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Agri-environmental policies and their effectiveness



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in Norway, Austria, Bavaria, France, Switzerland and Wales: Review and recommendations



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Agri-environmental policies and their effectiveness in Norway, Austria, Bavaria, France, Switzerland and Wales: Review and recommendations

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Cover photos:

Top left: France (W. Dramstad)

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Centre right: Bavaria (N. Siebrecht)

Bottom left: Wales (S. Eiter)

Bottom right: Switzerland (S. Eiter)

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Abstract

This review identifies 'successful' policies for biodiversity, cultural heritage, and landscape scenery and recreation in Austria, France, Bavaria (Germany), Wales (UK), and Switzerland, and a comparison with current efforts in Norway. All of these countries face similar risks and challenges, mostly with regard to mountain areas. Sources used for the analysis were the evaluations of the national Rural Development Plans, and the midway evaluation and national ex-post evaluations of the CAP programme period 2000-2006. An evaluation of the Swiss Direct Payment System was available from 2009, as well as information about further development from 2011. Scientific papers and other official reports by, e.g., the OECD, the European Commission and the European Environmental Agency, were used as well. Expert interviews were conducted by telephone and e-mail.

Measures deemed particularly successful often had very specific aims, included local information, appeared to involve fairly simple application and organization requirements, were developed and designed in cooperation with farmers and were adapted to local characteristics or challenges. Measures considered less successful were criticized for being unfair in terms of regional repartition of grants, for lacking transparency, for being applied only to

small areas, and for requiring a great deal of organization and implementation work. In terms of future developments of the Norwegian agricultural and agri-environmental subsidy system we recommend examining the following particular policies more closely: the Organic Farming scheme in Austria, the Welsh whole-farm scheme Tir Gofal, and the Austrian, Bavarian and Swiss measures for cultural landscape maintenance.

Since no 'best practice' or 'standard design' of agricultural support schemes has been recognized on an international level to date, an enhanced evaluation system will be as important as new and adjusted schemes. Monitoring data suitable for comparison should be collected, based on internationally defined indicators. For the time being, we suggest "double-tracked" agri-environmental support: mainly measures that have proved to be effective; but also measures where positive effects are considered very likely due to well-known cause-effect relationships, even though they may not yet have been thoroughly documented and approved, e.g. because of their long-term character or due to weaknesses in monitoring and evaluation.

Keywords: Agricultural subsidies, Biodiversity, Cultural heritage, Landscape scenery, Recreation

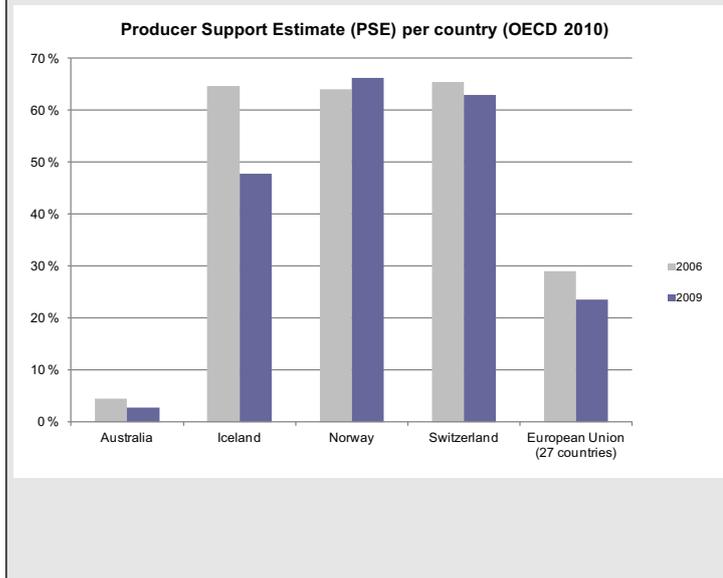
1 Introduction

Expressed aims of Norwegian agricultural policy have been, and still are, food security and preventing loss of the limited agricultural land resource in Norway (only 3.2% of the mainland area is fully cultivated land; http://www.ssb.no/english/subjects/01/01/areal_en/, 12.12.2011). In addition, Norwegian Governments stress the importance of a sustainable land use for biodiversity, maintenance of cultural landscapes and cultural heritage, and for promoting recreation opportunities for the public (Plattform for regjeringssamarbeidet mellom Arbeiderpartiet, Sosialistisk Venstreparti og Senterpartiet 2005; Politisk plattform for en regjering utgått av Høyre og Fremskrittspartiet 2013). Not least because of the relevance of agriculture for these 'public goods', the Norwegian authorities offer a wide range of forms of agricultural support.

According to the OECD, Norway's Producers Support Estimate (PSE) (Box 1) was 61% between 2007 and 2009, which

Box 1: PSE

The Producers Support Estimate is an indicator of agricultural support developed by the OECD. It is an account of the monetary value of different types of policy measures, such as subsidies, compensation payments for charging lower prices, and market price support and policies providing tax concessions or fee reductions (OECD 2009: 2).



means that 61% of the gross farm income came from government support, thus ranking Norway first among all OECD countries, followed closely by Switzerland (58%) (OECD 2010).

Despite the high level of support for the agricultural sector in many European countries, the number of farms has declined in recent years. At the same time, agriculture still exerts a high pressure on environmental goods (EEA 2009: 34). However, in some regions, cessation of agriculture is a reason for concern also from an environmental perspective, due to species loss and landscape changes (Hamell 2001). In general, this has led to strengthened efforts in terms of research and discussions on the effectiveness of different kinds of subsidies on national and international levels (Hamell 2001, Kleijn & Sutherland 2003, Kleijn et al. 2004). Moreover, with the long-term objective to establish a worldwide fair and market-oriented trading system, agricultural policies in all member states of the WTO (World Trade Organization) are under debate.

In 1995 the WTO members agreed to improve market access and reduce trade-distorting subsidies in agriculture (Mjør- lund & Vårdal 2007; Huige et al. 2010), and even though the current round of trade negotiations (Doha Development Agenda) which started in 2001 has not yet ended, there is no doubt that export subsidies have to cease and import protection has to be reduced (Huige et al. 2010). This concerns also the Norwegian agricultural support system, which has to change towards subsidies without influence on trade or production (the 'green box' measures in WTO terminology) (see Box 2) (Mjør- lund & Vårdal 2007). Yet in what way can the support system be developed? How can we design agricultural subsidies which are effective incentives for farmers to promote and maintain public goods, while at the same time securing food security through a continued food production?

1.1 Aim and scope of this review

To benefit from existing know-how and experiences of other countries in the field of agricultural policies, the aim of this review is to give an overview of existent agricultural subsidies in some European countries. To enable a comparison with

current Norwegian efforts, we also provide a brief summary of these. Additionally, we aim to identify 'successful' agricultural policies and subsidies, that is policies and subsidies that have been documented to have the desired effects on biodiversity, cultural heritage, and landscape scenery and recreation. We have chosen to look closer at measures available in five countries: Austria, France, Bavaria (Germany), Wales (UK), and Switzerland. With the exception of Switzerland, all are member states of the European Union. Even though the agrarian structures differ greatly among these countries (Table 1), the countries are all facing similar risks and challenges, mostly with regard to mountain areas where the abandonment of farms and decline in summer pastures causes a reduction in open landscapes, with negative impacts on biodiversity and the rural cultural heritage (MacDonald et al. 2000). Also, all of the countries selected for the present review have signed the Convention on Biological Diversity (CBD) (SCBD 2010). The CBD is highly relevant in this context, as it recognizes the important role played by decision makers such as landowners and farmers in protecting biodiversity. Governments are therefore required to set rules that guide the use of natural resources, to develop national biodiversity strategies and action plans, and to integrate these into broader national plans for environment and development, explicitly stated as being particularly important for such sectors as forestry, agriculture, fisheries, energy, transportation and urban planning.

The European Landscape Convention (ELC) has been ratified by France and the UK. Switzerland signed the ELC in 2000 but has not yet ratified it, while the federal states of Austria and Germany have not signed the Convention (CoE 2008). The European Landscape Convention demands from the signing parties that they implement landscape as a theme in all policies – also agricultural. Also the ELC is focused on stakeholder involvement, and it states explicitly that it applies not solely to the extraordinary landscapes of high protective value, but equally well to the "everyday" landscapes. In Norway as in many other countries, a large proportion of the "everyday" landscapes have a strong agricultural influence.

Box 2: The WTO 'boxes' of domestic support in agriculture (WTO 2010)

Amber box	Blue box	Green box
All domestic support measures considered to distort production and trade (except those in the blue and green boxes). This box includes measures to support prices and subsidies directly related to production quantities. In the current WTO trade negotiations round, various proposals deal with how much these subsidies should be reduced by.	Any support that would normally be in the amber box is placed in the blue box if the support also requires farmers to limit production. At present there are no limits on spending on blue box subsidies.	These subsidies must not distort trade, or at best cause minimal distortion. They have to be government-funded (as opposed to charging consumers higher prices). They tend not to be targeted at particular products, and include direct income support for farmers that are not related to (are 'decoupled' from) current production levels or prices. They also include environmental protection and regional development programmes.

Table 1: Statistics for agriculture in the countries studied (in 2007)

	Austria¹	Bavaria²	France³	Wales⁴	Switzerland⁵	Norway⁶
Inhabitants	8,362,000	12,519,728	64,491,000	2,980,000	7,709,000	4,768,212
Total surface area	83,872 km ²	70,552 km ²	551,500 km ²	20,779 km ²	41,284 km ²	323,779 km ²
Agricultural land (% of total land area)	31,900 km ² (38 %)	32,200 km ² (46 %)	293,141 km ² (53 %)	14,599 km ² (70 %)	10,581 km ² (26 %)	10,232 km ² (3 %)
Grassland (of total agricultural land)	51 %	35 %	33 %	85 %	70 %	17 % ⁷
Arable farming (of total agricultural land)	43 %	64 %	62 %	10 %	26 %	83 % ⁷
Agricultural holdings	169,079	121,659	506,900	38,215	61,765	49,935
Average farm size	35 ha	27.3 ha	78 ha	38 ha	17.2 ha	20.7 ha

Notes: ¹ Lebensministerium 2009c: 12; ² StMLF 2008; ³ Agreste 2008; ⁴ Welsh Assembly Government 2009a, 2009b; ⁵ Bundesamt für Statistik Schweiz 2010a; ⁶ Statistisk sentralbyrå 2013; ⁷ Sown hay meadows in Norway are included arable land.

1.2 Method

To identify agricultural policies and subsidies which are successful with regard to maintaining and enhancing biodiversity, cultural heritage and landscape scenery, we initially looked more closely at the farming scheme information websites of the respective authorities responsible for agriculture: the Welsh Assembly Government (Welsh Assembly Government 2010a), Bayerisches Staatsministerium für Ernährung, Landwirtschaft und Forsten (StMELF; Bavaria) (StMELF 2010), Lebensministerium (Austria) (Lebensministerium 2010a), Ministère de l'alimentation, de l'agriculture et de la pêche (France) (Ministère de l'alimentation, de l'agriculture et de la pêche 2010), and Bundesamt für Landwirtschaft (Switzer-

land) (Bundesamt für Landwirtschaft 2010a).

It became apparent that most schemes provided for EU farmers are organized under the Rural Development Programme policies for 2007–2013 as a part of the Common Agricultural Policy (CAP). In Switzerland the agricultural payments, called Direktzahlungen (Direct Payments), are targeted at quite similar objectives but they are organized in a different way and they are not limited to a particular programme period (see Table 2) (Bundesamt für Statistik Schweiz 2010b).

The main sources for the analysis of the Rural Development Programme policies presented in this review were the available evaluations of the national Rural Development Plans. A summarizing, comparative

and Europe-wide ex-post evaluation of the programme period 2000–2006 as well as national mid-term evaluations of the recent programme period (2007–2013) were not yet available. Thus, the most recent comparative study of Rural Development Plans in Europe can be found in the results of the midway evaluation of the programme period 2000–2006 (European Commission 2005) (cf. Agra CEAS Consulting 2005). Also the national ex-post evaluation reports for the period 2000–2006 were available. These are more complicated to compare, however, not the least because of the national languages, the volume of the studies (e.g. for France there is a combined total of 2600 pages), and the lack of standardization in terms of evaluation requirements. The situation regarding Switzerland is better due to the availability of an evaluation report from 2009 about the current Direct Payment System as well as information about the ongoing further development of the payments from 2011.

While information about effects of the policies on biodiversity and on landscape was readily available, albeit with a number of inconclusive results, topics such as cul-

tural heritage or recreation opportunities were either not included or were insufficiently considered in the evaluation reports, representing a challenge for this work.

In addition to the evaluation reports, and scientific papers, two reports from 2005 targeted especially at the so-called agri-environment schemes on a European level (EC 2005; Oréade-Brèche 2005), and also reports on agricultural policies and environmental themes published by the OECD (2008; 2010), by the European Commission (EC 2005), by the European Environment Agency (EEA 2009), and by the Institute for European Environmental Policy (Cooper et al. 2009), respectively, were useful. Furthermore, in the period March to August 2010 informal telephone and e-mail interviews with experts were conducted (e.g. from the responsible agricultural authorities, the universities of Weihenstephan (Bavaria) and ISARA (Lyon/France), and the Swiss Federal Institute for Forest, Snow and Landscape Research (WSL)) in an attempt to identify national ‘success stories’ in farming support with regard to the three themes of interest: biodiversity, cultural heritage, and landscape scenery and recreation.

2 Support measures in European agricultural policies

Financial support within agricultural policies has a long tradition in all European countries and in the Common Agricultural Policy (CAP) of the European Union. However, only a few measures have had a direct focus on encouraging the provision of environmental public goods (Cooper et al. 2009). Norway does, naturally, not have to follow the Common Agricultural Policy, but the hypothesis underlying this review is that a review probably would reveal more similarities than differences.

2.1 The Norwegian subsidy system

Subsidizing agriculture appears to be widely accepted in the Norwegian population at large, the question about whether this system provides good "value for money" has been raised in Norway, as in many other countries (Wilson and Hart 2011, Kleijn and Sutherland 2003). A key question seems to be whether the system really promotes the public good aspects of a truly multifunctional agriculture, or whether the system mainly promotes the continuing of a primarily productivist farming society (*sensu* Wilson 2011). Does the Norwegian agricultural subsidy system contribute to what Green and Vos (2001, p. 149) described as the need to "conceive, design, create and maintain new landscapes fit for the social, economic and environmental needs of the twenty-first century"? Or does this system mainly contribute to conserving a landscape heavily influenced by agricultural practices no longer viable? In this context it is also timely to question whether the Norwegian system is in line with that of other European countries, or whether some other

form of AES scheme organisation is practiced and reported to be successful elsewhere.

More than 50 percent of the Produce Support Estimate for Norway is due to price support in some form, either as a direct price support (budget support) or as the difference between import price and the price in the domestic market (due to toll on import). Such measures are considered less important for this review; however, price in the market in combination with area support and livestock related payments are important factors when the farmer decides whether farming is an economically interesting activity or not. It also influences what to produce and how to grow/produce it on his/her land. This implies that it influences management decisions. Thus it also influences the cultural landscape.

The subsidy scheme has been relatively stable between years; however, it is based on an annual agreement. Subsidies and payments for environmental services are administrated at three levels, the national level on which the core farm subsidies are administrated, at the county level and at the municipality.

The national schemes (production support) are administrated by the Norwegian Agricultural Authority (*Statens landbruksforvaltning*). It is at the national level, where we find payments that correspond to the typical pillar 1 payments in the EU. The level of payments as price support varies between regions, and is often 0 for the "best region" (Figure 1).

