had been

excluded two weeks later. For farmer 5 the requirement is not restrictive as well as the prescription on the cutting date not before 15th of July. Depending on the weather farmer 4 might cut the meadows about one week earlier as demanded. Concerning crop conservation farmer 4 treats the crop in the same way as hay but uses it for silage. Farmer 5 makes mainly hay-lage and hay; he is not affected by the guideline of the tier.

The management guidelines under tier 2 A led to an earlier exclusion of stock, a later cutting date and the treatment of the crop as hay. These measures enhance the botanical variety of the sward and consequently provide a basis for the protection of flora and fauna of the grassland concerned. Since this set of measures demands gentle farming changes each measure is credited with one point.

Fertilisation

The meadows managed under the tier of farm 4 had not received any fertiliser prior to the introduction of the ESA. This had been one of the prescriptions of the previous scheme run by the North Yorkshire County Council. However, the farmer would like to fertilise those meadows and noted a decreasing fertility of about 1/3 after 4 years tier 2 management. Farmer 5 applied 200 kg NPK-fertiliser on the meadows in the past and mentioned that now the meadows are hardly worthwhile taking all the machinery out there.

On both farms the meadows farmed under tier 2 A would be treated with mineral fertiliser if this was not prevented by the ESA prescriptions. Any input of mineral fertiliser would encourage the growth of competitive plants and change the botanically interesting composition of the sward. The maintenance of meadows is ensured by the application of farm yard manure, replacing the annual offtake in the hay crop. Thus prevention of mineral fertiliser on herb-rich meadows can be put down with two plus points.

Wall Renovation Supplement and Capital Works

On two farms (4 and 6) walls are maintained stockproof with the financial support of the Wall Renovation Supplement. This is a welcomed support as the walls have to be maintained anyway. Both farmers renovated a field barn supported by the grant under this tier.

In the case of walls the incentive speeds up and encourages the stockproof maintenance although an element of simple income support cannot be denied. The maintenance of field barns is surely encouraged under the scheme as they „are there to look nice, but of no great use“ (Farmer 5). This statement underlines that the renovation of field barns happens mainly due to the incentive available under the scheme which is considered to be a positive aspect of

the ESA. Hence the maintenance of elements of the cultural landscape is put down with one point.

Table 5: Survey of the ESA Pennine Dales

		Tier 1 B	Tier 2 A	Capital Works[20]	Ext. potential[21]
Livestock	Stocking rate	+			+
	Extensive breeds	O			O
Pastures	Kind of pasture	+			+
	Grazing frequency	O	+		+
Meadows	Cutting date	+ +	+		+ +
	Cutting frequency	+			+
	Cutting regime	O			O
	Crop conservation	+	+		+
Cultivation	Pasture-topping	O			O
	Rolling, levelling, harrowing	+			+
	Ploughing up	+ +			+
	Re- and surface-seeding	+			+
Fertiliser	Amount of fertiliser	+ +	+ +		+ +
Plant protection products	Input of plant protection products	+			+
Water regulation	Drains	+			+
Landscape elements		+		+	+

[20] Capital Works and Wall Renovation Supplement are put together in this column.
[21] Extensification potential.

5.2.3 Results of the scheme

The statements concerning the production losses on the three farms range from nil to 80%. On farm 4 the production foregone is ca. 20% which is compensated for by the incentive. Farmer 5 stated a loss of production on tier 1 B meadows of 50 to 60% and on tier 2 A meadows of 80% whereas the pastures still yield the same. The payments of MAFF are considered to be a sufficient compensation for the reduced yields. On farm 6 there is no production loss to note. Therefore the incentive is simply an additional income support.

On farms 4 and 6 the area managed under the ESA would be farmed more intensively without the scheme: more fertiliser would be applied and meadows would be cut earlier. Farmer 5 would still keep cattle. Farmer 6 would not change the farming practice at all.

Two of the farmers noticed changes under the extensive management of the ESA. On farm 5 the meadows have a greater variety of grasses and flowers as well as an increased birdlife. Farmer 6 mentioned an increase of weeds.

5.2.4 Conclusions

Looking at the survey of the ESA substantial farming changes become obvious. The drastic reduction of fertiliser is the main tool to achieve an extensive grassland management. Production losses under the scheme mount to ca. 25% on the farm studied under tier 1B and are even higher under tier 2 A (up to 80%). Furthermore special management requirements are specifically adapted to the agricultural and environmental conditions of the area. Together with other more general prescriptions they make up a well balanced set of measures.

Putting together the grassland measures studied drastic changes of the farming practice can be noted even though the ESA belongs to a less favoured area (Objective 5b Region, see beginning of chapters 5.2 “ESA Pennine Dales” and 2.1.1 “Development of the CAP”). Associating the farming changes with the high take-up rate of 62% an enhancement of the grassland is very likely. The agreement requires to enter all farmland within the ESA boundary to the ESA to prevent farmers from entering only unproductive grassland, however, according to the Project Officer there is an element of intensifying agriculture outside the boundaries of the ESA. The Project Officer tries to ensure that land suitable for the higher tiers is entered accordingly. The availability of various tiers, which are adapted to different types of farmland of the region, provides flexibility for farmers as they can tailor the scheme to the individual farm.

Taking the Project Officer-system into account, it is certainly beneficial for both sides, MAFF as well as the individual farmer as the Project Officer is a direct contact person for the farmers and familiar with most of the problems occurring on the farms. However, criticism targeted

the limited decision autonomy of the Project Officer since problem solving is slowed down enormously.

Does the ESA Pennine Dales meet its objectives?

The objective of tier 1 B is to achieve the appropriate agricultural management of nationally important hay meadows, pastures and allotments, to maintain their conservation interest and landscape value and to protect archaeological features, as introduced in chapter 5.2.2 „Introduction of the ESA Pennine Dales". The change of farming practice under the tier is likely to show beneficial effects on the biotic and non-biotic resources and certainly maintains if not enhances the conservation interest and landscape value of the areas concerned.

Enhancement of the nature conservation status of hay meadows under tier 2 A is also ensured by the management prescriptions of the scheme.

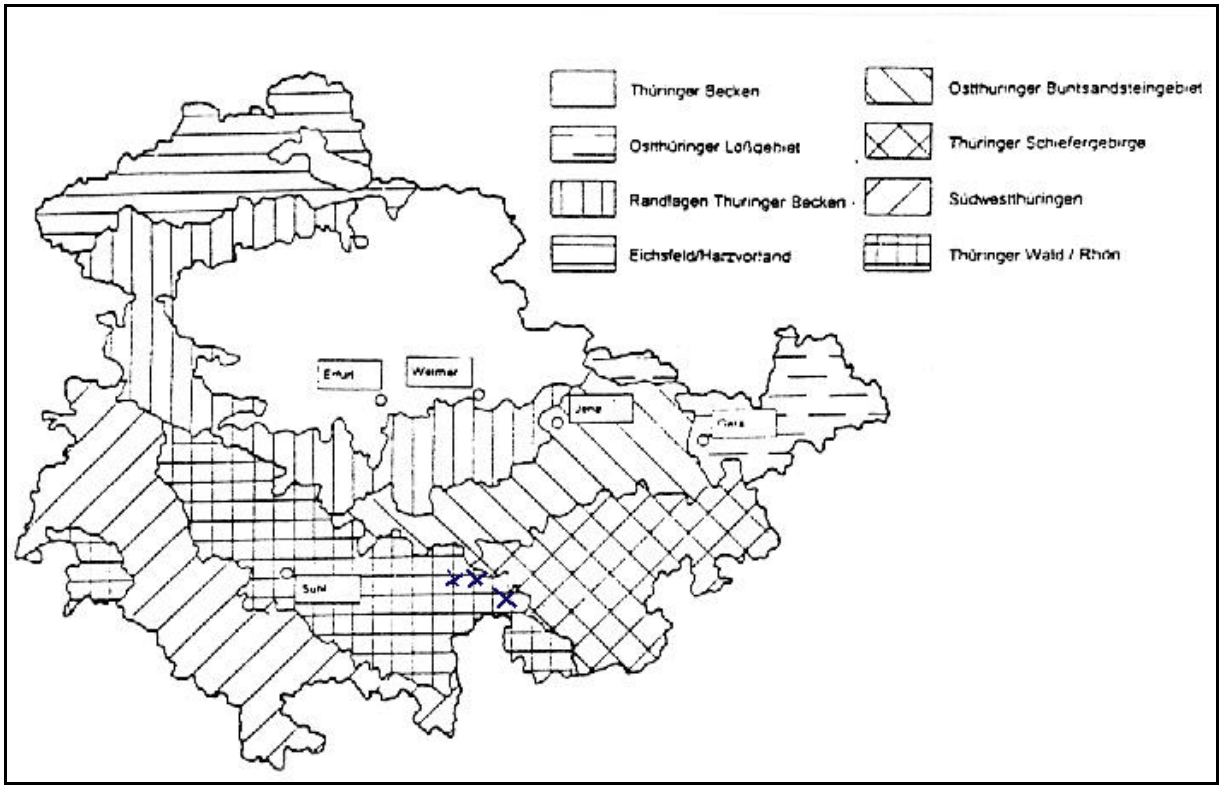
Wall maintenance and the renovation of barns encouraged under the Wall Renovation Supplement and the Conservation Plan meet their objective to enhance the character of the landscape, wildlife habitats and protect historic features, too.

Furthermore, the study revealed a market relief of at least 25% compensated for by the payments of the scheme.

5.3 Thuringia: KULAP

The Thüringer Wald is a mountain range reaching more than 800m above sea level in the Southeast and declining in height and width towards the Northwest. Geologically the bedrock of the forest is composed of gneiss and granite. The surface rock consists of sandstone, conglomerate and porphyry. Characteristic for the mountain range are deep and narrow valleys. The climate is determined by the geographical position (NW - SE) and the height, the average yearly precipitation increases from 600mm along the mountain fringe to 1300mm in the highest regions, most of it falling in winter. Compared to other regions of Thuringia the start of the spring is later, the yearly mean temperature decreases from 6.5°C along the foothills to 4.0°C in the centre of the mountain range. The soils are commonly acidic. Depending on the bedrocks there are podsols and ranker on conglomerates and sandstones and acid brown earths on mantle rocks of the surroundings of glaciers and on porphyrys. In general there is only little productivity of the soils to note resulting in an almost complete wood cover (RIESE, 1993, p. 4 f.).

The crosses on the map below roughly mark the location of the farms:



Source: RÖßLING, 1993, p. 137

Depending on the natural conditions agricultural land use varies remarkably. In the forest of Thuringia only 32.4% are arable land whereas the remaining 67.7% are grassland (the data include the Rhön, since the forest of Thuringia and the Rhön together comprise an agricultural region (TMLNU, 1996 b, p. 60).

According to the Thüringer Ministerium für Landwirtschaft, Naturschutz und Umwelt (TMLNU, Ministry for Agriculture, Nature Conservation and environmental Protection of Thuringia, 1996 b, p. 54) the entire forest of Thuringia is included in the designated disadvantaged area. Following Objective 5 b Regions (see chapter 2.1.1 “Development of the CAP”) the disadvantaged area is determined by harsher natural conditions. The higher mean altitude above sea level together with higher precipitation and lower mean temperature over the year lead to a lower index of land quality.

5.3.1 Introduction of the KULAP

Looking at the agricultural land use in Thuringia in 1996 about 77.9% of the total AA

(802 597 ha) were used as arable land, 21.6% as grassland and special crop grew on 0.5% (TMLNU, 1996 b, p. 8). This clearly reveals the importance of arable land compared to grassland.

The situation becomes different under the KULAP (Scheme for the support of environmentally sensitive agriculture, maintenance of the cultural landscape and nature conservation in Thuringia, TMLNU, 1996 a) scheme with its four components:

A) Extensive arable Production;

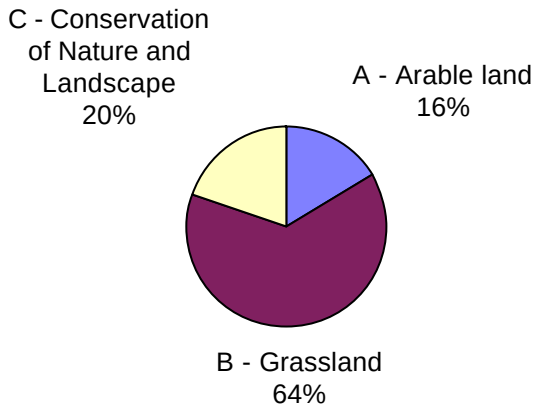
B) Extensive Grassland Management;

C) Conservation of Nature and Landscape; and

D) Education and Demonstration of environmentally friendly farming practices.

The total area managed under the scheme in 1996/97 was 235 155 ha, covering 29.3% of the total AA of Thuringia. Figure 22 below shows the breakdown of parts A, B and C of the scheme. Part D is not included, since it is not related to the AA but to individual people.

Figure 22: KULAP - area in 1996/97



Source: own diagram, data from TMLNU, 1998

What becomes obvious in Figure 22 is the reverse situation of the land use under the KULAP scheme compared to the general agricultural land use. Ca. 87% of the total grassland area of Thuringia are managed under the KULAP scheme whereas the take-up rate of the arable land is only 6%. This shows that grassland extensification is far more attractive than extensification of arable land.

The expenditures under the scheme have been rising continuously since it has been introduced in 1993. In the first financial year the expenditures mounted to ca. 19 million ECU/ year and have been rising in the following two years to 26 million ECU/ year.

As mentioned above the KULAP consist of four parts covering a wide range of farming activities. The overall objectives of the scheme are (TMLNU, p. 4f):

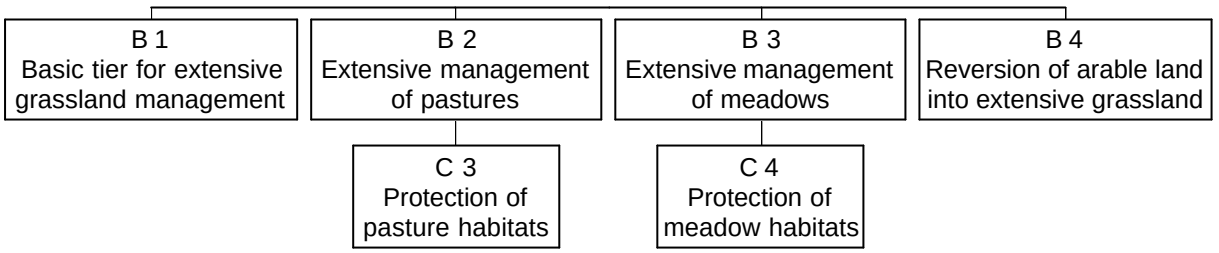
- Protection of the environment;
- Maintenance of the cultural landscape;
- Species and habitat protection, and
- Market relief.

The agreement between farmers and the TMLNU is for a period of five years. Farmers who enter into the agreement have to abide with the management prescriptions they committed themselves to in return for an annual payment. The general prescriptions of the scheme determine that only certain areas within Thuringia can be subsidised, that the agricultural land

and the right of utilisation has to be proved fieldly and that grassland cannot be reverted into arable land at all.

The following figure shows all grassland tiers of the KULAP. Except for tier B 4, which is not relevant for the study, all tiers are described in detail in Appendix 3.

Figure 23: Grassland tiers of the KULAP



Source: own diagram, data from TMNLU, 1998.

Tier B 1 „Extensive management of all permanent grassland of the holding with a maximum of 1.4 LU/ ha forage area“ includes the entire grassland branch of the farm[22] and targets the general extensification on grassland.

Tiers B 2 and B 3 aim to ensure and develop semi-natural habitats with their diversified flora and fauna (TMLNU, p.4 f.). Like in tier B 1 the management prescriptions have to be carried out on all permanent grassland of the farm. According to the Code of good agricultural practice the maximum stocking rate is 2.0 LU/ ha main forage area. This high rate is justified by the TMLNU (Appendix 3) by the threat of overstocking permanent grassland, because understocking is a problem in some areas.

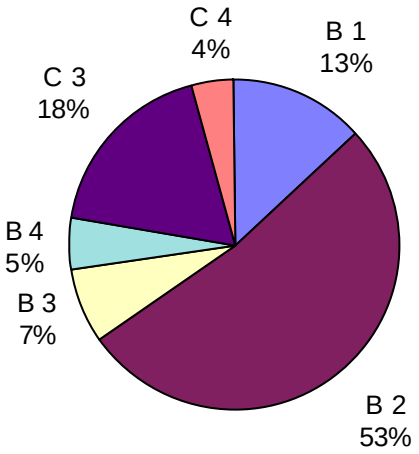
Every farmer in Thuringia can take part in the grassland tiers, which lay under the responsibility of the agricultural authority. This is different under tiers C 3 and C 4 (protection of specific habitats), as they refer to designated areas and are administered by the according environmental authority. When farmers join the KULAP scheme, the agricultural authority passes the application forms on to the environmental authority automatically. The authorities

[22] According to the TMLNU (personal interview) the motivation for taking the tier into the scheme was to ensure financial support. Since the tier corresponds to the demands of the common task GAK it is partly financed by the BML, partly by the EU. To have these two financial sources is considered to be safer than to rely on only one financial source.

check if there are areas suitable for tier C 3 or C 4 areas. According to the TMLNU (personal interview) this process prevents double support for the same area.

To get an idea about the different grassland measures, Figure 24 depicts the situation in 1996/97.

Figure 24: Grassland area in 1996/97



Source: own diagram, data from TMLNU, 1998

The figure reveals the dominant role of tier B 2 with more than half of the grassland under contract.

5.3.2 Implementation and discussion of the KULAP

5.3.2.1 Level of the TMLNU

The administration of the KULAP includes the processing of application forms, supervising the farmers and detailed reports on the expenditures.

The overall administrative effort is very high due to:

- Difficulties in supervision since the scheme structure is very complex;
- Difficulties in compliance checks;
- The current conversion of the whole administration to the IACS (see chapter 2.1.4 „Regulation 2078/92 and objectives“);
- The deviating financial years of Thuringia (1.7. - 30.6.) and the EU (16.10. - 15.10).

As mentioned above, the agricultural authority passes on application forms to the environmental authority automatically. Part A, B and D of the KULAP are under the responsibility of the agricultural authorities whereas the environmental authorities are responsible for part C of the scheme. This collaboration demands a good co-ordination throughout all levels of the authorities. It has led already to more acceptance of the different authorities for each other. Especially for the relevant agricultural authority the effort is very high (TMLNU, personal interview).

A special problem of the new German Bundesländer is the occurrence of frequent shifts of property rights or rented agricultural land (see chapter 2.2.1.1 „Agriculture in Germany"). The difficulties arise when agricultural land under contract is to be sold or rented. In most cases the new owner or tenant must fulfil the requirements of the agreement (TMLNU, personal interview).

Field inspections are performed according to Regulation 746/96 concerning the implementation of Regulation 2078/92 (see also chapter 2.1.4 „Regulation 2078/92 and objectives"). According to this Regulation the compliance of 5% of the agreement holders is checked every year, chosen by chance or risk analysis. In contrast, 10% of the agreement holders are examined if environmental measures are under contract. The inspections are carried out under the responsibility of the relevant agricultural or environmental authority.

There will be an evaluation of the entire scheme after the first five years of implementation which has been finished by the end of 1998 (TMLNU, personal interview).

Farmers are informed about the scheme through the press as well as brochures. The high take-up rate shows that the information strategy has been successful (TMLNU, personal interview).

5.3.2.2 Level of the farmers

In the box below key elements and the area managed under the tiers are listed.

Figure 25: Information about the farms

Farm 7

The agricultural holding consists of two separate farms, one of them has only grassland, on the other farm there is arable land as well. In the following the two holdings are considered as one farm.

- AA: 1811 ha
- Grassland: 711 ha, the entire grassland branch of the farm is managed under the KULAP.
- Tier B 2: 628 ha
- Tier B 3: 83 ha
- Tier C 3: 65 ha
- Tier C 4: 22 ha

Farm 8

- AA: 1560 ha
- Grassland: 632 ha
- Tier B 2.1 permanent grassland: 305 ha
- Tier B4: 224 ha
- Tier C 3 mountain meadow: 102.5 ha

Farm 9

The farm was founded in September 1992 with the intention to keep suckler cows. As this implies an extensive form of livestock management, the entire farm takes part in the KULAP scheme. The farm manager is convinced that an extensive management is the only suitable way of farming under the environmental conditions of the Forest of Thuringia.

- AA: 1750 ha
- Tier B 2.2 (> 60% grassland): 700 - 730 ha in combination with C 3
- Tier C 3: 700 - 730 ha
- Tier B4: 800 ha

Since none of the farms takes part in tier B1 the tier cannot be investigated.

General aspects of the scheme

Information and motivation

On the agricultural holdings studied the managers received the information about the KULAP from the agricultural authority, one of them additionally through the local press. It very easy to receive information about the scheme in the first place. This is in accordance with the statement of the TMLNU that its information strategy has been successful.

Prior to KULAP all three have been taking part in an extensification scheme offered by the environmental authority. They entered the KULAP scheme when it was launched on the 1 July 1993.

The financial support was mentioned to be the main motivation for taking part in the scheme. However, farm manager 9 stated that extensification under the KULAP is the only alternative to practise agriculture under such harsh environmental conditions. A more intensive agriculture would neither be sustainable nor economical. The cultural landscape can be maintained under the KULAP.

The administrative effort is immense particularly because of the fieldly record of management, which is one of the general prescriptions demanded in the KULAP.

The agricultural area is divided into small fields which is a relict of the agricultural structure prior to the former GDR where the owners have been expropriated under the government (see chapter 2.2.1.1 "Agriculture in Germany"). However, they were eligible to gain their property rights back after the reunification. Hence farmers have to deal with an enormous number of landowners. In the case of farm 8 there are 100 different landowners on 2000 rented fields, farm 9 has to deal with 1800 landowners on 20 000 individual fields. The three managers stated movements of renting fields or giving fields to rent. The leasing contracts either have to be adjusted to the five years period of the KULAP, or leaseholders and leasetakers have to manage the land according to the KULAP agreement, since otherwise the money received for the previous years has to be paid back. The managers of farms 7 and 8 pointed out that the begin of the financial year in the mid of the growth period is unfortunate. It would be better to have the change of the years in the autumn as the administrative effort is much higher at the end/ beginning of the financial year. All three farmers pointed to the immense administrative effort of the KULAP for various reasons:

- The fieldly record of the management;
- Frequent shifts of property rights or rights of utilisation; and
- The unfortunate start of the financial year on the 1st of July.

Again, the statements of the TMNLU concerning the administrative effort have been confirmed. Frequent shifts of the property rights or movements in the right of utilisation complicate the administration immensely. The start of the financial year on the 1st of July forces the farmers to deal with administrative aspects in the mid of the growing season. The TMLNU reported additional administrative effort due to the different start of the year of the EU (1st of October) hence there is certainly scope to improve the administrative efficiency for

both sides, farmers as well as the agricultural authorities. Supervision by the agricultural or environmental authority has been generally considered to be good.

Tiers B 2 and B 3: Extensive pastures and meadows

The prescriptions of the two tiers are almost identical with the exception of the categories "Pastures" and "Meadows". Hence the two categories are considered individually whereas all other categories are analysed together. All three farms manage land under tier B 2, farm 7 has additional fields under tier B 3.

Livestock

Two of the farmers keep suckler cows (Farms 7 and 9), farmer 8 keeps dairy cows and heifer. Heifer and calves are also kept on farm 7. There are no prescriptions on the kind of livestock to keep under the scheme. Farm managers 7 and 9 keep fairly extensive types of livestock.

The two tiers demand a stocking rate of 0.3 LU/ ha main forage area at least and 2.0 LU/ ha AA at most. After the breakdown of the GDR the numbers of livestock were reduced substantially on farms 7 and 8 and are now slowly increasing again (see chapter 2.2.1.1 Agriculture in Germany"). The stocking rates of farms 7 and 8 are very similar (Farm 7: 1.35 LU/ ha main forage area; Farm 8: 1.2 LU/ ha main forage area) and well below the maximum rate of the two tiers of 2.0 LU/ha AA, whereas the stocking rate of farm 9 is much lower with 0.8 - 0.9 LU/ ha main forage area.

