



**REGARDS**

*REsilience of marginal GrAssland and biodiveRsity  
management Decision Support*

UNIVERSITY INNSBRUCK, DEPARTMENT OF SOCIOLOGY

# **Work Package 4**

# **Country Report Austria**

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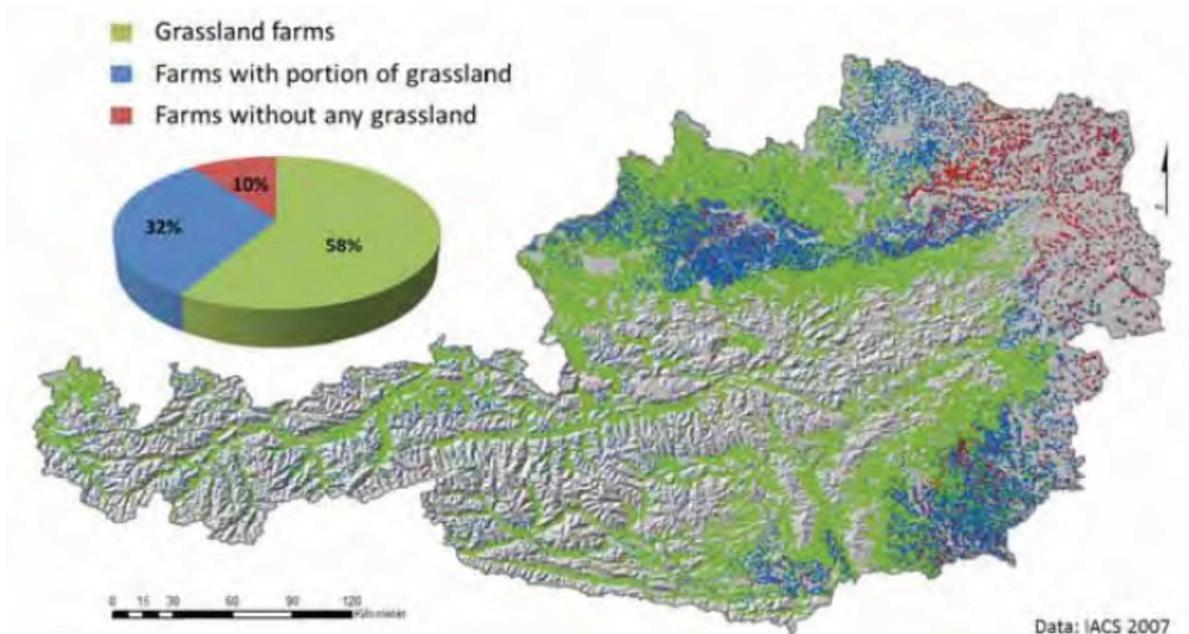
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## General relevance of permanent mountain grassland and present trends

**Figure 1: Spatial distribution of farms with grassland in Austria (Buchgraber et al, 2011)**



**Figure 1. Spatial distribution of Austria's farms and their classification in respect of the share of grassland farmed**

In Austria grassland is dominating alpine regions. In the most western Provinces Vorarlberg, Tirol and Salzburg the share of grassland within the total utilized agricultural area is 97%. The units of land are generally small, two third are below 05 ha and only 1,6% are larger than 5 ha. In terms of altitude distribution, 34% of all grassland areas are at altitudes of up to 600 metres, 17% are between 600 and 800 meters and almost 50% are above 800 meters (INVEKOS, 2009 in Buchgraber et al 2011).

Around 50 years ago, all grassland- and cattle farmers in Austria still carried out a very extensive form of grassland farming. Meadows in mountain regions were mowed once or twice annually and those in the favorable locations two or three times, and together with the pasture areas they were the main providers of ruminant forage. The fertilization of meadows and pastures was based almost exclusively on the use of the farm's own manure. While farming practices have changed rapidly in the more favorable areas, according to Buchgraber et al. (2011) in mountain areas traditional farming has only been changed slightly so that the meadows there today are still mowed twice or a maximum of three times annually. Mineral nitrogen is hardly used in the mountain locations and, moreover, with two to four kilograms per dairy cow the daily amounts of concentrates are at a comparatively low level (Buchgraber et al. 2011).

