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Thomas Streifeneder, Clare Giuliani, Christian Hoffmann

A CROSS-BORDER ANALYSIS OF THE POLICIES FOR ALPINE PASTURE FARMING

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Abstract
Livestock farming and the environmentally friendly management of Alpine pastures represent a traditional form of mountain farming. Grazing and the maintenance of pastures and the Alps are publicly subsidised in recognition of the ecological importance of the activities and because the costs are higher than usual due to the mountainous topography. Among the numerous support measures, payments made for agri-environmental measures and compensatory allowances for disadvantaged areas have proved to be the most effective arrangements for the ongoing management of Alpine pastures. This article analyses international and regional differences and similarities in objectives, processes, definitions/specifications and financial resources of these agricultural policy regulations for the preservation of this mountain cultural landscape. Since the payment system is not the only factor influencing the development of Alpine pasture farming, the relationship between the development of farms and tourism and regional economic conditions is analysed by way of an example. Based on the results and on the findings from expert interviews, the authors deduce recommendations for action for sustainable policies in mountain areas.

Keywords
Agriculture – agricultural policy – agricultural structural change – Alpine pasture farming – mountain farming – subsidies

1 Introduction

This article focuses on the development of Alpine pasture farming and the agricultural policy measures affecting it in the Alps. Alpine pasture farming refers here to the extensive farming of remote pastures and meadows (in Switzerland: summer grazing areas/pastures) of the high Alpine mountains (cf. Ringler 2009: 46). Farming on these green areas of the high altitude landscape usually involves a proportion of the foraging livestock being herded up to the Alpine pastures – only periodically during the summer months due to the climatic conditions. They should thus be distinguished from the spring, autumn and winter pastures. Alpine pasture farming involves important multi-functional ecosystem services and services for the common good. This includes the conservation of the cultural landscape and the biodiversity associated with it, protection from natural hazards and the production of high-quality food. The number and types of animals that are pastured on these areas and the type of preservation activities practised are determined by the ecological quality of the pastures. Also relevant from a commercial point of view are the reduced amount of work in the summer, the extension of the forage available beyond that of the home farm, the conservation of feeding areas in the valleys and the improvement of animal health (Ringler 2009: 46). Alpine pasture farming is thus of exceptional historical, socio-economic and aesthetic significance not only for the agricultural sector, but also for residents of the Alps, recreational visitors and tourists (tourist and recreational landscape). In addition to the qualitative cultural landscape, there are direct and indirect uses and value added that can develop from efficient Alpine pasture farming, contributing to local and regional economies (*LFI* [The Rural Further Education Institute Austria] 2015: 42 et seq.; cf. Mayer/Job/Ruppert 2010; Honisch 2017).

The development of Alpine pasture farming, as is the case with the agricultural sector generally, is based on the complex interaction of local, national and international parameters and direct (e.g. family situation) and indirect (e.g. presence of tourists) influencing factors.(cf. Streifeneder 2010). Numerous studies (including Mann 2003a; Mann 2003b; Ringler 2009; Streifeneder 2010; Tasser/Aigner/Egger et al. 2013; Weingartner 2014; Niedermayr/Wagner 2015; Job/Mayer/Haßlacher et al. 2017) emphasise that not just agricultural policy measures but also local and regional socio-economic conditions like the intensity of tourism and non-agricultural jobs have a considerable influence on the development of Alpine pasture farming. Influences that are external to the farm operation are closely linked with commercial conditions, which vary according to location, the size of the farm and type of production.

The development of agricultural structures in the Alps – referring here to trends concerning the number of farms and the quantity of agricultural land – is particularly influenced by the way in which the EU and Switzerland's (common) agricultural policy (CAP) is implemented. Many subsidies have an effect on Alpine pasture farming. A considerable proportion of agricultural income is thus drawn from direct and indirect public funding (Ringler 2009: 452). This situation is exacerbated by sinking product revenues (forinstance, the effects of the end of the milk quota). Of relevance for the development of Alpine pasture farming are the compensatory allowances and the agricultural environmental measures.