The livestock management demanded under the tiers did not lead to farming changes on the farms studied. A reduction of LU has not been encouraged, as the maximum stocking rate of 2.0 LU/ ha AA lies well above the stocking rates of the three farms. Understocking is not a problem on the farms either, in contrast to the statement of the TMLNU, claiming that farmers going underneath the minimum stocking rate would be the problem. This clearly shows that an extensification through livestock management depends on the individual farm manager, thus the category cannot be rewarded.

Although there are no prescriptions on the kind of livestock (e.g. suckler cows, heifer) or rare breeds, two farmers are keeping fairly extensive kinds of livestock. However, rare breeds are not taken into consideration in the scheme.

Pastures

Tier B 2

The requirements of the KULAP to graze the first or second growth and to use the grassland at least once per year did not cause any pasture management changes. The three farmers manage their pastures as rotational pastures, although to different intensities. Farmers 7 and 8 have fairly intensive forms of rotational pastures and farmer 9 has a mixture of rotational pasture with long grazing periods to set stocking. Since there are no guidelines on the kind of pastures, the intensity of the pasture management varies between individual farm managers. Restrictions on the amount of fertiliser affect the growth of the grassland and result in fewer grazing periods under the KULAP on farms 7 and 8. This does not apply to farm 9 due to the distinctive fertilisation regime and attitude of the manager.

Pasture management under tier B 2 does not include prescriptions on the kind of pastures and the number of grazing periods. The kind of pasture management entirely depends on the individual farm manager, leading to a fairly intensive pasture management on two farms in contrast to an extensive on the other farm. The element cannot be credited: stricter guidelines would result in more extensive forms of pasture management on two of the farms, the third farmer would be rewarded for his extensive form. The restriction on fertiliser reduces the productivity of the grassland resulting in fewer grazing periods and later cutting dates. Both subjects work towards a general extensification of grassland and are likely to show beneficial effects on the flora and fauna. Hence, the elements „grazing frequency“ and „cutting date“ can be put down with one credit point each. The prescription to graze the first or second growth does not have particular beneficial effects for nature conservation.

Tier B 3

With the exception of not to graze the first growth, the grazing of meadows roughly corresponds to the pasture management described above. Prior to the KULAP farmer 7 did not graze the first growth, thus the prescription does not provoke changes but lays down the farming practice.

Tier B 3 requires not to graze the first growth which applies to the pre-existing farming practice. The measure aims to prevent interventions of livestock until 15 June in order to protect breeding meadow birds and their nests. Meadow birds fly up and leave their nests behind when they are disturbed. Then the eggs are likely to fall victim to birds of prey and ravens. Thus the management according to the guideline might save the eggs of meadow birds and is put down with one point under the element “grazing frequency”.

Meadows

Tier B 2

The meadow prescription of the KULAP to use the permanent grassland at least once a year and to graze the first or second growth did not result in management changes on the farms studied. There are no prescriptions within the tier on the cutting date and -regime. All three farms cut only those fields suitable for the use of machinery. Farmers 7 and 8 cut as soon as possible, but generally later than in the past due to the limited amount of fertiliser slows down spring growth. Farmer 9 cuts the fields late between the 10. June and the 15. July.

Although the tier does not demand any specific cutting measures later cutting dates could be noted as an indirect effect of the reduced amount of fertiliser. Thus the element "Cutting date" is rewarded with one credit point.

Tier B 3

Farm manager 7 states that the cutting date of the 15th of June is very late - prior to the scheme the meadows have been cut about two weeks earlier. Therefore, there is one cut less than in the past. The other prescription to use the permanent grassland at least once a year did not change the meadow management.

The tier comprises a cutting date for the meadows which is about two weeks later than the general practice in the area studied. It specifically targets the protection of meadow birds and is supported by the prescription on not to graze the first growth (under the category "Pastures") and is put down with two points. The late cutting date is well balanced with the reduction on fertiliser. Both measures result in the less frequent use of the meadows which is credited with one plus point. The tier does not include prescriptions on the cutting regime and the conservation of the crop but on the minimum utilisation of the meadows. However, the latter did not cause any changes.

Cultivation of the grassland

The prescriptions given in this category are not to plough up grassland, to maintain the sward by regular re- or surface-seeding and in the case of tier B 2 to maintain them with other suitable management measures. On pastures suitable for the use of machines all three farms top their pastures after a grazing period. In the spring the pastures get rolled and harrowed on farm 8, levelled on farms 7 and 9. Re- and surface-seeding is done on the farms only when it is considered to be necessary. Prior to the scheme the grassland has been ploughed up on all three farms. Farm manager 7 converted most stony fields back into grassland. Farmer 8 ploughed up grassland as maintenance measure in order to improve the composition of the

sward by reseeding mass-growing grass species like rye-grass. According to farmer 9 it would make sense to level out the fields every 7 to 8 years.

As worked out above the farm managers stated that they would plough up the grassland if they were allowed to. Since ploughing up grassland is a drastic intervention to the grassland and the usual application of non-selective herbicides affects the non-biotic resources as well (for details see chapter 3.2.4 “Cultivation of grassland”) its prevention is a striking positive aspect of the scheme and thus credited with two points. The other requirements of the scheme do not apply to an extensive form of cultivation.

Fertilisation

The limit on the application of mineral or organic fertiliser of 60 kg N/ ha and year greatly affects farm managers 7 and 8. They regard the amount as far too less, twice of the amount would be sufficient. The farmers considered this restriction as major change under the KULAP, since it drastically limits the productivity of the grassland. The spring growth is slowed down and results in fewer uses of the grassland. Farm manager 9 applies only farm yard manure (solid dung), i.e. the farm is not concerned by the limit on mineral fertiliser. In the case of P and K the scheme demands the fertilisation after group C[23] which did not change the farming practice of farmers 7 and 8. The demanded soil examination is a relict of the GDR where it had been carried out regularly. On farm 7 the examination is carried out every 5 to 6 years, farm manager 8 considers it as too labour-, time- and cost-consuming[24] and farm manager 9 did it once without having to because of the renunciation of mineral fertilisers.

Under the prescriptions on fertilisation two of the interviewed farm managers mentioned the restricted amount of 60 kg N/ ha and year as the main limitation under tiers B 2 and B 3. Taking their former amount of fertiliser into account (ca. 120 kg N/ ha) the scheme significantly contributes to the protection of non-biotic resources and the possible protection of the biotic resources. Therefore it is put down with two points. Furthermore the restriction on fertiliser slows down the spring growth and hence reduces the productivity of the grassland over the growing season; this has been considered already under the categories „Pastures” and “Meadows”. The other prescriptions concerning fertilisation did not seem to influence the grassland management. In the case of the demanded soil examination a breach against the guidelines occurred.

[23] In Thuringia the soil is classified into five groups from A to E. The groups are determined by the content of P, K and Mg and thus give an idea of the nutrient supply. Group C refers to a mean supply.
[24] Farmer 8 admits to ignore the prescription of the KULAP here, which indicates the good validity of the interview.

Plant protection products

All three farms are troubled by weed infestations with dock. On farm 8 nettles additionally occur at cattle latrine sites on pastures unsuitable for the use of machines. The farm manager pointed out that weed infestations had not been a problem prior to the KULAP as parts of the grassland had been ploughed up and re-seeded every 7 years. Farm 9 has infestations of thistles, dandelion and couch grass in addition to dock. On farm 9 the manager's attitude and the organic production prevent the application of plant protection products absolutely. There is an intention to spray on farms 7 and 8 after the application has been permitted by the agricultural authority. Farmer 7 received the permission in the spring and is allowed to spot spray outside the fields under tier C now.

If farmers want to apply plant protection products to combat weed infestations they have to apply for a spraying permission. Although nothing can be said about the procedure of approving the application of plant protection products by the agricultural authorities there is an element of impeding their use. Therefore the possible protection of biotic as well as the protection of non-biotic resources becomes very likely. Because its extent is unknown it has been credited with only one point.

Water Regulation

The scheme demands no irrigation or amelioration measures on permanent grassland. Irrigation is generally not an issue in the Thüringer Wald but drains have been installed in the past. On all three farms there are existing drains on the fields. They are maintained on farm 7, farmers 8 and 9 do not maintain the drains; they noted some wet sites due to broken drains.

No new drainage measures have been undertaken. One farm manager maintained pre-existing broken drains. This shows that the farmer either did not understand the prescription or ignored it. The measure leads to the development of wet sites on the other two farms supporting a more diverse biotic life for which it is credited with one point.

Landscape elements

The last prescription under tiers B 2 and B 3, to be willing to manage nutrient-low or dry grassland, extensive orchards and mountain meadows after tier C concerned all three farmers. The C-tiers are analysed in the following chapters.

Concerning the maintenance of landscape elements farmers have to be willing to manage nutrient-low or dry grassland, extensive orchards and mountain meadows according to tier C. Thus the measure paves the way for an enhanced protection of biotic and non-biotic protection of resources for which the category is put down with one point.

Tier C 3: Extensive pasture management on nutrient-low fields, extensive orchards and mountain fields (>400m above sea level)

All three farmers manage fields under this tier. In addition to the prescriptions listed in the scheme the environmental authority adds site specific ones.

Individual prescriptions of the environmental authority in addition to those given in the scheme render an evaluation of these tiers difficult. Valuable grassland habitats and traditional grassland farming practices, e.g. maintenance of traditional orchards, are supported and prevent unproductive land from abandonment on the one hand and from an intensified use on the other hand. Hence the maintenance of the cultural landscape with typical landscape elements is supported. Prescriptions of the environmental authority are for instance late cutting dates, fencing out of wet sites on pastures and not to apply any fertiliser. Measures like these provide a good basis for the protection of biotic and non-biotic resources and have to be assessed as very beneficial for the environment.

Pastures

In the prescriptions of the tier it is said that additional fodder, corralling, re- and surface-seeding can only take place after the instructions of the environmental authority. On set stocked fields (only on extensive orchards and mountain fields) a stocking density of more than 1.0 LU/ ha, controlled grazing, utilisation of water banks, springs, wet areas, wood margins and hedges is not allowed.

Farmer 7 does not use wet sites on those fields. The kind of pasture is rotational grazing with shorter grazing periods resulting in a more extensive use. Farm manager 8 mentioned that the prescription of the environmental authority not to cut the pastures before 1st of July prevented him from doing so around 15th of June. He would like to adapt the management to the weather on the better fields, e.g. to drive out cattle early, cut the fields and graze again. Most of the fields concerned are used less intensively now and are likely to get changed to tier B 2 land in the next contract. On farm 9 the fields under this tier were used more intensively in the past. The fields are grazed extensively and cut after the set cutting dates of the environmental authority.

The prescription of tier C 3 on controlled grazing targets the prevention of the most intensive kind of pasture management. However, the farmers were not affected by the measure. Although one could argue that it is a positive aspect that the farming practice on C 3 fields applies to less intensive forms of management anyway, the initial situation on C 3 suitable fields must be taken into consideration. It can be taken for granted that the initial kind of

pasture management was fairly extensive thus a stricter prescription would have been justifiable. Subsequently the element “kind of pasture management” is not credited.

Two of the farmers had to reduce the grazing frequency on tier C 3 land which works towards a more extensive use of the pastures and is put down with one credit point. Cutting of the pastures is delayed by two weeks due to the special requirements of the environmental authority. Thus an enhancement of the biotic life becomes very likely and the measure is credited with two points.

Fertilisation

On all three farms there is no fertilisation permitted on the fields concerned, a prescription of the environmental authority. According to farm managers 7 and 8 mountain fields have been occasionally fertilised by helicopter in the former GDR. They yield less now.

Any input of mineral fertiliser would encourage the growth of competitive plants and change the botanical composition of the sward. Therefore the prevention of the application can be put down with two plus points.

Tier C 4: Meadow Habitats

Farmer 7 manages fields under this tier.

Meadows

The meadow prescriptions of the KULAP include set cutting dates (1st of July and 1st of September), the maximum cut of 1.5 ha in one go and the necessity to remove the crop. On the farm there is only one of the fields under tier C 4 larger than 1.5 ha. It is cut in one go since the prescription is “realitätsfern” (not practical)[25]. Some of the fields managed under this tier have not been used at all in the past. The farm manager noted very frequent visits by the environmental authority. The fields with the set cutting date of 1st of September do not yield anything since by then the crop has become too old. It gets composted.

Concerning cutting dates the effects and evaluation of the measures applies to the ones described under tier C 3 above. The tier entails a prescription on the cutting regime, namely to cut 1.5 ha at most in one go. However, beneficial effects cannot be expected as the farmer ignores the prescription. Despite frequent field inspections of the environmental authority, the breach has not been discovered by the environmental authority yet. Thus the measure cannot be credited.

[25] The farmer admits to ignore the prescription of the KULAP here, which indicates the good validity of the interview.

Fertilisation

In addition to the meadow prescriptions the environmental authority demands the renunciation of fertilisers. The farmer meets this requirement.

As this is likely to show the same effects than described above, the category is rewarded with two points.

Table 6: Survey of the KULAP - scheme

		Tier B 2	Tier B 3	Tiers C 3/ C 4	Ext. potential[26]
Livestock	Stocking rate	O	O		O
	Extensive breeds	O	O		O
Pastures	Kind of pasture	O	O	O	O
	Grazing frequency	+	+	+	+
Meadows	Cutting date	+	+ +	+ +	+ +
	Cutting frequency	O	+		+
	Cutting regime	O	O	O	O
	Crop conservation	O	O		O
Cultivation	Pasture-topping	O	O		O
	Rolling, levelling, harrowing	O	O		O
	Ploughing up	+ +	+ +		+ +
	Re- and surface-seeding	O	O		O
Fertiliser	Amount of fertiliser	+ +	+ +	+ +	+ +
Plant protection products	Input of plant protection products	+	+		+
Water regulation	Drains	+	+		+
Landscape elements		+	+	+	+

[26] Extensification potential.

5.3.3 Results of the scheme

All three farm managers pointed out a reduction of the yields, on farms 7 and 9 by about 30% and on farm 8 even by 50%. According to the managers there is sufficient compensation by the KULAP incentive; farm manager 9 even mentioned an over-compensation of the losses.

On all three farms the KULAP encourages more utilisation in general. Farm manager 8 stated that this encouragement is mainly affecting marginal fields.

Without the scheme better fields would be used more intensively on farms 7 and 8. On farm 9 labour-intensive fields could not be managed.

No altered species composition of the sward has been noticed on farm 7 yet. The manager of farm 8 pointed to an increase of weeds (curled dock and nettle) and white clover as well as a decrease of mass-growing grass species. On farm 9 an increase of orchids has been noted especially on mountain fields.

5.3.4 Conclusions

The survey of the KULAP grassland part reveals drastic farming changes. The grassland managed under tiers B 2 and B 3 is greatly affected by the substantial limitation of mineral fertiliser as the productivity of the grassland is lowered by more than 30%. This is supplemented by the ban on ploughing up grassland and delay of the first cut under tier B 3. The cultural landscape is maintained by farming valuable grassland habitats and preventing unproductive land from abandonment as well as from an intensified use.

The schemes well co-ordinated measures provide scope for an enhancement of the grassland beyond the status quo under all tiers through the drastic farming changes even though it has to be taken into consideration that agricultural wise the area of study is marginal and disadvantaged (see chapters 5.3.1 “Area of the study: Thüringer Wald “ and 2.1.1 “Development of the CAP”). Looking at the structure of the grassland- tiers the scheme has a “whole-grassland-branch approach” which prevents intensified grassland management outside the area under contract. Tier B 2 applies to the whole grassland of an agricultural holding and can be supplemented with tiers B 3, C 3 and C 4. Hence farmers are flexible to tailor the scheme to the farm. The payment rates depend on the amount of grassland of the farm, farmers with 60% grassland and more receive higher payments than farmers with a smaller proportion of grassland. This compensates for the lower productivity of grassland and supports farms with large proportions of grassland as the farming impact on grassland is generally much lower than on arable land.

Tiers B 2 and B 3 apply to the whole Bundesland and hence lack a more differentiated approach where the prescriptions would be adapted to the regional agricultural and environmental circumstances.

Recommendations

The administrative process of the scheme revealed that matching the financial years of the TMLNU and the EU would be beneficial for the farmers as well as the TMLNU. In addition the TMLNU should provide scope for easing the handling with the frequents shifts of property rights and the rights of utilisation and generally design the administrative process more efficiently. Because there are many changes of leaseholders and –takers the length of the scheme should be handled in a more flexible way. Additionally there should be a chance to try out the tiers with financial support before fixing the contract over a longer period.

The measures under the category „Water regulation" should be named more specifically to „no installation of new drains and no maintenance of existing broken ones". This would prevent a continual amelioration of the permanent grassland and slowly create more diversified grassland habitats.

Does the KULAP meet its objectives?

The study of the three farms revealed that the KULAP is certainly suitable to meet its objectives, namely the protection of the environment, the maintenance of the cultural landscape, species and habitat protection and market relief.

Considering the tiers investigated in this study a non-biotic protection of resources particularly through the restriction on fertiliser meeting the objective „Protection of the environment" can be noted. There is scope for the development of biotic resources under the scheme, too, targeting the objective „Species and habitat protection". The maintenance of the cultural landscape is primarily ensured through the prevention of the abandonment of grassland. Finally a market relief of more than 30% compensated for by the payments was revealed by the three farmers. The farmers stressed the importance of the incentive, thus indicating that the farms would be substantially smaller without the grant and that the KULAP provides a good perspective for the future.

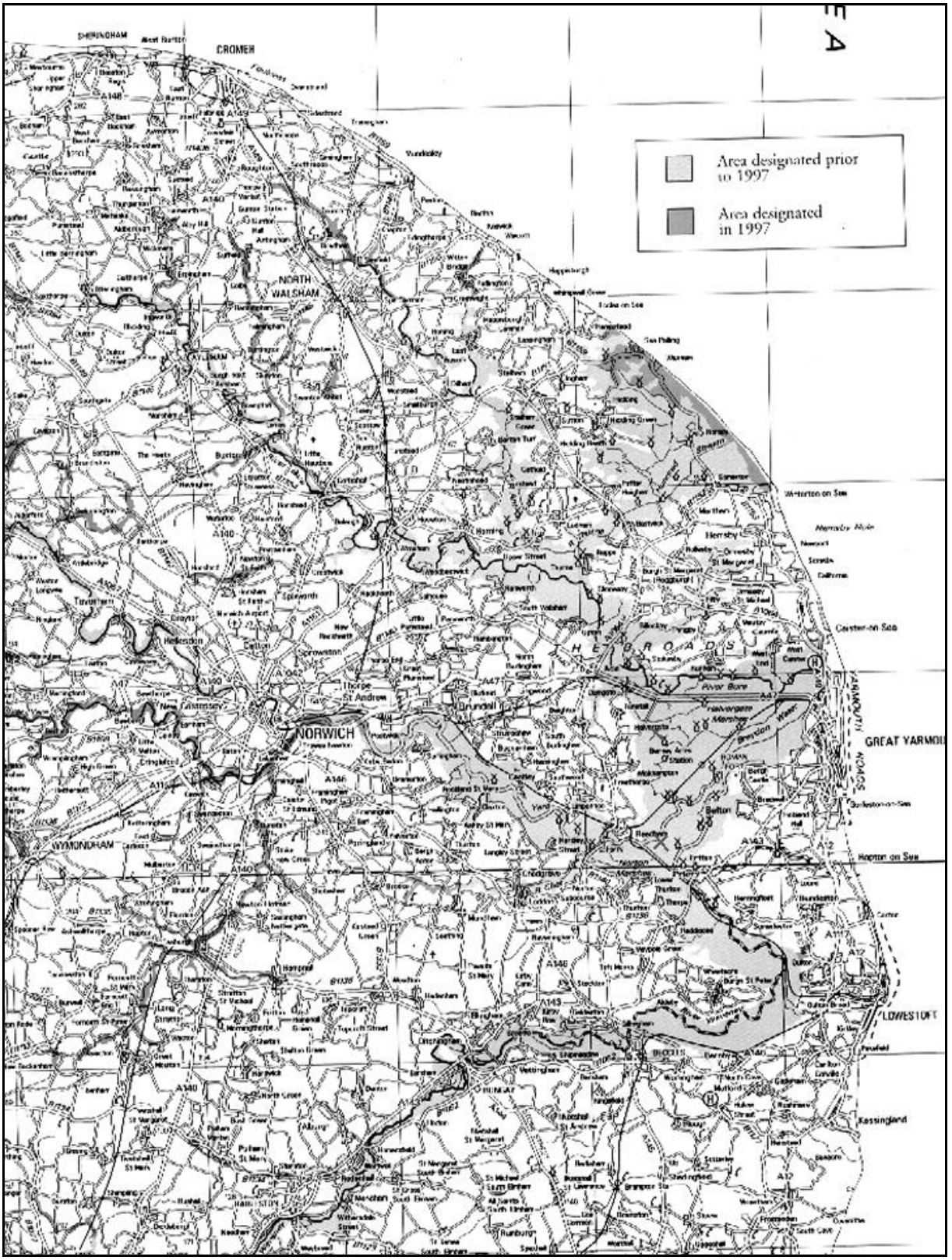
5.4 ESA Broads

The topography of the Broadland is described by the NCC (1965, p. 10) as „an extensive system of marshland, inter-connected waterways and shallow lakes or Broads lying in the valleys of the River Bure, Yare and Waveney, and their tributaries.“ Lower parts of the valleys and flood plains are known as the Halvergate Marshes. The shallow lakes or Broads are peat excavations which became flooded during medieval times. The maritime climate of the Broadland is determined by the North Sea nearby although it shows a slightly more continental influence than other parts of Great Britain. Mean precipitation is ca. 640 mm/ year, most of it falling during the winter. The mean annual temperature lies at 10°C (GEORGE, 1992, p. 24 ff.).

The marshes of the Broadlands were used to a great extent for the production of reed, sedge, marsh litter, alder poles and other crops until ca. forty years ago (NCC, 1965, p. 15 ff.). The traditional management of the marshes includes summer grazing for fatstock and dairy cattle mainly on drained grassland, cutting fen for thatching materials and animal bedding (MAFF, 1997 a, p. 2). According to the AGRICULTURAL COMMITTEE (1997, p. 11) it was particularly during the 1970s and 1980s when „traditionally managed grassland came increasingly under threat by conversion of permanent grassland to arable land. There seemed every prospect that grassland areas would continue to be ploughed up and that the traditional character of the grazing marshes would be virtually destroyed.“

There are three different levels for the organisation of the Broadland drainage system. Firstly, main rivers (natural or artificial ones) lie under the responsibility of the Environment Agency. Secondly important drains which are connected with main rivers are under the responsibility of the Internal Drainage Board (IDB). Landowners who are concerned by the IDB - drain are entitled to be elected to the Board where the water levels of the drains are fixed. The third level of drains comprises field ditches and other minor drainage measures. At that level, farmers are responsible for the water levels of the dykes (MOUNTFORD, 1998).

The map below shows the designated area; the crosses roughly mark the location of the farms.



Source: MAFF, 1997 a, p. 2 f.