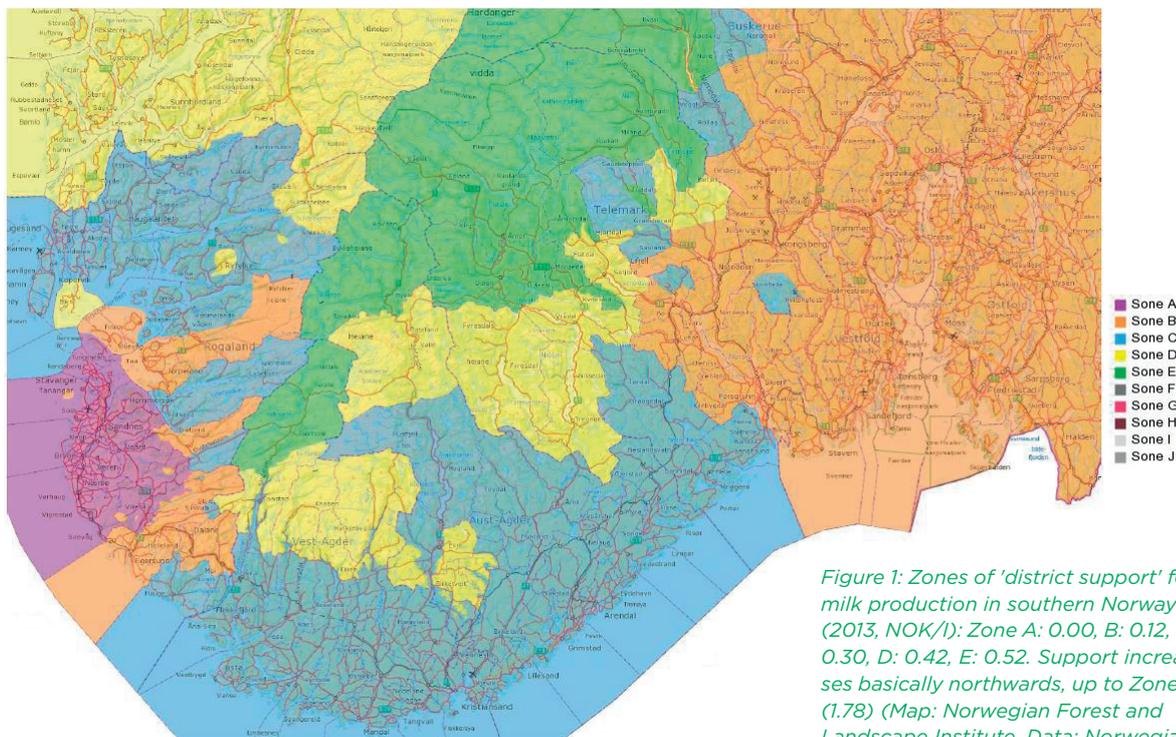


Figure 1: Zones of 'district support' for milk production in southern Norway (2013, NOK/l): Zone A: 0.00, B: 0.12, C: 0.30, D: 0.42, E: 0.52. Support increases basically northwards, up to Zone J (1.78) (Map: Norwegian Forest and Landscape Institute, Data: Norwegian Agricultural Authority).

In order to receive production support in general, such as the national acreage and headage support, farmers need to comply with the Norwegian compliance criteria for good agricultural practice. Another criterion is that support is limited to farmers who have a market income of at least 20 000 NOK (c. 2500 EUR).

Within the Production support system are also subsidy schemes that do have certain environmental aims on the agenda. These subsidy schemes, the National Environmental Scheme (*Nasjonalt miljøprogram*, NMP), the Regional Environmental Schemes (*Regionale miljøprogrammer*, RMP) and the locally managed support scheme

for "special environmental measures in agriculture" (*Særskilte miljøtiltak i landbruken*, SMIL) will be in focus in this paper.

The National Environmental Scheme administered by the Norwegian Agricultural Authority is composed of several sub-schemes of which the so-called "Area and cultural landscape support" (AK-scheme), is by far the largest, totalling more than 3 000 MNOK (375 mill. EUR) in 2010 (Figure 2). Payments from this scheme are distributed based on farming activities, but not related to the amount of products achieved. A key aim with the national support is to ensure continued farming in the entire country.

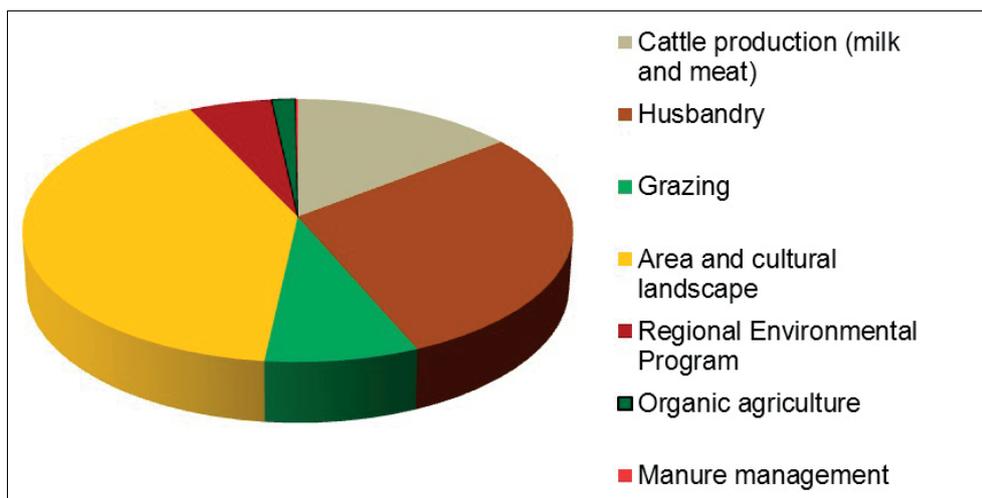


Figure 2: Percent of direct subsidies allocated to different main themes (2010). Data source: Norwegian national budget (Statsbudsjettet) 2012.

This particular scheme does not in itself support any type of environmentally focused activity conducted by the farmer. Rather, there are certain requirements as to activities not permitted by farmers receiving support, which are part of the "good agricultural practice". These include the reduction or removal of farm ponds, removal of stone fences or rocky outcrops, using pesticides on edges or remnants, etc. It is explicitly stated that violation of these restrictions will lead to a reduced support. The AK-scheme has been criticized,

accordingly, for the general and non-targeted structure of the environmental criteria. It deserves to be mentioned, though, that the criteria of the AK-scheme grew out of a situation in the 1960s and 1970s, where mechanization and intensification had large-scale impacts on the agricultural landscapes in Norway as in most of Europe (Image 1). At present, the scheme cannot be said to encourage hardly any extra effort to improve the environmental situation, but it helps to maintain the present situation.

Image 1a, b: Farmland in Østfold county, Southeast Norway, in 1974 (left) and in 2004: Land levelling has made the area suitable for intensive production of cereals. Photos: a) A.B. Haaje, b) O. Puschmann, Skog og landskap.



As regarding the success of the AK-scheme, there is an ongoing monitoring program of Norwegian agricultural landscapes ("3Q", see Dramstad et al. 2002 for details), monitoring state and change in agricultural landscapes and also targeting most elements mentioned specifically in the AK-scheme criteria. This monitoring has documented that the criteria to a large extent appears to be satisfied (e.g. Dramstad et al. 2006, Puschmann & Stokstad

2010). However the scheme does not conclude on the reasons thereof.

"Special payments for ecological farming" is also a national scheme. It includes acreage and headage payments that are given in addition to the subsidies that the conventional farmers can apply for. A special payment applies for the conversion period from conventional to ecological farming, in order to stimulate increased ecological production. To promote genetic diversity, there is also a special payment per dairy

cow of particularly rare old national breeds (Image 2).



Image 2: Dølafe, a historical Eastern Norwegian cattle breed eligible for funding from regional agri-environment schemes (RMP). Photo: A. Rehnberg, Skog og landskap.

During recent decades it has been strongly recommended to regionalize at least a part of the subsidy system. In response to these recommendations, a scheme under regional control was initiated in Norway in 2005, partly through the amalgamation of some older and less relevant schemes (SLF 2009). In these new schemes, entitled the Regional Environmental Scheme (RMP), the counties determine criteria to be fulfilled by the farmer to receive support, but also this scheme is voluntary.

There are two main categories of RMP-schemes. These are pollution control and agricultural landscape management. Both the distribution of the total budget between these two categories and spending on more specific measures vary greatly between counties. On a national level, the spending is more or less equal; 49 and 51% respectively. In contrast to farmers receiving payments under the AK-scheme only, those who receive subsidies from the RMP-schemes are required to conduct some type of specific activity. These activities are described and prioritised regionally, such as pollarding of trees (Image 3).

In 2006 the schemes varied across the country, and a total of more than 150 regionally distributed sub-schemes, existed. Also these funds (totalling c.400 MNOK in 2009) are distributed based on the principle that all who apply and fulfil particular criteria, will receive payments. The system has been evaluated and slightly modified

once, after the first four years (Puschmann et al. 2008). The proportion of farmers participating is rather variable across the country, ranging from only 33 to more than 80% due to the type of environmental payments supported in the region. Focusing on the sub-schemes under the heading agricultural landscape management, four main themes have been in focus during the initial phase of this regionally managed system: 1) preventing reforestation on formerly grazed land, 2) maintaining landscapes with particular historical or biological qualities, 3) maintaining cultural heritage values and 4) supporting accessibility and recreation.

In general, these regional schemes are the main funding opportunity for managing cultural heritage or management for recreation in agricultural landscapes. However, only a small number of counties have specific aims targeting this. According to the assessment by Puschmann et al. (2008), only three counties had schemes available for accessibility and recreation during the first period of RMP.

To what extent the scheme produces the desired public goods has not been thoroughly assessed. However, positive effects have been documented at least regionally, e.g. as result of the support to mountain summer farming (dairying in seasonally inhabited areas) (SLF 2006). Furthermore, certain farming activities are funded that would probably cease otherwise, e.g. the pollarding of more than 9000 trees.

From 2009 onwards, six main focus themes have been outlined (SLF, 2008);

- Agricultural landscape management, focusing on traditional management and that which is considered specific for the region
- Biological diversity – small biotopes, rare and threatened habitats as well as genetic resources e.g. in terms of old breeds
- Cultural heritage and cultural environments
- Accessibility and possibilities for recreation, e.g. through establishing footpaths and possibilities for crossing fences
- Prevention of run-off
- Reducing pesticides and ensure safe disposal of waste

Hitherto, an important challenge in focus in several counties has been to increase grazing, and these counties tend to steer a dominant proportion of their available funds towards promoting this. Other counties have given priority to pollution control through establishment of sedimentation ponds, haying of old meadows or management of traditional pollarded trees (Image 3).

Also a scheme managed by the local authorities ("SMIL") is established in Norway. Participation is voluntary, and funds from this scheme are only available for those who are willing to conduct particular activities, e.g. use particular species rich areas for haying only or restore an old building. The local scheme differs from the regional in the way, that also people who are not active farmers themselves, e.g. because they have rented out their land, can apply. It is also the only scheme providing support for restoration of old buildings. However, the scheme is much smaller in terms of the funds available, and it has been reported that there is a general lack of funds to match the number of applications, i.e. there is a larger number of farmers who want to do certain management activities than the ones currently receiving funding (SLF 2006).

According to an evaluation published in 2009, the scheme has a positive effect in terms of some themes, e.g. regarding ponds and protected buildings, while effects with regard to certain other themes are more variable (SLF 2009). The evaluation also points out options for further improvement, including developing the knowledge base in local management authorities and clarifying some of the aims.

To sum up on the part of the Norwegian agricultural subsidy system that is somehow under the "environmental umbrella", there appears to be a pronounced focus on ensuring continued farming and on reducing pollution from agriculture while less focus is placed on the other environmental effects. Also the fact that the schemes are all based on voluntary participation represents a limitation to the environmental effects that can be anticipated. Furthermore, neither the National Environmental Programme nor the Regional Environmental Programme can be said



to be very specifically targeted, although the RMP does focus on regionally prioritised issues or prioritised areas.

Image 3: Pollarded tree in Hordaland County, Norway. Photo: J.Y. Larsson, Skog og landskap.

2.2 Rural development policies

Since the Treaty of Rome (1957), in which the general objectives of a common agricultural policy were defined, the CAP has been reformed on a number of occasions (Hamell 2001, Kuyvenhoven & Stolwijk 2010). One event of particular importance in this context was the Agenda 2000 reform, which divided the CAP into two 'pillars': production support and rural development (Hamell 2001). Support under the first pillar is provided to secure farmers' incomes, in the form of 'direct payments' (EC 2010a). These payments can contribute to the maintenance of farms and thereby also to the provision of public goods produced through farming

(Cooper et al. 2009: 108). However, only measures under the Pillar 2: rural development), are targeted directly at the three topics of interest here (biodiversity, landscape, and cultural heritage). Therefore, measures under Pillar 1 are not considered further in this review.

All Rural Development Programmes (RDPs) in the period 2007–2013 are grouped under the European Agricultural Fund for Rural Development (EAFRD). The general structure of the RDPs is established by European Council Regulation No. 1698/2005 on support for rural development by the EAFRD and has four priorities (Axes):

Axis 1: Improving the competitiveness of the agricultural and forestry sector

Axis 2: Improving the environment and the countryside

Axis 3: Improving the quality of life in rural areas and encouraging diversification of the rural economy

Axis 4: Leader (Liaison entre actions de développement de l'économie rurale) (CoE 2005; Thomsen et al. 2010: 384), an approach for involving local partners in steering the future sustainable development of their area, e.g. through a local action group (EC 2006).

Within the frame of European Council Regulation No. 1698/2005 the member states can adapt their own RDP to fit with national specifics and needs. Due to its federal structure, Germany has implemented a rural development policy on the level of the 16 Länder (e.g. Bavaria). The RDPs of the Länder have to conform with the 'Nationale Rahmenregelung der Bundesrepublik Deutschland für die Entwicklung ländlicher Räume' (the German national framework for rural development) (EC 2010b). In the UK, the rural development policy is also implemented at the level of countries. Accordingly, in Wa-

les the Welsh Assembly Government is responsible for the Rural Development Plan (Welsh Assembly Government 2010a). In Austria, despite its federal structure, there exists only one national Rural Development Programme (Lebensministerium 2010b), whereas France has a national plan for rural development which has to be completed with a regional part at the level of the 21 Régions (Ministère de l'alimentation, de l'agriculture et de la pêche 2009). In Switzerland rural development policy does not come in under the agricultural policy but it is the responsibility of different sectoral policies (e.g. environmental, tourism, and regional policy) (Smola 2009).

Figure 3 shows the planned repartition of the financial subsidies on the four Axes within the second pillar of the CAP and for the technical part (including administration). It is particularly noticeable that in all four countries represented, over 50 % of the total amount of subsidies is distributed for improving the environment and the countryside (Axis 2) and that Wales and Austria spend 75 % and 73 % respectively of the amount under Axis 2. In terms of Axis 1 (improving the competitiveness of the agricultural and forestry sector) we find a wider margin between Wales (11%, lowest) and France (35%, highest). For Axis 3 (Improving the quality of life in rural areas and encouraging diversification of the rural economy) and Axis 4 (Leader), there are relatively equal levels of spending in all four countries. Due to the differences in the organization of the rural development policies in Switzerland it was not possible to generate comparable data for measures corresponding to the four Axes. Regarding the Direct Payment system, 80 % was used for General Direct Payments, 16 % for Ecological and Ethnological Direct Payments, and 4 % for payments targeted at summer grazing areas (El Benni & Lehmann 2010).