Against this background, a cross-border investigation of the approaches, scope and implementation of Alpine pasture farming policies seems to be of scientific relevance, with the aim of using the international comparison to shed light on the way in which agricultural policy priorities are set. This gives rise to the following structure for the article: The article firstly reviews the state of research before moving on to a discussion of the methodology used and a description of Alpine pasture farming in the selected research areas. The most important policy measures for Alpine pasture farming are then described and analysed in terms of the subsidy criteria used and the scope of the funding available. In addition, the influence of the intensity of tourism and of part-time farming are investigated. Finally, the article presents some recommended actions for the future of Alpine pasture farming.

2 Current state of research and research questions

Numerous national and regional studies consider the economic development of Alpine pasture farming and offer a statistical and cartographic picture of it (Ringler 2009; Tasser/Aigner/Egger et al. 2013; Weingartner 2014; Niedermayr/Wagner 2015; Job/Mayer/Haßlacher et al. 2017). On the other hand, there is very little research that captures and analyses agricultural policy parameters and pasture farming subsidies over time from a comparative, inter-regional perspective. This is due to the thematic complexity of the topic and difficulties related to the available data. Nonetheless, the authors of this article have been able to draw on the studies by Ringler (2009) and Niedermayr/Wagner (2015) for information on the extent, structure and conditions of the subsidies.

The level of state support (price support and direct payments) and the average payment per farm and per area impact how many farms are abandoned (Mann 2003a; Dax 2008). Thus 'the numbers and sizes of the farms reflect the structural change and intervention by agricultural policy' (Niedermayr/Wagner 2015: 71). Public subsidies of Alpine pasture farming – which accounts for between 30% and 90% of the total agricultural income of mountain farms – remains of central significance for the sustainment of this form of agriculture (Ringler 2009). On average more than half the profits made by mountain farms comes from public subsidies. The subsidy programmes thus have a significant impact on the income of the mountain farms and are crucial for safeguarding the livelihood of Alpine pasture farms, especially in comparison to other influencing factors like family situation and options for generating non-agricultural income. Ringler (2009: 443) therefore measures the 'pasture subsidy intensity which comprises the subsidies and premiums per hectare of grazing pasture.' Without this financial support many Alpine pastures would cease to exist and animals would no longer be herded up the mountains. This is also the reason why no Alpine pasture has been given up in Bavaria in the last 30 years (expert interview, Ringler).

The complexity of agricultural policy measures means that it is almost impossible to compare the level of subsidies, in particular on a small-scale level. It is therefore difficult to clearly identify and validate which regions of mountain and Alpine pasture farming receive more and which receive less support from subsidies. There is too much variety in the available information with different disbursement units, specified

years and reference values which can relate to a funding period, a year, total sums and relative amounts, a farm or an area of land. This is confirmed by past research (e.g. Ringler 2009; Anzengruber/Brandstetter 2014) and the experts interviewed (cf. Chapter 3). It is thus unsurprising that some studies on Alpine pasture farming almost completely exclude the issue of subsidies (e.g. in Tasser/Aigner/Egger et al. 2013). There is thus a need for more transparent information. The authors of this article consequently focus on agricultural and environmental measures and compensatory payments in the comparative analysis, and exclude other important subsidies such as those for investment in infrastructure.

The authors adopt the hypothesis that the more intense the agricultural policy measure, the lower the probability that farms will be abandoned (giving up the agricultural activity). This leads to the following research questions:

> What are the differences between policies in the research areas?

> What do the policies consist of, what is their scope, how are the measures defined and how differentiated are they?

> What cross-border commonalities or differences can be identified between policies?

> How do agricultural policy measures influence the development of Alpine pasture farming?

> What other factors influence the development of Alpine pasture farming?