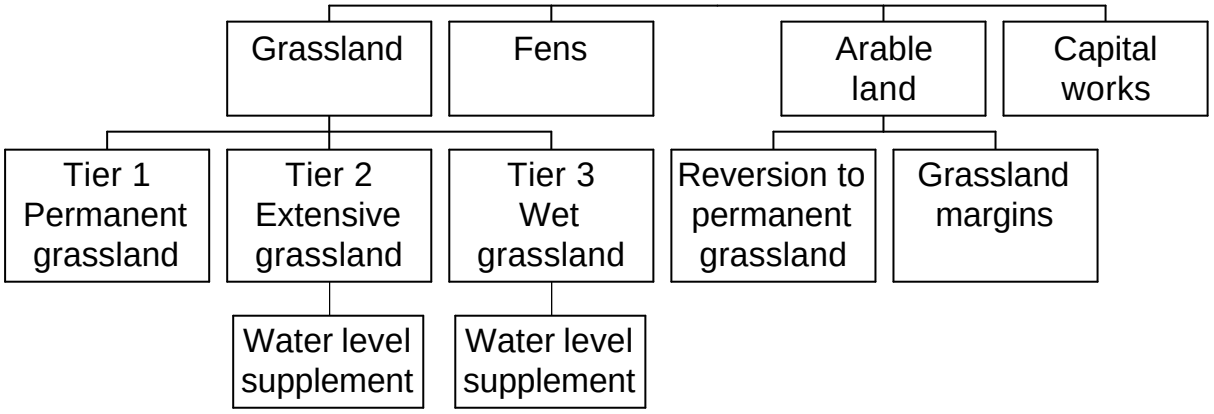
5.4.1 Introduction of the ESA Broads

The Broads belong to the group of ESAs launched by MAFF in 1987. In fact it was in the Broads where the development of the ESA scheme started. One of the farmers interviewed described the development:

„Under a previous scheme from MAFF you could get grants to drain the land on the marshes. About 50% of the land had been drained already when members from Friends of the Earth started a campaign against draining more marshes. The campaign resulted in a round table with environmentalists, farmers and the concerning authorities. Finally out of all this a scheme was developed to promote and support grazing on the marshes which then became the ESA scheme in 1987."

The scheme with its four main parts is depicted in Figure 26:

Figure 26: ESA Broads



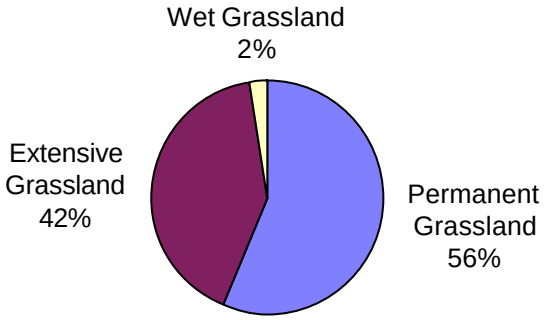
Source: own diagram, data from MAFF (1997 a, p. 4)

The designated area of the ESA Broads comprises 24 000 ha eligible land for agreement. About 75% of the eligible land are currently under contract. The take-up rate of the eligible grassland is 96%. The take-up rates of the arable part and the fen tier remain low on to 2% of the eligible area each.

In the following the grassland part of the scheme will be described and analysed in detail.

Figure 27 below shows the breakdown of the grassland tiers.

Figure 27: Breakdown of the grassland tiers



Source: own diagram; data from the Project Officer, personal interview.

In addition to the three different tiers land can be managed under the so-called „Water Level Supplement“. Farmers with land under tiers two or three can get the Water Level Supplement if they keep higher water levels than the ones laid down in the prescriptions. Currently about 4% of the grassland managed under tier 2 „Extensive Grassland“ fulfil the requirements of the Water Level Supplement in contrast to tier 3 “Wet grassland” where 53% meet the supplement`s requirements. The high take-up of Water Level Supplement on fields managed under tier 3 does not surprise since the Supplement does not add extra restrictions.

The four parts of the ESA scheme aim to „protect, and, where possible, enhance the distinctive pastoral landscape character of the area and its wildlife and historic resources by encouraging extensive grassland and fen management.“ (MAFF, 1997 a, p. 2).

The agreement between farmers and MAFF is for a period of ten years with a break clause after five years, which provides the option of ceasing or altering the contract for both sides. Farmers who join the scheme may include some or all of the permanent grass or arable land of the farm within the ESA. The three tiers concerning grassland management are based on each other, for example the prescriptions under tier 2 demand that one abide by the management prescriptions of tier 1 and tier 2.

Tier 1 aims to support the extensive management of grassland which provides a habitat for many plants and invertebrates. The flora and fauna on this grassland cannot tolerate disturbance caused by arable cropping or intensively farmed grassland. According to MAFF (1997 a, p. 6) the objective of the tier „is to maintain this pastoral landscape together with all

the field boundary features and items of historic interest.“ Any or parts of the grassland of a farm within the ESA boundary may be entered to the scheme.

Extensive grassland managed under tier 2 consists of marshes with high water levels in the surrounding dykes. Because of the distinct site factors they are more likely to contain wildlife interest. MAFF`s (1997 a, p. 7) objective of the tier is „to maintain and enhance the ecological interest of the marshes by environmentally friendly farming practices.“ Permanent grassland with significant ecological interest and with high summer water levels can be entered into the ESA. There is also an additional grant available through a Conservation Plan to cover 80% of the costs of measures to control water levels.

MAFF notes for tier 3 „Wet Grassland“ that „some of the marshes in the Broads are particularly wet during the winter and spring. These are valuable for wintering and breeding waterfowl such as wigeon, snipe and lapwing which require damp, soft ground for feeding. These wetter areas often support special wetland plants like marsh orchids and ragged robin.“ (MAFF, 1997 a, p. 8). Enhancement of the wet grassland can be achieved by controlling water levels and agricultural activities. Farmers who can control water levels to maintain bank full dykes through the late winter and spring and to limit the grazing in the early summer may enter the land to the ESA. Additional grant through a Conservation Plan is available under this tier, too.

The Water Level Supplement demands high water levels on the marshes during the summer months. This might create ideal conditions for breeding waders requiring permanently damp areas for feeding. According to MAFF (1997 a, p. 9) „these valuable low damp areas may occur naturally on undulating marshes but elsewhere they may need to be created through the use of footdrains to bring water on to the marsh from the dykes.“ Farmers who are able to maintain high water levels during the summer can apply for this additional grant under tier 2 and tier 3.

Under the tier „Capital Works“ there is an opportunity to get grants for a variety of capital works which will enhance the character of the landscape, wildlife habitats and protect historic features. All measures have to be included in a conservation plan agreed in advance.

The detailed prescriptions of the grassland tiers and the Water Level Supplement are put down in Appendix 4.

5.4.2 Implementation and discussion of the ESA Broads

5.4.2.1 Level of the Project Officer

As with all ESAs, there is a Project Officer with his staff in the Broads ESA, acting in the FRCA. The Project Officer holds a middle position between MAFF on the one side and farmers on the other side. The administrative process of the ESA includes that the Project Officer and his assistant have to recommend farmers to MAFF, in the case of the Broads they have to send application forms to the Regional Service Centre in Cambridge.

Advertising the scheme and supervision of farmers are the main tasks of the Project Officer and his staff. Notably the supervision work demands a high effort and includes in the case of the Broads following tasks (Project Officer, personal interview):

- Controlling water levels (in most cases an increase of the water level is desirable). The Project Officer deals with all persons who are involved in the control of the water levels.
- Dealing with Nature Conservation Agencies such as the Broads Authority (National Park) which is covering large areas of the ESA to co-ordinate for instance the fine tuning of the Conservation Plan of the ESA with the objectives of the National Park.
- Monitoring and compliance checks.
- Developing the Conservation Plan.
- Meeting the field officers who carry out the field inspections.
- Arranging liaison meetings with various bodies such as English Nature (in order to work out the management for SSSIs, SPAs (Special Protection Areas), etc.).

Fine tuning of the existing areas under agreement, i.e. matching the tiers together instead of having patches of tier 1, 2 and tier 3 land in one area, is a major task at present. Filling the gaps between the existing areas. This is more desirable than extending the existing ESA area.

Controlling the water levels is one of the most difficult problems. Since water gets pumped away the whole region becomes dryer whereas the ESA management aims to keep or even increase the water levels.

Field inspections are carried out by field officers from MAFF, they actually inspect the farms and fields.

The monitoring programme mainly lays under the responsibility of MAFF and conducted by ADAS.

Farmers, farm managers and landowners get informed about the scheme through adverts in newsletters, letters sent to them directly, lectures at various meetings and liaison meetings. The high take-up rate underlines the effectiveness of the information strategy.

5.4.2.2 Level of the farmers

In the following box information about farm size and the area under agreement is given.

Figure 28: Information about the farms

Farm 10

The farm was taken over in April 1997. The previous owners had already managed some of the land under ESA agreement. Now all of the marshland is under agreement. A farm manager is looking after the farm.

- AA: 1377 ha
- Area under agreement: 1093.5 ha
- Area under tier 2: 1053 ha
- Area under tier 3: 40.5 ha

Farm 11

A tenant manages the area under contract for the landowner. On the fields under contract he keeps his stock only for grazing as he deals with livestock. It is not clear if the tenant would still be able to rent the area if the ESA did not exist and if the landlord himself would manage the land more intensively to get more profit out of it. According to the landlord half of the land would be arable land by now without the ESA scheme.

- AA: 315 ha
- Area under agreement: 40 ha
- Area under tier 1: 2 ha
- Area under tier 2: 3 ha
- Area under tier 2 with Water Level Supplement: 35 ha

Farm 12

The RSPB as a nature conservation body has land under contract as farming is considered as a tool which delivers nature conservation. The NGO took an active role in developing the scheme and is pursuing a cost-effective way of nature conservation is pursued on the reserves.

- Area under agreement: 700 ha
- Area under tier 1: 105 ha
- Area under tier 2: 84 ha
- Area under tier 2 with Water Level Supplement: 350 ha
- Area under tier 3: 121 ha
- Area under tier 3 with Water Level Supplement: 40 ha

A comparison between the breakdown of the grassland tiers on the three farms studied with the general breakdown of the ESA reveals that the three farms do not give a representative picture of the tiers. The highest take-up is under tier 2 with 83% (compared to 42% of the ESA), 11% of the total AA of the farms are managed under tier 3 (2%) and 6% are managed under tier 1 (56%). This distortion is taken into consideration under the results of the scheme.

General aspects of the implementation

Two of the farm managers actively took part in the development of the ESA scheme and entered the scheme when it was launched in 1987. Farmer 10 received the information about the scheme from MAFF, parts of the farm were already under contract when he took over the holding, other parts of the farm were entered recently.

All three farmers welcomed the conservation idea of the ESA. For farmer 10 the scheme fits in with his ideals of livestock management. The fact that minor restrictions result in a significant incentive is the motivation for him to take part. The land-agent of farm 12 stated that „most of the land in the Broads was bought from 1980 onwards in order to stop a further conversion of marshlands into arable land." Since the marshes are a very important habitat for many bird species we tried to provide at least some of the marshes as grassland."

Two of the farm managers stated a high initial administrative effort and on all three farms the effort demanded after the set up of the scheme is considered to be reasonable. Supervision by the Project Officer is also considered to be good, two farmers pointed out the brilliant relationship to the Project Officer. Criticism concerning the administration of the scheme applies to the understaffed Project Officer. This makes it difficult to get hold of him, prolongs the time of processing applications and causes delays of the payments at the beginning of the scheme.

To sum up the general aspects of the scheme, financial support and nature conservation issues are important motivations for the three farm managers. Since the ESA development started in

the Broads it is well known among farmers and the way farmers get informed about the scheme is considered to be effective. Initially the administrative effort was very high but is reasonable now. The supervision by the Project Officer is generally considered to be very good as he can speed up processes substantially and is a direct contact person. This matches the statement of the Project Officer, who sees himself holding a middle position between MAFF and farmers. The Project Officer system and the reasonable administrative effort are considered to be very positive aspects of the ESA scheme.

Tier 1: Permanent grassland

As described above the management prescriptions of tier 1 also apply to the higher tiers. The categories "Livestock", "Cultivation", "Plant protection products" and "Landscape elements" under tier 1 apply to all other tiers. Although only two farms (11 and 12) actually manage land under tier 1, the statements of all three farm managers are analysed for those categories. To prevent confusion the number of farms affected by the individual categories will be given at the beginning of each category.

Livestock (three farms)

The scheme does generally not demand a certain stocking rate but it prescribes to graze only with cattle, sheep or horses. Farm manager 10 keeps cattle and sheep mounting to a stocking rate of 1.2 LU/ ha grassland. Farmer 11 has cattle and sheep and reaches a stocking rate of ca. 2.75 LU/ ha grassland. On Farm 12 the stocking density mounts to 1.0 LU/ ha. Though this number might be incorrect due to woodland, fen, ponds, buildings etc. included in the total area owned by the RSPB, it gives a rough idea about the stocking rate. On all three farms kind and number of livestock kept is not affected by the guidelines of the scheme.

The requirements under the category „Livestock" did not result in changes towards a more extensive form of livestock management but maintain the status quo. The latter is fairly extensive on two farms but at a more intensive level on the other farm. Thus stricter prescriptions would target the conventional farmer and would still support environmentally friendly farming practices. However, the actual design of livestock management required under tier 1 does not entail stricter guidelines and is not credited subsequently. The keeping of rare breeds is not covered by the scheme.

Pastures (two farms)

The management prescriptions of the tier aim to avoid poaching and over- or undergrazing.

On both farms concerned the overall grazing season lasts from 1st of April until 31st of December, on farm 12 cattle stay out from May until October. The kind of pasture management is rotational grazing on farm 11 and shepherding on the RSPB land. On the latter grazing density and period are adjusted to the nature of the individual fields. Farmer 11 mentioned possible overgrazing in dry seasons, but no undergrazing or poaching of the grassland.

Likewise livestock management the pasture management of the concerned farms differs, too. Both, intensive and extensive forms of pasture management are possible. The argument of the fictive effectiveness of stricter prescriptions applies to this category as well. Thus the category is not credited. This also applies to the element "Grazing frequency".

Meadows (two farms)

The scheme demands to carry out one cut of hay or silage at most, together with aftermath grazing. On both farms the cutting has not changed under tier 1 of the scheme.

Thus meadow management is up to the individual farmer and hardly affected by the prescription. Again intensive and extensive forms are possible and, referring to the argument of the first two categories, meadow management under tier 1 is not regarded.

Cultivation (three farms)

Maintenance measures allowed under the scheme do not include ploughing, levelling or re-seeding but the use of a chain harrow or roller.

Farm manager 10 maintains the pastures through grazing though he would like to plough up and re-seed some fields where the sward has a poor quality. Approximately half of the marshes would get levelled without the scheme. Farmer 11 re-seeded the sward regularly in the past and considered the requirement not to re-seed the grassland as restrictive. The RSPB reserve is not affected by the guideline as the sward is maintained mainly by grazing and by pasture topping when necessary.

The prescription on the cultivation of grassland changed the farming practice of two of the three farmers. Re-seeding, levelling and ploughing up of the grassland is prevented by the scheme which provides a basis for the protection of biotic resources as habitats remain undistorted. In addition the sward is not improved by mass-growing grasses but has to regenerate itself and adapt to newly developed conditions. Thus levelling and re-seeding are

credited with one point and ploughing up is credited with two points since its negative impact on the environment is far higher.

Fertilisation (two farms)

Concerning fertilisation tier 1 requires not to exceed the existing level of inorganic fertiliser and not to exceed 125 kg N/ ha, 75 kg P/ ha and 75 kg K/ ha in any case. No more than 94 kg N/ ha have to be applied in one go. The application of farm yard manure must not be exceeded, the maximum is 30t/ ha of home-produced cattle slurry at 10% dry matter in any year or the equivalent if dry matter is less than 10%. Pig slurry or poultry manure must not be applied.

The tenant of farmer 11 does not apply any fertiliser due to the lack of equipment. Therefore most of the land could be entered to the Water Level Supplement. On the RSPB reserves no fertiliser is applied on the pastures at all since the organisation as a nature conservation body basically rejects fertilisation. However, some of the RSPB - meadows under tier 1 are fertilised with 50 kg N/ ha.

Although the guidelines on fertilisation of tier 1 allow the application up to certain limits, fertilising large quantities is not an issue on the two farms studied. Both farm managers apply to an extensive use of fertiliser for which the category is put down with two points as an enhancement of the biotic and non-biotic resources becomes very likely.

Plant protection products (three farms)

The scheme requires to control weeds without using fungicides or insecticides. Herbicides are allowed to control certain weeds. All three farms are troubled by weeds, on the grassland of farm 10 thistles and chickweed have occurred; they are controlled by spot spraying. Farm manager 11 noted thistles, rushes and horsetail, farm manager 12 thistles and ragwort. The tenant of farm 11 controlled the thistles by a blanket spray when the problem had become worse under the scheme. The revised version of the scheme from 1997 allows to spot spray several weeds so weed infestations are likely to become easier to control now. Farm manager 12 prefers pasture topping to control weeds and spot sprays when problems become worse.

The scheme allows spraying herbicides to control several weeds which is undertaken by two farm managers, although to different degrees. Spot spraying and even blanket spraying in one case were mentioned by the farm managers. Hence the category „Plant protection products“ does not prevent from an input of plant protection products and cannot be regarded.

Water Regulation (two farms)

Both farm managers did not mention any changes due to the management prescriptions under tier 1 concerning water regulation.

Since the guidelines do not lead to management changes of the water regulation on the farms but apply to the general farming practice enhancing effects for the biotic resources cannot be credited.

Landscape elements (three farms)

The category „Landscape elements“ lists the maintenance of hedges, ponds and reedbeds.

On farm 11 there is a pond concerned by the prescriptions under the category „Landscape elements“ which required very little maintenance so far.

These elements support a diverse landscape and consequently diverse habitat structures for wildlife for which the category is put down with one credit point.

Tier 2: Extensive grassland

Additional requirements to tier 1 are analysed under this tier. All three farms manage land under tier 2.

Pastures

The specific prescriptions concerning pasture management under tier 2 fix the grazing season from 1st of April until 31st of December.

On Farm 10 the cattle grazing season lasts from 1st of April until 1st of December and sheep graze from 1st of August until 1st of December. Poaching, over- and undergrazing do not trouble the farm manager.

Concerning the grazing management there are no changes to tier 1 on farms 11 and 12 (where the category was not credited) subsequently no credit points can be given here, too.

Meadows

Considering the meadow management tier 2 neither allows to cut for silage at all, nor for hay before the 16th of July, i.e. the elements “cutting date” and “crop conservation are connected. Farm manager 10 sticks to the cutting date for hay but cuts for silage and thus ignores the

actual prescription[27]. However, according to the Project Officer´s interpretation the cutting date refers to both, hay and silage, thus approving the management of farm manager 10. On farm 11 there is one cut for hay-lage[28] if there is enough grass. Prior to the ESA the fields were cut about one month earlier. Farm manager 12 cuts for hay and silage and sticks to the cutting dates of the scheme in the case of hay making. The cut for silage is one month later (16th of August).

The late first cutting date under the tier delayed the cut on two of the farms for about one month. This is a striking positive aspect of the tier as the measure supports the natural regeneration of the sward and protects meadow birds as the nests are not destroyed by machines. Therefore it is put down with two credit points. The cutting regime depends on the farmer and is not influenced by the management guidelines. The crop conservation requirement (not to cut for silage, respectively) targets to support the natural regeneration of the sward and supplements the late cutting date. Unfortunately the Project Officer interprets the prescription deviating from the official guidelines. He cancels out the positive aspects of the element "crop conservation". Although one farm manager abides to the prescription in its original meaning and cuts for silage substantially later than for hay, the element cannot be credited.

Fertilisation

The prescriptions concerning fertilisation under tier 2 are not to exceed the existing level of N, not to exceed 44 kg N/ ha in any case, not to apply P or K, not to apply lime, slag or any other substance to reduce soil acidity and not to apply any organic manure.

Farm manager 10 sticks to the maximum of 44 kg N/ ha and would apply twice the amount on silage marshes without the scheme. Farms 11 and 12 were not affected by the prescriptions of the tier for the same reasons as described under tier 1 (lack of equipment, general rejection of fertilisers, see description under "Tier 1: Permanent grassland").

In fact the limit on the application of fertiliser reduced the amount of fertiliser by 50% on certain fields of one farm whereas the other two farms were not affected. The negative effects of fertiliser on the biotic and non-biotic resources are substantially reduced under the tier which is thus credited with two points.

[27] The statement indicates the good validity of the interview, see chapter 4.1.2 „Validity".
[28] Although hay-lage stands between proper hay and silage, it is generally considered as hay under the scheme.

Water Regulation

The guidelines of the tier set various water levels to be kept in the dykes during the summer and the winter. Mechanical operations should not be carried out between 31. March and 16. July and a plan of dyke management has to be agreed and implemented. Farm manager 10 sticks to the water levels demanded as it is better for cattle to keep higher water levels in the dykes anyway. There is only one main drainage board running through the land on the farm. To control the water levels a sluice has been installed after entering the scheme.

Farm manager 11 is mainly affected by the requirements of the Water Level Supplement. He stated the active maintenance of high water levels which is possible due to the special location of the farm: on the border from the uplands to the marshes. The water runs downhill and is kept in the ditches with sluices and dams. One main draining dyke is running through the fields but does not affect the water levels due to the sluices and dams. Footdrains have been dug under the scheme to hold the water on the fields. The only problem with elevated water levels occurs in wet years as the marshes are likely to become flooded now.

The RSPB is able to control 100% of the sub-drain ditches of the land under agreement. In general the RSPB wants to see much higher water levels on the fields than the adjoining landowners. Therefore the RSPB tries to be elected to the Board and to represent its interests there. According to the land-agent drains and foot drains were re-dug, new ditches were dug and sluices and dams were built on some fields. He considers the ESA agreement as slightly unfair in some cases, e.g. when high water levels have to be maintained but the water supply cannot be controlled. In some cases the RSPB even pays the IDB to pump water into fields.

On two farms the water levels of the dykes would be lower without the ESA scheme as the high water levels lower the yields of the grassland. High water levels in the dykes result in wetter conditions on the fields and many intensive, mass growing grass species cannot cope with wetter conditions. Consequently an adaptation of the sward to the wet conditions, i.e. a more diverse sward can be expected. Furthermore, wet fields provide food for a wider range of birds, for example waders. Hence the category is put down with two points.

Tier 3: Wet grassland

Additional guidelines to tiers 1 and 2 are analysed under this tier. Farms 10 and 12 manage land according to the guidelines of tier 3.

Pastures

The guidelines require grazing with livestock between 1. November and 15. May and grazing with no more than 0.75 LU/ ha grassland.

On farm 10 the land managed under tier 3 is on a lower altitude and therefore wetter compared to the other marshes. The fields concerned are not grazed until 1st of July. Since the RSPB has been involved in creating the guidelines the shepherds adjust stocking density and grazing time to the management rules.

The measures required help to keep the sward intact as poaching is very likely under wet conditions. Birds might benefit from these restrictions, too, as less stock is disturbing them or destroying their nests. Therefore a positive effect of the guidelines on the biotic resources is probable and regarded with one point.

Fertilisation

No organic or mineral fertiliser is applied on tier 3 land of both farms. Farm manager 10 would fertilise without the scheme to improve the quality of the grass, hence a change due to the scheme rules can be noted.

This restriction changed the practice of one of the farm managers and is therefore certainly beneficial for the non-biotic resources and for the maintenance or development of biotic resources. Thus the category is credited with two points.

Water regulation

The management rules demand higher water levels and the creation of shallow pools under this tier. Farm manager 10 sticks to the management rules and farm manager 12 even goes beyond them: instead of creating shallow pools the RSPB tries to widen the ditches in certain distances in order to keep the water throughout the year.

On one of the farms the water levels of the dykes would be lower without the ESA scheme as high water levels reduce the yields of the grassland. The water levels in the dykes are the same under tier 2 and 3 but tier 3 requires them for a longer period, so the effects of the high water levels and the creation of shallow pools during the winter are likely to go beyond the ones described under tier 2. Hence the possibility of protecting and enhancing biotic resources under this tier is very high and can be put down with two credit points.

Water Level Supplement

For reasons of clarity the Water Level Supplement is analysed in the same way as the individual tiers before, although it is only a supplement. Farms 11 and 12 entered land into the supplement.

Pastures

Both farm managers stick to the management rules of this category, namely a maximum stocking rate of 0.75 LU/ ha from 1st of April until 31st of May and the renunciation of grazing with sheep until 1. June. The pasture management required under the Water Level Supplement goes beyond the tier 2 prescriptions. It is more restrictive than its management under tier 3.

The guidelines on livestock influence farming on tier 2 land. The effects of the requirements correspond to those described under tier 3 under the category "Livestock". They are likely to be beneficial to biotic resources and are credited with one point.

Fertilisation

The requirement to refrain from applying any organic or mineral fertiliser corresponds to the general farming practice of the two farm managers for the same reasons as described under tier 1 (lack of equipment, general rejection of fertilisers).