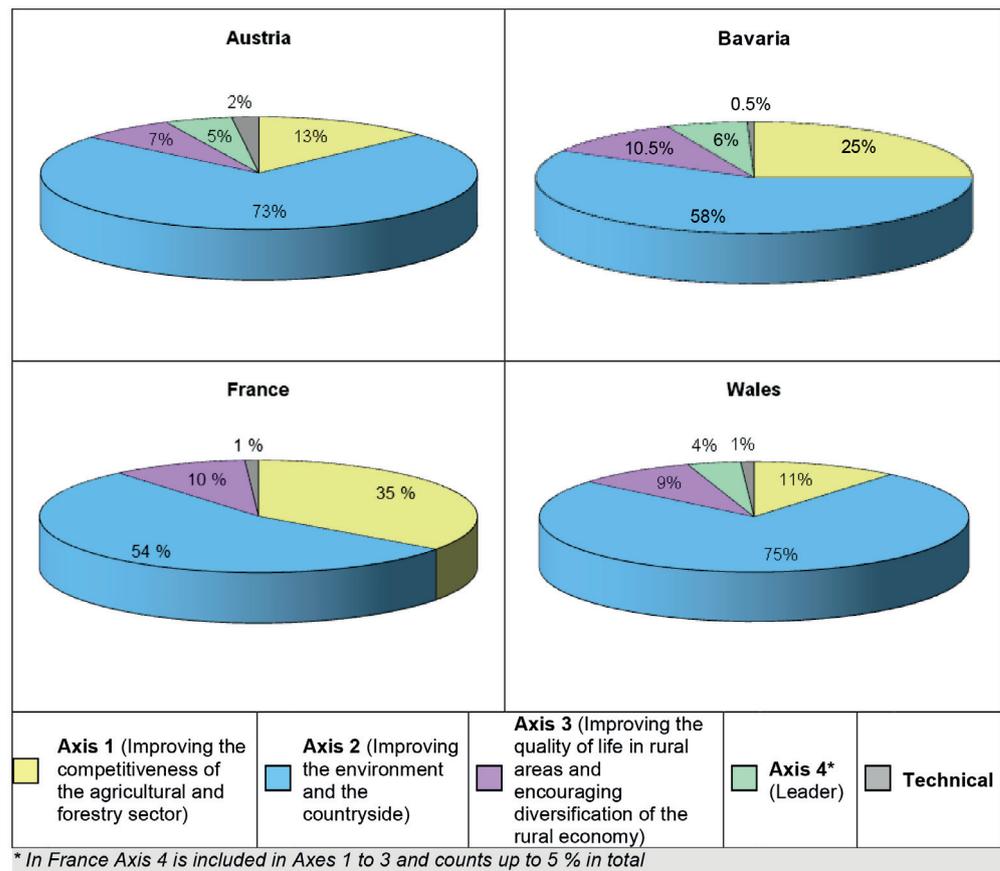


Figure 3: Planned amount of financial subsidies in the CAP's Rural Development Programmes according to Axes (programme period 2007-2010). Not underlying CAP, Switzerland is excluded from this figure.

In the following, we will take a closer look at Axes 2 and 3 of the Rural Development Plans because they contain measures targeted at environmental themes and thereby also biodiversity, landscape, and cultural heritage. Although relevant projects may exist under the Leader approach (Axis 4) as well, for practical reasons they have not been included in this review - too large is the variety of projects and themes under this axis.

2.3 Measures of importance for biodiversity, cultural heritage, landscape scenery, and recreation

Due to the requirements of European Council Regulation 1698/2005, the structure of measures under the Rural Development Programmes is quite similar in all EU-countries (Table 2). Only in Switzerland they have a somewhat different structure, however, some parallels can be found (Smola 2009). Farmers who want to participate in the measures have to respect the usual 'good farming practices' (cross compliance), which are defined on a

national level and, in the case of the EU member states, submitted to the European Commission as part of the RDPs (EC 2005; El Benni & Lehmann 2010).

All countries provide subsidies for farmers in Less Favoured Areas (LFAs) (often divided into mountain and non-mountain areas). In Wales the measure is called Tir Mynydd, and in Switzerland these payments are organized under the General Direct Payments (El Benni & Lehmann 2010). In Bavaria, Austria and France additional payments (within the agri-environment measures) exist for farmers whose farmland is part of the Natura 2000 system (EC 2010d).

Grants to support organic farming are offered in all the considered countries and they are usually included in the agri-environment schemes. Another similarity is that all five countries provide payments for sustainable silviculture (e.g. a programme for forest biodiversity in Switzerland; Bundesamt für Umwelt 2010) and/or for the afforestation of agricultural land.

Table 2: Structure of the Rural Development Programmes

	Wales Rural Development Plan	Bavaria Bayrisches Zukunftsprogramm für die Entwicklung des ländlichen Raums	Austria Österreichisches Programm für die Entwicklung des ländlichen Raums	France Programme de développement rural Hexagonal 2007-2013	Switzerland ¹
Axis 1	e.g. young farmers support, farm advisory, education, infrastructure, marketing, modernization of farms, regional producer groups...				Agricultural Policy (e.g. social measures, education etc.)
Axis 2	Tir Cynnal (AEM ²)	Cultural Landscape Programme (KULAP) (AEM)	ÖPUL (AEM)	Agri-environmental measures (AEM)	Ecological Direct Payments (AEM)
	Tir Gofal (AEM)	Contract-based nature protection and compensation payments (VNP) (AEM)			General Direct Payments
	Tir Mynydd Aid to farmers in less favoured areas	Aid to farmers in less favoured areas - mountain and not mountain	Aid to farmers in less favoured areas - mountain and not mountain	Aid to farmers in less favoured areas - mountain and not mountain	Improvement of agricultural infrastructure
	Organic Farming (AEM)	Non-productive investments - maintenance of hedges & protection of endangered species Natura 2000 Cattle pasture management	Natura 2000 Animal welfare for agriculture	Non-productive investments	Protected areas policy
Better Woodlands	Sustainable silviculture (7 sub-measures)	Sustainable silviculture	Sustainable silviculture (4 sub-measures)	Forest policy (e.g. program for forest-biodiversity)	
Axis 3	Implemented through local partnerships: - Diversification of and services for rural economy - Rural tourism - Village renewal - Conserving the rural heritage	Diversification of rural economy	Diversification of rural economy	Diversification of rural economy	Traffic planning & and spatial policy
		Services and infrastructure for rural economy and population	Encouragement of rural tourism	Encouragement of rural tourism	Tourism policy
		Rural development concepts with public participation	Enhancement of rural life quality	Services and infrastructure for rural economy and population	Nature and homeland-protection policy
		Village renewal	Village renewal	Village renewal	Services and infrastructure for rural economy and population
	Enhancement of the rural heritage	Enhancement of the rural heritage Vocational training	Enhancement of the rural heritage Vocational training		
Axis 4	Leader	Leader	Leader	Leader	Regional development projects (agricultural policy)

¹ Smola 2009² AEM: agri-environment measures

France and Bavaria provide additional measures targeted at non-productive investments for agriculture which are limited to farmers with agricultural land in areas of high natural value and which offer non-recurring payments for the protection of endangered landscape features and species. Examples from France are measures for restoration of peatland and planting of hedges (Ministère de l'agriculture et de la pêche 2007). In Bavaria the non-productive investment payments include a hedgerow maintenance scheme (StMELF & StMUG 2010).

It is noticeable that all countries provide *agri-environment programmes* which, according to the Institute for European Environmental Policy (IEEP), are

'the most directly focused [measures] on the maintenance and improvement of agricultural landscapes and farmland biodiversity. As the only compulsory rural development measure, the agri-environment measure is the most significant both in terms of its spatial coverage and the financial resources allocated to it' (Cooper et al. 2009).

Within the agri-environment schemes we can find a great variety of measures (EC 2005), but it is possible to identify some basic principles: in general participation in the schemes is optional, and activities carried out under the schemes have to go beyond the usual 'good farming practices'. Two types of agri-environment schemes can be distinguished. On the one hand, there are schemes tending to include a large number of farmers and cover a wide area. These schemes make relatively modest demands on farmers' practices and in return pay relatively little for the provided environmental services. On the

other hand, there are schemes targeted at specific environmental issues. Such schemes include fewer farmers, are more demanding, and pay correspondingly more. Sometimes agri-environment programmes include both kinds of schemes (EC 2005, Evans et al. 2002). In addition, it is possible to distinguish 'whole farm schemes' (e.g. all schemes in Wales) and measures which can be implemented just on parts of farms.

The basic structure of the agri-environment schemes in Austria, Bavaria, Wales, and Switzerland has developed without larger changes during the most recent programme periods (2000–2006, 2007–2013). Only France shows an absence of continuity in the proposed schemes through the different programme periods, ranging from more demanding, whole farm schemes to less demanding and nationwide schemes (Jauneau 2009, unpublished).

The current basic structure of the agri-environment schemes in the programme period 2007–2013 is shown in Figure 4. Austria has an agri-environment scheme which includes nationwide measures as well as two measures which are implemented on a regional level. In France there are eight nationwide measures available. Additionally, the responsible authorities at regional level can choose measures for implementation in the territory under their control, from a national catalogue of 'regional agri-environment measures'. In Switzerland, Ecological Direct Payments are available for farmers throughout the country as a whole and are divided into Eco-Payments (e.g. organic farming) and Etho-Payments (e.g. animal welfare) (El Benni & Lehmann 2010).

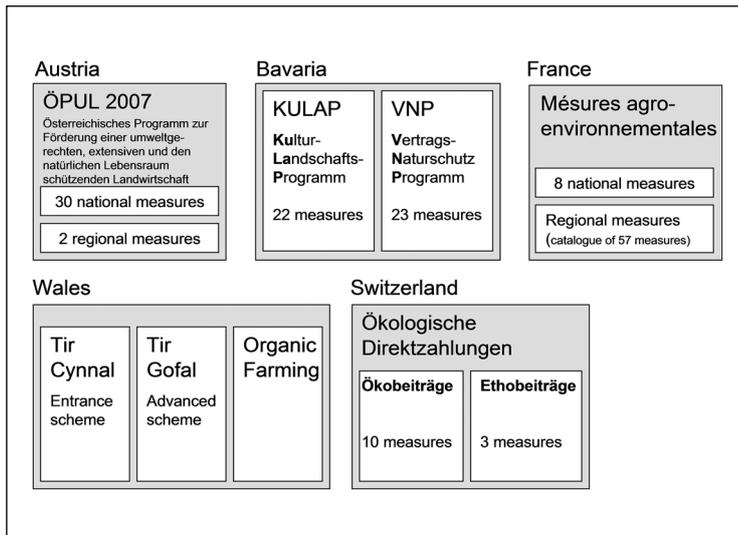


Figure 4: Basic structure of agri-environment schemes (programme period 2007-2013).

In Bavaria two different kinds of agri-environment schemes exist: the Bavarian Nature Protection Contract Programme (Vertragsnaturschutz-programm, VNP) and the Cultural

Landscape Programme (KULAP). The VNP is only applied to ecologically valuable habitats with endangered animals and plants and is organized under the Bavarian State Ministry of the Environment and Public Health, while the KULAP (under the responsibility of the Bavarian State Ministry of Food, Agriculture and Forestry) is available for the whole territory.

Wales has developed a two-level system with an entrance agri-environment scheme (Tir Cynnal) and an advanced scheme (Tir Gofal). In order to participate in the Tir Gofal scheme, farms are assessed by external consultants using a scoring system (Wales Audit Office 2007) (see Box 3). It is also noticeable that the Welsh Government responds fast to new challenges and problems identified in the course

of scheme evaluations. This can be seen in, for example, the introduction of new schemes in the middle of a programme period (e.g. Tir Cynnal in 2005 due to the fact that the area under Tir Gofal was not as large as expected). In 2012 a new agri-environment scheme called Glastir has replaced the existing agri-environment schemes to face 'new' challenges (defined in the CAP Health Check), such as climate change, water management, and biodiversity (Welsh Assembly Government 2010b).

Measures under Axis 3 (improving quality of life in rural areas and encouraging diversification of the rural economy) are mostly implemented through local partnerships. Within this Axis the two most important measures for the three themes of interest are 'Village renewal' and 'Enhancement of the rural heritage' because they include support for activities which aim to maintain or enhance cultural and natural landscape features.



Image 4: Hedgerows are planted, maintained or restored with funds from Tir Gofal. Photo: P. Thorvaldsen

Box 3: Tir Gofal – advanced agri-environment scheme of Wales

The objectives of Tir Gofal are:

- to protect and enhance habitats of importance to wildlife
- to protect and enhance the beauty of the landscape
- to protect and enhance historic and archaeological features
- to provide opportunities for new public access to the countryside
- to protect and improve the quality of water, soil and air by measures to reduce pollution

(Welsh Assembly Government 2008d)

Farms are assessed by external consultants using a scoring system and only those farms scoring

100 points or more are admitted to the scheme (Wales Audit Office 2007). The points are calculated depending on the given area and a 'weighting' factor, e.g. heathland, wetland, or species-rich meadows are heavily weighed. Other existing features, such as traditional buildings and archaeological sites, will also contribute to the points. In addition, points can be gained by creating habitats, restoring traditional field boundaries, and providing new public access (Morgan 2007). Agreements are for ten years, with a break clause at the mid-point of agreement (Welsh Assembly Government 2008a). They consist of both a mandatory section and a voluntary section. The mandatory section sets basic standards for all farms participating in the scheme, regardless of their type or size, e.g. retain existing traditional field boundaries (e.g. hedgerows, Image 4), safeguard any historic features. The optional section includes management practices or capital works that meet the objectives of the scheme, but which are not considered essential on all relevant farms (Wales Audit Office 2007).

3 Agricultural subsidies for biodiversity

Agriculture is the main land use in Europe: 34 % of the European terrestrial area is used for crop production and 14 % for grassland (Cooper 2009: 18). Many areas of high nature value farmland exist, providing habitats for a wide range of species (Image 5). Such areas are under threat from both intensification and land abandonment, and for this reason the conservation and promotion of sustainable farming practices in these areas is crucial for maintaining biodiversity (EEA 2009). Throughout Europe, measures have been introduced to reduce the negative environmental impact of agriculture on biodiversity through providing financial incentives to farmers for adopting environmentally friendly farming practices.

3.1 Measures targeted at biodiversity

Most of the measures targeted at maintaining and enhancing biodiversity on farm-



Image 5: Skylark (Alauda arvensis), a bird species declining due to intensive agriculture. Photo: Frank Steinkjellå.

land are set up within the agri-environment schemes. Basically, three types of measures can be distinguished (cf. Vojtech 2010):

- Measures targeted at maintaining species diversity on farmed land through the reduction of inputs (extensification of grassland and crop farming, organic farming, etc.) and through measures targeted directly at species in need of protection (e.g. late mowing dates)
- Measures targeted at safeguarding endangered endemic animal breeds or plant varieties
- Measures targeted at the creation and maintenance of habitats and of areas of high natural value (Natura 2000 listed sites, wetlands, hedges, field strips, pastures, etc.).

3.1.1 Species diversity

An overview of the numerous measures which focus on species diversity is given in Table 3. Within the agri-environment schemes one can mainly distinguish between measures targeted directly at protecting and enhancing specific species in need of protection, and measures where the impact on species diversity is more indirect, e.g. measures favouring less intensive farming practices. Most prominent among the agri-environment measures are payments to support the adoption of less input-intensive and/or more environmentally friendly farming practices. These include integrated crop production (low use of fertilizers and pesticides), extensive management of grassland (livestock grazing with restricted uses of fertilizers and low stocking densities), and organic farming (Vojtech 2010). Payments for these measures are in general offered annually, per hectare of land under contract. The Swiss Ecological Quality Payments is an example of a measure with a particular and more result-oriented structure. Introduced in 2001, the payments per hectare are made for the biological quality of extensive meadows and pastures, and specific indicator species are subject to periodical surveys on the areas under contract (El Benni & Lehmann 2010). In addition to governmental programmes, there are numerous measures for the protection of endangered species from, for example, agricultural and environmental NGOs and

other organizations on national, regional or local level. One example is the French programme Ferti-Mieux (see Box 4) which is targeted at reducing input levels on farmland.

Measures targeted at species in need of protection

Some examples of measures targeted directly at species in need of protection can be found under the agri-environment schemes operating in Bavaria, France and Wales (Table 3). Measures exist to adapt the management of grassland or crop fields to the needs of animal species

Box 4: Ferti-Mieux (France)

In 1991 the French Association Nationale pour le Développement Agricole (ANDA), in cooperation with the Ministry of Agriculture and Environment, water agencies, and fertilizer producers and distributors, started the programme Ferti-Mieux. It is targeted at the promotion of rational and environmentally friendly fertilization practices, to protect water quality. In every Ferti-Mieux region a guideline is elaborated and given to farmers, together with advice and information on mineral and organic fertilizers, soil preparation, etc.

Participation in the measure is voluntary. Approved Ferti-Mieux operation, which respects the guidelines, is recognized by a label, which is attributed for one or two years, by three different national bodies. The label serves as a guarantee for farmers, advisors, financial bodies, and the general public. As of May 2010, almost 30,000 farmers with a combined total of 1,800,000 ha land participated in Ferti-Mieux (Association Nationale pour le Développement Agricole 2010).