3 Methodological approach and research areas

The following investigation only considers the direct subsidies that – according to expert opinion – significantly influence the development of Alpine pasture farming. The experts interviewed (see below) generally confirmed the findings of previous studies (Ringler 2009; Streifeneder 2010; Niedermayr/Wagner 2015), which suggests that the agricultural and environmental measures and compensatory payments of the second pillar of the European agricultural policy are crucial for the sustainment of Alpine pasture farming. In Switzerland equivalent, specific direct payments are made in the framework of cultural landscape payments and security of supply payments (cf. Section 5.1). The Austrian expert Gerhard Hovorka sees the measures of the Austrian programme for environmentally sound and extensive agriculture that protects the natural habitat (*Österreichisches Programm zur Förderung einer umweltgerechten, extensiven und den natürlichen Lebensraum schützenden Landwirtschaft, ÖPUL*) as a major reason for the sustainment of Alpine pasture farming in Austria.

Among the subsidies not considered here are the direct payments under the first pillar of the Common Agricultural Policy and the basic payments for permanent pasture made within the framework of the security of supply payments in Swiss agricultural policy. Similarly excluded are the payments for the diversification and modernisation

of farms and investment subsidies that contribute towards the improvement, regeneration and sustainment of Alpine pasture farming such as Part B of the Bavarian mountain farmers and cultural landscape programme (*Bayerisches Bergbauern- und Kulturlandschaftsprogramm, KULAP*).

The following criteria are analysed in the investigation:

a) Objectives of the measures

b) Criteria and requirements (subsidy zone, number of animals, area-based or farm-based approach, etc.)

c) Financial endowment of the subsidies

Due to the complexity of the topic the aggregated data are compared. The article thus does not offer a differentiated consideration of the various subsidies which depend on the size of the farm, the number of animals, whether the farm operation is a primary, secondary or part-time occupation and any impediments to farming, as is provided e.g. by the South Tyrol Farming Association (*Südtiroler Bauernbund*) (2016: 30 et seq.). The exploratory analysis of subsidies was carried out in the following six research areas in the central area of the Alps (listed below in alphabetical order by country), which are characterised by different national and regional parameters (cf. Fig. 1 and Table 1):

> Germany: the district of Oberallgäu (Bavaria, Swabia)

> Italy: the Province of Belluno (Veneto) and South Tyrol and the Autonomous Province of Bolzano/South Tyrol (Trentino-South Tyrol)

> Austria: East Tyrol and the district of Lienz (Tyrol), and Pinzgau-Pongau and the districts of Zell am See and St. Johann (Salzburg)

> Switzerland: the canton of Graubünden (eastern Switzerland)

The structures of the Alpine pastures differ widely among the research areas (cf. Table 1). The relative significance of Alpine pasture farming within each agricultural sector also varies greatly. About half of all the livestock graze on the Tyrol and Salzburg Alpine pastures. On the summer grazing areas in Graubünden – which account for only a quarter of agricultural land – the figure is even 90%. Although Alpine pasture farming in Oberallgäu is a characteristic element of the landscape and culture, it is less significant within regional agriculture.

Research area	Number of pastures	Pasture area in ha (% of agricultural land)	Number of livestock units kept on the Alpine pasture (% of cattle, sheep, goats, horses)
Oberallgäu	692	20,792* (37)	31,631 (35)
Belluno	182**	not specified	not specified
South Tyrol	1,739	91,000 (49)	39,400 (50)
East Tyrol	495	24,600*** (50)	13,100 (61)
Pinzgau-Pongau	1,223	50,900*** (47)	44,250 (74)
Graubünden	750	50,000*** (23)	56,100 (90)