Concerning fertilisation the prescription of the Water Level Supplement is restrictive on tier 2 land whereas there is no change on tier 3 land. As the prescription is identical to the requirements of tier 3, beneficial effects on non-biotic resources and the possible benefits for biotic resources can be noted here, too. In accordance with tier 3 they are put down with two points.

Water Regulation

Both farms actively keep the high water levels required in the scheme.

The Water Level Supplement surpasses the prescriptions on „Water regulation" of tiers 2 and 3 and the effects of high water levels over a long period, as described under tier 2, are very likely to be beneficial to biotic resources. Therefore the category is regarded with two points.

Capital Works

The tier „Capital Works“ supports the creation and maintenance of hedges, ponds and various other elements of landscape and therefore a diverse landscape. It also financially supports measures of the Conservation Plan, for example the construction of sluices and dams to keep high water levels.

All three farms received grants for capital works. Farm manager 10 cleared long distances of dykes which had not been cleared for a long time, on farm 11 a pond was re-created and farm 12 was supported for installing sluices and dams to control the water levels in the dykes.

As the measures have to fit in the Conservation Plan worked out individually they are very likely to protect the biotic resources and are put down with one point.

Table 7: Survey of the ESA Broads

		Tier 1	Tier 2	Tier 3	WLS[29]	Ext. potential
Livestock	Stocking rate	O		+	+	+
	Extensive breeds	O				O
Pastures	Kind of pasture	O	O			O
	Grazing frequency	O	O			O
Meadows	Cutting date	O	+ +			+ +
	Cutting frequency	O	O			O
	Cutting regime	O	O			O
	Crop conservation	O	O			O
Cultivation	Pasture-topping	O				O
	Rolling, levelling, harrowing	+				+
	Ploughing up	+ +				+ +
	Re- and surface-seeding	+				+
Fertiliser	Amount of fertiliser	+ +	+ +	+ +	+ +	+ +
Plant protection products	Input of plant protection products	O				O

[29] Water Level Supplement and Capital Works are considered together in this column.

		Tier 1	Tier 2	Tier 3	WLS[29]	Ext. potential
Water regulation	Drains	O	+ +	+ +	+ +	+ +
Landscape elements		+			+	+

5.4.5 Results of the scheme

Farm manager 10 was not able to figure out the reduction of yields as the farm in its present state has been existing only since April 1997. He pointed to the excellent compensation by the incentive for not intensifying the production. On farm 11 there was a reduction of yields of 30% to note; the landowner claimed even a higher loss when taking the potential yields into consideration. The land-agent of the RSPB could not note any production losses as the land under agreement had not been managed intensively prior to the scheme.

Without the scheme on farms 10 and 11 the area under contract would be used more intensively, half of the area of farm 11 would have been converted into arable land. The RSPB uses the areas under agreement in the same way as areas outside the ESA boundary, with farming measures adapted to the needs of nature conservation.

Farm manager 10 did not notice any changes of the sward so far but farm manager 11 noted an increase of rushes in wetter parts of the fields. The land-agent of farm 12 stated that Rye-grass almost disappeared and some older grass species that are more tolerant to wetter conditions have increased particularly on tier 3 land.

5.4.7 Conclusions

As depicted in the survey above, the productivity of the grassland in the ESA Broads is reduced by three factors: firstly the reduction of fertiliser which is secondly accompanied by the delayed cutting date and thirdly high water levels in the ditches over various periods. Those three factors are supplemented by low stocking rates in the higher tiers and by restrictions on the cultivation of grassland in all tiers. These drastic farming changes result in a production loss of about 30%[30] and are very likely to lead to an enhancement of the environment. The individual measures of the different tiers as well as the tiers themselves are excellently co-ordinated between each other.

[30] This figure goes back to only one farmer; the other two farmers were not able to tell the production loss yet or did not manage the land intensively.

Taking the high take-up rate of 75% into consideration and looking at the environmental enhancement on the one side and at market relief on the other side, the impact of the ESA in the region is remarkable. Although farmers may enter single fields to the scheme - which enables farmers to intensify their production just outside the area under agreement - the overall take-up of the ESA is fairly high. Farmers have several options to change their farming practice to different intensities and are thus flexible to tailor the scheme to the individual farm. The limitation of the ESA area allowed to design the different tiers according to the agricultural and environmental needs of the region.

Recommendations

The original prescriptions of the scheme include a distinction between the treatment of hay and silage. This has been cancelled out by the Project Officer´s interpretation on crop conservation who allows to cut for hay *and* silage after the cutting date. It would certainly be beneficial for the scheme to stick to the original prescriptions as the measure targets the natural regeneration of the sward.

Tier 2 limits mechanical interventions on grassland until 16th of July in order to protect ground nesting birds. Despite this limitation the nests still might be destroyed through trampling of the grazing livestock and by the use of a chain harrow or roller in the spring. Consequently a reduced stocking rate and a further limitation of cultivation measures would be desirable.

Due to the numerous exceptions the input of plant protection products still seems to be fairly easy. Putting the obstacle for spraying herbicides slightly higher might prevent from applying them in many cases. The promotion of a more sparse use of plant protection products would be beneficial to the biotic and non-biotic resources and would therefore enhance the ecological value of the grassland managed under the scheme.

Does the ESA Broads meet its objectives?

The objective of tier 1 is to maintain the pastoral landscape together with all the field boundary features and items of historic interest. The analysis of the two farms taking part in this tier revealed the maintenance of the status quo under most categories and a slight enhancement under the category „Cultivation“.

Under tier 2 the ecological interest of the marshes is intended to be maintained and enhanced. In fact, on the three farms the elements „Livestock“ and „Plant protection products“ were kept in the present state and the other categories of grassland management showed enhanced effects on the biotic and non-biotic resources.

Tier 3 has been developed to enhance the wet grassland by controlling water levels and agricultural activities. Summarising the evaluation of the tier the control of agricultural activities and water levels on wet grassland has been successful.

Putting together the results of the three tiers, they all meet their objectives.

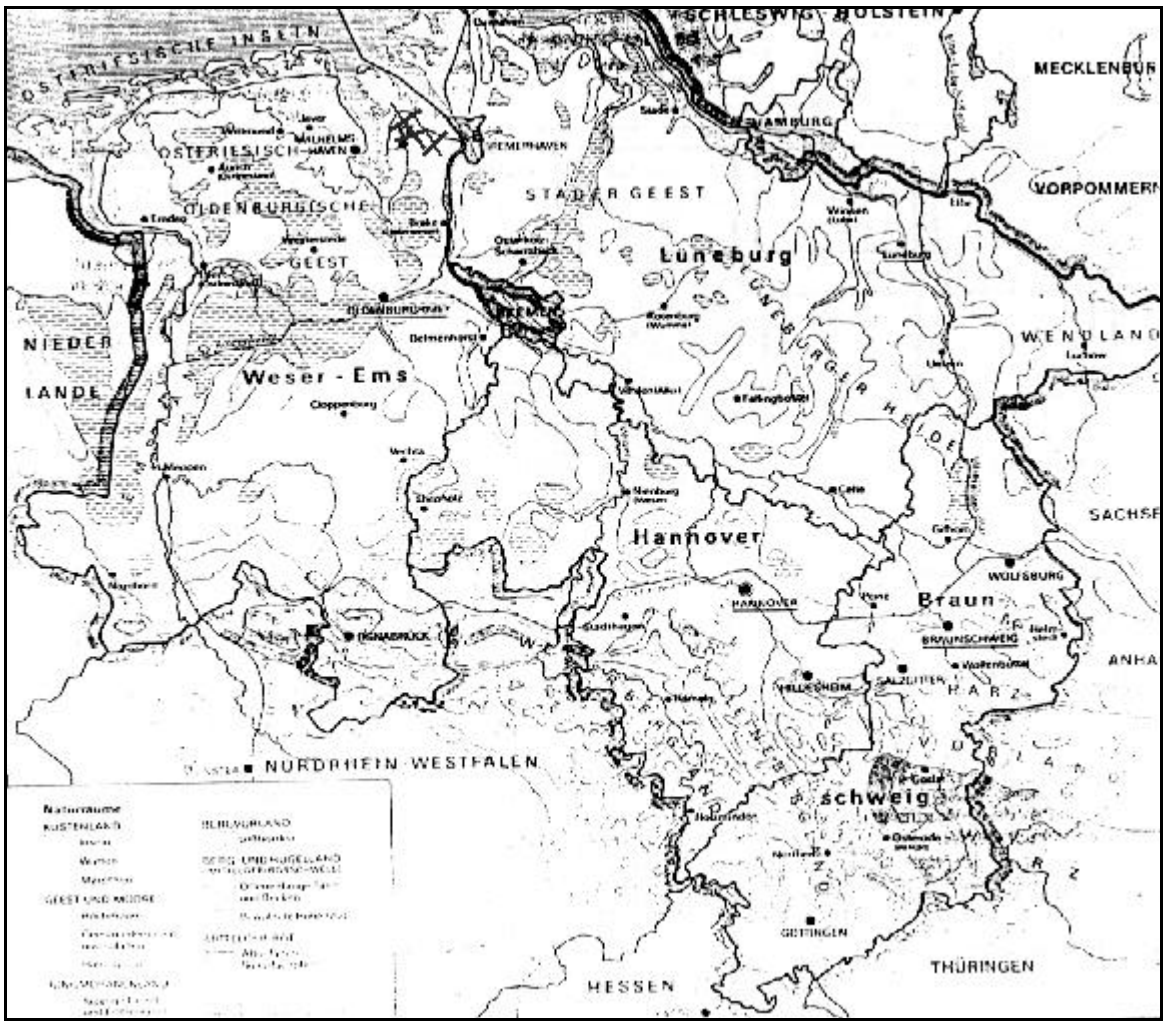
Beside the objectives mentioned above, the scheme also contributes to a market relief of ca. 30% for which the farmers are compensated.

Criticism concerning the payments of the scheme targets that payments made to the farmers should rise with the rate of inflation and that the payments for the higher tiers are still not high enough to attract commercial farmers.

5.5 Lower Saxony

The Wesermarsch belongs to the strip of marshland between the coastline and the sandy heathland further inland. Marshes are a feature of the Holocene; they developed through sedimentation of the tides. The coarser material (sand, silt) is deposited along the coast and brings along a slightly higher land (+ 0.7 to 2m) than towards the inland but is only a very narrow strip in the Wesermarsch. Clay is deposited towards the sandy heathland and leads to lower mean altitudes of about + 0.3 to - 1m (SEEDORF & MEYER, 1992, p. 58 f.). The climate is determined by the maritime influence of the North Sea with characteristic mild winters and cool, wet summers. The mean precipitation is 650 - 800 mm/ year, most of it falling in the summer and the mean annual temperature is 8° to 9°C. The soils are strongly influenced by the geological and geomorphological situation: along the coast they are lighter and well drained due to the higher amount of sand whereas further inland the soils become very heavy and difficult to drain since they mainly contain clay (SEEDORF & MEYER, 1992, p. 200)

The map shows the Wesermarsch and gives the location of the farms (roughly).



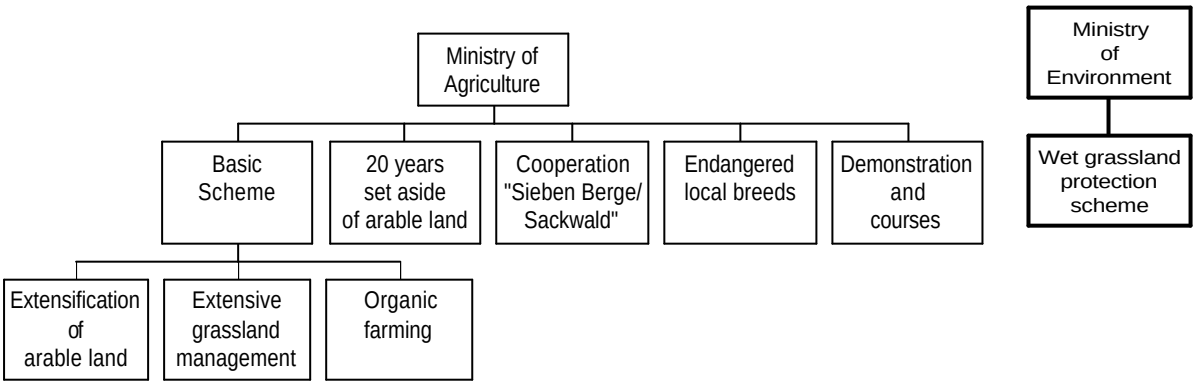
Source: SEEDORF & MEYER, 1992

The higher land close to the coast generally allows arable production. In the Wesermarsch villages are located on this narrow strip, whereas on the lower land the use as grassland becomes optional. Dairy farming is the dominating agricultural production in the region, beef production is only of minor importance. Despite the drainage system with ditches the ground water table remains high on the lower land.

5.5.1 Introduction of Lower Saxony´s agri-environment programme

The implementation of Regulation 2078/92 in Lower Saxony is carried out by the Ministerium für Ernährung, Landwirtschaft und Forsten (Ministry of Food, Agriculture and Forest, ML) and the Umweltministerium (Ministry of Environment, MU). Figure 29 below shows the schemes offered by the two ministries.

Figure 29: Agri-environment program of Lower Saxony



Source: own diagram

Out of the agri-environment programme depicted above the Basic scheme and the Wet grassland protection scheme are the most successful ones considering take-up rates whereas the other schemes offered by the ML remain fairly unimportant. Therefore the two schemes mentioned are studied in the following.

Looking at the general agricultural land use of Lower Saxony in 1995 (NIEDERSÄCHSISCHES LANDESAMT FÜR STATISTIK, 1996, p. 221), the total agricultural area of Lower Saxony was 2 700 786 ha, of which 65.6% were used as arable land, 33.7% were used as permanent grassland and 0.7% were used for other crop.

The area managed under regulation 2078/92 of the Bundesland amounts to 2.6% of the total agricultural area.

Basic scheme

As depicted in Figure 25 above, the Basic scheme is divided into three tiers (ML, 1997):

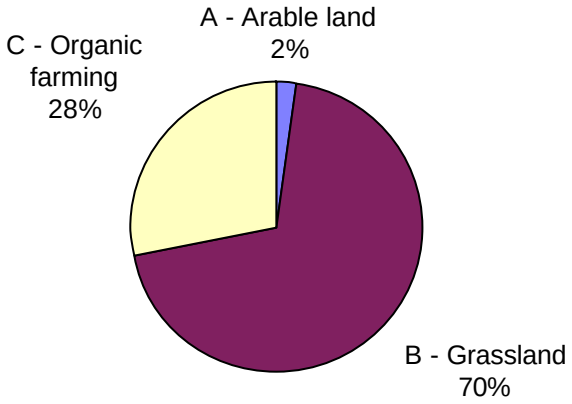
A) Extensification of arable land

B) Extensive grassland management

C) Organic farming

In 1996 the Basic scheme covered 2.5% of the total agricultural area. The land use showed a reverse situation to the general agricultural land use (see Figure 30):

Figure 30: Area managed under the Basic scheme in 1996



Source: own diagram, data from ML (personal interview)

The diagram reveals the importance of extensive grassland management compared to the extensification of arable land or organic farming. A take-up rate of 5.1% of the total grassland area in Lower Saxony can be seen in tier B whereas only a take-up rate of 0.1% of the arable land can be noted under tier A. Apparently it is not attractive for farmers to take part in the extensification of arable farming. Tier C is not considered in this context as organic farming is not investigated in this study.

Since the introduction of the scheme in 1993 the expenditures have been rising continuously. From 1994 to 1997 the expenditures of the scheme almost doubled (from 5.7 to 10.3 Million ECU; ML, personal interview).

It has to be mentioned, however, that in 1996 only the introduction of organic farming and in 1997 the introduction and the continuation of organic farming were supported. At the time of

the interview there was no intention of the ML to renew the contracts for tiers A and B due to financial shortages (ML, personal interview). The Basic scheme has run out be the end of 1998.

As aforementioned the scheme consists of three tiers covering arable farming, permanent grassland as well as organic farming. The scheme targets the following objectives (ML, 1997):

- Protection of the environment;
- Preservation of the natural living conditions; and
- Market relief.

The agreement between the ML and the farmers was for a period of five years. Like in other schemes under regulation 2078/92 farmers who entered into an agreement had to abide to the management prescriptions in return for an annual payment. The general prescriptions of the scheme laid down a maximum of 2.0 LU/ ha main forage area on the agricultural holding, not to plough up grassland and to keep livestock in a certain way.

The tier extensive grassland, which is analysed in this study, comprised two parts, namely the extensive management of permanent grassland of the agricultural holding with 1.4 LU/ ha forage area at most and the reversion of arable land into extensive grassland. However, reversion of arable land into extensive grassland has not been offered because of financial shortages (ML, personal interview). The grassland tier is shown in detail in Appendix 5.

Wet grassland protection scheme

The Wet grassland protection scheme is offered by the Ministry of Environment in designated areas for the protection and development of wet grassland areas in Lower Saxony (MU, 1995). The designated area applies to ca. 140 000 ha of wet grassland (BRAHMS, 1994, p. 23), of which 2893 ha (2.1%) are under contract in the period from 1994 to 2002 (MU, personal interview).

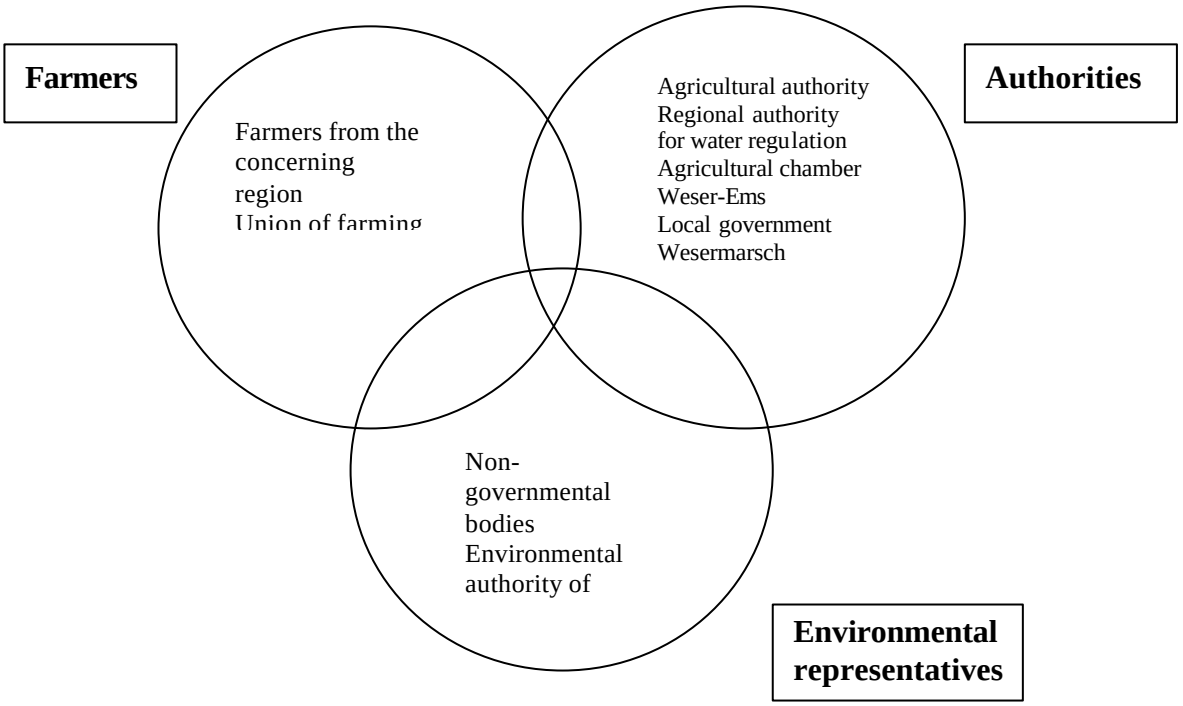
According to the MU (personal interview), the expenditures for the scheme in the same period amount to 715 459.5 ECU in the period mentioned above.

The objectives of the scheme are long-term conservation and development of bird habitats, for instance meadow birds and waders, and of the typical flora of those moist and wet areas.

General prescriptions of the scheme are that the land managed as wet grassland has to be identified on a map, the management has to be documented on field files and the length of the agreement is five years. It consists of three tiers (MU, 1995):

- Extensification of the management after instructions of the environmental authority;
- Conversion or construction of agricultural holdings[31];
- Development and conservation of habitats.

Within the designated area farmers who enter the scheme have to abide to general as well as to special management prescriptions. The latter have been designed by according environmental authority and are adapted to local circumstances. In the case of the Wesermarsch, the designated area under the Wet grassland protection scheme is the „Stollhammer Wisch“. The scheme was developed in a unique way in Lower Saxony. In 1992 farmers and environmentalists met at a round table to discuss the implementation of the Wet grassland protection scheme. At this round table representatives of the following groups were involved (GARDEN, 1997, p. 5):



They created a pilot project called “Stollhammer Wisch”. Objectives were firstly to ensure the existence of meadow birds, secondly, to adapt nature conservation measures gently to the existing farming practices through contracts and thirdly, to protect meadow birds as common

[31] The measure is not covered by regulation 2078/92 and therefore financial support from the EAGGF is not available.

task for *all* local persons involved. The groups involved created a regional workshop for the specific Wet grassland protection scheme of the „Stollhammer Wisch“. GARDEN (et al, 1997, p. 5) points out the importance of the workshop with its three main tasks:

- To co-ordinate measures of the project with existing local farming practices by integrating special knowledge and local circumstances into nature conservation.
- To give farmers a platform to concern themselves with the objectives of nature conservation and to have a say on nature conservation measures.
- To improve the scheme through discussing results and new measures.

The Wet grassland protection scheme in general and the local adaptation to the „Stollhammer Wisch“ are shown in detail in Appendix 5. According to the MU (personal interview) the general prescriptions of the Wet grassland protection scheme apply to every regional adaptation of the scheme. They are incorporated into the prescriptions of the “Stollhammer Wisch", in order to give the chance to see all prescriptions together.

5.5.2 Implementation and discussion of the Basic - and the Wet grassland protection scheme

The two schemes are introduced, analysed and discussed together in order to face the two schemes and to depict the situation of Lower Saxony. For reasons of clarity, each aspect starts with the Basic scheme, followed by the Wet grassland protection scheme.

5.5.2.1 Level of the ministries

The administration of the Basic scheme included the selection of applicants, processing of the application forms, the supervision of farmers and the detailed proof of expenditures. According to the ML (personal interview) the overall administrative effort for the scheme was very high and carried out by the “Amt für Agrarstruktur” (authority for agricultural structure). Due to the limited budget the ML developed various methods to select farmers as not all new applicants could enter the scheme. Since 1996, however, no new applicants have been considered except for the tier “Organic farming” and additional ones of farmers already taking part in the scheme (e.g. for additionally rented fields during the contract period).

The according „Obere Naturschutzbehörde“ (higher agricultural authority) controls the Wet grassland protection scheme in terms of adaptation of the measures to the needs of the protected habitats. Processing of the applications and making the contracts is under the responsibility of the „Amt für Agrarstruktur“. Since these authorities process all agricultural

applications, the administrative effort is reasonable and double incentives and other mistakes are prevented.

Field inspections were carried out every year on 5 to 10% of all agricultural holdings under the Basic scheme. The farms inspected were chosen by chance and risk analysis which was worked out by former contract breaches. Difficulties emerged especially:

- When fields were rented additionally during the period of contract;
- When fields have been put down in the contract map as too large;
- When farm managers had difficulties in understanding the application form;
- When the actual livestock unit, which had to be worked out monthly, was incorrect;
- When the input of fertiliser had to be inspected.

The „Amt für Agrarstruktur“ is responsible for field inspections and inspects at least 5% of all farms under contract (Wet grassland protection scheme) per year, in some areas up to 20%.

There are no monitoring reports of the schemes, however, there are local monitoring programs, for example the monitoring of the pilot project „Stollhammer Wisch“.

Farmers and farm managers were informed about the Basic scheme by publications in the agricultural press, the local press, the German Farmers` Union or other local agricultural organisations.