(mostly birds), such as the skylark (*Aiauda arvensis*), Montagu's harrier (*Circus pygargus*), lapwing (*Vanellus vanellus*), the European hamster (*Cricetus cricetus*), and beaver (*Castor fiber*), as well as endangered plant species such as the Checkered Lily (*Fritillaria meleagris*) (in Bavaria). These measures impose restraints, for example in terms of mowing dates, or they support the set-aside of agricultural land in areas where, for example, beavers live (in Bavaria) and pay compensation for the loss of income. Some of these measures (e.g. the Bavarian Nature Contract Programme; StMELF & StMUG 2010) are only available in areas of high natural value (e.g. Natura 2000), while others are accessible throughout the whole territory. Within the Bavarian KULAP, only the measure 'inten-

sification of meadows with late mowing date' is directly targeted at the protection of species (e.g. birds which breed in fields). Additionally, environmental organi-

zations or foundations provide diverse measures to protect endangered species. One example of such a project on farmed land is the 'Skylark plots' (see Box 5).

Table 3: measures aimed at maintaining species diversity within the Rural Development Programmes (2007-2013)

		Bavaria Kulturlandschaftsprogramm - KULAP A-Vertragsnaturschutz (VNP)	Austria ÖPUL 2007	France - National measures (N) - Regional measures (R)	Wales - Tir Cynnal (TC) - Tir Gofal (TG) - Organic Farming (OF)	Switzerland - Ecological Payments (Ec)
Measures for the reduction of inputs	Grassland	Less or no use of fertilizers (KULAP, VNP)	Less or no use of fertilizers	Less use of fertilizers and pesticides (N)	Conversion of improved grassland to semi-improved grassland (TG)	Less or no use of fertilizers and pesticides (Ec)
	arable land	- Crop rotation (KULAP) - Field margins (KULAP) - Winter planting (KULAP) - Conversion from crop farming to grassland (KULAP) - No field working between 15 April and 30 June (VNP)	- Field margins - Less or no use of fertilizers, pesticides and fungicides - Abandonment of silage fodder in certain regions - Winter planting on arable farmland	- Crop rotation (N) - Less use of fertilizers and pesticides (N) - Winter planting on arable farmland (N)	- Unsprayed crops (TG) - Field margins, (TG) - Winter stubbles (TG) - Conversion of arable land to grassland (TG)	- Field margins - Rotation with fallow land (Ec)
	habitats	- Extensive grassland and/or orchard (KULAP) - Environmentally friendly viticulture in mountain areas (KULAP) - Extensive fish farming (KULAP) or no fish farming in ponds (VNP)	- Integrated farming in pomiculture, viniculture, horticulture - Maintenance of extensive orchards - Environmental friendly farming of herbs and seeds		5% of area wildlife habitat (TC)	Ecological compensation (Ec)
	organic Farming	Organic farming (KULAP)	Organic farming	Organic farming (N)	Organic Farming (OF)	Organic farming (Ec)
	Measures directed at endangered species		- Late mowing dates for field birds (KULAP und VNP) - Fallow land in beaver habitats (VNP) - Non-productive investments- Measures for the protection of endangered species		Crop rotation including lucerne in favour of the hamster (R)	Manage improved grassland for breeding lapwings or overwintering wildfowl (TG)
				Measures targeted at the corn-crake (R)		



Image 6: Undrilled patch within a field, suitable as a skylark nesting site. Photo: S. Wolfrum.

Box 5: Skylark plots ('Lerchenfenster')

The taller and denser structure of winter wheat crops makes them unsuitable for birds such as skylarks (*Alda arvensis*) that nest and forage on the ground within crops. To enhance the situation for these birds the 'Skylark plots' project was introduced in Bavaria by the Landesbund für Vogelschutz (Association for the Protection of Birds) in cooperation with the Bayerischer Bauernverband (Bavarian Farmers Association). The project is based on the experiences of the Royal Society for the Protection of Birds in England and the

Vogelwarte Sempach (Sempach Bird Observatory/Swiss Ornithological Institute) in Switzerland, and it aims to manipulate crop structure to increase the numbers of skylarks (and other within-crop biodiversity) while minimizing the impact on crop profitability. This is done by creating undrilled patches, also known as 'skylark plots', within fields with crops (Image 6). There are 2–3 skylark plots per hectare, each 20 m² in size, which is sufficient to enhance the breeding conditions. Participation in the programme is voluntary and no compensation is paid to farmers. In Bavaria in the course of the project in 2009–2010 a total of 600 skylark plots were created on 160 fields (Landesbund für Vogelschutz in Bayern e.V. 2010; RSPB 2010). To date, the actual population of skylarks in Bavaria has not been monitored, but the project in England and Switzerland has shown positive results, with a higher density of nests next to the plots and 49% more chicks raised in a season than in fields without plots (Morris 2009).

Organic farming: an example of measures targeted at reducing inputs

To delimit the scope of this review we have chosen one measure promoting less intensive farming practices, which is offered in all countries considered, namely organic farming. In 2009 organic agriculture covered c.6.5 million ha in Europe and is still increasing (EEA 2009). All countries compared offer schemes for the improvement of organic farming, mostly in the form of whole farm schemes. To compensate farmers for loss of income while converting to organic farming (due to higher production costs and missed opportunities to sell produce under an organic farming label over a 2-year period), Bavaria, France and Wales offer both a 'conversion to organic farming scheme' with higher payments (2 years in Bavaria and Wales, and 5 years in France) and an 'organic farming maintenance scheme'. Austria and Switzerland offer payments for organic farming too, but these countries do not have special payments for the conversion period.

The annual payments are dependent upon the type of cultivation and the number of

hectares under contract. For example, the rates for horticultural land (41 0 EUR/ha in Bavaria and 850 EUR/ha in Switzerland, in the ongoing programme period) are higher than those for crop farming (between 110 EUR/ha in Austria and 550 EUR/ha in Switzerland) and for grassland (between 100 EUR/ha in France and 240 EUR/ha in Austria) (Ministère de l'agriculture et de la pêche 2007; Lebensministerium 2009a; StMELF & StMUG 2010; Bundesamt für Landwirtschaft 2010b).

Effectiveness in maintaining species diversity

Although the countries have, for example, chosen different species, the basic structure of measures to maintain species diversity is quite similar (Table 3). The impact of the schemes on species diversity has been considered in all evaluation studies, but the available data are not that conclusive.

Under the Bavarian measure 'Late mowing dates for field birds', between 2000 and 2006 c.24,500 ha was under contract annually and it was possible to identify more endangered species in mea-

dows with a mowing date after 1st of July than in conventionally farmed meadows (ART 2008: 155). The Bavarian Nature Contract Programme also seems to contribute to maintaining species diversity. A study from 2007 showed that more plant species could be found on grassland under the Nature Contract Programme than on surrounding conventionally used grassland. However, the decline of field bird populations continued also in areas under the Nature Contract Programme (ART 2008). In addition, the effects of the programme on biodiversity were restricted through the fact that the scheme is applied to only 2% (56,564 ha) of the total farmed land in Bavaria (ART 2008).

In France the agri-environment measures targeted directly at endangered species showed positive effects too: the population of two bird species, the corncrake (*Crex crex*) and the Little Bustard (*Tetrax tetrax*), increased after 2002 in regions where they occurred (CNASEA 2008a). The Welsh evaluation only provides information about the number of hectares under the measure 'improved grassland for breeding birds' in the Tir Gofal scheme (1,112 ha) (EKOS 2008). The evaluation does not assess whether the measure was successful in terms of protecting endangered species. In Switzerland measures targeted directly at endangered species were introduced for the first time with the new Direct Payments System in 2011 (*Artenförderungsprogramme*) (Lanz et al. 2010).

Some evaluation reports quoted below provide quantitative results for the implementation of the organic farming schemes. Austria is the leading country in Europe today in terms of agricultural land under organic management (15%) and the evaluation report for the programme

period 2000–2006 states that the spread of organic farming is closely connected with the agricultural policy framework. In addition to the payments under the Rural Development Programme ÖPUL (*Österreichisches Programm zur Förderung einer umweltgerechten, extensiven und den natürlichen Lebensraum schützenden Landwirtschaft*), organic farms receive higher direct payments (within the first pillar of the CAP) per hectare of agricultural land than conventional farms (Eder 2006). In Switzerland the proportion of organic farms is high too (10.7% of total agricultural land) (Niggli 2007; Bundesamt für Landwirtschaft 2009), even though the Swiss Government, in common with the Austrian Government, does not provide payments for the conversion to organic farming.

France has the lowest area under organic management and the development of participating farms under the organic farming schemes decreased after a reaching a peak in 2001. The reasons for this can be found in the replacement of the CTE (*Contrat Territoriaux d'Exploitation*, Territorial Farming Contract) by the CAD (*Contrat d'Agriculture Durable* (Sustainable Agriculture Contract)) in 2002, with fewer payments for organic farming (CNASEA 2008a; Appendix CAB). In Wales the area under organic farming increased by more than 126% during the last programme period (Table 4), but the total amount of land farmed organically still remains low (5% of the total farmed land). The evaluation report does not discuss whether this increase is linked to the programme design. However, compared to France and Bavaria, Wales provided relatively high payments for conversion (c.1200 EUR/ha establishment payment, plus for example 130 EUR/ha grassland) (Welsh Assembly Government 2009c).

Table 4: Results of measures targeted at organic farming (OF)

	Austria ¹	Bavaria ²	France ³	Wales ⁴	Switzerland ⁵
Area under the OF measure	322,000 ha (2006)	120,000 ha (2006)	Data not available	39,670 ha (2006)	112,537 ha (2008)
Farms under OF Measure	17,300 to 18,500 (2000–06)	2000 to 4750 (2000–06)	Data not available	144 to 683 (2001–06)	5930 (2008)
Total Area under OF	383,756 ha (2008) ⁶	152,628 ha (2007)	583,799 ha (2008)	124,617 ha (2008)	112,537 ha (2008)
Recent increase	+ 41% (2000–08)	+ 78% (2000–07)	+ 61% (2000–08)	+ 126% (2002–08)	+ 36% (2000–08)
Share of total agricultural area	15%	5.8% ⁷	2.1%	5%	10.7%

Notes: ¹ Lebensministerium 2008: 88; ² ART 2008: 108; StMLF 2002: 97; ³ Agence Bio 2001: 4; 2009; ⁴ EKOS 2008: 107; Defra 2010; ⁵ Bundesamt für Umwelt 2009: 2; Bundesamt für Landwirtschaft 2009: 213; ⁶ Bundesanstalt für Agrarwirtschaft 2000; ⁷ BMELV 2009

Compared to estimating the number of participant farmers or size of the area under scheme management, it is more demanding to quantify and judge the importance of measures for maintaining or increasing species diversity. This is not least due to the fact that because the habitat requirements of wild species are rarely only dependant on farming practices but also on climate, food, quality of water and/or soils, etc., it is difficult to assign trends in the development of species populations to concrete measures of agricultural schemes (Lebensministerium 2008).

Often the number of species on farmed land under the organic farming schemes is used as an indicator of species diversity and is compared with areas under conventional farming. However, even in cases where comparative studies have shown that species diversity is higher on areas under contract, this cannot be readily traced back to the successful design of a given scheme, due to the fact that areas under agri-environment schemes are often already used more extensively prior to the start of a scheme and often we do not have data on the condition of the areas prior to the schemes (Knop et al. 2006). Furthermore, a higher number of species on land farmed under agri-environment measures does not necessarily indicate higher levels of biodiversity: a measure may have positive impacts on common species, while uncommon, endangered species do not benefit from the measure (Kleijn et al. 2006). In Wales,

moreover, some evaluation managers consider the scheme monitoring 'weak' and it has been mentioned that the 'lack of baseline data makes the assessment of scheme effectiveness and the contribution to RDP difficult to assess' (EKOS 2008).

However, it is generally assumed that organic farming is more favourable for the diversity of species than conventional farming (EEA 2009), even if effects are difficult to prove. Hole et al. (2005), in a review of comparative studies of organic and conventional farming, have tried to determine whether organic farming can deliver biodiversity benefits or not. Among the results of this review are that many comparative studies encounter methodological problems, limiting their ability to draw quantitative conclusions, the knowledge of the impacts of organic farming in pastoral and upland agriculture is limited, and there remains a need for long-term studies to compare influences of organic and conventional farming practices.

3.1.2 Habitat diversity

Up to 17% of EU land areas are included in the Natura 2000 network; in addition are 16% protected under national instruments. At the same time, 40–85% of habitats of European interest have unfavourable conservation status. Linked to this is the progressive decline in grasslands and wetlands across Europe and rise in urban, woodland and open water habitats (EEA 2009). The results of a first systematic assessment across the European Union

show that the status of most species and habitats of European interest is unfavourable (EEA 2009). For this reason, the five countries under study in the present review have introduced subsidies to enable farmers to manage land which is

under Natura 2000 or protected by national law in an appropriate way. Payments are provided for management concepts and studies, as well as for the maintenance and improvement of habitats (see Table 5).

Table 5: Examples of measures targeted at habitat diversity, under the Rural Development Programmes (programme period 2007-2013)

Austria	Axis 2: Natura 2000 Axis 2: ÖPUL - Maintenance of orchards (Streuobstwiesen) Axis 2: ÖPUL - Maintenance of areas of high natural value or value for water protection (Erhaltung und Entwicklung naturschutzfachlich wertvoller oder gewässerschutzfachlich bedeutsamer Flächen) Axis 3: Enhancement of the rural heritage - Nature protection (Verbesserung des Ländlichen Erbes - Naturschutz)
Bavaria	Axis 2: Natura 2000 Axis 2: Nature Protection Contract Programme (VNP) Axis 2 KULAP: Maintenance of orchards (Streuobst)
France	Axis 2: Regional agri-environment measures (Natura 2000, European Water Framework Directive & other environmental issues) (MAET: Natura 2000, Directive Cadre sur l'Eau.& autres enjeux environnementaux) Axis 3: Enhancement of the rural heritage (Conservation et la mise en valeur du patrimoine rural)
Wales	Axis 2: Tir Gofal Axis 2: Tir Cynnal
Switzerland	General and Ecological Direct Payments (Direktzahlungen)

In Bavaria, compensation is not paid for the loss of income resulting from the maintenance of Natura 2000 habitats because the Bavarian Act on Nature Conservation already prohibits the degradation of Natura 2000 sites (BayNatSchG 2005: Art. 13c), although measures exist to pay for the renaturation and/or reconstruction of such habitats.

Measures targeted at habitat diversity outside protected areas can be divided into measures which aim to create new habitats, such as Tir Gofal in Wales, and measures to maintain habitats, such as the orchard programmes in Bavaria and Austria which provide annual payments per fruit tree (EUR 5, in Bavaria) or per hectare (EUR 120, in Austria).



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Box 6: Prairies Fleuries (Flower Meadows)

In 2010 the Fédération des Parcs naturels régionaux (Federation of the Regional Natural Parks), the Parcs nationaux de France (National Parks in France), and the Assemblée Permanente des Chambres d'agriculture (Permanent Assembly of the Chambers of Agriculture) launched the first agri-ecological contest Prairies Fleuries (Flower Meadows). Cooperating partners are the cheese-quality and trade organizations as well as bee-keeping and environmental associations. The prize for 'agri-ecological excellence' is awarded to farmers in Natural Parks whose permanent meadows represent the 'best balance between the production of fodder of high quality and biodiversity in the meadow'. The three categories are: unimproved fodder meadows, fertilized fodder meadows, and grazed meadows at local and national level. The meadows can also include hedges, stone walls, and groups of trees.

The contest proceeds in two stages. A local jury visits the meadows between May and July, at a date fixed in each Park according to the maturity of the vegetation. Then, the jury will choose two farms to participate in the national contest. The national prize winner will receive honorary awards and EUR 600 for 'ecosystem service' to the Prairies Fleuries (Boughriet 2010).