Currently about 60% of permanent grasslands are extensively utilized, such as alpine pastures, extensive meadows and pastures (Pötsch 2009). However this share is rapidly decreasing. Groier (2007) describes the decline of permanent grassland - especially of extensive grassland - in Austria and analyses the reasons and the problems resulting out of it. A long term comparison reveals that between 1960 and 2003 the share of permanent grassland has declined by 21% while the more intensive forms have even increased by 16%. Especially the extensive but ecologically valuable forms (Alpine pastures, extensive meadows) have been drastically reduced by 40%.

Groier describes the current trend (from 2000 to 2006) as a polarization into production oriented intensively used grassland and nature protection oriented extensive grassland. Production oriented intensive grassland (with more than three cuts annually) has been made possible by new technical devices for harvest and conservation (silage) which matches the increase of productivity in animal husbandry.

The polarization described by Groier (2007) has consequences on biodiversity and landscape development. The intensification of dairy breeding results in increased milk yields per cow, which are concentrated in fewer farms. In general the overall number of cows in mountain areas is decreasing. The remaining cows are heavier and therefore to some extent less fit for alpine pasturing. This results in a quantitative and qualitative reduction of biodiversity on alpine pastures. If there are fewer cows in alpine meadows succession by forest in lower lying alpine meadows and pastures will be the result. In general the status of biodiversity is higher on extensive alpine meadows than in forests. Furthermore there is the fear that too much forest would reduce landscape attractivity and have ultimately possibly negative consequences on tourism. As consumers associate grassland with flowering meadows and plant variety, which is generally not found in intensively managed grassland, a loss of attractivity is noted also in the case of intensification (Pötsch 2009).

Thus both, intensification and abandonment result in a loss of biodiversity. According to Pötsch (2009) an abandoned plot lost within 8 years 50% of the original species on level ground and 5% on the slope. At the same time a number of undesirable species (ferns, shrubs, poisonous plants) invaded the plot. Even if alpine pastures are not completely abandoned, changes of management in comparison to traditional practices are inevitable. Guggenberger et al (2014) describe the traditional management of alpine pastures as a combination of different animals as follows: lactating cows need fodder of best quality and quantity. Therefore the areas close to the huts are cultivated most intensively and fertilized with the dung from the alpine barn. Calves, sheep and goats are herded in more distant pastures. If dairy cows are not kept on alpine pastures anymore (due to intensification of dairy with highbred cows as described above), pasture management changes rapidly. Normally there is no permanent herdsmen necessary and the animals are supervised from the main farm by

occasional trips to the alpine pasture. Therefore the animals stay close to the hut and graze the formerly intensively managed areas. Grazing pressure on more distant pastures decreases. Especially on the margins depending on the altitude other species of plants invade. In lower elevations forest encroaches, in higher altitudes grasses and herbs are replaced by shrubs. In the intensive grazed areas around the hut problem weeds emerge due to eutrophication.

Groier (2007) elaborates further on the consequences for regional economy. He fears that farming in the mountains might become a 'living museum' with the only function to preserve the current status of landscape or that landscape preservation will be kept up only in touristic hotspots by non-farming employees. Consequently this would reduce agricultural innovation and rural development activities. Extensive and organic farming practices are a base for supply chains which have the potential together with local processing and direct sales to tourism to give substantial impetus to gastronomy and local trade. Together with the necessary educative programs such innovative practices could result in a dynamic development of a region.

## Societal claims to permanent grassland management

Pötsch (2009) categorizes the functions of (permanent) grassland in analogy to the functions of forests, which are formulated explicitly in the Austrian forest legislation (Forstgesetz 1975, BGBl 440/1975), into:

- Welfare function: grasslands are central elements of cultural landscapes, are a habitat for flora and fauna, a CO<sub>2</sub> storage, and provider of oxygen.
- Protection function: they are a filter and storage for water, they provide protection against erosion and avalanches.
- Recreation function: many permanent grasslands like alpine pastures and meadows are the basis for leisure activities, tourism and hunting
- Utility function: permanent grasslands are the basis for the production of milk, meat and energy.