* High pasture; ** Number of alpine cabins; *** Alpine pasture area

Table 1: Selected Alpine pasture indices 2010/2015 / Source: Lauber/Böni/Calabrese et al. (2014), Autonomous province of Bolzano/South Tyrol (2015), Land Tirol [Federal State of Tyrol] (2015), Niedermayr/Wagner (2015), BMLFUW (2016), EURAC (2017b), Regione del Veneto (2018)

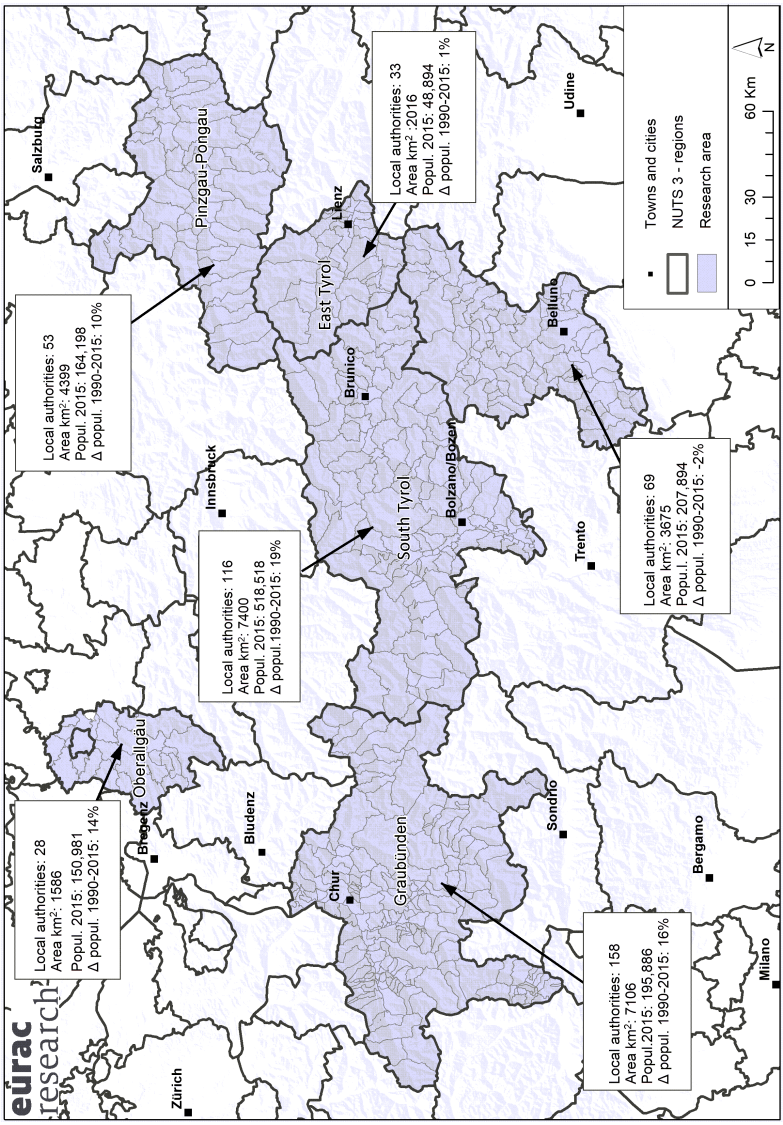

Fig. 1: Research areas / Source: the authors, based on EURAC (2017a)

Tourist intensity (number of beds per 1000 inhabitants) and the proportion of part-time farms are meaningful indicators for regional economic conditions (e.g. additional sources of income derived from the direct marketing of agricultural products to tourists and non-agricultural activities like agritourism). They are thus included in the investigation as additional important factors influencing the development of mountain farming. Here the authors use a comprehensive databank with agricultural and socio-economic data from municipalities throughout the Alps, which was compiled in the course of the EURAC projects AGRALP and MONAS.