Parc naturel régional du Massif des Bauges – Fédération des Parcs naturels régionaux de France

In Switzerland and Wales 'wildlife habitats' are created and/or maintained under the General Direct Payments and Tir Gofal, respectively. These two programmes require the designation of 'eco-compensation areas' which must cover at least 7% and 5% of the participants' farmland in Switzerland and Wales, respectively (Welsh Assembly Government 2008d: 34; El Benni & Lehmann 2010).

The measures *Erhaltung und Entwicklung naturschutzfachlich wertvoller oder gewässerschutzfachlich bedeutsamer Flächen* in Austria, the Nature Contract Programme (VNP) in Bavaria, Tir Gofal in Wales, and the former CTE in France are all quite similar. They are based on individual contracts and management plans which are elaborated by the farmers, ecologists, and/or representatives of local nature conversation authorities.

Also measures not explicitly targeted at 'habitats' (Table 3) such as the creation of field margins, the maintenance of mountain pastures, and the afforestation of agricultural land in intensive crop farming

areas, and even measures that are not part of agri-environment schemes (e.g. Prairies Fleuries; Box 6) can contribute to the diversity of habitats on farmland.

Effectiveness of measures targeted at maintaining and/or improving habitat diversity

Different organization and objectives of the measures targeted at habitat diversity make them difficult to compare. Generally, the evaluations of such schemes are often limited to a description of the size of the area under contract and of the number of participants. Measures limited to Natura 2000 areas were not provided in any of the considered countries under the last programme period, due to the fact that the designation of Natura 2000 areas had not been completed.

In Bavaria, measures for the renaturation and/or reconstruction of habitats (under Natura 2000) received financial support totalling 14.3 million EUR between 2000 and 2006 (ART 2008).

In Austria participation in the programmes for the maintenance of habitats increased in the course of the programme period, but acceptance of the programmes remained low in general (Lebensministerium 2008). The three main measures targeted at the creation and maintenance of habitats were implemented on just 3.5% of the total farmed land (Lebensministerium 2008).

In Switzerland the eco-compensation areas covered c.120,000 ha (c.11% of the total farmed land) in 2008. Nevertheless, the biodiversity (in this case number of species) decreased on farmed land, although the evaluation detected a slight improvement due to the existence of eco-compensation areas (Bundesamt für Landwirtschaft 2009).

In Wales the total area under Tir Gofal was c.332,600 ha. 'Although the Assembly Government does not know precisely how much of each main habitat type is covered by Tir Gofal the prescriptions are likely to deliver environmental benefits' (EKOS 2008). However, '[t]here is also a risk that payments have little beneficial effect on habitats, because applicants are frequently paid for maintaining existing practices as well as for restoring or creating habitats. The maintenance of existing practices may add value in protecting existing habitats if the scheme discourages landholders from making changes that would have an adverse environmental impact. However, no evidence is available on the extent to which this has happened' (EKOS 2008).

3.1.3 Genetic diversity

In Europe the Communication of the European Commission to the Council and to the Parliament on a European Community Biodiversity Strategy, set up in 1998, established a general framework for the development of policies and instruments

to fulfil the requirements of the Convention on Biological Diversity, opened for signing in Rio de Janeiro in 1992 (EC 2010c). This strategy recommends in situ conservation (i.e. within the natural environment) and ex situ (i.e. in gene banks, laboratories, zoos and botanical gardens) conservation of species and ecosystems. The European Commission introduced in addition an Action Plan which includes objectives to halt the decline of biodiversity and measures by 2010 (EC 2007). In addition to wild species, both documents also concern cultivated plants and breeds, because it is assumed (e.g. by the Food and Agriculture Organization of the United Nations) that most of the existent genetic diversity of cultivated plants and domestic breeds is no longer used in production (FAO 2010). The populations of native, well-adapted breeds have largely been replaced by a few highly productive breeds. Therefore, many native breeds with limited populations are in danger of extinction, which would contribute to increased biodiversity loss (EEA 2009).

To maintain the biodiversity of cultivated plants and endemic breeds, the considered countries have introduced corresponding programmes and subsidies (Table 6) for farmers either within their Rural Development Programmes (France, Austria), and thus co-financed by the EU, or exclusively financed by national grants (Switzerland, Bavaria). In Austria, France and Switzerland the programmes are targeted at breeds and cultivated plants while the programmes in Bavaria and the UK (including Wales) are mainly targeted at breeds alone, although collections of plant genetic resources (e.g. gene banks) exist too (Defra 2003a). For these programmes the countries set up lists of endangered endemic breeds and cultivated plants, which are revised regularly.

Table 6: Examples of measures targeted at genetic diversity

Austria	Axis 2 (ÖPUL): Rare cultivated plants (Seltene landwirtschaftliche Kulturpflanzen) Axis 2 (ÖPUL): Rare breeds (Seltene Nutzierrassen)
Bavaria	Conservation of endangered breeds in agriculture (Förderung von Maßnahmen zur Erhaltung gefährdeter einheimischer landwirtschaftlicher Nutzierrassen)
France	Axis 2 (AEM ¹ regional): Protection of endangered breeds (protection des races menaces) Axis 2 (AEM regional): protection of endangered cultivated plants (préservation des ressources végétales menacées de disparition)
Wales	UK National Action Plan on Farm Animal Genetic Resources
Switzerland	Action Plan for the Protection and Sustainable Use of the Genetic Resources of Cultivated Plants (Nationaler Aktionsplan zur Erhaltung und nachhaltigen Nutzung pflanzengenetischer Ressourcen für Ernährung und Landwirtschaft) National Plan of Action for Animal Genetic Resources (Nationaler Aktionsplan Tiergenetische Ressourcen)

Notes: ¹ AEM: agri-environment measures

Schemes for the establishment of gene banks and the collection of information about the cultivation or breeding of endangered species are not primarily directed at farmers (e.g. the Swiss *Nationaler Aktionsplan zur Erhaltung und nachhaltigen Nutzung pflanzengenetischer Ressourcen für Ernährung und Landwirtschaft*). Of greater interest are programmes which aim to support and/or provide for the cultivation or breeding of endangered species (Image 4) on farms in situ, which are generally calculated in terms of the loss of income, due to the reduced productivity of endangered types compared to more common and more productive types (e.g. Ministère de l'agriculture et de la pêche 2007; Lebensministerium 2009a). In Wales it has been decided that there is little reason to provide payments for indigenous breeds unless there is a realistic and viable market for the products derived from such breeds. However, the Welsh Government supports campaigns to promote, for

example, Welsh Black Cattle (The Welsh Black Cattle Society 2010, N. Howard (e-mail interview)) and the Pedigree Welsh Pig (Pedigree Welsh Pig Society 2010).

Effectiveness of measures targeted at maintaining and/or improving genetic diversity

In Austria the programme for the protection of genetic diversity seems to be successful, at least to some extent. The numbers of farms involved in the scheme increased during the last programme period, and c.90% of the listed domestic breeds are included in projects (Lebensministerium 2008) (Image 7). According to the ex-post evaluation, without the

Image 7: Tiroler Steinschaf ("Tyrolean rock sheep"), a predominantly Austrian domestic livestock breed, officially recognised as being endangered and subject to agri-environmental support. Photo: L. Iwon, Arche Warder.



grants there would have been insufficient numbers of male breeding animals to ensure successful breeding (Lebensministerium 2008). Endemic plant species have also increased during the course of the programme period. In addition, some species (e.g. crop species and types) were more successful than others (e.g. some types of vegetables) (Lebensministerium 2009: Annexe 1 (J)).

In Bavaria an aid scheme to support animal breeding was introduced in 2004 with a total budget of 2 million EUR and to be available until 2011 (EC 2009b). Information about the number of supported projects on farms, etc., was not found. While Bavaria does not have a programme for the protection of plants, the ex-post evaluation of the Rural Development Plan 2000–2006 for Wales considers the following agri-environment measures to be favourable to the use of endemic cultivated plants: organic farming, crop rotation (the farmer receives higher payments for rare plants), and maintenance and planting of orchards. However, it has not been possible to assess how many hectares of farmland were planted with traditional plants in the period 2000–2006 (ART 2008).

In France the effectiveness of the programme targeted at the protection of endangered breeds in the period 2000–2006 has been judged in the ex-post evaluation as very low because of the low level of participation by farmers and also the fact that only 5% of the listed endangered endemic breeds were affected by this measure (CNASEA 2008a). The scheme in the previous programme period did not cover plants and as a consequence we do not have any information on the genetic variety of cultivated plants.

In Switzerland the existent measures for the protection of endangered endemic species show positive effects (Bundesamt für Landwirtschaft 2009). Between 1999 and 2009, 40 projects for endangered Swiss breeds were supported by the Bundesamt für Landwirtschaft (C. Marguerat, e-mail interview) but the Swiss evaluation report states that the bare number of preserved types and breeds does not tell anything about their importance for production (Bundesamt für Landwirtschaft 2009). This is mostly dependant on the

marketing possibilities of these types and breeds. Furthermore, there is no nationwide monitoring of the numbers of livestock of endangered endemic types and breeds or the total areas they cover.

Recapitulatory information about UK support for the maintenance of farm animal genetic resources was not available. However, in a report by the Department for Environment, Food and Rural Affairs (Defra) on the Policy on Genetic Resources for Food and Agriculture it is mentioned that the vast majority of farm animal genetic resources exist on-farm (in situ). Ex-situ collections are mostly held by breeders (Defra 2003b). Additionally, three NGOs – the Rare Breeds Survival Trust, Rare Breeds International, and the Sheep Trust – work for the conservation of rare or heritage farm animal breeds (Defra 2003a). Regarding the protection of plant genetic resources, the UK holds collections (e.g. the Commonwealth Potato Collection, the Vegetable Genebank, and the National Fruit Collection) but there is little in situ conservation. Some of 66 native UK species of economic value ‘may be protected by chance in nature reserves and through agri-environment schemes. However, these species are not monitored or recorded’ (Defra 2003b).

The basic structure and objectives of the measures targeted at maintaining and/or improving genetic diversity are very similar in the five countries under review, but systematic comparison between the different kinds of programmes targeted at maintaining genetic diversity was restricted by the limited information available about concrete programme design and also the lack of comparable datasets relating to the implementation in practice. However, as shown above, most of the countries considered their measures targeted at genetic biodiversity as successful, because endangered breeds of livestock have been protected to some extent.

3.2 Conclusion

A high number of schemes in the countries under review aim to maintain or increase biodiversity on farmed land. However, in recent years there has been some debate about the effectiveness of schemes for delivering biodiversity, linked to the difficulties in quantifying the environmental

benefits (cf. Kleijn & Sutherland 2003; Kleijn et al. 2006; Knop et al. 2006; Wittingham 2007; EEA 2009).

The impacts of the schemes on biodiversity have been an important part in all evaluation reports studied but it seems to be difficult to state positive effects on biodiversity due to missing scientific and/or quantitative data. Some of the main difficulties can be seen in the relatively short evaluation periods, which are not adapted to the long-term effects within biodiversity. Other important explanatory factors are the fact that biodiversity is not only influenced by agricultural use but also by other factors such as climate and the condition of water, soils and other habitat structures. Results relating to the development of species populations cannot therefore easily be traced back directly to the applied measures.

It seems easier to judge the effectiveness of the measures targeted at genetic diversity alone, because the objectives are well defined and it is easier to assess numbers of domestic animals and types than numbers of wild, especially migrating animal species.

It may also be seen as problematic that to a large extent the results depend on what species groups are surveyed and what index of diversity is used (Kleijn et al. 2006). The Austrian evaluation report for the programme period 2000–2006 underlined the need for more precisely defined objectives for biodiversity for the country as a whole because this could contribute to improving the efficiency and effectiveness of the agri-environment scheme ÖPUL. Possible criteria mentioned were, for example, population density, reproduction of endangered species, and the desired extent of a habitat type (Lebensministerium 2008).

To solve these problems, the definition of indicators for biodiversity is emphasized in research on national level (Umwelt-Kernindikatoren-system des Umweltbundesamtes, Germany (Umweltbundesamt 2010)) as well as on international level

(Streamlining European 2010 Biodiversity Indicators SEBI of the EEA (EEA 2010)), the Biodiversity Indicators for National Use by UNEP (UNEP 2010), and the current EU-funded research project BioBio – Indicators for Biodiversity in Organic and Low-input Farming (<http://www.biobio-indicator.org>).

Another way to improve the efficiency and effectiveness of subsidies for biodiversity is presumed to be a stronger emphasis on ‘result-oriented measures’ (also called payment-by-results, performance-based, or output-oriented incentives) (Schwarz et al. 2008; Matzdorf & Lorenz 2010). In contrast to payments which compensate for loss of income or hectares under agreement, these subsidies are paid for the desired and proved outcome (e.g. number of plant species per hectare). It is assumed that these measures can improve the efficiency of agri-environment measures because they motivate participating farmers to be more interested in the positive development of the area under contract (ART 2008). The disadvantages of the payments per area scheme are the higher administration costs and more complicated evaluation processes.

Even if it is not possible to quantify the effects of the schemes on biodiversity exactly, the OECD (OECD 2008) and IEEP (Cooper et al. 2009) have stated that the pressure of agriculture on biodiversity in the European countries has eased. Furthermore, based on evidence that sustainable land use and more extensive farming practices are profitable for the abiotic factors and hence also for species, we can assume that the provided schemes have positive effects on species diversity. At the same time, however, the EEA has pointed out that, for example, nitrogen surpluses (the difference between all nitrogen inputs and outputs on agricultural land) are declining but generally remain high (particularly in Western Europe), indicating high productivity and also that pressure on biodiversity still remains (EEA 2009).

4 Agricultural subsidies for cultural heritage

In many regions of Europe agriculture has played an important role in shaping and preserving cultural heritage in rural areas. Examples of important elements are for example archaeological and built heritage, such as farmhouses, barns, boundaries, terraces, which also forms the basis for rural tourism (Cooper et al. 2009).

Today, agriculture is seen as both a caretaker and a threat to cultural heritage, due to the fact that heritage on agricultural land is threatened by changes in farming practices (e.g. drainage, modern freestall barns) as well as loss of function, such as the abandonment of farms (Daugstad et al. 2006).

Most European countries stress the economic, social and environmental importance of maintaining agriculture rather than the relation to cultural heritage directly (Daugstad et al. 2006). This can also be underpinned by the fact that the number of agricultural subsidies available for farmers and which are targeted at the maintenance and restoration of rural cultural heritage on farmland is relatively lower than the number of measures for the maintenance of biodiversity or for soil and water protection (an exception is Wales). These findings were also confirmed in the course of the interviews, when the interviewees stated that scheduled ancient monuments and listed buildings are pro-

tected by legislation and that the support and protection of (listed) cultural heritage is the responsibility of cultural heritage administration (e.g. Denkmalschutzbehörden in Bavaria and Austria, Cadw in Wales (Cadw 2010)) and not the objective of the agricultural policies. In Switzerland the Bundesamt für Kultur (Federal Office of Culture) together with the cantons is responsible for measures relating to the protection of cultural heritage, archaeology, and the visual appearance of settlements (cities and villages), and hence no subsidies targeted at cultural heritage are integrated into agricultural payments (Direct Payments) (Bundesamt für Kultur 2010).

However, within the Rural Development Programmes of Austria, Bavaria, France, and Wales some measures exist which are targeted at enhancing the quality of life in rural areas through the enhancement and maintenance of cultural heritage. In addition, the restoration or renovation of cultural heritage Europe-wide is often funded by NGOs or foundations (private or governmental).

4.1 Rural Development Plans

To identify successful agricultural policies with positive impact on cultural heritage on farmed land in the five countries under review, we considered the results of the evaluation reports from the previous programme period (2000–2006) as well as those under the most recent Rural Development Plans in order to identify measures which have been continued over time and are thus probably successful in enhancing cultural heritage.

In the programme period 2000–2006 measures targeted at promoting the development of rural areas, including villages, and thereby also the protection and conservation of the rural heritage, are mentioned in Article 33 (Promoting the Adaptation and Development of Rural Areas) of European Council Regulation No. 1257/1999 (CoE 1999). The measures mentioned in Article 33 are not compulsory but nevertheless they were implemen-

ted in all of the considered EU member states. Measures including the maintenance and enhancement of cultural heritage were mainly ‘renovation and development of villages’ and ‘protection and conservation of the rural heritage’ (Table 7). Austria provided the additional measure ‘protection of the countryside’, which supported non-recurrent measures such as the creation and maintenance of landscape elements (Lebensministerium 2008).