Farmers who are eligible to enter the Wet grassland protection scheme are informed about the scheme by the “Bezirksregierung” (county council). As there are areas of focus within the designated area it is not difficult to get in contact with the farmers via work shops or environmental stations.

5.5.2.2 Level of the farmers

Figure 31: Information about the farms

Farm 13

- AA: 53 ha
- Grassland: 49 ha
- Basic Version 1: 3.81 ha
- Version 3 for Nature Conservation: 4.35 ha

Farm 14

- AA: 80 ha, all of which is permanent grassland
- Basic Version 1: 6.5 ha
- Version 3 for Nature Conservation: 24 ha

Farm 15

- AA: 70 ha
- Grassland: 70 ha
- Basic scheme: 70 ha

General aspects of the implementation

Farmer 15 was informed about the scheme on the „Landvolkversammlung“ (assembly of rural folk). He was taking part since the scheme had been launched in 1993. Prior to the Basic scheme the agricultural holding did not take part in an extensification scheme. Motivation to enter the scheme was the financial support and the 50% reduction of mineral fertiliser over the last ten years.

Farmer 13 received the information about the Wet grassland protection scheme through the Berufsverband (trade association). Because he found it very interesting he even participated in the development of the scheme. It is the first Extensification scheme for the farmer who entered the scheme when it was launched on 1. April 1994. He stated „großes Interesse am Gelingen des Projektes, da ich aktiv an der Entwicklung teilgenommen habe.“ (a high motivation concerning the success of the project, since I actively took part in the development of the scheme). Furthermore the farmer is convinced that the bottom-up approach of the development of the scheme, where anyone interested can take part is the only sensible way of implementing the scheme. Farmer 14 received the information about the scheme through the press. Prior to the Wet grassland protection scheme, which he entered in 1996, the farm had been managed under another Extensification scheme. Motivation to enter the scheme was the financial aspect on the one hand and the maintenance of agriculture on a low intensity on the other hand. The latter is inevitable since the agricultural area of the farm increased

substantially over the previous years but lack of labour prevents intensive agriculture. However, the farmer intends is to intensify production again in a few years.

Setting up the Basic scheme with the fieldly record of utilisation, working out the stocking rate and considering to buy new land resulted in a remarkable effort for farmer 15. Apart from the beginning it did not involve much administrative effort.

For farmer 13 the administrative effort is comparable to other schemes. Farmer 14 pointed out a high effort due to the fieldly record of utilisation, particularly when he entered the scheme. He added that planning the different management on different fields meant a much higher effort than before. On farm 13 an intensive collaboration with the agricultural authority goes along with a good supervision. The farmer stated the „Abbau eines `Sicherheitsabstandes´ vom Landwirt zu den Behörden“ (reduction of a `security - distance´ between the farmer and various authorities). For farmer 14 supervision has been good.

Summarising the general aspects of the two schemes, no explicit criticism or suggestions concerning the general aspects information and motivation, administration and field inspection of the Basic scheme were given. Concerning the general aspects of the ML, high administrative effort especially concerning the selection of farmers and difficulties of compliance checks were stated.

Concerning the Wet grassland protection scheme, however, one of the farmers was attracted by the financial compensation as well as the low intensity of labour. In contrast, the other farmer actively takes part in the development of the scheme. The motivation of the latter is to achieve a successful pilot project of the scheme. To receive the information about the scheme in the first place did not cause any problems. This matches the statement of the MU that the way of information is working. Concerning the administrative effort it has been reasonable for one of the farmers whereas the other farmer stated a higher administrative effort particularly at the set-up of the scheme. Taking the statements of the MU into account the administrative effort as well as the effort for field inspections, carried out by the “Amt für Agrarstruktur”, is considered to be reasonable.

Extensive grassland management (Basic scheme)

Livestock

The farm kept cattle and had to sell livestock to meet the prescription of the scheme. As compensation more heifer were kept. Under the scheme the stocking rate had to be between 0.3 LU/ ha and 1.4 LU/ ha main forage area, there were no other prescriptions on livestock.

The actual reduction up to a limit of 1.4 LU/ ha main forage area is likely to lead to positive effects on the biotic resources of the grassland for which it is credited with one point.

Pastures

Rotational pasture management characterised the pasture management of farmer 15. Neither grazing frequency nor the kind of pasture were affected by the Basic scheme.

Since there are no special requirements on pasture management and the farmer interviewed does not apply to an extensive form of pasture management, this grassland category is not regarded.

Meadows

The first cut of the meadow is around 20th May to 1. June. Usually they get cut twice during the growing season and the aftermath gets grazed. About 90% of the crop is used for silage making and the remaining 10% for hay-making. The management of the meadows has not changed under the scheme as there were no prescriptions on cutting dates and the cutting regime. Thus the category is not credited.

Cultivation

A general prescription was not to plough up permanent grassland. In the past the grassland had been ploughed up very rarely (ca. every 20 years) to level the surface. The farmer did not consider the prescription as a major restriction. The grassland gets levelled from mid until the end of March, a measure which was not influenced by the scheme.

The renunciation of ploughing up has beneficial effects on the non-biotic and possibly on the biotic resources of the grassland. Therefore it is put down with two points. Levelling is still carried out by the farmer and cannot be credited.

Fertilisation

Prior to the scheme the farmer reduced the amount of fertiliser by 50% to 60% because otherwise he would have produced too much fodder for 1.4 LU. At present 30 kg N/P/K - fertiliser plus farm yard manure is applied per year.

The indirect effect of the reduced stocking rate led to drastic limitation of mineral and organic fertiliser. This is beneficial to the non-biotic resources as well as to the biotic resources and consequently a very positive aspect which is credited with two points.

Plant protection products

The farm is troubled by weeds with thistles, dock, nettles, dandelion and marsh horsetail. In dry years the problems become worse whereas in wet years the weeds go down. The problems with weeds did not change under the scheme. Prior to the scheme the weeds were sprayed sometimes, under the scheme the concerned areas were mulched (weeds suffocate under the cut grass). There was a derogation of plant protection products because of the prescription of the Basic scheme although the farmer could have possibly applied them if this had been approved by the agricultural authority.

Non-biotic resources are protected by the Basic scheme and the grassland is probably enhanced. Thus the category can be put down with two credit points.

Water regulation

There are broken drains in the subsoil which are not maintained due to possible weed infestations. Generally there are no problems with wet fields. The category „Water regulation“ of the scheme did not seem to affect the general farming practice. Hence the category is not credited.

An important feature of the marshes are the ditches which separate the fields and provide livestock with fresh water. The drainage system is under the responsibility of the „Entwässerungsverband“ (Drainage Union) and not under individuals. Water levels of the ditches are kept at ca. 70cm. Every two years the farmer clears the ditches on one side of the field.

Analysis of Basic Version 1

Livestock

On farm 13 the stocking rate adds up to 2.0 LU/ ha grassland. Farmer 14 has a stocking rate of 1.3 LU/ ha. The prescription of this tier demands a maximum stocking rate of 2.0 LU/ ha until 15th of June. On both farms the number of livestock did not change when they entered the scheme since it is an agreement for individual fields. Farmer 14 pointed to the reduction of the yield due to the prescriptions as grass is likely to overmature and consequently useless on undergrazed fields.

A reduction of the number of livestock is not encouraged as only individual fields are concerned and overstocking on fields outside the contract area may occur. Therefore livestock management cannot be credited. The keeping of rare breeds is not covered by the scheme and hence cannot be rewarded.

Pastures

The grazing season of the two farms is ca. seven months starting around 15th of April and lasting until 15th of November the latest, depending on the weather. It has not been affected by the scheme. On both farms the grassland is used as hay-pastures, on farm 13 the type of pasture is rotational grazing whereas on farm 14 rotational grazing happens after a period of set stocking. Concerning the kind of pasture of Basic Version 1 the renunciation of controlled grazing did not affect the two farmers since both apply to less intensive forms of pasture management anyway.

Apparently Basic Version 1 did not provoke big changes of pasture management on the farms. The prescriptions on using the fields as permanent grassland and the renunciation of controlled grazing seem to correspond with the management practice of the region and an extensive land use is not encouraged.

Meadows

Cutting takes usually place around the end of May and the beginning of June, depending on the season of course. This has not been changed under the scheme as there is no cutting date in Basic Version 1. On both farms the cutting frequency of two cuts per year has not been influenced by the prescription of two cuts at most either. Thus the prescription of two cuts at most applies to the general farming practice and cannot be credited as an extensive form of meadow management.

Prior to the scheme both farmers cut the fields from the outside to the centre. Changing the practice to cut from the centre to the outside as it is demanded under the general prescription of the Wet grassland protection scheme resulted in a slightly higher effort. The cutting regime, to cut the first time from one side to the other or from the centre to the outside, however, did cause management changes of the two farmers. The measure aims to protect wildlife hidden in the grass by giving it a chance to flee and hence it is a positive aspect of the tier and put down with one credit point.

On both farms the crop is mainly used for silage, less than 10% of the crop is used for hay. Whether the crop is used for silage or hay depends on the farmers, there are no prescriptions concerning crop conservation. The element crop conservation is not covered by the scheme and the management practice of the two farmers does not apply to an extensive conservation of the crop.

Cultivation

The prescriptions of the tier (no changes of the relief, no renewal of grassland) did not result in any changes of management and did not rise criticism on the farmers` side. Changing the relief and renewal of grassland (ploughing up) had not belonged to the cultivation measures of the two farmers anyway.

The renunciation of relief changes targets to limit mechanical operations on grassland in the spring and is hence likely to protect breeding meadow birds. It is credited under the element "Rolling, levelling, harrowing" with one plus point. Not to plough up grassland is beneficial for the biotic life and for the non-biotic resources and is credited with two points.

Fertilisation

The prescription of the tier to apply 110 kg N/ ha at most did not affect farm 14 as prior to the scheme the same amount of fertiliser had been applied. Farmer 13, however, had to reduce the amount of fertiliser remarkably, from 160 to 180 kg N in the past to 10 kg N at present.

Despite the high maximum limit of fertiliser a reduction of fertiliser takes place which has positive effects on the biotic and non-biotic resources of the environment. Therefore it is credited with one point.

Plant protection products

To control the sward, farmer 13 prefers surface seeding. Frost changed the composition of the sward on his fields towards more dandelion and clover. On farm 14 weed infestations of tall buttercup and dock occurred for unknown reasons. On both farms spraying is not an issue yet.

Unless the agricultural authority agrees to an exception of the rule the application of plant protection products is basically not permitted.

As a consequence of the scheme both farmers do not spray any plant protection products. This results in a protection of biotic as well as non-biotic resources and is thus credited with two points.

Water regulation

Existing drains are maintained on farm 13 and, according to the prescription of the scheme, no new drainage measures are undertaken. On farm 14 the high water table prevents drainage measures. The management practice on the two farms has not changed due to the demands of the scheme.

Although the explicit wish of removing existing drainage measures is included in the prescription there is no incentive to encourage farmers to do so. The water conditions of the grassland are maintained in the status quo by the management rule that no new drainage measures are to be introduced but existing ones can be maintained. Thus the category is not rewarded.

Landscape elements

Both farmers clear the ditches every two to three years; apart from property ditches or ditches between parcels they may be cleared throughout the year. The restriction on the period of clearing of property ditches or ditches between parcels does not affect the management practice of the two farmers.

The category "Landscape elements" does not support the maintenance of certain landscape elements and is not credited.

Version 3 for Nature Conservation

Only additive elements to the Basic Version 1 are described under this tier; the categories „Livestock", „Plant protection products" and „Water regulation" do not differ from Basic Version 1 analysed above.

Meadows

The prescriptions of this tier concerning the grassland management mainly concern the cutting of the fields:

- The fields have to be used as permanent grassland;
- There has to be no controlled grazing;
- The first cut has to be performed from the centre to the outside or from one side to the other;
- Hay-pastures must not be cut before 15th of June;
- There has to be one cut at least and two cuts at most;
- When cutting before 1st of August a strip of at least 2.5m has to be left until 31st of July.

Changes of the management practice occurred particularly due to the late cutting date: Prior to the scheme the fields were cut about two weeks earlier on both farms. The measure aims to protect meadow birds by preventing any impacts on the grassland in the spring and can be considered as positive for wildlife for which it is credited with two points. On farm 14 the crop gained from these fields is now used for hay, whereas prior to the scheme it has been used for silage. Beside the direct protection of biotic life the requirement also encourages hay-making, as the late cut grass is not suitable for silage. By this measure the natural regeneration of the sward is supported; it is credited with one point.

The cutting regime has changed on both farms in the same way as described in the previous chapter (see description "Basic Version 1"), providing a basis for the protection of wildlife. This has led to a slightly higher effort. The crop gained from the strip left until 31st of July cannot be used for fodder on both farms as the grass is overmature. However, the measure works towards the natural regeneration of the sward on the one hand and provides reserves for wildlife on the other hand. Therefore the prescription has beneficial effects on the biotic resources and is put down with one point. Neither the cutting frequency nor the use as permanent grassland have changed since the two farmers have joined the scheme.

The other prescriptions concerning the grassland management, namely to use the area as permanent grassland, to cut at least one time and two times at most and to renounce controlled grazing on the fields concerned did not change the farming practice of the two farmers. They seem to demand a management which is according to the general farming practice of the region. The prescription on one cut at least and two cuts at most is pointless as the abandonment of grassland is very unlikely in the region studied and the late cutting date prevents an intensive use of the grassland with more than two cuts anyway.

Cultivation

Under Version 3 for Nature Conservation the scheme demands not to use machinery on the fields between the 15th of March and the cutting date of 15th of June. This has changed the farming practice on the farms studied as levelling of the fields is not possible any longer (because before the 15th of March the fields are too wet for levelling). Particularly meadow birds are protected by this measure since their nests cannot be disturbed by machines. Therefore the element "Rolling, levelling, harrowing" is put down with one point.

Fertilisation

As stated above, farmer 13 reduced the amount of fertiliser to 10 kg N on the fields managed under the scheme. Farmer 14 sticks to the management rules and fertilises 80 kg N on the

fields under Version 3 for Nature Conservation in contrast to the ca. 110 kg N he applied prior to the scheme.

The reduction of the amount of fertiliser together with the late application are both limiting the intensive use of permanent grassland. The input of mineral fertiliser is lower under the tier and therefore beneficial to the biotic and non-biotic resources. Since there is no reduction of livestock under the scheme the amount of organic fertiliser remains stable. The effects of the late application are twofold: Firstly, the impact of machinery on the grassland during the nesting period of meadow birds is prevented and goes along with the prescription under "Cultivation". Secondly, less fertiliser reaches the ground water since fertiliser can be absorbed better later in the spring when the grassland is dryer. To sum up the effects concerning the prescriptions on fertiliser, benefits for the biotic and non-biotic resources can be expected and are credited with two points.

Water regulation

No changes of the prevailing management practice can be noted under the aspect of clearing the ditches. Therefore the prescription does not encourage the extensification of grassland.

Table 8: Survey of the Basic scheme and the Wet grassland protection scheme

		Basic scheme	**Version 1[32]**	**Version 3[33]**	**Ext. potential[34]**
Livestock	Stocking rate	+	O		O
	Extensive breeds	O	O		O
Pastures	Kind of pasture	O	O		O
	Grazing frequency	O	O		O
Meadows	Cutting date	O	O	+ +	+ +
	Cutting frequency	O	O	O	O
	Cutting regime	O	+	+	+
	Crop conservation	O	O	+	+
Cultivation	Pasture-topping	O	O	O	O
	Rolling, levelling, harrowing	O	+	+	+

[32] Basic Version 1.
[33] Version 3 for Nature Conservation.
[34] Extensification potential of Versions 1 and 3 of the Wet grassland protection scheme.

		Basic scheme	Version 1[32]	Version 3[33]	Ext. potential[34]
	Ploughing up Re- and surface-seeding	+ + O	+ + O		+ + O
Fertiliser	Amount of fertiliser	+ +	+	+ +	+ +
Plant protection products	Input of plant protection products	+ +	+ +		+ +
Water regulation	Drains	O	O	O	O
Landscape elements		O	O		O

5.5.3 Results of the two schemes

Farmer 15 (Basic scheme, ML) pointed to the reduction of the yields of ca. 20% which is compensated for by the incentive.

Concerning the fields managed under the Wet grassland protection scheme (MU) both farmers pointed out a production loss of 20 - 30%. The incentive does not compensate for the income foregone on farm 13 whereas it is a sufficient compensation on farm 14.

Apart from an increased growth of clover no changes of the sward have been noticed under the Basic scheme (ML). Farmer 14 noticed an increase of weeds under the Wet grassland protection scheme.

On both farms participating in the Wet grassland protection scheme (MU) the fields managed under the scheme would be used more intensively without the scheme, abandonment of grassland would not happen.

5.5.4 Conclusions of the two schemes

Putting together all elements of grassland management, the Basic scheme of Lower Saxony limited the number of livestock and the application of farm yard manure on the agricultural holding investigated. These two restrictions are likely to show beneficial effects on flora and fauna as well as on the non-biotic resources such as the ground water. Hence it can be said that on the farm studied the scheme met its objectives „Protection of the environment“ and „Preservation of the natural living conditions“. The third objective of the scheme, namely to achieve a market relief, could be approved on the farm, too. However, as the take-up rate of

the Basic scheme was low and it ceased in 1998 enhancing and production reducing effects remain little.

The survey of the Wet grassland protection scheme reveals that substantial farming changes can be achieved under the scheme, though not under Basic Version 1; the tier targets the maintenance of the status quo and comprises only little enhancing effects. Version 3 for Nature Conservation provides scope for drastic changes, the productivity of the grassland is reduced by the limitation of fertiliser accompanied by late cutting dates. The market relief of ca. 25% can be credited mainly to Version 3 for Nature Conservation. Prescriptions on the cutting regime and the cultivation of the grassland in the spring mainly target the protection of meadow birds.

Considering the take-up of about 22% in the area of the "Stollhammer Wisch" and the take-up of 2.1% of the designated area in Lower Saxony only slight enhancing effects become possible under the scheme as the area under contract is very limited. Additionally, because of the "single-field approach" farmers are inclined to intensify their production outside the area under contract which does not support an overall extensification, either. However, the designated area of the scheme applies to sensitive areas for the protection of wet grassland. Due to the set of measures listed in the scheme the environmental authorities are able to tailor the scheme specifically to different regions. A strikingly positive aspect of the pilot project "Stollhammer Wisch" is the bottom-up approach. As described in chapter 5.5.1 "Introduction of Lower Saxony´s agri-environment program" all interested parties could get involved in the development of the scheme. A complex scheme consisting of six different tiers adapted to different farming types of the region as well as to environmental needs is the result of this round table. Flexibility of farmers has been conserved as they can choose different tiers for different fields.

The unique set up of the scheme certainly reduced the "security distance" between farmers and the local environmental and agricultural authority. Furthermore the bottom-up approach has supported the integration of agricultural and environmental issues and improved the negative image of agriculture.

The most important objective of the pilot project „Stollhammer Wisch" is the protection of meadow birds. At this point no statements can be made about an actual success of the scheme in terms of rising numbers of meadow birds in the area though the conditions for meadow birds are certainly improved under the scheme. None of the prescriptions investigated is a severe restriction to the farmer and hence the second objective of the scheme, the gentle adaptation of nature conservation measures to existing farming practices is achieved, too.

Both schemes are likely to have beneficial effects on the environment although to different intensities. The effects of the Basic scheme (ML) are comparable to the Basic Version 1 (MU) of the Wet grassland protection scheme and target more general extensification measures such as the prevention of ploughing up, limitation of fertiliser and the application of plant protection products. Version 3 for Nature Conservation comprises more enhancing effects and is specifically adapted to the needs of the environment of the "Stollhammer Wisch".

Recommendations

The administration of both schemes lays under the responsibility of the "Amt für Agrarstruktur". Therefore the deviating perception of the administrative effort by the ML and the MU is quite astonishing. A better arrangement between the two ministries might result in an effective administration for both schemes.

One of the administrative difficulties stated by the ML are difficulties of the farmers in understanding the application form. Adapting the application forms to the target group farmers might solve this problem.

As the Basic scheme showed enhancing effects on the non biotic resources and is likely to enhance the biotic resources it should be offered again. The availability to all farmers of the entire Bundesland together with its approach of a basic extensification are desirable effects for the agricultural landscape of Lower Saxony.

6. Conclusions of the schemes

6.1 Comparison of MEKA, ESA Pennine Dales and KULAP

6.1.1 Comparison of the general aspects

With regard to the general aspects the information strategy has been successful under all three schemes. Concerning the motivation to take part, all farmers pointed out the financial support as decisive criterion in addition to this attractive way of farming in disadvantaged areas. Beside these similarities the administration revealed differences among the three schemes. The MEKA and the ESA Pennine Dales demand a reasonable effort for administration on both sides, farmers and ministry/ Project Officer. This is different under the KULAP which requires a high administrative effort on the side of the farmers as well as on the side of the ministry. The other striking difference is the existence of a Project Officer system in the ESA scheme, which has generally been approved.

6.1.2 Comparison of the grassland categories

Table 9: Extensification potential under the MEKA, ESA Pennine Dales and KULAP

		MEKA	ESA Pennine Dales	KULAP
Livestock	Stocking rate	+ / O	+	O
	Rare breeds	+	O	O
Pastures	Kind of pasture	O	+	O
	Grazing frequency	+	+	+
Meadows	Cutting date	+ +	+ +	+ +
	Cutting frequency	+	+	+
	Cutting regime	O	O	O
	Crop conservation	O	+	O
Cultivation	Pasture-topping	O	O	O
	Rolling, levelling, harrowing	O	+	O
	Ploughing up	+ +	+	+ +
	Re- and surface-	O	+	O

		MEKA	ESA Pennine Dales	KULAP
	seeding			
Fertiliser	Amount of fertiliser	+	+ +	+ +
Plant protection products	Input of plant protection products	O	+	+
Water regulation	Drains	O / +	+	+
Landscape elements		+	+	+

In view of elaborating differences and similarities of the three schemes the individual grassland categories are compared.

Concerning livestock management the measure of set stocking rates does not generally work towards an extensification. MEKA and KULAP both comprise minimum and maximum stocking rates. The latter are set at fairly high levels and hampered further intensification only in one case, namely in one sensitive area of the MEKA. Going below the minimum stocking rate was not an issue on the farms. In the ESA the measure is taken as a tool to reduce the impact of livestock on allotments, thus specifically protecting those fields. The keeping of rare breeds in order to maintain a diverse genetic pool is promoted under the MEKA only.

With regard to pasture management the ESA comprises a specific tool to exclude stock from meadows for a longer period. The measure applies to the environmental needs of the region.

The next elements are considered together as grazing- and cutting frequency as well as cutting date and fertilisation are closely linked. All three schemes prescribe late cutting dates and the limitation of fertiliser which consequently reduces grazing- and cutting frequency. At first glance the extensification potential of the three schemes depicted in Table 9 shows an almost identical situation. However, bearing the potential of the different tiers in mind, the situation looks different. The ESA and the KULAP demand drastic reductions on fertiliser and late cutting dates even under the basic tiers, additionally supplemented by more requirements under the higher tiers. In contrast, the amount of fertiliser and the cutting dates are hardly affected under the basic tier of the MEKA. The higher measures demand a reduced utilisation or the pure maintenance of certain habitats, such as wet grassland. They do not comprise any specifically adapted requirements for their maintenance.

The ESA scheme includes measures to support the natural regeneration of botanically valuable meadows of the Pennine Dales (promotion of hay-making, no re- and surface seeding). Additionally the cultivation measure `levelling´ is prevented and consequently supports breeding meadow birds.

The renunciation of ploughing up grassland belongs to the extensification potential of all three schemes and is a striking positive aspect of the schemes.

The input of plant protection products has been reduced under the ESA and the KULAP, whereas the study of the MEKA revealed the necessity of stricter compliance checks.

This applies to the category "Water regulation", too. Wet sites on fields have developed under the ESA and the KULAP. This has happened under the MEKA as well, though not in the intended area.

A positive aspect of all three schemes is the maintenance and financial support of landscape elements.