In order to better evaluate the findings in the literature and to obtain up-to-date data on Alpine pasture farming, experts on policies for Alpine and mountain farming from the research areas were surveyed, either in person or by telephone, using semi-standardised questionnaires with around 20 questions on the development of Alpine pasture farming and the subsidies.[1]

4 Developments in mountain and Alpine pasture farming

The process of agricultural structural change seems unbroken in many areas of the Alps, especially in the southern Alps (cf. Fig. 2). Between 2000 and 2010, 22% of the farms in the Alpine region were abandoned. In the last 30 years the number of farms decreased by more than half (Streifeneder 2016a: 10). The numbers of small farms with less than five hectares of farm land declined considerably, especially in the southern Alpine range. In addition, a parallel decline in farm land was seen in Italy (Belluno: -15%), with far-reaching consequences for the appearance of the landscape, the sustainment of ecosystem services and the vitality of rural areas.

Structural change in the research areas displays great spatial variety due to the diverging agricultural structures (number of farms, amount of farm land, livestock, labour, etc.) and political and regional economic conditions (cf. Fig. 3): In the province Belluno more than three-quarters of farms ceased operations between 1980 and 2010, while in Pinzgau-Pongau it was only 5% (EURAC 2017a; EURAC 2017b). In this period the number of livestock per farm in these areas remained relatively constant, although in the other research areas it declined (EURAC 2017a).

1 The authors thank all of the following for their willing and expert cooperation: Dr. Michael Honisch of the Specialist Centre for Alpine Farming (*Fachzentrum Alpwirtschaft*) in Kempten (25 October 2016); Dr. Gerhard Hovorka, researcher at the Federal Institute for Mountain Farming Issues (*Bundesanstalt für Bergbauernfragen*) in Vienna (24 October 2016); Riet Pedotti, Head of the Department for Direct Payments/Summer Grazing, Agricultural Measures Division (*Abteilung Direktzahlung/Sömmerung, Fachbereich Agrarmaßnahmen*) in Chur (16 February 2017); Dr. Alfred Ringler, researcher at the Association for the Protection of the Mountain World (*Verein zum Schutz der Bergwelt*) in Munich (24 October 2016) and Dr. Siegfried Rinner, Director of the Farmers' Association of South Tyrol (*Südtiroler Bauernbund*), Bolzano (22 November 2016). After numerous attempts it proved impossible to make contact with or interview an expert for the province of Belluno.