In the most recent Rural Development Plans (2007–2013) the measures for enhancing cultural heritage are almost the same as in the previous programme period: ‘Village renewal’ and ‘Enhancement of the rural heritage’. They are now organized under Axis 3 (Improving the quality of life in rural areas and encouraging diversification of the rural economy), and one of their objectives is to improve the physical environment and economic situation of villages and to conserve the rural heritage. Both measures are mainly addressed at local partnerships or authorities but are also available for farmers (Table 7). An exception is Wales, where the Axis 3 payments are not directly accessible for farmers, but require the elaboration of planning concepts and/or programmes with public participation and implementation through local partnerships (Welsh Assembly Government 2008b).

The ‘Enhancement of the rural heritage’ measures in Austria, France, and Wales are targeted at both natural and cultural rural heritage, while the corresponding programme in Bavaria only provides payments for measures which invest in the natural heritage and the renaturation of water bodies (StMELF & StMUG 2010). A further characteristic of the Bavarian programmes is that the amount of subsidies is dependent on the type of applicant. This means that measures from local partnerships or municipalities may receive up to 100% support while measures from private persons (including farmers) receive 30–60% support (StMELF & StMUG 2010).

Table 7: Measures targeted at cultural heritage (within the Rural Development Plans)

(Beneficiaries: (P) initiatives with public participation; (F) farmers)

	Programme period 2000–2006	Programme period 2007–2013
Austria¹	Article 33: Village renewal Article 33: Protection of the countryside	Axis 3: Village renewal (F, P) Axis 3: Rural heritage (F, P)
Bavaria²	Article 33: Village renewal	Axis 3: Village renewal (F, P)
France³	Article 33: Village renewal AEM ⁵ : CTE ⁶ /CAD ⁷ (F)	Axis 3: Village renewal (F, P) Axis 3: Enhancement of the rural heritage (F, P)
Wales⁴	Article 33: Village renewal (P) AEM: Tir Gofal, Tir Cynnal (F)	Axis 3: Village renewal and protection of the rural heritage (P) Axis 2 (AEM): Tir Gofal, Tir Cynnal (F)

Notes: ¹ Lebensministerium 2009a: 434; ² StMELF & StMUG 2010: 669; ³ Ministère de l'agriculture et de la pêche 2007: 272–279; ⁴ Wales Audit Office 2007; Welsh Assembly Government 2008b; ⁵ AEM: agri-environment measures; ⁶ Contract Territoriaux d'Exploitation; ⁷ Contrat d'Agriculture Durable

A feature of the Welsh Rural Development Plan is that the agri-environment schemes Tir Gofal and Tir Cynnal require participants to maintain all historic features on their land. Furthermore, Tir Gofal as well as the French measure Contract Territoriaux d'Exploitation (CTE: Territorial Farming Contract; only available in the programme period 2000–2006) have supported the improvement of historical features on farmland. Both measures have been whole farm agri-environment schemes. Whereas in Wales Tir Gofal continues under the current programme period, the CTE in France was ended due to the complex requirements and application process, unproven

environmental benefits, and the large differences between the number of applications and size of grants awarded in the different regions (Ministère de l'agriculture et de la pêche 2006). A further reason lies in the fact that in 2003 – due to political changes – the CTE was replaced by the Contrat d'Agriculture Durable (CAD: Sustainable Agriculture Contract), which was directed more towards environmental issues. This disruption has also been criticized in the ex-post evaluation 2000–2006, because the CTE also marked the end of the dynamic of 'interesting projects' (CNASEA 2004).

4.2 Other measures



Image 8a, b: "Moulin de la Tranchère" in Ceyrat, Clermont-Ferrand, France: Historic water mill renovated with financial support from the Fondation du Patrimoine. Photo: J.-P. Brun, Compagnons de la Tranchère.

Box 7: Fondation du patrimoine (France)

The Fondation du Patrimoine (Heritage Foundation) is a private, non-profit organization with the goal of protecting unregistered cultural heritage which is not protected by the state. The Fondation du Patrimoine is based on a network of departmental and regional representatives. In obtaining the Fondation du Patrimoine's stamp, a private landowner with cultural heritage (of particular cultural significance but not protected or listed as a historical monument) on his or her land, becomes eligible for tax deductions when carrying out maintenance or restoration works. In addition, the Fondation du Patrimoine can support the restoration of heritage under public or associate ownership by providing financial aid through subsidies (Image 8). The Fondation du Patrimoine can collect donations to finance a project where the project is insured by a commune or by an association. The funds raised are then handed to the builder (minus a 3% management fee).

Supported projects between 2000 and 2008:

- 6600 stamps (tax deduction) for traditional buildings and so-called small cultural heritage sites

- 1676 projects supported with subsidies and collected donations

(Fondation du Patrimoine 2010).

Other than the measures presented above, information relating to measures or subsidies available for farmers to maintain or enhance cultural heritage on their land is either rather limited and/or difficult to access.

The Bavarian Förderwegweiser (Guide to Payments Accessible to Farmers) contains one additional measure to protect and/or enhance the cultural heritage on mountain pastures: KULAP B (Box 8). This programme is not co-financed by the EU. The objectives of KULAP B are to encourage measures (e.g. renovation of buildings and fences) which invest in mountain pastures (*Alm*).

Another support possibility for farmers or other owners of historic buildings or monuments are funds or foundations (often financed by government), such as the Historic Buildings and Conservation Area Grant of the Cadw (Wales) (Cadw 2007), the Fondation du patrimoine

(France) (Box 7), and the Fond für Landschaft Schweiz (Switzerland).

4.3 Conclusion

In preparing this review it was not possible to assess the amount of subsidies paid by cultural heritage authorities or funds paid to farmers. However, in terms of available capital the foundations are in general not as effective as, for example, the measures under the Rural Development Programmes.

The lack of comparable data (see Table 8) and lack of reference data (e.g. amount and condition of cultural heritage on farmed land within and outside the measures) make it difficult to assess and evaluate the effectiveness of measures. The theme 'cultural heritage' has not received further attention either in the evaluation reports of the Rural Development Programmes or in other international evaluations reports of the EU, the OECD, or the

IEEP. If considered at all, any evaluation is restricted to quantitative aspects, as confirmed in the following quote: 'l'analyse de 7 mesures du chapitre IX se limite à un descriptif physique et financier de la programmation et des réalisations' (the analysis of the 7 measures under Chapter 9

[article 33] is limited to a description of the organization and finances of the measure and the realized projects) (CNASEA 2008c). However, some final conclusions regarding the effects of the measures are possible, and these are summarized in Table 8.

Table 8: Results of measures targeted at cultural heritage (2000–2006)

Austria
Village renewal: 896 projects in 663 villages. Amount of grants: c.8.4 million EUR, of which 40% was for the 'renovation of objects' and 14% for the maintenance of village character (Lebensministerium 2008: 206)Protection of the countryside: Grants: c.22 million EUR (1507 Projects) and 6.8 million EUR for measures investing in mountain pastures and for 'cultural landscape elements' (Lebensministerium 2008: 235)
Bavaria
Village renewal: 1244 measures with a total cost of 42 million EUR were supported: Re-use, protection & renovation of rural buildings: 68 measures (16.6 million EUR) Boundaries: 10.6 km; 265 measures (6.8 million EUR) Small cultural heritage sites: 446 measures (6.1 million EUR) (ART 2008)
KULAP B: In 2006: 916,000 EUR (Bayerischer Landtag 2007)
France
Village renewal (incl. the protection and conservation of rural cultural heritage) 6511 measures (15.9 million EUR), of which 83% were implemented under CTE (CNASEA 2008c)
Wales
Tir Gofal: A total of 16,382 historic features were supported: 2489 traditional farm buildings 651 scheduled ancient monuments 13,242 other historic features 3449 ha historic parks and gardens (EKOS 2008)

The most comprehensive programme for the maintenance and enhancement of cultural heritage on farms seem to be the schemes in Wales, where the 'protection of the historic environment' is even defined as one of the main objectives of the agri-environment schemes. Despite the considered data being fragmented, the Tir Gofal programme is seen as successful in terms of enhancing cultural heritage: 'Although little monitoring and evaluation have been carried out available evidence [outputs are used as indicator of outcomes] suggests that Tir Gofal is protecting the historic environment' (EKOS 2008). Thus, a comparison of the schemes shows that Tir Gofal has supported the highest number of historical features (although we do not have information about the extent or dimension of the projects).

Also of interest is the programme targeted at mountain pastures: the Bavarian KULAP B. In 2006, a total of 916,000 EUR (bet-

ween 2000 and 2006 the average was 1.7 million EUR per year) (StMELF (L. Treffler, interview)) was paid to farmers with mountain pastures (1400 mountain pastures in total in Bavaria). However, detailed information about the number and type of measures is not available (StMELF (L. Treffler, interview)). In general, the measure is considered successful and will be integrated into the new Bergbauernprogramm (Box 8)

In Austria an overall assessment of the measure Landschaftsschutz is considered as being hardly possible because its various sub-measures operate quite differently. However, even if both target areas and effects of Landschaftsschutz are restricted to local or sub-regional level, it is considered to contribute to the protection of cultural landscapes and natural resources and to have fruitfully complemented respective ÖPUL measures (Lebensministerium 2008).

5 Agricultural subsidies for landscape scenery and recreation

Over time most of the landscapes in Europe have been transformed by agriculture and many of them have become highly appreciated. They vary significantly between localities and are seen as a resource in terms of rural tourism and recreation (El Benni & Lehmann 2010). However, not all agricultural landscapes are valued as desirable public goods. Certain landscapes have been intensified and denuded through, for example, large-scale specialization, mono-cropping, and the

abandonment of farms (El Benni & Lehmann 2010). Where the character of a landscape is under threat of degradation, the demand for public intervention is high. This is particularly important for the maintenance of relic features which provide a clear environmental or cultural benefit, but which no longer serve an agronomic function and may be an economic disadvantage in the present-day farm business (Cooper et al. 2009).

However, not only measures targeted directly at maintaining traditional landscape features have an influence on the scenic quality of a landscape. Almost all subsidies offered to farmers have direct or indirect effects on the appearance of the landscape they relate to. Some examples are:

- Measures aimed at maintaining farming in marginal (less favoured) areas such as mountainous areas. These measures contribute to the maintenance of cultural landscapes and creating a mosaic of different land uses.
- Measures which promote fixing elements in cultural landscapes (e.g. maintenance and/or creation of small landscape elements)
- Measures providing more extensive land use, such as crop rotation or less use of fertilizers. These measures contribute to, for example, a greater variety of cultivated plants and wild flowers in the landscape.
- Measures promoting afforestation or maintenance of agricultural land

- Measures supporting the maintenance of cultural heritage (e.g. terraces, old farmhouses)
- Measures enhancing public access and recreation opportunities.

Measures targeted at the creation of habitats and the extensification of farming practices, as well as to cultural heritage, have been discussed in the preceding sections. Therefore, the main focus in the following sections will be on measures targeted at maintaining cultural landscapes, maintaining and creating linear elements in the landscapes (e.g. hedges and boundaries), and enhancing public access to the countryside.

5.1 Maintaining cultural landscapes

The abandonment of farms in less productive areas, often followed by regrowth of the formerly farmed land, has undesirable effects on landscape scenery. For this reason specific measures for maintaining farms in such areas have been instituted, also within the European common agricultural policy (MacDonald et al. 2000) (Table 9).

Table 9: Measures targeted at maintaining cultural landscapes

	Programme period 2000–2006	Programme period 2007–2013
Austria	Compensation payments for less favoured areas (Ausgleichszahlungen für naturbedingte Nachteile zugunsten von Landwirten in Berggebieten)	Axis 2: Compensation payments for less favoured areas (Ausgleichszahlungen für naturbedingte Nachteile zugunsten von Landwirten in Berggebieten)
	ÖPUL: Keeping up cultural landscapes (Offenhaltung der Kulturlandschaft)	Axis 2 (ÖPUL): Mowing grassland on steep hillsides (Mahd von Steiflächen)
	ÖPUL: Alpine pasture and herding (Alpung und Behirtung)	Axis 2 (ÖPUL): Maintenance of Bergmähdern (alpine fodder meadows, often very steep) (Erhalt von Bergmähdern im Alpen Bereich)
		Axis 2 (ÖPUL): Alpine pasture and herding (Alpung und Behirtung)
Bavaria	Compensation payments for less favoured areas (e.g. mountains) (Ausgleichszulage in benachteiligten (Berg)gebieten)	Axis 2: Compensation payments for less favoured areas (e.g. mountains) (Ausgleichszulage in benachteiligten (Berg)gebieten)
	KULAP: Mowing grassland on steep hillsides (Mahd von Steilhangwiesen)	Axis 2 (KULAP): Mowing grassland on steep hillsides (Mahd von Steilhangwiesen)
	KULAP: Alpine pasture and herding (Behirtungsprämie für anerkannte Almen und Alpen)	Axis 2 (KULAP): Alpine pasture and herding (Behirtungsprämie für anerkannte Almen und Alpen)
	KULAP B: scrub clearance (Schwendprogramm)	KULAP B: Scrub clearance (Schwendprogramm)
France	Axis 2: Compensation payments for less favoured areas (Les Indemnités Compensatrices du Handicap Naturel)	Axis 2: Compensation payments for less favoured areas (Paiements destinés aux agriculteurs situés dans des zones de montagne qui visent à compenser les handicaps naturels)
	Payments for pastures/grassland (Prime herbagère agroenvironnementale (PHAE) Réutiliser les milieux en dynamique de déprise)	Axis 2 (AEM ¹): Payments for pastures/grassland (PHAE)
Wales	Tir Mynydd (supports livestock production in less favoured areas)	Axis 2: Tir Mynydd (supports livestock production in less favoured areas)
Switzerland	General Direct Payments (Incl. payments for agriculture on steep hillsides) (Allgemeine Direktzahlungen (inkl. Hangbeiträge)) Payments for summer pastures (Sömmerungsbeiträge)	

Note: ¹ AEM: agri-environment measures

All countries considered in this review provide subsidies for Less Favoured Areas (LFAs), which are often divided into mountain and non-mountain areas. In Wales the measure is called Tir Mynydd and in Switzerland the payments are organized under the General Direct Payments (El Benni & Lehmann 2010). The aim of these measures is to maintain farming in areas where agricultural production or activity is more difficult because of natural

and infrastructural conditions. LFAs are designed to maintain the countryside and the biodiversity through farming practices. Since 1975, when they were introduced, LFA payments have been one of the most financially strong measures under Axis 2 (c.32% of total payments in Austria; 52% in Bavaria, and 22% in Wales) (Welsh Assembly Government 2008a; Lebensministerium 2009a; StMELF & StMUG 2010). They are granted annually per hectare of

utilized agricultural area, sometimes linked to the number of grazing animals (Cooper et al. 2009) or the size of the farm. In the five countries in focus, the level of payment varies between a minimum of c.25 EUR/ha for farms in 'intermediate designations' (e.g. in Wales (Welsh Assembly Government 2010b: 38) and Bavaria (StMELF & StMUG 2010: 352)) and a maximum of c.850 EUR/ha for small-scale farms in high mountain areas (in Austria (Lebensministerium 2009a)). Furthermore, the measure in Wales is only targeted at maintaining livestock production. Since 2003 the payments for less favoured areas have been under review by the EU, particularly with regard to the designation of 'intermediate LFAs' and the lack of targeting of this form of aid (EC 2009a). Accordingly, the Welsh measure Tir Mynydd has not been continued in the new agri-environment programme Glastir, which came into force in 2012 (Welsh Assembly Government 2010c).