Pistrich and Wyrtrzens (2005) describe the societal claims for grassland in Austria on a national and local level. To elicit the guiding societal principles for grassland development in Austria they analyzed 141 legal documents and 349 political documents. They found a rather limited number (26 documents) where goals focusing explicitly on grassland are laid down. These concern mainly alpine pastures. Laws for the protection of alpine pastures (Almschutzgesetze) exist in Styria and Tyrol, regulations can be found in the law concerning the support of farming (Landwirtschaftsförderungsgesetz) of Salzburg and law to maintain pasturing in Lower Austria.

Among the documents which state goals with indirect relevance on grassland the authors found 144 documents formulating goals of landscape ecology, 99 documents with agrarian sectoral goals and 64 documents with socioeconomic goals. While documents by agrarian stakeholders favor quality and quantity of fodder production, those from environmental actors demand extensive use and preservation of cultural landscape elements like nutrient poor, wet or dry grasslands. In total Pistrich and Wyrzens identified 28 agrarian objectives, 18 socio-economic and 25 landscape ecology oriented goals.

**Agrarian** 'Leitbilder' have in general two different orientations, one claiming that agriculture needs to be competitive on the world market with little financial support and protectionism, the other focusing on multifunctional agriculture.

**Socio-economic** goals relate to general tasks of agriculture, like sustainable provisioning of food, food security in times of crisis, protection against natural hazards, contribution to regional identity and culture. Specific interests include preservation of cultural landscape, access to recreational areas, preservation of endemic wildlife etc.

**Landscape ecology** goals relate to the concept of sustainability, preservation of natural resources, species and biotope conservation.

Out of this analysis of societal goals Pistrich and Wyrzens (2005) deduct a number of criteria for future grassland use which are oriented on the principle of sustainability.

## Formal governance instruments

Greif et al (2005) report that the Austrian Agri-environmental Program (Österreichisches Programm für umweltgerechte Landwirtschaft, ÖPUL) has in particular a relevance for grassland farming: farms in mountain areas participate to a higher degree with 75,4% as compared to other regions (60-70%). With increasing natural handicaps the participation increases as well (handicap zone 1: 60.4%, handicap zone 4: 92,9%). Among grassland based fodder producing farms the participation is highest (90%), followed by mixed farming with 87% versus the national average of 71%. Within the ÖPUL the measure "basic support" covered 93% of the total ÖPUL area. This measure includes LSU limits per ha and prescriptions for preserving landscape elements and the grassland share of the total acreage. Further important measures include "organic farming" (covering 17% of the grassland area, leaving apart alpine pastures), "renunciation of intensification" (24% of grassland area), "mowing of steep slopes", "alpine pasturing", "structural payments for less favored areas". Especially in mountain areas the public support programs are vital for the preservation of extensive permanent grassland.

According to Pötsch (2009) the participation of farmers in the environmentally important measures of the Austrian agro-environmental program ÖPUL differs strongly. While in extensively utilized grassland regions the share of areas under measures like mowing steep slopes, mountain meadows, alpine pasturing and natural protection is about 16-20%, it is negligible in intensive grassland areas (Pötsch 2009).

Hovorka (2011) evaluated the role of the compensations for natural handicaps, which is part of the structural payments and concludes that these payments are crucial for farmers to continue farming and thus for the preservation of permanent grassland in less favored areas.

Several regional states have started programs to counter negative effects of changes in the management of alpine pastures by developing various alpine pasture revitalization programs. They give financial support and elaborate alpine pasture management plans in order to encourage a more even herding. Active removal of shrubs and mountain pine is recommended (Guggenberger et al 2014). Penker (2002) lists a number of interventions out of the perspective of nature protection which are relevant for grassland cultivation in Lower Austria which include a number of regional instruments on top of the already mentioned ÖPUL measures plus some EU-instruments like Natura 2000. An evaluation of the "Salzburger Regionalprojekt für Grundwasserschutz und Grünlanderhaltung" (Suske 2012) underpins the contribution of regionally adapted measures and lists a number of recommendations for the further adaptation of the program which include amongst other compulsory participation of farmers in courses to enable self-evaluation.