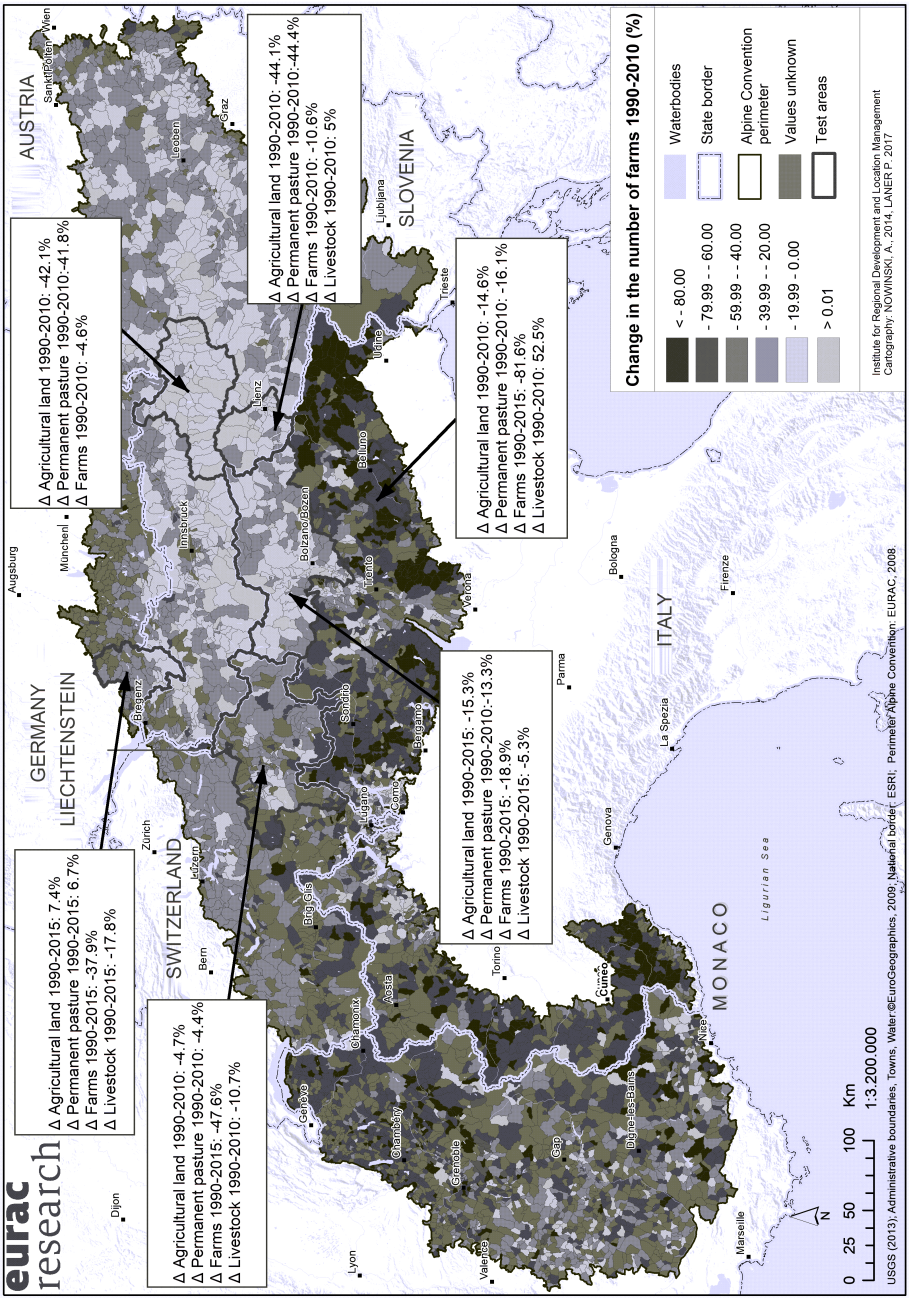

Fig. 2: Development in the number of farms 1990–2010/2015 (in %) / Source: Agricultural and Forestry Green Reports from the individual countries, EURAC (2017a), EURAC (2017b)

The fact that in the Italian mountain region the number of mountain farms – which was low in any case – halved between 2000 and 2010 shows how ineffective the agricultural policy measures introduced in the 1990s were. The situation is also influenced by the difficult demographic circumstances with a high proportion of older farm owners: 58% are 55 and older, while less than 6% are younger than 34 (Niedermayr/Wagner 2015: 36; EURAC 2017a; EURAC 2017b). As in most cases the younger population has migrated out of the area (Streifeneder 2010), it seems unlikely that these figures will improve in the coming years.

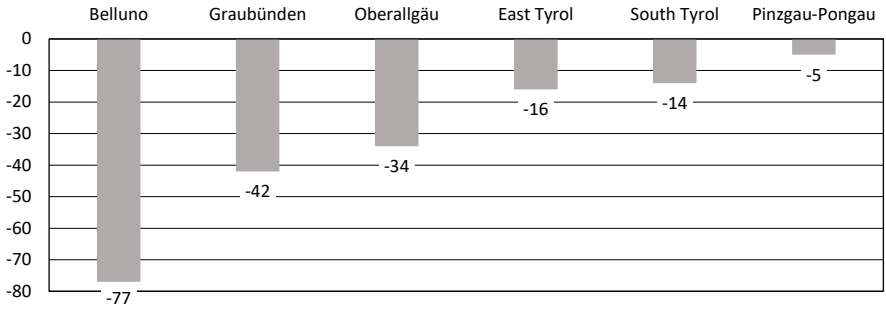

Fig. 3: Development of the number of farms in the research areas 1990–2010 (in %) / Sources: EURAC (2017a), EURAC (2017b)