6.1.3 Comparison of the schemes in a wider context

Facing the three schemes reveals substantial farming changes under the KULAP and the ESA Pennine Dales. The grassland productivity under both schemes has been reduced drastically mainly due to the restriction on fertiliser. Enhancing effects on the environment become very likely under the two schemes. Furthermore, the measures of both schemes apply to the whole farm or grassland branch in contrast to the MEKA, where farmers can enter single fields to the different measures. This underlines that the MEKA primarily aims to maintain the status quo, as there are only minor production losses and little enhancing effects to note. According to the MLR (1998, personal interview) measures concerning species and habitat protection are of minor importance in the scheme, but are included in the Landschaftspflegerichtlinie.

The two German schemes both apply to the whole Bundesland. Therefore they have a more spread impact than the ESA, which is only available in the designated area. The latter is perfectly adapted to regional circumstances, whereas under the two German schemes only the MEKA has an element of regionalisation. Considering the take-up rates, all three schemes experience a high acceptance among the farmers and show the importance of agri-environmental schemes as a source of income in particular. The complexity of the ESA supports the flexibility of the farmer since the different tiers apply to various farming types, such as arable and improved grassland and herb-rich pastures and meadows. Thus the scheme copes with flexibility for the farmer on one side but is still adapted to the agricultural and environmental concerns on the other side. The KULAP applies to this, too, although to a lesser extent. In contrast, the MEKA provides flexibility for the farmer but lacks adaptation to

certain agricultural and environmental conditions. Maintaining the status quo is primarily financially rewarding; abandonment of land and, to a lesser extent, further intensification are prevented.

6.1.4 Comparison of the payment rates

In view of the payment rates remarkable differences become obvious: compared to the other two schemes the MEKA is a fairly "cheap" agri-environmental scheme, the payments of the basic extensification come to 20 to ca. 80 ECU/ ha. Farmers in Thuringia and the ESA Pennine Dales receive much higher grants, ranging from 127 to 229 ECU/ ha for tiers B2 and B3 under the KULAP and from 137 to 210 ECU/ ha for tier 1 B under the ESA. Higher tiers correspond to higher payments, of course, and the grants for the traditional farming measures of the MEKA are fixed between 71 and 202 ECU/ ha or more, as the accumulation of measures is possible under the scheme. The grants available for tiers C3 and C4 under the KULAP range from 203 to 407 ECU/ ha and in the case of the Pennine Dales they come to 210 to 361 ECU/ ha.

Considering the "content" of the three schemes, the payments seem to be fair, they compensate the farmers interviewed for the production losses they experienced under the schemes. The payment rates offered by the various ministries mirror the access to EU – co-financing and the extensity of the schemes. The MEKA scheme of Baden-Württemberg is co-funded by the EU by 50% and is offered to all farmers of the Bundesland. Thuringia offers the KULAP to all farmers of the land but receives a co-funding of 75% by the EU; therefore Thuringia can afford higher payment rates going along with higher requirements. The payment rates of the ESA Pennine Dales are roughly comparable to those of the KULAP, however, the 50% co-financing from the EU allows MAFF to offer the scheme only in a limited area.

6.2 Comparison of ESA Broads, Basic scheme and Wet grassland protection scheme

6.2.1 Comparison of the general aspects

The comparison of the schemes shows that the way of information has been successful. With regard to the motivation of farmers to take part, the incentive has been pointed out together with nature conservation interests in the ESA Broads, a successful pilot project and less labour intensive farming in the Wet grassland protection scheme. Concerning the administration of the schemes, the effort has generally been considered to be reasonable.

6.2.2 Comparison of the grassland categories

Table 10: Extensification potential under the ESA Broads, Basic scheme and Wet grassland protection scheme (pilot project "Stollhammer Wisch")

		ESA Broads	Basic scheme	Wet grassland protection scheme
Livestock	Stocking rate	+	+	O
	Rare breeds	O	O	O
Pastures	Kind of pasture	O	O	O
	Grazing frequency	O	O	O
Meadows	Cutting date	+ +	O	+ +
	Cutting frequency	O	O	O
	Cutting regime	O	O	+
	Crop conservation	O	O	+
Cultivation	Pasture-topping	O	O	O
	Rolling, levelling, harrowing	+	O	+
	Ploughing up	+ +	+ +	+ +
	Re- and surface-seeding	+	O	O
Fertiliser	Amount of fertiliser	+ +	+ +	+ +
Plant protection products	Input of plant protection products	O	+ +	+ +
Water regulation	Drains	+ +	O	O
Landscape elements		+	O	O

The survey of the three schemes in Table 10 above reveals substantial differences as well as similarities.

With regard to livestock management the ESA Broads includes maximum stocking rates under the highest tier and the Water Level Supplement. The stocking rate is a tool to control

the intensity of livestock management on extensive and wet grassland. It is specifically adapted to the environmental needs of these habitat types. In contrast, the Basic scheme of Lower Saxony comprises a general minimum and maximum stocking rate. The latter actually reduced the number of livestock in the case study. Maximum stocking rates set under the pilot project „Stollhammer Wisch“ remained ineffective because they were set at fairly high levels. The promotion to keep rare breeds is not included in the three schemes.

Extensive pasture management is not targeted under the three schemes but meadow management concerns the elements cutting date, -regime and crop conservation. Important components of the ESA and the Wet grassland protection scheme are late cutting dates under the higher tiers. They render the protection of breeding meadow birds very likely under the two schemes. The beneficial cutting regime required under the Wet grassland protection scheme specifically protects wildlife of the meadows. Concerning crop conservation a reverse situation of the two schemes becomes obvious: although the Wet grassland protection scheme doe not comprise a measure on the promotion of hay-making, a greater proportion of hay was the result of the late cutting date. In contrast, the ESA actually comprises a prescription on hay-making which remained ineffective due to the loose handling by the Project Officer.

In view of the cultivation measures under the schemes, ploughing up grassland has not been carried out under the schemes which is a very positive effect. Levelling has been prevented under the ESA and the Wet grassland protection scheme. The measure reduces interventions on grassland during spring and thus provides a basis for the protection of meadow birds during the breeding period. The natural regeneration of the sward is strongly supported by the prevention of re- and surface seeding under the ESA Broads.

Concerning fertilisation the overall extensification potential is high under all three schemes (see Table 10), though the impact of the different tiers has to be taken into consideration. Tier 1 of the ESA and the Basic Version 1 of the pilot project „Stollhammer Wisch“ do not promote a substantial reduction of fertiliser, this is the task of the higher tiers. The basic scheme does not target the limitation of fertiliser directly: The maximum stocking rate prevents from applying large amounts of fertiliser since this would lead to the production of more fodder than needed for the 1.4 LU.

The application of plant protection products has been ceased completely under the two German schemes. In contrast, spot spraying certain weeds (and even blanket spraying in one case) is allowed and performed under the ESA Broads.

Maintaining high water levels in dykes during longer periods is an important objective of the ESA scheme. Marshland with high water levels provides crucial habitat types and feeding places for waders and other birds requiring high water levels. Although the pilot project

"Stollhammer Wisch" operates exclusively on marshland, too, the tool of maintaining high water levels is hardly used in the scheme. The Basic scheme operates throughout Lower Saxony and does not include the maintenance of high water levels.

The maintenance of landscape elements is promoted under the ESA scheme bot not under the two German schemes.

6.2.3 Comparison of the schemes in a wider context

The comparison of the three schemes above shows that the ESA Broads and the pilot project "Stollhammer Wisch", both operating in designated areas, pursue a comprehensive approach for extensification and cover nearly all grassland categories listed. Both schemes involve the protection of meadow birds in their set of objectives but offer different management tools: The control of water levels in the ditches to maintain them sufficiently high to create habitats for the birds has been chosen in the Broads whereas the Wet grassland protection scheme targets to stop major interventions in the spring during the breeding season of meadow birds. In contrast, the Basic scheme operates throughout Lower Saxony and pursues a more general approach of extensive farming. The reduction of the stocking density is the main tool to lower the yields and leads to a production loss of ca. 20%. The requirements of the other two schemes lead to production losses of about 25% (pilot project „Stollhammer Wisch") and 30% (ESA Broads) thus achieving a remarkable market relief. These percentages reveal that the restrictions in the ESA are slightly higher compared to the "Stollhammer Wisch" and the Basic scheme. Under the ESA and the pilot project "Stollhammer Wisch" farmers may enter exactly those fields they wish; thus the flexibility of farmers is strongly supported. However, this enables farmers to intensify farming just outside the area under agreement which might be counterproductive in some cases. Deduced from this it would be desirable – from a nature conservation point of view – to design both schemes with a "whole-grassland-branch approach", offering farmers grassland extensification in different intensities. This approach is pursued under the Basic scheme though it does not offer different tiers.

Concerning the take-up rates substantial differences between the two countries become obvious. 75% take-up of the eligible area in the Broads stand in contrast to only 22% in the "Stollhammer Wisch" and 2.5% under the Basic scheme. There is definitely scope to foster higher take-up rates in Lower Saxony to achieve enhancing effects over larger areas.

Derived from the study of the ESA and the pilot project "Stollhammer Wisch" both would benefit from a stocking rate applying to the whole grassland branch of a farm. The current situation allows overstocking of fields outside the contract area, in fact farmers even might increase their number of livestock under the scheme without loosing their eligibility to take part. To extend the stocking rate on the whole grassland branch would prevent a more

intensive use outside the area managed under the scheme resulting in a more comprehensive extensification of the grassland.

6.2.4 Comparison of the payment rates

The payments rates of the ESA Broads are slightly higher than the ones of the Wet grassland protection scheme. Farmers taking part in tier 1 (basic extensification) are rewarded with 195 ECU/ ha in the Broads and with 153 ECU/ ha in the Wesermarsch. Tier 2 in the ESA offers 325 ECU/ ha and the corresponding tiers in the "Stollhammer Wisch" range from 280 to 331 ECU/ ha. The highest tiers of the two schemes come to 448 ECU/ ha in the ESA and 407 ECU/ ha in the "Stollhammer Wisch". Taking the slightly higher effort for farmers in the Broads into account the payment rates seem to be reasonable and comparable. The payment under the Basic scheme is 102 ECU/ ha and stands below the other two schemes.

6.3 Comparison of the schemes at the level of the Ministries/ Project Officers

Administrative efficiency is an important subject of the implementation of schemes in general. The agri-environmental schemes studied have been administered efficiently in most cases, except for the KULAP and the Basic scheme. The investigation of two schemes in Lower Saxony brought out diverting statements concerning the administrative effort although both schemes are administered by the same agricultural authority, namely the "Amt für Agrarstruktur". The ML (personal interview) stated high administrative effort for the Basic scheme, whereas the effort was considered to be fairly low for the Wet grassland protection scheme. The wide range of measures of the KULAP is considered by the TMLNU (personal interview) as a positive aspect concerning the effective implementation on one hand though employees of the authority complain about difficulties in the administration and supervision on the other hand. Although more specific prescriptions would be beneficial for the environment, e.g. individual prescriptions for the different habitat types nutrient-low grassland, wet and moist grassland, dry grassland, they could hardly be administered. This impedes the elaboration of the scheme. In view of the ESAs nothing can be said about MAFF´s effort to administer the scheme. However, both ESAs are equipped with a Project Officer who holds a middle position between farmers and MAFF`s Regional Service Centres. Therefore there is scope to develop confidence on both sides (Project Officer Pennine Dales, personal interview). This has been proved by the farmers to be a very good instance as the Project Officers are direct contact persons. However, the Project Officer of the ESA Broads (personal interview) critically observed MAFF`s tendency towards a rule system away from guidelines. This would lead to a drastic reduction of the scheme's flexibility and might deter

some farmers. The Project Officer of the Pennine Dales (personal interview) regretted the restricted decision autonomy slowing down everything. The development of the pilot project „Stollhammer Wisch“ was carried out in a bottom-up approach resulting in a non-bureaucratic scheme. The MU (personal interview) considers the environmental focus of the Wet grassland protection scheme as major advantage. It allows a very flexible handling as the measures are tailored to the needs of the local environment as well as to the different agricultural holdings by various tiers. This has been proved by one farmer (personal interview) who explained that some of the tiers of the pilot project “Stollhammer Wisch” have been specifically adapted to certain farm types.

Compliance checks are carried out by MAFF´s Field Officers in the two ESAs and do not lay under the responsibility of the Project Officers. The three German Ministries check 5% of the farms, chosen by chance or risk analysis (inspection of conspicuous farms) and more in exceptional cases.

The two ESAs are monitored within the monitoring scheme of MAFF in a standardised way (see chapter 2.2.2.3 “General implementation of agri-environmental schemes”). The monitoring of the three German schemes has not been standardised; it lays under the responsibility of the individual Bundesland. In contrast to the MEKA and the KULAP which have been monitored once there has been no comprehensive evaluation of Lower Saxony´s schemes so far though parts of the designated area of the Wet grassland protection scheme have been evaluated.

The means of information under the five schemes are listed below:

- Adverts in the press;
- Brochures and leaflets;
- Consultations;
- Environmental stations;
- Special campaign with local information meetings;
- Phone calls;
- Addition of the scheme to the joint application form;
- Work shops;

Determining the take-up rate of each scheme is a means to prove the success of the way of information although possible restrictions on the take-up (such as financial limitation) must be taken into consideration, too.

6.4 Conclusions: Regulation 2078/92 in the two countries

All five agri-environmental schemes investigated in this study can claim to meet the objectives of regulation 2078/92 as well as their individual objectives. Market relief, income support as well as the protection of non-biotic and the basis for the protection of biotic resources are achieved. However, the degree to which the schemes meet these objectives varies. It is determined by two main factors , firstly by the financial resources of the two countries, accompanied with the rate of co-funding be the EU, and secondly by the agricultural and environmental policies the schemes are based upon.

Looking at the comparison of the five schemes the inevitable question arises: is it preferable to support many farmers in large areas or to support a restricted number of farmers in designated areas?

The first approach includes that the budget of a scheme has to be shared among many farmers, thus individual payments remain at a low level. Low payment rates inevitably lead to little requirements under the scheme, i.e. that environmentally enhancing effects are not very likely. In addition, they hardly allow to demand drastic production losses, hence a market relief becomes unlikely, too. This is underlined by the fact that under the MEKA scheme the farmers themselves doubted the market relief. Furthermore, regional aspects and requirements specifically adapted to the environmental needs can hardly be included in the scheme. It would inevitably result in a complex scheme which could scarcely be administered. The administrative problems of the KULAP are a good proof of this aspect. There is no distinction between areas of protection and areas of no specific nature conservation value which is a positive aspect of this extensive approach. However, the financial resources are limited, thus the payment rates are too low to be attractive in areas of intensive agriculture. This has been underlined by the TMLNU (personal interview), stating that the incentive for converting arable land to grassland on better soils is not attractive enough. Therefore the schemes are economically restricted to marginal areas.

Under the second approach, to support a restricted number of farmers in designated areas, the financial budget of a scheme has to be shared among fewer farmers, thus leading to higher payments for each farmer. As a consequence higher requirements of environmentally friendly farming practices can be made. Environmentally enhancing effects and a market relief become likely since financial means have been *specifically* directed towards the

environmental needs of the region. However, farmers outside the designated area cannot take part.

The extension of the schemes directs to a difference between the two countries. Except for the Wet grassland protection scheme the three German Bundesländer pursued an extensive approach. In contrast, ESAs apply to designated areas and although the Countryside Stewardship scheme operates outside ESAs one has to bear in mind the predominance of the ESA scheme in England (for details see chapter 2.2.2.3 “General implementation of agri-environmental schemes”).

Looking at the implementation of the schemes at the level of the Ministries/ Project Officers the standardised handling of administration, field inspections and monitoring of the ESAs becomes obvious. An outstanding difference between the two countries becomes obvious: in Great Britain Project Officers hold a middle position between farmers and the ministry and even out many differences, thus they are very important for the success of the ESAs. In contrast, German farmers have to deal with agricultural or environmental authorities directly.

The German schemes are not standardised and have different approaches of administration and monitoring in particular. However, the schemes are adapted to the legal framework, administrative processing and financial resources of each Bundesland. Especially monitoring is considered to be a weak aspect of the German way of implementation of regulation 2078/92 as an element of refusal cannot be denied.

To draw a conclusion, the different implementation of agri-environmental schemes mirrors different policies: in Germany the ministries concerned stick to the specific legal framework of the according Bundesland or of the Federal State respectively. In England the Project Officers are the key for the schemes` success: they have enough influence to bring local conditions into account and thus allow more flexibility (briefly outlined in chapter 2.2.2.2 “Integrating agricultural and environmental policy until 1992”), although the ESA scheme as such is standardised.

The majority of the farmers in both countries explicitly pointed out the good perspectives for agriculture under those agri-environmental schemes. This should be taken as motivation to carry on with agri-environmental schemes and to extend them over larger areas addressing more farmers.

Recommendations applying to all five schemes target measures such as an altered cutting regime and the promotion of hay-making instead of silage-making. They would slightly modify the farming practice and probably show positive effects on the biotic life. Including such guidelines would mean a slightly higher effort for the farmers but almost no production

losses. Thus those measures could be additionally taken into the schemes without leading to higher payment rates.

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7.2 Figures and Tables

7.3 Abbreviations

AA	Agricultural area
ADAS	Agricultural Development and Advisory Service
BMELF	Bundesministerium für Ernährung, Landwirtschaft und Forsten
BUND	Bund für Umwelt und Naturschutz Deutschland
CAS	Countryside Access Scheme
CAP	Common Agricultural Policy
CC	Countryside Commission
CLA	Country Landowners Association
CS	Countryside Stewardship Scheme
DBV	Deutscher Bauernverband
DoE	Department of Environment
EAGGF	European Agricultural Guidance and Guarantee Fund
EC	European Community
ECU	European Currency Unit
EEC	European Economic Community
EN	English Nature
ESA	Environmentally Sensitive Area
EU	European Union
FRCA	Farming and Rural Conservation Agency
FRG	Federal Republic of German
GAK	Gemeinschaftsaufgabe zur Verbesserung der Agrarstruktur und des Küstenschutzes
GATT	General Agreement on Tarifs and Trade
GDR	German Democratic Republic
IACS	Integrated Administration and Control System
IDB	Internal Drainage Board
K	Potassium
KULAP	Programm zur Förderung von umweltgerechter Landwirtschaft, Naturschutz und Landschaftspflege in Thüringen
LPG	Landwirtschaftliche Produktionsgenossenschaft
LU	Livestock Unit
MAFF	Minstry of Agriculture, Fisheries and Food
MEKA	Marktentlastungs- und Kulturlandschaftsausgleich
ML	Niedersächsisches Ministerium für Ernährung, Landwirtschaft und

	Forsten
MLR	Ministerium für Ländlichen Raum, Ernährung, Landwirtschaft und Forsten (Baden-Württemberg)
MU	Niedersächsisches Umweltministerium
N	Nitrate
NABU	Naturschutzbund
NCC	Nature Conservancy Council
NFU	National Farmers Union
NGO	Non-Govermental Organisation
NSA	Nitrate Sensitive Area
OECD	Organisation for Economic Cooperation and Development
P	Phosphate
RSPB	Royal Society for the Protection of Birds
SNH	Scottish Natural Heritage
SRU	Sachverständigenrat für Umweltfragen
SSSI	Site of Specific Scientific Interest
TMNLU	Thüringer Ministerium für Landwirtschaft, Naturschutz und Umwelt
UK	United Kingdom

8. Appendix

Baden-Württemberg: Marktentlastungs- und Kulturlandschaftsausgleich (MEKA)

Ziele:

Ausgleich für:

- Erhaltung und Pflege der Kulturlandschaft;
- Umweltschutz;
- Marktentlastung;

Zugleich sollen die Voraussetzungen für die Existenz einer ausreichenden Anzahl bäuerlicher Betriebe zur Erhaltung und Pflege der Kulturlandschaft verbessert werden.

A 1: Extensive Grünlandbewirtschaftung

Allgemeine Bedingungen

- Verpflichtungszeitraum: 5 Jahre
- Kein Grünlandumbruch im gesamten Betrieb

Fördergegenstand	Fördervoraussetzungen	Förderhöhe
Extensive Grünlandnutzung (in sensiblen Bereichen zum Schutz des Grundwassers)	***Viehbesatz:*** • Max. Viehbesatz der HFF: 1,4 RGV/ ha HFF; • Mind. 0,3 RGV/ ha HFF. ***Weiden/ Wiesen:*** Dauergrünland mindestens einmal jährlich nutzen. ***Bodenbearbeitung:*** • Vermeidung von Narbenverletzungen durch ausreichende Schnitthöhe bzw. Schonendes Befahren, z.B. Bei ungünstigem Bodenabstand; • Behebung von Narbenschäden durch regelmäßige Über- oder Nachsaat; • Grünlanderneuerung ohne Umbruch. ***Düngung:*** Nicht mehr Wirtschaftsdünger ausbringen, als es dem Dunganfall eines Gesamtviehbesatzes von 1,4 RGV/ ha LF entspricht. ***Pflanzenschutzmittel:*** Unkrautbekämpfung mit chemischen Verfahren nur, wenn andere Verfahren keinen Erfolg haben und der Futterwert erheblich gemindert ist und das Amt für Landwirtschaft einen entsprechendem Antrag schriftlich zugestimmt hat. ***Wasserregulierung:*** Keine Beregnungs- oder Meliorationsmaßnahmen.	160 DM/ ha (81,36 ECU/ha) (8 Punkte/ ha Grünland)

Fördergegenstand	Fördervoraussetzungen	Förderhöhe
Extensive Grünlandnutzung in sensiblen Bereichen zum Schutz vor Erosion	***Viehbesatz:*** Max. Viehbesatz von 1,8 RGV/ha LF. ***Bodenbearbeitung:*** • Vermeidung von Narbenverletzungen durch ausreichende Schnitthöhe bzw. Schonendes Befahren, z.B. Bei ungünstigem Bodenabstand; • Vermeidung von Ätz- und Abdeckschäden durch angepaßte Güllegaben; • Behebung von Narbenschäden durch regelmäßige Über- oder Nachsaat; • Grünlanderneuerung ohne Umbruch. ***Düngung:*** Begrenzung des Wirtschaftsdüngers entsprechend einem Tierbesatz von höchstens 1,8 GV/ ha im Betrieb oder ausgeglichene Nährstoffbilanz, die dem Amt für Landwirtschaft nachzuweisen ist. ***Pflanzenschutzmittel:*** Unkrautbekämpfung mit chemischen Verfahren nur, wenn andere Verfahren keinen Erfolg haben und der Futterwert erheblich gemindert ist und das Amt für Landwirtschaft einen entsprechendem Antrag schriftlich zugestimmt hat. ***Wasserregulierung:*** Keine Neuanlage von Meliorationen.	Bis 1,2 RGV/ ha HFF: 100 DM/ ha Grünland (5 Punkte) (50,85 ECU/ha) 1,2 - 1,8 RGV/ ha HFF: 60 DM/ ha Grünland (3 Punkte) (30,51 ECU/ha) Über 1,8 RGV/ ha HFF: 40 DM/ ha Grünland (2 Punkte) (20,34 ECU/ha) Bei Schafweiden ist zusätzlich ein Mindestbesatz an Mutterschafen von 0,3 GV/ ha erforderlich

Fördergegenstand	Fördervoraussetzungen	Förderhöhe
Extensive Grünlandnutzung in sensiblen Bereichen zur Erhaltung und Pflege der Kulturlandschaft	***Viehbesatz:*** Max. Viehbesatz von 1,8 RGV/ha LF. ***Weiden/ Wiesen::*** • Mindestens eine landwirtschaftliche Nutzung pro Jahr; • Bei Beweidung soll zusätzlich ein Pflegeschnitt erfolgen. ***Bodenbearbeitung:*** Grünlanderneuerung ohne Umbruch. ***Düngung:*** • Nicht mehr Wirtschaftsdünger ausbringen, als es dem Dunganfall eines Gesamtviehbesatz von 1,5 RGV/ ha LF entspricht oder ausgeglichene Nährstoffbilanz, die dem Amt für Landwirtschaft nachzuweisen ist. • Flüssigen Wirtschaftsdünger nur in der Zeit vom 1.3. - 30. 11. ausbringen. ***Pflanzenschutzmittel:*** Unkrautbekämpfung mit chemischen Verfahren nur, wenn andere Verfahren keinen Erfolg haben und der Futterwert erheblich gemindert ist und das Amt für Landwirtschaft einen entsprechendem Antrag schriftlich zugestimmt hat. ***Wasserregulierung:*** Keine Neuanlage von Meliorationen. ***Landschaftselemente:*** Erhaltung prägender Landschaftselemente wie Hecken oder Bäume	Bis 1,2 RGV/ ha HFF: 100 DM/ ha Grünland (5 Punkte) (50,85 ECU/ha) 1,2 - 1,8 RGV/ ha HFF: 60 DM/ ha Grünland (3 Punkte) (30,51 ECU/ha) Über 1,8 RGV/ ha HFF: 40 DM/ ha Grünland (2 Punkte) (20,34 ECU/ha) Bei Schafweiden ist zusätzlich ein Mindestbesatz an Mutterschafen von 0,3 GV/ ha erforderlich

A 2: Sicherung landschaftspflegender, gefährdeter Nutzungen

Fördergegenstand	Fördervoraussetzungen	Förderhöhe
Erschwernisse bei der Bewirtschaftung von steilem Grünland[4]	• 25 - 50% Hangneigung • Über 50% Hangneigung	100 DM/ ha (50,85 ECU/ha) 180 DM/ ha (91,53 ECU/ha)
Beibehaltung oder Einführung einer extensiven **Grünlandbewirtschaftung**[5]	• Mit nicht mehr als 2 Nutzungen pro Jahr • Als einschüriges Grünland • Auf feuchten oder nassen Standorten	20 DM/ ha (10,17 ECU/ha) 40 DM/ ha (20,34 ECU/ha) 100 DM/ ha (50,85 ECU/ha)
Erhaltung von Streuobstbeständen	• 30 - 200 Bäume je ha • Für wegbegleitende und andere Reihenpflanzungen werden bis zu 3 Ar je Baum abgerechnet	200 DM/ ha (101,7 ECU/ha)
Erhaltung der Weinbausteillagen	• Im örtlichen Rebenaufbauplan abgegrenzt	200 DM/ ha (101,7 ECU/ha)
Grünlandnutzung durch Haltung regionaltypischer gefährdeter Nutztierrassen	• Vorderwälder Rind • Hinterwälder Rind • Limpurger Rind • Braunvieh alter Zuchtrichtung • Schwarzwälder Füchse • Süddeutsches Kaltblut • Altwürttemberger Pferd	100 DM/ Muttertier (50,85 ECU) 200 DM/ Muttertier (101,7 ECU) 140 DM/ Muttertier (71,19 ECU) 100 DM/ Muttertier (50,85 ECU) 200 DM/ Muttertier (101,7 ECU) 200 DM/ Muttertier (101,7 ECU) 200 DM/ Muttertier (101,7 ECU)

[4] Bedingung ist die Einhaltung der entsprechenden Grünlandbewirtschaftungsregeln der jeweiligen Grünlandkulisse.
[5] Bedingung ist die Einhaltung der entsprechenden Grünlandbewirtschaftungsregeln der jeweiligen Grünlandkulisse.