On a local level Pistrich and Wytrzens (2005) investigated which planning instruments are relevant for certain plots. They identified a number of directives relating to protection of water resources, natural hazards, landscape protection, touristic activities like skiing slopes, spatial planning zones etc. The listing shows that a large number of public planning interventions exist, but that also private actors like tourism enterprises impact on land management.

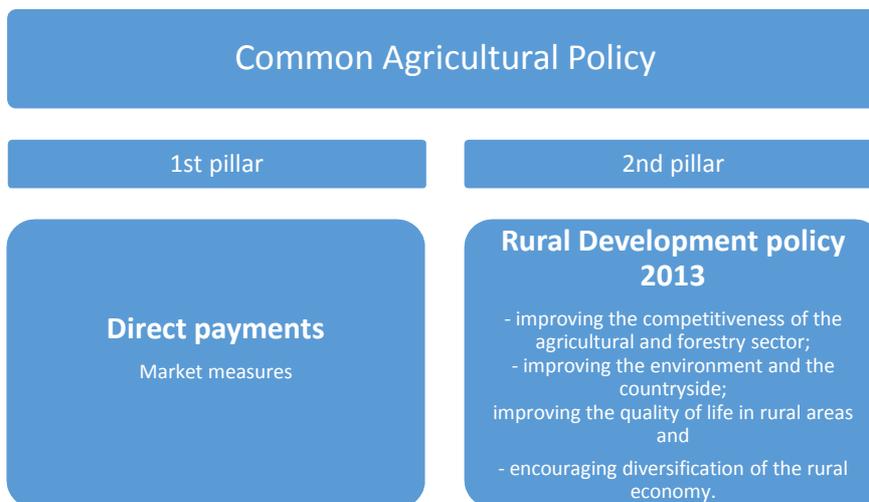
Pistrich and Wytrzens (2005) conducted interviews to compare the directives found with the understanding of the plot owners and they found out that in Tyrol for instance most owners did not mention the natural hazard protection. They conclude that these planning interventions have no significant implication on their land management. On the other hand farmers overestimated the protection of agricultural land against other uses, like building etc. (so called "landwirtschaftliche Vorrangflächen") in spatial planning documents. In order to elicit their values and norms the interviewed farmers were asked to rate the functions of grassland in general and of their own fields. Quality production, safeguarding the enterprise and sustainability were rated highest, while prestige, quantity of production and preservation of rare species received the lowest values.

## Public support systems affecting biodiversity on different levels

The EU budget for agriculture investments is divided in two pillars.

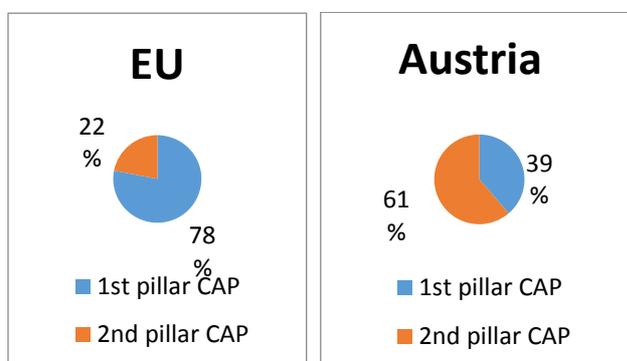
- 1) market interventions, coupled subsidies and direct income support (Single Farm Payments /SFP)
- 2) Rural development payments

**Graph 1: Subsidy System GAP**



The distribution of the money varies between the EU member states. Farmers receiving subsidy from the first pillar (SFP) are obliged to manage their land in good agricultural and environmental condition (cross-compliance). Subsidies from the second pillar focus on maintaining agriculture and want to generate a biodiversity friendly management regime.

**Graph 2: Distribution of financial support among the two pillars, 2011**



Source: bmlfuw: Invekos 2013; Grüner Bericht Austria 2012, own calculations

In Austria the priority areas for agriculture were identified through a consultative process. The areas include the environmental program, compensatory allowances for farmers in mountainous regions and subsidies for investment (OECD 2013: 143).

**Payments to compensate for natural handicaps to farmers in mountain areas** (VO (EG) Nr. 1698/2005, Art. 37) are one of the most important financial sources for mountain farmers.