While all countries provide for the maintenance of grassland for the whole territory (e.g. Tir Gofal in Wales and PHAE in France), Austria, Bavaria, and Switzerland provide additional measures which are exclusively directed towards mountain areas: to prevent overgrowth in such landscapes, the mowing of fields with a slope of more than 25% in Austria, > 35% in Bavaria, and > 18% in Switzerland, is subsidized. Farmers must mow at least one time per year and they have to cart the swath away. Austria provides an additional measure with higher payments, which is limited to grassland in alpine areas (Bergmähdern), where grazing is not possible (Lebensministerium 2009a; StMELF & StMUG 2010; Bundesamt für Landwirtschaft 2010b). In Bavaria the KULAP B measure (see Box 8) supports the clearance of scrubs on mountain pastures, which are recognized and listed as *Alm*.

Box 8: KULAP B and Bergbauernprogramm

From 1 January 2011, KULAP B has been integrated into the Bavarian mountain farmers programme (Bergbauernprogramm), which is directed at farms with registered *Alm* (summer pastures). The aim of this programme is to maintain typical mountain pasture landscapes and thereby also the basis for rural tourism in the Bavarian Alps.

The scheme can be divided into four measures:

- A (former KULAP B): Clearance of scrub and other restoration work on summer pastures (e.g. after an avalanche)
- B (former KULAP B): Support of measures which invest in, for example, cattle sheds or enclosures on summer pastures
- C Investments in farms located in valleys, which use summer pastures (e.g. small cattle sheds, hay barns, or mowers for hillsides)
- D Diversification of the economy of mountain farms, e.g. through rural tourism

The Bergbauernprogramm, in contrast to KULAP B, will be co-financed by the EU (total annual budget: c.5.4 million EUR) (L. Treffler, oral communication)

Furthermore, Austria, Bavaria (Behirtungsprämie für Almen), and Switzerland (Sömmerungsbeiträge) provide special payments for roughage consuming animals that graze on mountain pastures in the summer. The aim of this form of support is to maintain the extensive summering pastures in mountainous regions. The payments are dependent on area under contract and the number of animals, and stand in direct correlation with the accessibility of the *Alm* (summer pasture). In addition, Austria and Bavaria offer special payments for mountain shepherds

(Lebensministerium 2009a; StMELF & StMUG 2010; Bundesamt für Landwirtschaft 2010b; El Benni & Lehmann 2010).

Effectiveness of measures targeted at maintaining cultural landscapes

A high amount has been spent on the less favoured areas schemes (see Table 10). Representatives in almost all of the countries regarded the subsidies as having positive effects on the landscape, but they also point out that it was not possible to quantify to what extent farming (and

hence also the open, farmed landscape) had been maintained with help of the LFA measure in recent years:

Wales: 'Although not measured in quantitative terms, Scheme Managers and PMC [Programme Monitoring Committee] members feel that Tir Mynydd has successfully contributed to maintaining the beauty of the Welsh landscape, and enabled hill farmers and their families to keep in business' (EKOS 2008: 18).

Bavaria: The effects of the compensatory allowance on the cultural landscape cannot be quantified. However, it is assumed that the compensatory allowance, with its structure conserving effects, can contribute to maintain farming over the whole territory (ART 2008: 530).

France: In the mountainous areas the payments of the Rural Development Programmes, and especially the payments for the less favoured areas, play an important role because they represent 40% of farmer's income. Despite the inability to quantify the effects, the maintenance of the production system (surfaces, livestock) shows that the countryside is maintained (CNA-SEA 2008b: 156).

In *Austria* the measure seems to be appreciated and will be continued in the future

programme periods: 'The decline in small and medium-sized holdings, referred to as "structural change", would take place much more rapidly [without the compensatory allowance]. The continued existence of a major part of Austria's cultivated landscape, which constitutes a decisive precondition for tourism, would be in danger. For this reason the compensatory allowance also has to be an integral component of a comprehensive ecologically and socially-oriented overall programme in the future' (Lebensministerium 2009b: 35).

In Wales Tir Mynydd will not be continued in the next programme period. One reason given is that the 'main weakness of the compensatory payment scheme was thought to be its lack of environmental focus, and/or alignment of payments to certain environmental actions which would help changing farmer's attitudes and farming practice' (EKOS 2008: 18). In Switzerland too, the general payments are under discussion. For the further development of the Direct Payment System (2011), there are plans to introduce Kulturlandschaftsbeiträge (cultural landscapes payments), which will be offered for maintenance of the landscape (Lanz et al. 2010).

Table 10: Results of measures targeted at less favoured areas

	Austria ²	Bavaria ²	France ³	Wales ⁴
Total participating farms	97,039 (2008)	74,883 (2006)	96,000 (2007)	66,268 (2007)
Farms in mountain areas	68,000 (2008)	9277 (2006)	67,000 (2007)	- ⁵
Total hectares in million	1.55	1.5 (2006)	4.3	1.0
Total amount per year	275 million EUR (2008)	133 million EUR (average 2000-2006)	517 million EUR (2007)	53 million EUR ⁶ (average 2000-2006)
Average annual investment/ha	c.175 EUR	c.90 EUR	c.120 EUR	55 EUR

Notes: ¹ Lebensministerium 2009b: 21ff.; ² ART 2008: 32; ³ CNASEA 2008b: 26, Agreste 2009: 30; ⁴ EKOS 2008: 13; Welsh Assembly Government 2008a: 45; ⁵ The Welsh programme does not differ between 'mountain' and 'not mountain' areas, but between 'severely disadvantaged areas' and 'disadvantaged areas'; ⁶ GBP 36 million, exchange rate from 31 December 2006

Compared with the controversial Less Favoured Areas payments, the measures which are designed directly to maintain landscapes through mowing or grazing seem to be more effective with regard to landscape issues.

Within the measures 'mowing grassland on steep hillsides' in 2005 c.187,983 ha in

Austria and 1700 ha in Bavaria were under contract (the high difference may be partly due to the fact that the mountainous area in Bavaria is smaller than in Austria and also the Bavarian definition of steep hillsides is more strict).

In Austria almost 8000 farms participate in measures targeted at maintaining and

enhancing alpine pastures and herding, and thereby also typical cultural landscapes, with 475,000 ha (the area under contract decreased between 2000 and 2006 by 75,000 ha) (Lebensministerium 2008). In Bavaria 1200 farms participate with 25,000 ha (ART 2008) and in Switzerland 7200 farms (Bundesamt für Landwirtschaft 2009). It was not possible to identify from the evaluation reports what proportion of summer pastures was managed by shepherds.

It is noteworthy that in Austria the hectares and number of participating farms in both measures (mowing grassland on steep hillsides and on alpine pastures) decreased between 2000 and 2006. The reasons for this include the general abandonment of farms in mountain areas as well as in the fact that farmers used the fields for other measures which were more

profitable (ART 2008; Lebensministerium 2008).

Austria, Bavaria, and Switzerland all determined that these measures play an important role in maintaining summer pastures in mountainous regions (Lebensministerium 2008; Bundesamt für Landwirtschaft 2009, StMELF & StMUG 2010) and there are plans to continue these measures in future programme periods (Lanz et al. 2010; StMELF (L. Treffler, interview)).

5.2 Linear landscape elements

Measures targeted at linear fixed elements in the landscape, such as hedges, boundaries, and stone walls, exist in all of the countries under review. They are organized differently (see Table 11) but we can distinguish between measures principally targeted at maintenance and measures targeted at creating new linear elements on farmed land.

Table 11: Measures targeted at maintaining and creating linear landscape elements (within the Rural Development Plans and/or Direct Payment System).

	Programme period 2000–2006	Programme period 2007–2013
Austria	ÖPUL: Creation of landscape elements (Neuanlegung Landschaftselemente)	Axis 3: Enhancement of the rural heritage – cultural landscapes (Landliches Erbe – Kulturlandschaft, Landschaftsgestaltung & -entwicklung)
Bavaria	Land consolidation (Flurbereinigung) Conservation of the countryside & Natural Park Directive (Landschaftspflege- und Naturpark-Richtlinien)	Axis 1: Land consolidation (Flurbereinigung) Axis 3: Enhancement of the rural heritage – Conservation of the countryside & Natural Park Directive (Erhaltung und Verbesserung des landlichen Erbes – Landschaftspflege- und Naturpark-Richtlinien) Axis 2: Maintenance of hedgerows (Heckenpflege-Programm)
France	AEM: Maintenance and planting of hedgerows and maintenance of ditches (entretien de haies, réhabilitation de fossés, création de haies)	Axis 2 (AEM ¹ regional): Maintenance of hedgerows (MAET- entretien des haies) Axis 2: Aid for non-productive investments (Aide aux investissements non productifs) Axis 1: Planting plan for farms (Plan végétal pour l'environnement- modernisation des exploitations agricoles)
Switzerland	Payments for ecological compensation (Ökologischer Ausgleich)	
Wales	Tir Gofal Tir Cynnal	Axis 2 (AEM): Tir Gofal Axis 2 (AEM): Tir Cynnal

Note: ¹ AEM: agri-environment measures

The structure and the objectives of these measures have remained largely unchanged between the two programme periods (2000–2006 and 2007–2013). Measures targeted at maintaining the existent linear structures include the agri-environment schemes Tir Cynnal (Wales) and the Heckenpflegeprogramm (Bavaria). The latter

scheme offers annual payments, calculated on hedge length (1 EUR/m hedgerow), while Tir Cynnal simply requires the maintenance of all linear elements on farmed land.



Box 9: Flurneuordnung (Land consolidation)

One of the oldest agricultural support programmes in Bavaria is the Flurneuordnung, introduced in 1886. The main aim was the allotment of farmed land and the creation of roads in rural areas. With the 1976 German Federal Act on the Consolidation of Farmland (Flurbereinigungsgesetz), social and environmental aspects became more important. Thus, in addition to the improvement of the agrarian structure, financial support includes also the creation of landscape elements and recreation opportunities as well as ecological improvements, preventive flood protection, and the challenge of conciliating in conflicts over land use.

Photo: W. Dramstad, Skog og landskap.

The creation of new linear elements is provided through programmes such as the regional agri-environment measures ‘création de haies’ (France) or the Flurneuordnung (Bavaria) (Box 9), while some measures provide both payments for maintenance and the creation of landscape elements. The latter measures include the ‘Enhancement of the rural heritage’ (Austria) and the advanced agri-environment scheme in Wales (Tir Gofal). Some payments for the creation of linear elements are calculated based on the length of the element (e.g. Tir Gofal – planting of hedges: EUR 3 per metre) (Welsh Assembly Government 2010d), while others provide payments as a percentage of the total costs (e.g. Enhancement of the cultural heritage in Austria).

Only Switzerland does not have a corresponding programme in support of the creation of landscape elements. However, there are plans to integrate payments for the creation of structural elements such as hedgerows or orchards into the new Direct Payment System (2011) (El Benni & Lehmann 2010).

Effectiveness of measures targeted at linear elements

While measures targeted at linear landscape elements (often hedgerows) are widespread, the absence of reference data for linear elements (e.g. the existence and length of linear elements for the whole territory) make objective judgements and comparisons of such measures difficult. For example, due to changes in assessment method in France, it was not possible to assess the evolution of the number and length of linear elements in the country during the last programme period (CNASEA 2008a).

However, the evaluation reports of the Bavarian, French, and Welsh Rural Development Plans include at least basic information about the creation of new landscape elements. Also, the creation of 3500 km (under Tir Gofal) in Wales, 2400 km (under MAET) in France, and 56 km hedgerows (under Flurbereinigung) in Bavaria were supported (ART 2008; EKOS 2008; CNASEA 2008a). In Austria the length of linear elements decreased despite the availability of support to maintain

and enhance them (Lebensministerium 2008, Appendix). The reason for this has been seen in the fact that linear landscape elements (with the exception of hedge-rows) are not protected by regulations (Lebensministerium 2008, Appendix).

Despite the deficits in the evaluation and assessment of linear landscape elements, the fact that the schemes have been continued over programme periods shows that the measures are appreciated by the authorities concerned.

5.3 Public access to the countryside

The countryside represents one of the most important recreational facilities for the public. Substantial areas of European countries are under agricultural use and the role of farms in providing recreation opportunities for the public has also been taken into account in the agricultural subsidies (Table 12).

Within the current Rural Development Programmes, measures targeted at improving public access to the countryside (e.g., enhancement of the rural heritage, village renewal and encouragement of rural tourism) can mostly be found under Axis 3 of the Rural Development Programmes. These measures include the offer of payments to create viewpoints, rest areas, benches, gates, cycle paths and footpaths, fitness trails, and small bridges. As mentioned earlier in this review, measures under



Axis 3 are not exclusively directed at farmed land but also at public and other private land, and in Wales they even require implementation through local partnerships. Thus, the Welsh advanced agri-environment scheme Tir Gofal provides payments for farmers targeted at better public access on their land. Unlike other measures which offer payments calculated as a percentage of the total cost, the payments list of Tir Gofal is very precise (e.g. creation of 1 metre of footpath: EUR 9; a bench seat: EUR 37; and a kissing gate (Image 9) of Welsh oak: EUR 180) (Welsh Assembly Government 2010d).

Image 9: "Kissing gate", a gate without latches, preventing livestock to pass through while giving easy passage to one person at a time. Photo: P. Dennis.

Table 12: Measures targeted at enhancing public access to the countryside (within the Rural development Plans)

Programme period 2007–2013	
Austria	Axis 3: Encouragement of rural tourism (Förderung des Fremdenverkehrs) Axis 3: Enhancement of the rural heritage – Nature protection (Ländliches Erbe – Naturschutz: Infrastrukturmaßnahmen für die landschaftsgebundene Erholung wie insbesondere Besuchersystems)
Bavaria	Axis 3: Village renewal (Dorferneuerung)
France	Axis 3: Encouragement of rural tourism (Promotion des activités touristiques) Axis 3: Enhancement of the rural heritage – Nature protection (Conservation et mise en valeur du patrimoine naturel)
Wales	Axis 2: Tir Gofal Axis 3: Encouragement of rural tourism

It was not possible to gather information about agricultural policies or grants designed explicitly to enhance public access to the countryside in Switzerland, neither in literature nor in the course of the interviews (Swiss Federal Institute for Forest, Snow and Landscape Research, interview). However, a wide range of grants exist for rural tourism, such as Innotour, founded by the Swiss Government (for the period 2008–2011, with a budget of 16.1 million EUR) (SECO 2010).

Effectiveness of measures targeted at enhancing public access to the countryside

The evaluation reports from Austria and France do not contain information about whether or not and/or to what extent measures for creating better access for the public to the countryside have been supported. In Bavaria the measure *Flurbereinigung* provided for the creation of c.5000 km cart tracks in the period 2000–2006 (ART 2008), which are mainly also accessible to the public (ART2008). In the case of support for village renewal in Bavaria, 1 rest area, 19 benches, and 54 km of cycle paths and footpaths were supported in the same period. However, most of the constructions were probably undertaken within villages rather than the wider countryside, because the main focus of *Flurbereinigung* is the villages (ART 2008).

One of the four main objectives of the Welsh agri-environment scheme *Tir Gofal* is to increase opportunities for public access to the countryside. Under the scheme 428 km of footpaths and 4220 educational farm visits were supported. However, a study by EKOS found that the condition of public rights of way on *Tir Gofal* farms was only slightly better than the average for Wales (EKOS 2008).

None of the evaluation reports included information on whether, how, and to what extent people used the new access opportunities.

5.4 Conclusion

Programmes and schemes with influence on the appearance of landscapes are numerous and diverse, but parallel developments in the design of the support possibilities in the compared countries can be observed (e.g. payments for less favoured areas, mowing and grazing on mountain pastures). While maintenance of biodiversity, landscape coherence and open landscapes are some of the main objectives of the rural development policies in most of the countries (Cooper et al. 2009), the creation of recreation opportunities on farmed land has not been emphasized. The only exceptions are the schemes in Wales. One reason for this may be that in Wales, in contrast to the other countries under consideration, public rights of access agricultural land and forests are more restricted (Enclosure Acts; Countryside and Rights of Way Act (2000)).

The effects of the different schemes on landscape issues are part of most evaluation studies of the Rural Development Plans. Unfortunately though, the evaluation system is not sufficiently detailed and comprehensive to compare the effectiveness of the measures with regard to the maintenance of landscapes, the maintenance of linear elements, and recreation opportunities. One of the main problems has been regarded as the lack of reference data, and there is also a lack of precisely defined aims. Regarding the payments for less favoured areas, the effects for maintaining landscapes are seen as questionable. However, most of the other schemes are judged as important and effective for the maintenance of rural landscapes (Lebensministerium 2008; Bundesamt für Landwirtschaft 2009; StMELF & StMUG 2010; ART 2008).