ESA Pennine Dales

Objectives:

Tier 1 A: Protection of features of significant landscape and historic interest such as dry stone walls and field barns.

Tier 1 b: Achieve the appropriate agricultural management of hay meadows, pastures and allotments and to maintain their conservation interest and landscape value and to protect archaeological features.

Tier 2 a: Enhance the nature conservation status quality of hay meadows by more traditional methods of meadow management.

Tier 2 b: Protect and enhance existing herb-rich pastures and allotments by maintaining or introducing appropriate grazing management systems.

General prescriptions:

- Sheep dip must be disposed of safely and not spread where it may affect areas of nature conservation value.
- Obtain written advice on siting and material before constructing buildings, roads or any other engineering operations which do not require planning permission or prior notification determination by the Local Planning Authority.
- Obtain written advice within two years on the management of existing woodland. Consult the Project Officer on proposals to plant any new woodland.
- You must abide by the Codes of Good Agricultural Practice for the Protection of Water, Soil and Air.

Subject of Support	Prescriptions	Payment
Tier 1 A: **Arable and improved grassland**	***Pastures:*** Do not graze any land so as to cause poaching, over- or undergrazing. ***Fertilisation:*** Do not exceed your existing application rate of inorganic or organic fertiliser. ***Landscape elements:*** • Maintain stockproof walls and hedges in a stockproof condition using traditional materials • Any weatherproof field barns which you own or are responible for must be maintained in a weatherproof condition using traditional materials • Do not damage or destroy any feature of historic interest	£ 20/ ha (28,90 ECU/ ha)
Tier 1 B: **Meadows, pastures and allotments**	***General:*** • Land to be managed as meadow must be identified on your contract map and must continue to be managed as such for the length of your agreement; • You must observe all tier 1 A prescriptions plus the additional guidelines set out below. ***Pastures:*** • Exclude stock from meadows at least 7 weeks before the first cut for hay or silage and by 1. June at the latest; • For allotments identified on your contract map agree a written grazing management plan with the Project Officer . In addition you must not exceed your current overall stocking rate.	Meadow land: £ 145/ ha (209.54 ECU/ ha) Other grassland: £ 95/ ha (137.28 ECU/ ha)

Subject of Support	Prescriptions	Payment
	Meadows: • Do not cut grass for hay or silage in any year before 8. July. All meadows must have their first cut after 22. July at least once every 5 years or at least 20 percent of meadows must be nominated to be cut after 22. July every year for the length of your agreement. The aftermath on all meadows must be grazed; • You must indicate your proposed programme for late cutting in your agreement map; • If you cut grass for silage, wilt and turn it before removal and graze the aftermath. ***Cultivation:*** • Maintain grassland and do not plough, level or re-seed the land; • Cultivate meadows only with a chain harrow or roller as early as possible in the spring as soon as stock are removed; • Harrowing or rolling may not be carried out in pastures or allotments between 1. April and 15. July; ***Fertilisation:*** • Do not exceed your existing level of inorganic fertiliser and in any case do not exceed 25kg of nitrogen/ ha, 2.5 kg of phosphate/ ha, and 12.5 kg of potash/ ha or the equivalent in artificial organic fertiliser. This must be applied in one application; • Do not apply slurry or poultry manure; • Apply only farm yard manure produced on the farm, and do not exceed your existing level of application on any fields; • In any case do not use more than 12.5 t of farm yard manure/ ha/ year and apply in a single dressing. Farm yard manure produced off the farm may only be used with the prior written approval of	

Subject of Support	Prescriptions	Payment
	the Project Officer and must be well-rotted; • Do not apply lime, slag or any other substances to reduce soil acidity; • Do not apply inorganic or organic fertilisers to allotment land identified on your contract map. ***Plant Protection Products:*** • Do not use fungicides and insecticides; • Do not apply herbicides except to control bracken, nettles, spear thistle, creeping or field thistle, curled dock, broad-leaved dock or ragwort; • When applying herbicides always use a weed wiper or spot treatment; • Where bracken cannot be controlled by mechanical means, asulam must be used; • Do not cut or spray existing areas of rushes in pastures or allotments. ***Water regulation:*** Do not install any new drainage system or substantially modify any existing drainage system	
Tier 2 A: **Herb-rich meadows**	***General:*** You must observe all the tier 1 prescriptions plus the additional guidelines set out below. ***Pastures:*** Stock must be excluded from meadow land by 15. May. ***Meadows:***	Payment: £ 250/ ha (361.27 ECU/ ha)

Subject of Support	Prescriptions	Payment
	All meadows must be cut and the crop removed. They must not be cut for hay before 15. July. The crop may be cut for silage but not before 1. August. ***Fertilisation:*** Do not apply inorganic or artificial organic fertiliser.	
Tier 2 B **Herb-rich pastures and allotments**	***General:*** • You must observe all the tier 1 prescriptions plus the additional guidelines set out below; • Agree with the Project Officer a written programme of grassland management to enhance the nature conservation value of herb-rich grassland. ***Livestock:*** Do not exceed an overall stocking rate of 0.3 LU/ ha at any time. ***Pastures:*** Your programme must include a continuous 8 week period in the period April 1. To July 31. When only light (less than 0.15 LU/ ha) or no grazing will be permitted. ***Fertilisation:*** Do not apply inorganic or artificial organic fertiliser.	£ 145/ ha (209.54 ECU/ ha)

Subject of Support	Prescriptions	Payment
Wall Renovation Supplement	Agree and implement a 5 year programme for the renovation of drystone walls. This will involve the rebuilding of gaps to make non-stockproof walls stockproof or the dismantling and rebuilding of stockproof walling in poor condition. In all cases material must be cleared down to the foundations before being rebuilt. Payment will be calculated on the basis of the actual length of walling renovated each year, up to a maximum of 10 metres per hectare of agreement land each year.	£ 14/ m (20.23 ECU/ m)
Capital Works	• Provision or rebuilding of drystone walls using traditional materials; • Planting and laying of hedges; • Renovation of field barns using traditional materials; • Re-creation of floristically rich meadows, tree planting and other works including works to protect historic features approved by the Minister to enhance the environment - the meadow must then be entered into Tier 2 for the remainder of your agreement.	Payment: The maximum grant payable to you is calculated by multiplying your agreement area at the start of the plan by £ 100 /ha subject to a ceiling of £ 2000/a, i.e. £ 4000 for a two year Conservation plan.

KULAP - Thüringen

Allgemeine Fördervoraussetzungen:

- Verpflichtungszeitraum beträgt 5 Jahre;
- Betriebsfläche und Nutzungsrecht sind feld- und flurstücksbezogen nachzuweisen;
- Gilt nur für Flächen innerhalb Thüringens;
- Keine Umwandlung von Grünland in Ackerland.

Ziele:

- Schutz der Umwelt;
- Erhaltung der Kulturlandschaft;
- Arten- und Biotopschutzes, und
- Marktentlastung.

1. B 1: Extensive Grünlandnutzung

Allgemeine Voraussetzungen:

- Bei strohloser Aufstallung Flüssigmistlagerraum für mind. 6 Monate Lagerzeit;
- Keinen Flüssigmist auf einem Randstreifen von 10m Breite entlang von Gewässern ausbringen.

Fördergegenstand	Fördervoraussetzung	Förderhöhe
B 1 **Einhaltung einer extensiven Bewirtschaftung des gesamten Dauergrünlandes des Betriebes mit 1,4 RGV/ ha HFF**	***Viehbesatz:*** • Max. 1,4 RGV/ ha HFF • Min. 0,3 RGV/ ha HFF ***Weiden/ Wiesen:*** • Mindestens eine jährliche Nutzung; • Keine Beweidung des ersten Aufwuchses. ***Bodenbearbeitung:*** • Kein Grünlandumbruch; • Lediglich Nach- oder Übersaaten als bestandsverbessernde Maßnahme vornehmen. ***Düngung:*** Wirtschaftsdüngerausbringung auf dem Dauergrünland höchstens in Höhe des Dunganfalls eines Gesamtviehbestandes von 1,4 GVE/ ha LF. ***Pflanzenschutzmittel:*** Keine Pflanzenschutzmittel auf dem Dauergrünland (Ausnahmen nach Vorgabe der zuständigen Landwirtschaftsbehörde) ***Wasserregulierung:*** Keine Beregnung und keine Meliorationsmaßnahmen auf dem Dauergrünland.	200 DM/ ha (101.7 ECU/ ha)

2. B 2/ C 3: Extensive Weidenutzung

Ziele:

B2: Sicherung und Entwicklung naturbetonter Lebensräume mit ihrer vielfältigen Pflanzen- und Tierwelt.
Die tiergebundene Pflege dient auch der Erhaltung des typischen Landschaftsbildes und des Erholungswertes einer vielfältigen Kulturlandschaft.

C3: Erhaltung/ Entwicklung standortgerechter Wiesentypen und Streuobstwiesen auf den Verebnungsflächen im Mittelgebirge, in den Feuchtlagen der Hügelländer, sowie auf den Überschwemmungswiesen entlang der größeren Flüsse.

Fördergegenstand	Fördervoraussetzung	Förderhöhe
B 2 **Einführung/ Beibehaltung einer extensiven tiergebundenen Bewirtschaftung des gesamten Dauergrünlandes (incl. Streuobstwiesen) des Betriebes durch Weidenutzung**	***Viehbesatz:*** • Mind. 0,3 RGV/ ha HFF; • Max. 2,0 RGV/ ha LF. ***Weiden:*** • Nutzung mindestens des 1. oder 2. Aufwuchses durch Beweidung; • Mindestens eine jährliche Nutzung. ***Bodenbearbeitung:*** • Erhaltung der Bestände in einer zweckmäßigen Zusammensetzung durch geeignete Maßnahmen der Weidepflege[6]; • Kein Grünlandumbruch; • Lediglich Nach- oder Übersaaten als bestandsverbessernde Maßnahme vornehmen.	1. Dauergrünland: 250 DM/ ha (127,13 ECU/ ha) 2. Bei Grünlandanteil >60% der LF: 300 DM/ ha (152,55 ECU/ ha) 3. Beweidung von Extensivgrünland mit Hüteschafen: 300 DM/ ha (152,55 ECU/ ha) 4. Bei alleiniger Schafhaltung zur Landschaftspflege außerhalb d. benachteiligten Gebietes[7]: 400 DM/ ha (203,4 ECU/ ha) 5. Landschaftspflege auf nur zur

[6] Nach den Grundsätzen der ordnungsgemäßen Landwirtschaft.
[7] für benachteiligtes Gebiet siehe Kapitel 5.3.1 „Introduction of the KULAP“

Fördergegenstand	Fördervoraussetzung	Förderhöhe
	Düngung: • Max. 60kg N in mineralischer oder organischer Form je ha und Jahr auf den Verpflichtungsflächen ausbringen. • Bei P und K Gehaltsklasse C[3] nicht überschreiten. • Bis 31.5. des auf die Antragsstellung folgenden Jahres Bodenuntersuchungen zu P und K nachweisen; darf nicht älter als 3 Jahre sein. ***Pflanzenschutzmittel:*** Keine Pflanzenschutzmittel auf dem Dauergrünland (Ausnahmen nach Vorgabe der zuständigen Landwirtschaftsbehörde). ***Wasserregulierung:*** Keine Beregnung und keine Meliorationsmaßnahmen auf dem Dauergrünland. ***Landschaftslemente:*** Bereitschaftserklärung, bei Biotoptypen Mager- und Trockenrasen, Streuobstwiesen und Bergwiesen (>400m NN) zusätzliche Pflegeverträge nach Programmteil C mit der Naturschutzbehörde abschließen.	Beweidung überlassenen Flächen: 220 DM/ ha (111,87 ECU/ ha)

[3] Die Böden Thüringens sind in fünf verschiedene Nährstoff - Versorgungsstufen eingeteilt. Diese werden durch Bodenuntersuchungen ermittelt, Gehaltsklasse C ist dabei die mittlere Versorgungsstufe. Bodenuntersuchungen wurden in der DDR routinemäßig durchgeführt und daher in das Programm mit aufgenommen, da die Landwirte an die

Untersuchungen gewöhnt sind. Wenn ein Landwirt jedoch nicht düngt, besteht keine Notwendigkeit für die Bodenuntersuchung.

Fördergegenstand	**Fördervoraussetzung**	**Förderhöhe**
C 3 **Extensive Weidenutzung auf Mager- und Trockenstandorten, Streuobstwiesen und Bergwiesen (>400m NN)**	***Weiden:*** • Zufütterung, Pferchung, Nach- und Übersaaten nach Maßgaben der Naturschutzbehörde • Beweidung mit Hüteschafen nach Beweidungsplan der Naturschutzbehörde • Bei Standweide (nur bei Streuobst- und Bergwiesen zugelassen) Besatzdichte bis 1,0 GVE, keine Portionsweide, Auskoppeln von Gewässerufern, Quellfluren, Naßstandorten, Waldrändern und Hecken ***Landschaftselemente:*** Bei Streuobstwiesen hochstämmige Obstbäume nicht und abgestorbene Obstbäume nur mit Zustimmung der Naturschutzbehörde beseitigen.	• Zusätzlich zu B2: 150 DM/ ha (76,28 ECU /ha) • Zusätzlich zu A1 (ext. Beweidung) 50 DM/ ha (25,43 ECU/ ha) • Zusätzlich zu A1 (Ext. Beweidung mit Hüteschafen) 100 DM/ ha (50, 85 ECU/ ha) • Vollförderung anstelle B1: 400 DM/ ha (203,4 ECU/ ha)

3. B 3/ C 4: Extensive Wiesennutzung

Ziele:

B 3: Sicherung und Entwicklung naturbetonter Lebensräume mit ihrer vielfältigen Pflanzen- und Tierwelt.

C 4: Erhaltung/ Entwicklung standortgerechter Wiesentypen und Streuobstwiesen auf den Verebnungsflächen im Mittelgebirge, in den Feuchtlagen der Hügelländer, sowie auf den Überschwemmungswiesen entlang der größeren Flüsse.

Allgemeine Voraussetzungen:

- bei strohloser Aufstallung Flüssigmistlagerraum für mind. 6 Monate Lagerzeit;
- keinen Flüssigmist auf einem Randstreifen von 10m Breite entlang von Gewässern ausbringen.

Fördergegenstand	Fördervoraussetzungen	Förderhöhe
B 3 **Extensive Bewirtschaftung von Wiesen mit Schnittzeitauflage (einzelflächenbezogen)**	***Viehbesatz:*** • Mind. 0,3 RGV/ ha HFF; • Max. 2,0 RGV/ ha LF. ***Wiesen:*** • Mindestens eine jährliche Nutzung; • Die Verpflichtungsfläche darf nicht vor dem 15.6. gemäht werden; • Mind. 1x im Jahr mähen; • Keine Beweidung des ersten Aufwuchses.. ***Bodenbearbeitung:*** • Kein Grünlandumbruch; • Lediglich Nach- oder Übersaaten als bestandsverbessernde Maßnahme vornehmen.	300 DM/ ha (152,55 ECU/ ha)

Fördergegenstand	Fördervoraussetzungen	Förderhöhe
	Düngung: • Maximal einmal jährlich mit Flüssigmist düngen; • Max. 60kg N in mineralischer oder organischer Form je ha und Jahr auf den Verpflichtungsflächen ausbringen; • Bei P und K Gehaltsklasse C nicht überschreiten; • Bis 31.5. des auf die Antragsstellung folgenden Jahres Bodenuntersuchungen zu P und K nachweisen; darf nicht älter als 3 Jahre sein. ***Pflanzenschutzmittel:*** Keine Pflanzenschutzmittel auf dem Dauergrünland (Ausnahmen nach Vorgabe der zuständigen Landwirtschaftsbehörde). ***Wasserregulierung:*** Keine Beregnung und keine Meliorationsmaßnahmen auf dem Dauergrünland. ***Landschaftselemente:*** Bereitschaftserklärung, bei Biotoptypen Mager- und Trockenrasen, Streuobstwiesen und Bergwiesen (>400m NN) zusätzliche Pflegeverträge nach Programmteil C mit der Naturschutzbehörde abschließen.	

Fördergegenstand	Fördervoraussetzungen	Förderhöhe
C 4 **Extensivierung der Grünlandbewirtschaftung mit Schnittzeitauflagen (Wiesenbiotope)**	***Wiesen:*** • Mahd nicht vor dem 1.7.; • Naßwiesen und andere Feuchtstandorte nicht vor dem 1.9. mähen; • bei einem Arbeitsgang max. 1.5 ha zusammenhängende Fläche mähen; • Mähgut entfernen und verwerten; ***Bodenbearbeitung:*** • Nach- und Übersaaten nur nach Maßgaben der Naturschutzbehörde; • Grünlandpflege (Anwalzen, Abschleppen) nur vor Vegetationsbeginn, in Wiesenbrütergebieten nur bis 20.3. ***Landschaftselemente:*** Bei Streuobstbeständen sind hochstämmige Obstbäume nicht und abgestorbene Obstbäume nur mit Zustimmung der Naturschutzbehörde zu beseitigen.	Zusätzlich zu B 3: 200 DM/ ha (101,7 ECU/ ha) Wiesenbrütergebiete und Feuchtwiesen: 1. Schnitt nach dem 1.7.: 300 DM (152,55 ECU/ ha) 1. Schnitt nach dem 1.9.: 500 DM/ ha (254,25 ECU/ ha) Bergwiesen (1. Schnitt nach dem 1.9.): 300 DM/ ha (152,55 ECU/ ha) Bei Kombination mit A1: Reduzierung um jeweils 50 DM (25, 43 ECU/ ha), bei Kombination mit B1 Erhöhung um jeweils 100 DM (50,85 ECU/ ha)

ESA Broads

1. Grassland

Objectives:
Tier 1: Maintain pastoral landscape together with all the field boundary features and items of historic interest;
Tier 2: Maintain and enhance the ecological interest of the marshes;
Tier 3: Enhance the wet grassland by controlling water levels and agricultural activities.

General prescriptions:
- Length of agreement is 10 years (with the option of termination after 5 years);
- You may enter any or part of your grassland.

Subject of Support	Prescriptions	Payment
Tier 1: **Permanent grassland**	***Livestock:*** Graze with cattle, sheep or horses. ***Pastures:*** Avoid poaching, over- or undergrazing. ***Meadows:*** One cut of hay or silage per year at most, graze the aftermath. ***Cultivation:*** • Do not plough, level or re-seed the land; • You may use a chain harrow or roller. ***Fertilisation:*** • Do not exceed the existing level of inorganic fertiliser;	£ 135/ ha (195,08 ECU/ ha)

Subject of Support	Prescriptions	Payment
	• Do not exceed in any case 125 kg N/ ha, 75 kg P/ ha, 75 kg K/ ha; • No more than 94 kg N/ ha in any one application; • Do not apply pig slurry or poultry manure and do not in any case exceed existing level of organic manure do not apply more than 30t/ ha of home-produced cattle slurry at 10% dry matter in any year or the equivalent if dry matter is less than 10%. ***Plant Protection Products:*** • Do not use fungicides or insecticides; • Do not apply herbicides except to control nettles, spear thistle, creeping or field thistle, curled dock, broadleaved dock or ragwort. Infestations of these weeds must be controlled by cutting or herbicides. Herbicides used for these purposes shall be applied by weed wiper or spot treatment. Weed control should be carried out as soon as any problem starts to develop. ***Water Regulation:*** • Do not install under-drainage or mole drain and do not subsoil or slit drain; • Do not substantially modify your existing draining system; • Maintain existing dykes in rotation over the period of your agreement and by mechanical means, not sprays; • Spoil must be levelled following slubbing out, after allowing to dry; • Maintain water level at suitable level for livestock to graze on grazing marshes; • Ensure that there is at least 30cm of water in the dykes between 31 Oct and 1 March; • Begin to increase dyke water levels to summer levels no later than	

Subject of Support	Prescriptions	Payment
	1 March to ensure adequate dyke water during the summer. ***Landscape elements:*** • Maintain hedges, ponds and reedbeds; • Do not damage or destroy any feature of historic interest.	
Tier 2: **Extensive grassland**	Observe all the Tier 1 prescriptions plus the additional guidelines set out below: ***Pastures:*** • Do not graze with livestock between 31 December and 1 April. ***Meadows:*** • Do not cut for silage; • Do not cut for hay before 16 July. ***Fertilisation:*** • Do not exceed the existing level of nitrogen; • Do not exceed in any case 44 kg N/ ha; • Do not apply P or K; • Do not apply lime, slag or any other substance to reduce soil acidity; • Do not apply any organic manure. ***Water Regulation:*** • Within two years of the start of your agreement you must agree a plan of dyke maintenance and implement it thereafter; • Do not carry out any mechanical operations between 31 March - 16 July;	£ 225/ ha (325,13 ECU/ ha)

Subject of Support	Prescriptions	Payment
	• Water levels on your grazing marshes must be maintained at not more than 45 cm below marsh level between 31 March and 1 November; • Provide at least 60 cm of water in the bottom of the dyke between 30 November - 1 March; • Begin to raise water levels no later than 1 March in order to achieve the maximum summer freeboard as early as possible; • Maintain existing foot drains and grips but do not dig new ones.	
Tier 3: **Wet grassland**	Observe all the Tier 1 and Tier 2 prescriptions plus the additional guidelines set out below: ***Pastures:*** • Do not graze with livestock between 1 Nov - 15 May; • Before 30 June do not exceed grazing density of one bovine animal per 0,75 ha and do not cause poaching, over- or undergrazing. ***Fertilisation:*** Do not apply any organic and inorganic fertiliser. ***Water Regulation:*** • Maintain water table at marsh level so as to create shallow pools from 1 January - 30 April; • Maintain dyke levels at no more than 45 cm below marsh level from 1 June - 31 October; • Begin to raise your water level no later than 1 November.	£ 310/ ha (448 ECU/ ha)

2. Water Level Supplement

Subject of Support	Prescriptions	Payment
Water Level Supplement	***Pastures:*** • From 1. April until 31. May, do not exceed a grazing density of one bovine animal per 0.75 ha and do not cause poaching, over-grazing or under-grazing; • Do not graze with sheep until 1. June. ***Fertilisation:*** Do not apply any inorganic or organic fertiliser or manure. ***Water Regulation:*** • Agree an in-field water management plan with the Project Officer to include the creation, reinstatement and management of foot drains and grips; • Maintain dyke water levels at not more than 30 cm below marsh level from 15. March until 31. August; • Begin to raise dyke water levels to the maximum summer freeboard no later than 15. February.	£ 50/ ha (72,23 ECU/ ha)

3. Capital Work

Objective: Enhance the character of the landscape, wildlife habitats and protect historic features.