The farmers have to conform with the cross compliance requirements to receive the subsidies, including basic requirements for good the obligation to preserve the land in good agricultural and environmental condition, which includes to preserve permanent grassland (Lebensministerium 2010b). The specific criteria include that at least 2 ha of agricultural land has to be managed a whole year from the beginning of the calendar year for which he / she has received the first payment for at least 5 years.

The amount of the subsidy varies according to farm size (distinction between farms below 6 ha, farms between 6ha and 60 ha, farms between 60ha and 100ha) the level of mountain farm cadastral points (as indicators of the handicap), management use (meadows, grazing land, and communal pastures) and weather ruminants are kept or not (Lebensministerium, 2010, 156). The rates vary between 70€/ha and 250€/ha while the average amount is 196€/ha (ibid.).

**Payments according to the agri-environmental program ÖPUL** (Article 36 (a) (iv) of Reg. (EC) N° 1698/2005) have a high relevance for grassland preservation.

The measure, which was during the last programming period operated under the heading "ÖPUL 2007", aims mainly to the environmentally friendly management of agricultural land. The main objectives are to preserve the cultural landscape and protect nature (in particular relating to biodiversity), to reduce the use of resources (in particular, issues relating to soil, air and water) and greening and water conservation (in particular relating to soil and water)

Every five years the farmers have the possibility to join the program. If they quit the scheme earlier, they are obliged to pay back the amount of funding received so far unless they have quit farming altogether.

The effect of the measure on biodiversity is evaluated by indicators, including the agricultural land area in Natura 2000 sites and the Farmland Bird Index (FBI) which measures population trends of common bird species in cultural landscape (Lebensministerium 2010b). The bird species biodiversity correlates very well with the overall biodiversity so the farmland bird index suits well as an indicator for assessing the effects of the agri-environment measure on biodiversity. The data collection is done by "Bird Life Austria" (<http://www.birdlife.at/>). A further indicator relates to High Nature Value

Farmland (HNVF). The basic idea of the HN VF concept is that agricultural land which are managed with less intensity have generally a higher biological diversity. This includes in Austria for example extensive grazing systems, such as pastures and meadows where low stocking rates indicate low productivity and an extensive land management. It includes also extensively managed meadows with a low cutting frequency and low fertilizer use and so a high biodiversity.

The evaluation has, amongst others, to answer the question to what extent agri-environmental measures have contributed to maintaining or improving habitats and biodiversity. The strict conservation measures have fortunately a significantly positive trend, there was an area increase of 18.9% from 2007 to 2009 and an increase of the participating farms by 10.5% in Austria. The "compensatory" elements or 'counter-trends "(including nature protection measures and measures for the preservation of traditional land management as mowing of steep surfaces and preservation of scattered fruit tree stands) are out of a perspective of biodiversity also evaluated positively.

**Table 1. Grassland relevant ÖPUL-measures and their influence on yield factors** (Buchgraber et al 2011)

ÖPUL-measures	number of farms (2010)	total area in ha (2010)	grassland therefrom in ha (2010)	fertilisation		utilisation		plant stand		
				intensity level date <sup>5</sup>	type of fertiliser date	frequency	type of utilisation forage conservation	ploughing up	renewing	weed control
organic farming	20,789	414,148	231,881	×	×	×	×	×	×	×
environmental friendly use of arable land and grassland	67,305	1.286,793	468,802	×		×	×		×	
abdication of yield increasing substances on grassland	38,400	408,965	371,895 <sup>2</sup>	×	×	×	×		×	×
abdication of silage production	9,999	113,993	111,057 <sup>3</sup>	×	×	×	×			
mowing of steep slopes	41,703	149,731	149,702			×	×	×	×	×
maintenance of field orchards	16,904	10,106	10,102						×	
use of mountain meadows	1,215	1,787	1,787		×		×	×		×
Herding on alpine pastures	7,770	409,793	409,793	×	×		×			×
nature conservation measures	23,858	84,776	60,662	×	×	×	×	×	×	×
ecopoint-system <sup>6</sup>	6,571	133,603	80,885	×	×	×	×		×	×
water protection and maintenance of grassland <sup>7</sup>	2,029	28,339	28,331	×	(×) <sup>8</sup>	×	×	(×) <sup>8</sup>	×	(×) <sup>8</sup>