The question of whether or not the above-mentioned measures (Cooper et al. 2009) also have positive impacts on the variety of landscapes and landscape identity (cf. European Landscape Convention) (CoE 2000) has not been considered further in the evaluation reports.

6 Overall conclusions

6.1 European agricultural support – complex structure but similar aims

Agricultural policies and payment systems in Europe have a long history and are organized in a very complex manner. This complexity, the high number of schemes and measures provided, national specifics and terms, different responsibilities, and the changes in programme design have proved problematic for this review of agricultural support aimed at maintaining and/or enhancing biodiversity, cultural heritage and landscape. However, through studying and comparing the schemes in Austria, Bavaria, France, and Wales it became apparent that they are generally organized and targeted in a quite similar manner (cf. Table 2), and this can be traced back to, for example, the fact that the European Council regulates the objectives and components of the schemes in a very concrete manner (cf. EC Regulation

1698/2005). In Switzerland the objectives of the schemes are very similar to those of the EU member states (e.g. agri-environment payments and payments for mountain pastures), although their organization differs.

6.2 RDP as a driving force for changes in landscapes, biodiversity and cultural heritage

For the three themes of interest (i.e. biodiversity, landscape, and cultural heritage), the measures under Axes 2 and 3 of the Rural Development Programmes (CAP Pillar 2) were the most important. These two Axes and particularly the agri-environment schemes (in Switzerland, Ecological Direct Payments) dispose of an enormous amount of funding and have been applied across a large geographical area in the European Union (Whittingham 2007: 1) (e.g. 88% of Austria's agricultural area is covered by the agri-environment pro-

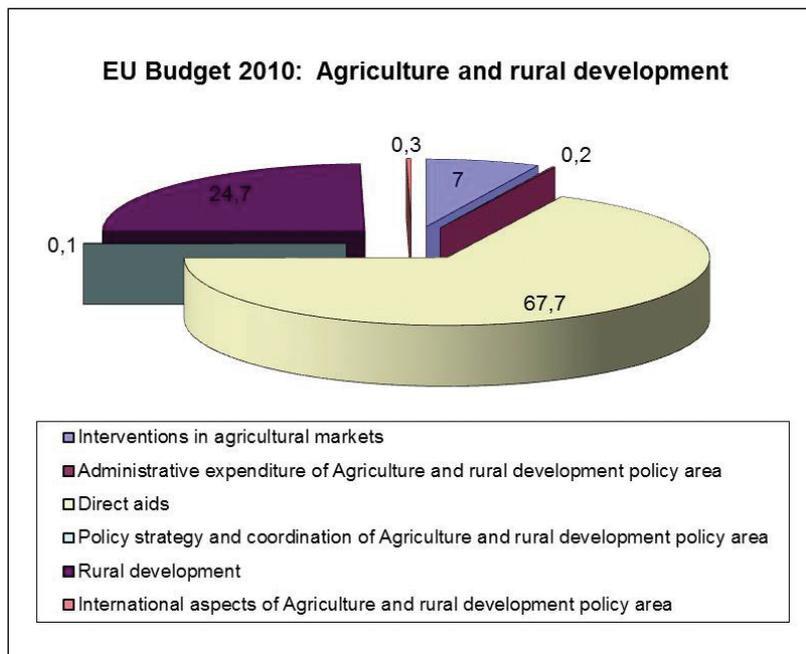


Figure 5: European budget for agriculture and rural development (EUR-Lex 2010)

gramme ÖPUL (Lebensministerium 2008)). As a consequence, they have probably a high level of influence on farmers' decisions and land use practices, and hence also the provision of public goods. However, other forms of agricultural support, such as the direct payments under the first pillar of the European CAP (Figure 5) and the General Direct Payments in Switzerland (Bundesamt für Statistik Schweiz 2010c) have higher value and thus might have more significance for farming decisions. Additionally, other driving forces, such as markets, legislation, and infrastructure, also influence the provision of public goods through agriculture. Furthermore, all of these factors, as well as the subsidies, are influenced by global policies beyond Europe (e.g. WTO policies) (cf. Cooper et al. 2009; Primdahl & Swaffield 2010).

With regard to expected changes in agricultural support policies and the corresponding requirements of the WTO (reduction of measures which are considered to distort production and trade) and the EU (new programme period 2013–2020), the discussion on the effectiveness and improvement of the CAP, the Rural Development Programmes, and the agri-environment schemes will be in greater focus in the coming years.

6.3 Criticisms of scheme design and evaluation difficulties

Criticisms of the design of agri-environment schemes and of the Rural Development Plans are numerous. They range from the criticisms related to short-term programme design (6 years, which conflicts with the goal of long-term effects on biodiversity), regarding the problem that only fragmented areas are involved (research focuses on the importance of matrix), and that frequent changes in programme design leave farmers feeling insecure and have negative impacts on scheme participation (cf. Organic Framing under the CTE in France) (Appendix CAB in CNASEA 2008a), to the problem that schemes are often only implemented in areas which have not previously been used intensively and where intensification is not profitable (and therefore they do not lead to environmental improvements) (Kleijn et al. 2006; Knop et al. 2006; Whittingham 2007; Lanz et al. 2010).

Apart from criticisms of the schemes themselves, their evaluation has been criticized too. The following citation from the Welsh evaluation reveals some of the main criticisms with regard to scheme evaluation:

None of the current schemes operating in Wales have extant commissioning documents that precisely define the scheme benefits, outcomes or outputs to be delivered, although Tir Gofal, for example, does have defined (although non-targeted) objectives. [...] There is some evidence to suggest that the activities funded by the scheme *should* benefit habitats. However, there is only limited evidence about the extent to which beneficial changes to habitats can be attributed to Tir Gofal rather than other factors. Also, there is a lack of comprehensive data on Welsh habitats and how they are changing over time. This makes it difficult to put the achievements of Tir Gofal into context. The point to be emphasised here is not that Tir Gofal has failed to deliver benefits but that evaluation of the delivery of those benefits is problematic (Welsh Assembly Government 2008c: 8).

In the following, the main difficulties concerning scheme evaluation are described.

Timescales involved – Because of the criticisms of the evaluations and the effectiveness of the provided schemes during the mid-term evaluation of the programme period 2000–2006, the Council of Europe has already with Regulation 1698/2005 established requirements regarding scheme evaluation: each member state has to set up a monitoring committee to ensure that a given programme is implemented effectively. In addition, the management authority for each programme is obliged to send an annual report to the European Commission on the implementation of the programme. The rural development policy and its programmes have to be evaluated ex-ante, mid-term, and ex-post to improve the quality, efficiency, and effectiveness of the implementation of the Rural Development Programmes. A further aim of evaluations is to draw lessons for future rural development policy by identifying factors that have contributed to the success or failure of programme implementation (EC 2009c).

However, in a literature review, identification of the most effective schemes or ‘best practice examples’ regarding the themes of interest was constrained by the lack of available evaluation studies. Studies are only available for the last programme period (which ended in 2006), and they

do not allow us to draw lessons from the ongoing schemes. The evaluations, especially those on international levels – measured on the duration of a 7-year programme period – take a relatively long time. Thus, the design of the schemes for the next programme period is mainly based on the results of the mid-term evaluation of the ongoing programme period (mid-term is after 3.5 years). This could be judged critically because it seems difficult to assess effects of the measures in an appropriate manner after such a short period of time, especially with regard to long-term effects on landscape changes or biodiversity.

Lack of specifically defined objectives – The lack of specifically defined objectives of the schemes (e.g. ‘maintaining or enhancing biodiversity or cultural heritage’) makes it difficult to measure their effectiveness. For this reason, discussion and research relating to indicators (e.g. SEBI of the EEA) (EEA 2010) has been emphasized in recent years. Other trends to simplify the measurement of the effectiveness of schemes include the introduction of results-based payments, such as those in Switzerland, where payments for less favoured areas will be replaced by payments based on the number of hectares of farmland maintained.

Limited availability of data – A further problem is the limited availability of data. From this review, it is apparent that a general lack of reference data has often been discussed and criticized during scheme evaluation because this information is important for judging the outcomes of a given measure. How can we, for example, judge the importance of a given length of hedgerows created in area, if we do not have reference data on the length of hedgerows prior to implementing the scheme, or a quantified goal for the length of hedgerows to be established through the scheme?

Other difficulties concern the limited data on scheme implementation and documentation, especially under Axis 3 of the Rural Development Plans. There is often a lack of detailed information about the type of projects supported, as well as about the quality of outcomes, e.g. the quality of the created recreation opportunities on farmland.

Vaguely formulated results – Vaguely formulated results, such as ‘it was assumed’ or ‘it was felt’, when used for example in the argument that the less favoured areas scheme has positive effects on the landscape (ART 2008: 530), are very common in the reviewed evaluation studies. They represent a level of uncertainty, especially with regard to results which go beyond a description of the output of the schemes (e.g. number of participants, area under contract). As seen in the evaluation of the Welsh scheme Tir Gofal (above), these uncertainties originate in, for example, the fact that it is difficult to trace results (e.g. positive development in a bird population) back to single support measures, due to the complexity of environmental issues, the high number of driving forces and stakeholders, and also the combination of and interaction between applied measures (Welsh Assembly Government 2008c; Cooper et al. 2009)).

6.4 Acceptance of agricultural support

As a consequence of all of the above-mentioned evaluation difficulties it is in turn difficult to present the success of the schemes to both farmers and the public. This could be seen as problematic because the acceptance of the schemes is already lower than hoped for (cf. ART 2008; Lebensministerium 2008, Appendix) and public resources become more and more under pressure from other sectors, so that there is a need to achieve and present outcomes (Primdahl & Swaffield 2010). Reasons for the low acceptance of some schemes – besides the influence of other driving forces – can be identified as a lack of insufficient information on the objectives (the environmental benefits) and/or a missing regional and/or local adaptation of the measures (cf. ART 2008: XXXIII; Lebensministerium 2008, Appendix). To handle these deficits, approaches to enhance information work as well as schemes implemented on a local and/or regional level were implemented. Examples include the collective approaches which used local expertise to solve environmental problems, such as the former CTE in France or the Environmental co-operatives in the Netherlands (Polman et al. 2010)

6.5 Scheme success stories and future challenges: "simple" measures and "better" evaluation – in Norway and internationally

As outlined above, there are various constraints in using a literature review and interviews to identify the most effective schemes or ‘best practice examples’ for the themes of biodiversity, cultural heritage, landscape scenery and recreation. For example, the feasibility of comparing and quantifying agri-environmental measures and their results internationally is, to some extent, constrained by the fact that the character of the landscape is the underlying basis for agricultural support systems. Landscapes differ in different countries, and even the same type of landscape may be valued differently in different countries, in the light of other national resources and priorities. Combinations of history, culture and politics may lead to country-specific characteristics in policies, and farmers’ interests and cultural inclinations will also influence which policies are successful. Moreover, there is a general lack of objective data, and in the course of the interviews it was difficult to identify ‘best practices’ judged as effective by more than one person.

However, the countries in this review were selected based on their expected similarity to Norway in terms of landscape characteristics and challenges related to agriculture and agricultural landscapes. It is of great interest, therefore, that we were able to identify a number of features in the agricultural support schemes of Austria, Bavaria, France, Wales and Switzerland that are considered successful in terms of creating or maintaining multifunctional landscapes with high species diversity, rich cultural heritage, and attractive and representative landscape scenery. We would advise examining these more closely when considering future developments of the Norwegian agricultural and agri-environmental subsidy system.

The Organic Farming scheme in Austria has been mentioned several times as a successful scheme under the Rural Development Programmes, because of the high percentage of organic farmland achieved. Also the Austrian authorities judge the scheme as successful.

In terms of maintaining or enhancing recreation opportunities and cultural heritage on farmland, the Welsh agri-environment programmes seem to be the most advanced and highly approved. The fact that both topics are included in the main objectives of the Welsh schemes, stands in contrast to other countries' schemes where these topics are not emphasized to the same degree. Also the Welsh Tir Gofal appears to be the most successful of the schemes reviewed in terms of the number of projects carried out.

With regard to cultural landscape maintenance, the Austrian, Bavarian and Swiss measures (e.g. mowing on steep hillsides, summer pastures) are outstanding because they are directly targeted at maintaining cultural landscapes. Considering the fact that in Austria the number of participants and area under contract declined in the last programme period, the programmes in Bavaria and Switzerland seem to be of most interest for countries wanting to maintain their cultural landscapes in mountainous regions. Furthermore, from 2011 both countries planned to change and extend their programmes regarding seasonally inhabited mountain farms.

Interestingly, when asked for examples of successful measures, interviewees often referred to smaller programmes or foundations which are not organized under the Rural Development Programmes, such as the 'Skylark plots' or 'Ferti-Mieux'. We suspect that a major reason for this is that, although they are not that financially strong, they have very specific aims. These aims are probably easy to relate to locally, as they also often include local information. Furthermore, they appear to involve fairly simple application and organization requirements.

Schemes are also generally evaluated as more positive and effective if they are developed and designed in cooperation with farmers and if they are adapted to local characteristics or challenges. This applies, for example, to the Welsh whole farm scheme Tir Gofal and to the Vertragsnaturschutzprogramm in Bavaria. In France, however, these kinds of schemes (former CTE) were met with more critical assessment. In particular, schemes were criticized for being unfair in terms of regi-

onal repartition of the grants, for lacking transparency, for being applied only to small areas, and for requiring a great deal of organization and implementation work (CNASEA 2008a).

Schemes that are adapted to local or regional challenges and characteristics, are already part of the Norwegian agri-environmental support system (Regional Environmental Schemes, RMP, and special environmental measures in agriculture, SMIL). However, these are fairly restricted in their scope, often focusing solely on pollution or on the preservation of agricultural practices. In our opinion, measures addressing other environmental aspects of agriculture deserve more consideration. In addition, as for the other countries reviewed, it has been suggested that Norwegian agricultural support schemes would benefit from having more specific objectives (Puschmann et al. 2008). Exchange of information about measures considered effective can thus be considered a joint international task.

This review has also shown that no 'best practice' or 'standard design' of agricultural support schemes has been recognized on an international level to date. It seems probable that there will be greater emphasis on scheme design and effectiveness in future evaluations of ongoing programmes, in discussions of the design of programmes for new periods, and with regard to WTO requirements.

An enhanced evaluation system will therefore be as important as new and adjusted schemes themselves, and will allow for more lessons to be learned across national boundaries. In our view, an enhanced evaluation should include collection of monitoring data suitable for comparison, preferably taking particular national challenges and aims of the schemes into account. Also the definition of international indicators (e.g. biodiversity) and effective evaluation techniques appear important. However, the extent to which this has already been taken into account in the framework for the common monitoring and evaluation of the programme period 2007-2013 by the European Commission could not be considered in the course of this review.

Careful design of agri-environmental measures can probably help to overcome

many of the difficulties involved in evaluation. Important aspects will be, for example, addressing precisely defined objectives, including timescales for expected positive effects, and linking to monitoring data documenting the situation before and after implementation. This will also enhance the comparability of schemes and, through increased knowledge about the characteristics of effectiveness, enable improved effectiveness of future schemes. A European standard for how to record suitable monitoring data may further enhance comparability internationally.

However, development of more enhanced evaluation techniques will take time, during which agri-environmental policies will continue to be implemented. Moreover, measurable effects of some policies will be of a longer-term character, which requires a correspondingly long timeframe

to document them. For certain measures, cause and effect may not yet be well-known, and rely on anecdotal information or traditional knowledge. In most, if not all cases, there will be a multitude of factors, many of which occur outside agriculture, that influence the outcome of agri-environmental measures. Therefore, we suggest prioritizing "double-tracked" agri-environmental support: On the one hand supporting measures that have already proved to be effective; on the other hand supporting measures where positive effects are considered very likely due to well-known cause-effect relationships - even though they may not yet have been thoroughly documented and approved, e.g. because of their long-term character or due to weaknesses not yet solved in monitoring and evaluation systems.

7 References

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