Subject of Support	Prescriptions	Payment
Capital works	• Creation or reinstatement of scrapes and dykes for the benefit of wildlife; • Any clearance work with the ditches being dug to appropriate dimensions and gradients; • Restoration of fen areas including the creation and restoration of reed and sedge beds, marsh hay and litter marshes, and the control of scrub; • Manual cutting followed by either chemical treatment of stumps or cutting regrowth. Cut material should be removed from the site or burned on carefully chosen areas; • Construction of bunds, sluices, culverts and other works to control water levels; • Replacement of existing metal field gates with wooden gates, associated wings and the provision of liggers as dyke crossing; • Re-creation of herb rich meadows, the creation or restoration of ponds, the planting, laying and coppicing of hedges and other works, including works to protect historic features, approved by the minister to enhance the environment; • The meadow must then be entered into at least tier2 for the remainder of your agreement; • Do not materially damage the grassland margin by machinery or other means; • You may regularly cultivate and apply herbicides to a one metre edge of the margin adjacent to the cropped area.	The maximum grant payable to you is calculated by multiplying your agreement area at the start of the plan by £ 75/ ha, subject to a ceiling of £ l500 /ha i.e. £3000 for a two year conservation plan.

Niedersachsen: Basisprogramm

Allgemeine Voraussetzungen:

- Verpflichtungszeitraum: 5 Jahre
- Keine Umwandlung von Dauergrünland in Ackerland
- max. Viehbesatz von 2,0 GVE/ ha LF im gesamten Betrieb
- bei der Tierhaltung sind folgende Haltungsformen im gesamten Betrieb zu keiner Zeit erlaubt:

1. bei Legehennen die Käfighaltung
2. bei der Geflügelhaltung das Kürzen der Schnäbel
3. die Haltung von Wassergeflügel ohne ein über das Trinkwasser hinausgehendes Wasserangebot
4. bei der Schweinehaltung das Einziehen von Rüsselklammern
5. eine Anbindehaltung von Sauen sowie eine Kastenstandhaltung außerhalb der Säugezeit
6. bei der Rinderhaltung die dauerhafte Anbindung und ganzjährige Stallhaltung ohne Laufhof, elektrisch geladene Disziplinierungseinheiten im Stall; sofern Umbaumaßnahmen erforderlich sind, um durch andere Aufstallungsformen den Einsatz des „Kuhtrainers“ überflüssig zu machen, wird eine Übergangsfrist von 4 Jahren eingeräumt
7. bei der Schafhaltung die dauerhafte Anbindung und die ganzjährige Stallhaltung
8. in allen Stallungen muß natürliches Tageslicht vorhanden sein; der Tag- Nachtrhythmus ist einzuhalten.

Förderung extensiver Grünlandnutzung

Fördergegenstand	Fördervoraussetzungen	Förderhöhe
Einhaltung einer extensiven Bewirtschaftung des Dauergrünlandes des Betriebes mit höchstens 1,4 RGV/ ha HFF	***Viehbesatz:*** • Einhaltung einer Bewirtschaftung mit max. 1,4 RGV/ ha HFF; • Auf der HFF einen Mindestbesatz von 0,3 RGV/ ha zu keinem Zeitpunkt unterschreiten. ***Weiden/ Wiesen:*** Mind. eine jährliche Nutzung des Dauergrünlandes. ***Düngung:*** Nicht mehr Wirtschaftsdünger ausbringen, als es dem Dunganfall eines Gesamtviehbesatzes von 1,4 GVE/ ha LF entspricht. ***Pflanzenschutzmittel:*** Keine Ausbringung von Pflanzenschutzmittel (mit Ausnahmen, Genehmigung durch Landwirtschaftskammer). ***Wasserregulierung:*** Keine Durchführung von Beregnung oder Meliorationsmaßnahmen	200 DM/ ha Dauergrünland (101,7 ECU/ha)

2. Niedersachsen: Feuchtgrünlandschutzprogramm

Ziel:
Langfristige Erhaltung, Pflege und Entwicklung von Lebensräumen für die Vogelwelt (Wiesenbrüter, Wat-/ Wasser- und Rastvögel) und die für diese Feuchtstandorte typische Flora.

Förderbereich:
Gesondert bekanntgegebene großräumige Gebiete für die Feuchtgrünlandentwicklung.

Allgemeine Bedingungen:
- Darstellung der Flurstücke in einer Karte;
- Führung einer Schlagkartei;
- Dauer: 5 Jahre;
- Flächen über 0,5 ha.

Fördergegenstand	Fördervoraussetzungen	Förderhöhe
Maßnahmen zur Nutzungsextensivierung nach den Vorgaben der oberen Naturschutzbehörde für die jeweiligen Gebiete • **Beibehaltung oder Extensivierung der Nutzung der Flächen** • **Maßnahmen zur Pflege der Flächen**	Max. 5 gebündelte Bewirtschaftungsauflagen, entsprechend dem Gebiet: **Allg. Bewirtschaftungsbedingungen**: ***Viehbesatz:*** Bis zum 15.06. 2,0 GVE/ ha nicht überschreiten. ***Weiden:*** • Nutzung der Flächen als Dauergrünland; • Keine Nutzung als Portionsweide; ***Wiesen:*** • Max. 2 Schnitte/ Jahr;	Für allg. Bewirtschaftungsbedingungen: 300 DM/ ha /Jahr (152,55 ECU/ha/Jahr) Zusätzlicher Verzicht auf Schleppen und Walzen vom 15.3. - 15.5.: 350 DM/ ha / Jahr (178 ECU/ ha/ Jahr)

Fördergegenstand	Fördervoraussetzungen	Förderhöhe
	• Erster Wiesenschnitt nur von innen nach außen oder von einer Seite zur anderen durchführen. ***Bodenbearbeitung:*** • Keine Veränderung des Bodenreliefs; • Keine Grünlanderneuerung (Nachsaat ist erlaubt). ***Düngung:*** Max. 110 kg N/ ha/ Jahr (= 1,4 GVE); Begrenzung gilt für Gesamtmenge aus chemisch-synthetischen und organischen Düngemitteln. ***Pflanzenschutzmittel:*** Keine Anwendung von chemischen Pflanzenschutzmitteln. Tipula Bekämpfung nur in Einzelfällen. ***Wasserregulierung:*** Keine zusätzlichen Entwässerungsmaßnahmen (zulässig bleibt die ordnungsgemäße Unterhaltung bestehender Gräben, Grüppen oder Drainagen; keine Neuanlage von Entwässerungsanlagen; Aufhebung der flächeninternen Entwässerungsanlagen ist ausdrücklich erwünscht).	Besondere Bewirtschaftungsbedingungen:

Fördergegenstand	Fördervoraussetzungen	Förderhöhe
	Besondere Bewirtschaftungsbedingungen: ***Viehbesatz:*** • Mahd nach dem 30. Juni: diese Flächen dürfen erst nach der Mahd mit bis zu 3 Stück Vieh/ ha beweidet werden. Die Weidefläche für ein Stück Vieh pro Flurstück oder Nutzungseinheit (mehrere Flurstücke oder Teilflurstücke) muß mind. 0,33 ha betragen; • Mahd nach dem 15. Juni: diese Flächen dürfen erst nach der Mahd mit bis zu 2 Stück Vieh/ ha beweidet werden. Die Weidefläche für ein Stück Vieh pro Flurstück oder Nutzungseinheit (mehrere Flurstücke oder Teilflurstücke) muß mind. 0,5 ha betragen; • Mahd nach dem 31. Juli: diese Flächen dürfen erst nach der Mahd mit bis zu 2 Stück Vieh/ ha beweidet werden. Die Weidefläche für ein Stück Vieh pro Flurstück oder Nutzungseinheit (mehrere Flurstücke oder Teilflurstücke) muß mind. 0,5 ha betragen; • Weidenutzung: die Flächen dürfen höchstens mit 2 Stück Vieh/ ha beweidet werden. Die Flächen sind im Herbst auszumähen. ***Weiden:*** • Keine Weidenutzung: mit Zustimmung der oberen Naturschutzbehörde ist eine Beweidung mit max. 2 Stück Vieh / ha zulässig • Nutzung der Flächen nur als extensive Standweide (keine Portions- bzw. Umtriebsweide) mit Rindern • Die Flächen müssen im Herbst gemäht werden (Pflegeschnitt) • Nutzung als Dauergrünland entsprechend den von der oberen Naturschutzbehörde vorgegebenen besonderen Bewirtschaftungsbedingungen, die bes. Zielen des Naturschutzes	Mahd nach 30. Juni max. Dünger 80 kg (1,0 Dungeinheiten) zugelassene Beweidung in best. Fällen Mahd nach 15. Juni → 550 DM/ ha/ Jahr gebietsspezifische weitergehende Einschränkungen hinsichtlich Mahdtermin/ Art der Beweidung Einhaltung des Düngeverbots → 650 DM/ ha / Jahr Bewirtschaftung der in der Übersicht genannten Flächen → 800 DM/ ha / Jahr

Fördergegenstand	Fördervoraussetzungen	Förderhöhe
	Wiesen: • Bei Mahd vor dem 1. August muß an einer Außenseite ein zusammenhängender Streifen von mind. 2,5 m bis zum 31. Juli stehenbleiben • Wiesennutzung: Mahd erst ab dem 15. Juni • Wiesennutzung: Keine Düngung; Mahd erst nach dem 31. Juli ***Bodenbearbeitung:*** Vom 1. März bis zum festgelegten Mähtermin sind Pflegearbeiten und Maßnahmen zur Bodenbearbeitung (Walzen, Schleppen) unzulässig. ***Düngung:*** • Vom 1. März bis zum festgelegten Mähtermin keine Ausbringung von organischem oder mineralischem Dünger. Eine Düngung mit breitwerfender Ausbringung innerhalb der genannten Zeit ist mit Zustimmung der oberen Naturschutzbehörde zulässig; • Düngung mit max. 80 kg/ ha mineralischem N zulässig; • Keine Ausbringung von Gülle oder Jauche auf den Flächen; • Düngung auf den Flächen mit max. 1,0 Dungeinheit/ ha; • Düngung auf den Flächen ganzjährig unzulässig; • Keine N-Düngung auf den Flächen. Mahd erst ab dem 15. Juni.	

Fördergegenstand	Fördervoraussetzungen	Förderhöhe
Maßnahmen zur Umstellung oder zum Aufbau von landwirtschaftlichen bäuerlichen Betrieben	Anschaffung von Maschinen, Geräten, Weidevieh (vorrangig einheimische Rassen), nach den Vorgaben des Naturschutzes wenn sie zu überwiegenden Teilen für die Pflege der für den Naturschutz wertvollen Flächen innerhalb der Förderbereiche eingesetzt werden oder notwendig sind.	Maßnahmen innerhalb großräumiger Fördergebiete Unterhaltung und Folgekosten der geförderten Investitionsgüter sind nicht zuschußfähig 22,5% der Gesamtausgaben in benachteiligten Regionen 15% in sonstigen Gebieten max. Fördersumme im 6- Jahres-Zeitraum: 143.000 DM/ Arbeitskraft 286.000 DM/ Betrieb
Maßnahmen zur Biotopentwicklung und -pflege	Verbesserung der Flächen im Sinne des Naturschutzes z.B. durch: • Umwandlung von Acker in Grünland; • Wiederherstellung der natürlichen Wasserverhältnisse; • Anlegen feuchter Senken; • Beseitigung störender oder biotopbeeinträchtigender Anlagen; • Instandsetzungsmaßnahmen oder andere Maßnahmen zur Wiederherstellung des naturnahen Charakters von Flächen; • Maßnahmen zur Pflege zur Erhaltung eines für den Naturschutz wertvollen Zustandes.	Bis zu 90% der zuwendungsfähigen Gesamtausgaben Bei Umwandlung von Ackerflächen bis zu 100%

Feuchtgrünlandschutzprogramm - Pilotprojekt „Stollhammer Wisch“

Fördergegenstand	Fördervoraussetzungen	Förderhöhe
Grundvariante 1	***Viehbesatz:*** 2,0 GVE/ ha bis 15.06. ***Weiden:*** • Nutzung der Flächen als Dauergrünland; • Keine Nutzung als Portionsweide; ***Wiesen:*** • Maximal 2 Schnitte; • Erster Wiesenschnitt nur von innen nach außen oder von einer Seite zur anderen durchführen.. ***Bodenbearbeitung:*** • Keine Veränderung des Bodenreliefs; • Keine Grünlanderneuerung (Nachsaat ist erlaubt). ***Düngung:*** 110 kg N insgesamt. ***Pflanzenschutzmittel:*** Keine Anwendung von chemischen Pflanzenschutzmitteln. Tipula Bekämpfung nur in Einzelfällen. ***Wasserregulierung:*** Keine zusätzlichen Entwässerungsmaßnahmen (zulässig bleibt die ordnungsgemäße Unterhaltung bestehender Gräben, Grüppen oder Drainagen; keine Neuanlage von Entwässerungsanlagen; Aufhebung	300 DM/ ha (152,55 ECU/ ha)

Fördergegenstand	Fördervoraussetzungen	Förderhöhe
	der flächeninternen Entwässerungsanlagen ist ausdrücklich erwünscht).	
Grundvariante 1 + Gelegeschutz	• Im Frühjahr Gelegeschutz • Vom 15.3. - 15.5. keine Bewirtschaftung außer Düngen und Beweiden	+ 50 DM/ ha (25,43 ECU/ ha)
Aufbauvariante Naturschutz 2	***Viehbesatz:*** Bis zum 15.06. 2,0 GVE/ ha nicht überschreiten. ***Weiden:*** • Nutzung der Flächen als Dauergrünland; • Keine Nutzung als Portionsweide; • Dauerweide: keine Schnittnutzung. ***Wiesen:*** • Max. 2 Schnitte/ Jahr; • An einem Seitenrand der Parzelle darf ein Streifen von 2,50m bis zum 31. Juli nicht gemäht werden; • Erster Wiesenschnitt nur von innen nach außen oder von einer Seite zur anderen durchführen. ***Bodenbearbeitung:*** • Keine Veränderung des Bodenreliefs; • Keine maschinellen Arbeiten (Schleppen, Düngen u.ä.) vom 15.03. bis zum Schnittermin; • Weidepflege (ausmähen, mulchen) ab dem 15.06; • Keine Grünlanderneuerung (Nachsaat ist erlaubt). ***Düngung:***	550 DM/ ha (279,68 ECU/ ha)

Fördergegenstand	Fördervoraussetzungen	Förderhöhe
	Keine Düngung. ***Pflanzenschutzmittel:*** Keine Anwendung von chemischen Pflanzenschutzmitteln. Tipula Bekämpfung nur in Einzelfällen. ***Wasserregulierung:*** • Keine zusätzlichen Entwässerungsmaßnahmen (zulässig bleibt die ordnungsgemäße Unterhaltung bestehender Gräben, Grüppen oder Drainagen; keine Neuanlage von Entwässerungsanlagen; Aufhebung der flächeninternen Entwässerungsanlagen ist ausdrücklich erwünscht); • Parzellengräben (Eigentumsgräben) dürfen nur vom 1.9. - 15.10. aufgereinigt werden.	
Aufbauvariante Naturschutz 3 **(wurde speziell für Milchviehbetriebe entwickelt)**	***Viehbesatz:*** Bis zum 15.06. 2,0 GVE/ ha nicht überschreiten. ***Weiden:*** • Nutzung der Flächen als Dauergrünland; • Keine Nutzung als Portionsweide; • Dauerweide: keine Schnittnutzung. ***Wiesen:*** • Max. 2 Schnitte/ Jahr; • An einem Seitenrand der Parzelle darf ein Streifen von 2,50m bis zum 31. Juli nicht gemäht werden; • Erster Wiesenschnitt nur von innen nach außen oder von einer Seite zur anderen durchführen;	550 DM/ ha (279,68 ECU/ ha)

Fördergegenstand	Fördervoraussetzungen	Förderhöhe
	• Mähweide: Schnittermin ab 15.06.; • Mind. ein Ertragsschnitt. ***Bodenbearbeitung:*** • Keine Veränderung des Bodenreliefs; • Keine maschinellen Arbeiten (Schleppen, Düngen u.ä.) vom 15.03. bis zum Schnittermin; • Weidepflege (ausmähen, mulchen) ab dem 15.06; • Keine Grünlanderneuerung (Nachsaat ist erlaubt). ***Düngung:*** • Ausbringen von mineralischem N erst ab dem 15.6.; • 80 kg N/ ha insgesamt. ***Pflanzenschutzmittel:*** Keine Anwendung von chemischen Pflanzenschutzmitteln. Tipula Bekämpfung nur in Einzelfällen. ***Wasserregulierung:*** • Keine zusätzlichen Entwässerungsmaßnahmen (zulässig bleibt die ordnungsgemäße Unterhaltung bestehender Gräben, Grüppen oder Drainagen; keine Neuanlage von Entwässerungsanlagen; Aufhebung der flächeninternen Entwässerungsanlagen ist ausdrücklich erwünscht); • Parzellengräben (Eigentumsgräben) dürfen nur vom 1.9. - 15.10. aufgereinigt werden.	

Fördergegenstand	Fördervoraussetzungen	Förderhöhe
Aufbauvariante Naturschutz 4	***Viehbesatz:*** Bis zum 20.06. 2,0 GVE/ ha nicht überschreiten. ***Weiden:*** • Nutzung der Flächen als Dauergrünland; • Keine Nutzung als Portionsweide; • Mähweide: Schnittermin ab 20.06. ***Wiesen:*** • Max. 2 Schnitte/ Jahr; • An einem Seitenrand der Parzelle darf ein Streifen von 2,50m bis zum 31. Juli nicht gemäht werden; • Erster Wiesenschnitt nur von innen nach außen oder von einer Seite zur anderen durchführen; • Mind. ein Ertragsschnitt. ***Bodenbearbeitung:*** • Keine Veränderung des Bodenreliefs; • Keine maschinellen Arbeiten (Schleppen, Düngen u.ä.) vom 15.03. bis zum Schnittermin; • Keine Grünlanderneuerung (Nachsaat ist erlaubt). ***Düngung:*** Keine Düngung. ***Pflanzenschutzmittel:*** Keine Anwendung von chemischen Pflanzenschutzmitteln. Tipula Bekämpfung nur in Einzelfällen.	650 DM/ ha (330,53 ECU/ ha)

Fördergegenstand	Fördervoraussetzungen	Förderhöhe
	Wasserregulierung: • Keine zusätzlichen Entwässerungsmaßnahmen (zulässig bleibt die ordnungsgemäße Unterhaltung bestehender Gräben, Grüppen oder Drainagen; keine Neuanlage von Entwässerungsanlagen; Aufhebung der flächeninternen Entwässerungsanlagen ist ausdrücklich erwünscht); • Parzellengräben (Eigentumsgräben) dürfen nur vom 1.9. - 15.10. aufgereinigt werden.	
Aufbauvariante Naturschutz 5	***Viehbesatz:*** Keine Beweidung. ***Weiden:*** • Nutzung der Flächen als Dauergrünland; • Keine Nutzung als Portionsweide; ***Wiesen:*** • Max. 2 Schnitte/ Jahr; • An einem Seitenrand der Parzelle darf ein Streifen von 2,50m bis zum 31. Juli nicht gemäht werden; • Erster Wiesenschnitt nur von innen nach außen oder von einer Seite zur anderen durchführen; • Mähwiese: Schnittermin ab 20.06.; • Mind. zwei Ertragsschnitte, Nachweide je nach Aufwuchs.	650 DM/ ha (330,53 ECU/ ha)

Fördergegenstand	Fördervoraussetzungen	Förderhöhe
	Bodenbearbeitung: • Keine Veränderung des Bodenreliefs; • Keine maschinellen Arbeiten (Schleppen, Düngen u.ä.) vom 15.03. bis zum Schnittermin; • Keine Grünlanderneuerung (Nachsaat ist erlaubt). ***Düngung:*** Keine Düngung. ***Pflanzenschutzmittel:*** Keine Anwendung von chemischen Pflanzenschutzmitteln. Tipula Bekämpfung nur in Einzelfällen. ***Wasserregulierung:*** • Keine zusätzlichen Entwässerungsmaßnahmen (zulässig bleibt die ordnungsgemäße Unterhaltung bestehender Gräben, Grüppen oder Drainagen; keine Neuanlage von Entwässerungsanlagen; Aufhebung der flächeninternen Entwässerungsanlagen ist ausdrücklich erwünscht); • Parzellengräben (Eigentumsgräben) dürfen nur vom 1.9. - 15.10. aufgereinigt werden.	
Aufbauvariante Naturschutz 6	***Viehbesatz:*** Keine Beweidung. ***Weiden:*** • Nutzung der Flächen als Dauergrünland; • Keine Nutzung als Portionsweide;	800 DM/ ha (406,8 ECU/ ha)

Fördergegenstand	Fördervoraussetzungen	Förderhöhe
	Wiesen: • Max. 2 Schnitte/ Jahr; • An einem Seitenrand der Parzelle darf ein Streifen von 2,50m bis zum 31. Juli nicht gemäht werden; • Erster Wiesenschnitt nur von innen nach außen oder von einer Seite zur anderen durchführen; • Mähwiese: Schnittermin ab 30.06.; • Mind. zwei Ertragsschnitte, Nachweide je nach Aufwuchs. ***Bodenbearbeitung:*** • Keine Veränderung des Bodenreliefs; • Keine maschinellen Arbeiten (Schleppen, Düngen u.ä.) vom 1.03. bis zum Schnittermin; • Keine Grünlanderneuerung (Nachsaat ist erlaubt). ***Düngung:*** Keine Düngung. ***Pflanzenschutzmittel:*** Keine Anwendung von chemischen Pflanzenschutzmitteln. Tipula Bekämpfung nur in Einzelfällen. ***Wasserregulierung:*** • Keine zusätzlichen Entwässerungsmaßnahmen (zulässig bleibt die ordnungsgemäße Unterhaltung bestehender Gräben, Grüppen oder Drainagen; keine Neuanlage von Entwässerungsanlagen; Aufhebung der flächeninternen Entwässerungsanlagen ist ausdrücklich erwünscht);	

Fördergegenstand	Fördervoraussetzungen	Förderhöhe
	• Parzellengräben (Eigentumsgräben) dürfen nur vom 1.9. - 15.10. aufgereinigt werden.Ausbringen von mineralischem N erst ab dem 15.6; • Zeitlich begrenzter Rückstau des Winterniederschlages in Gräben oder Grüppen.	
zusätzlicher Vertragstyp (vom Kreis)	Frühjahrsruhe: keine Bewirtschaftung außer Düngung und Beweidung vom 15.03. - 15.05.	50 DM/ ha (25,43 ECU/ ha)