<sup>1</sup> on at least 5 % of total grassland

<sup>2</sup> including 37,067 ha temporary grassland

<sup>3</sup> including 2,937 ha temporary grassland

<sup>4</sup> indirectly by hay production

<sup>5</sup> timely limits (ban periods) for fertilisation have to be

fulfilled for all ÖPUL measures according the national „action programme nitrate“

<sup>6</sup> only offered in lower Austria

<sup>7</sup> only offered in Salzburg

<sup>8</sup> only available in combination with organic farming

Within the ÖPUL specific targets relevant for biodiversity on grassland areas include:

Organic management. Objectives are inter alia a stronger species and habitat protection (natural sound management, conservation and maintenance of landscape elements) and an increase of biodiversity in animal and plant area by renunciation of synthetic chemical pesticides, reduced fertilizers use and a more diverse crop rotations.

Environmentally friendly use of arable and grassland surfaces (UBAG). The preservation of traditional cultural landscapes through the conservation of grassland and landscape elements (eg, natural sound management of landscape elements; installation of insect- and flower stripes and special biodiversity areas in at least 2% of arable land. In grassland there have to be at least 5% of the mowing area with only two cuts.

Abdication of silage. This should guarantee plant and animal biodiversity on grassland by late mowing.

Mowing of steep slopes. This should contribute to keep steep grasslands from forestation, to keep cultural landscapes open, to ensure plant and animal biodiversity through an annual cut of grassland and to contribute to the conservation of habitat and landscape diversity.

Use of mountain meadows. This supports the preservation of a mosaic of different land usage between grazing and mowing areas, keeping cultural landscapes open below the tree line and preserving high-quality mountain meadows from forestation. Extensively used, mowed agricultural areas provide important habitats for a variety of animal and plant species. In addition, the measure contributes to the preservation of traditional local cultural landscapes and habitat diversity.

Herding on Alpine pastures. This ensures the sustainable and environmentally sound management of pastures, which on the one hand, preserve the diversity of plant and animal biodiversity and on the other preservation from forestation. Thus, the measure makes an important contribution keeping open traditional cultural landscapes, which have a high aesthetic landscape value. It attributes to nature conservation and is important in terms of water protection.

The results of the evaluation show there is a higher biodiversity (greater number of habitats and food sources) in a diverse land use (presence of various field crops, grasslands, orchards, forests). Different measures have different impacts on the biodiversity and number of habitats: targeted and "stricter" requirements have a high impact than general measures with less strict requirements. Environmentally friendly use of arable and grassland surfaces and herding on Alpine pastures are considered broad measures with high impact (Lebensministerium, 2010a: 293 ff).

## Suggestions for future governance interventions

Groier (2007) suggests a number of measures at the intersection of agricultural policy, spatial planning and nature protection on the level of regional policy. He demands a reorientation of breeding programs, from the present orientation towards high yearly milk yield towards optimizing the lifetime yield (thus including longevity) and high grass feeding the and the long term safeguarding of milk quota system (the latter will be abolished without compensation by 1.April 2015)

Groier (2007) furthermore demands support for organic farming and a territorial conversion in less favored areas in general. This could be a driver for regional development. Moreover the agrarian support policies of the second pillar should become a true element of regional development policy.

Greif et al (2005) suggest a differentiated approach to grassland governance by public institutions according to

- location and use,
- diversity of species and biodiversity as well as their importance for protection,
- a parallel consideration of socio-economic processes in order to put the changes into a correct perspective
- grassland as cultural landscape element, its value and functions
- socio-economic alternatives in the functions of grassland

Their analysis demonstrates that functions are more and more segregated and is in line with Groiers (2007) polarization thesis. As in alpine areas the farms are small and pluri-active, alternative sources of income are paramount for the preservation of grassland management and its related functions.

Kirner (2013) as well as Horvoka and Gmeiner (2012) aim to anticipate the CAP regulations until 2020 on permanent grassland systems. Kirner looks into the area payments and suggests that the results of the proposed changes favor extensive dairy and lamb production, while Hovorka and Gmeiner propose new calculations for the compensation of natural handicaps which should favor extreme mountain farming.

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