Direct payments remain of key importance for mountain farming and are made as single farm payments per hectare of farmed land, irrespective of what is produced. These payments are therefore completely independent of production ('decoupled'). They represent income support that aims to level out imbalances in income and thus to reduce the farmers' commercial risks. These arise from the volatile and low prices for agricultural goods and the climatically induced quantitative fluctuations in production. They thus significantly influence the entire commercial situation of the farm and consequently Alpine pasture farming activities in general.

Alpine pasture farming underwent a major transformation in the 1960s and 1970s. Labour-intensive farming in the higher altitudes with its low rates of productivity and infrastructural disadvantages was abandoned while farming in more favourable locations where machinery could be used continued or intensified (Pötsch/Krautzer/Buchgraber 2012). Since the mid-1980s Bavaria, Austria, South Tyrol and Switzerland have focused their subsidy policies on stabilising Alpine pasture farming (Ringler 2009; Tasser/Aigner/Egger et al. 2013; expert interview, Rinner). Groundbreaking subsidy programmes for the cultural landscape were introduced in the 1980s, such as the compensatory payments and agricultural environmental measures (e.g. Alpine pasture premiums, sustainment and conservation measures). In Austria this is linked to accession to the EU and the introduction of targeted subsidies such as the programme for environmentally sound and extensive agriculture that protects the natural habitat and the compensatory payments (*BABF* [Austrian Federal Institute of

Agricultural Economics] 2010; *BMLFUW* [Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management] 2017). After a sharp decline until 1980 the number of Alpine pastures has been consolidated from the 1990s at the latest, and thus for about the last three decades, especially in German-speaking Alpine regions. In contrast Veneto only began to focus on subsidies for Alpine pastures from 1992.

The sustainment of Alpine pasture farming is promoted because open pastures that are preserved from reforesting fulfil important ecological functions and thus have significant social and socio-economic value. Since the end of the 1980s the structure, type and extent of farming has changed considerably. Despite the public funding, market pressure has led to the vast majority of Alpine pastures being used for young cattle, sheep and horses. The dairy cows are kept in barns on the farm throughout the summer where they produce more milk and thus allow the farmer to profit from the above average payments for milk produced during the summer months (Tasser/Aigner/Egger et al. 2013). Steep, marginal or remote areas difficult to reach or work are continually being taken out of production (Lauber/Calabrese/von Felten et al. 2011; Herzog/Oehen/Raaflaubet al. 2014). The encroachment of scrub or forest on the Alpine pastures leads to well-known consequences for the cultural landscape and a decline in biodiversity (and possible effects on tourism). The necessity of providing access to the Alpine pastures and the way in which they are accessed is therefore often the subject of public debate. This is seen as essential for maintaining the viability of Alpine pasture farming by the farmers and those representing their interests. Well-known examples are the conflict in 2010 over the development of the Antersasc Alpine pasture (Nature Park Puez Geisler and Natura 2000 and UNESCO World Area of Natural Heritage) (Hinterwaldner 2010: 22 et seq.) and in Upper Bavaria the longstanding controversy about individual footpath projects (cf. Mayer/Job/Ruppert 2010).

While unprofitable areas are no longer worked the other areas are used increasingly intensively with more livestock per hectare. The constant increase in demand for high-quality products (e.g. organic, pasture-grazed and hay milk, Alp cheese), new animal husbandry requirements (possible prohibition of the use of tethering by the EU in favour of free range or pasturing) and demands that the origin of agricultural products should be traceable (e.g. in Switzerland the successful introduction of the Alp product label) have positive effects on the commodification of the products of Alpine pasture farming. The extent to which these developments encourage more extensive land management of the pastures remains to be seen. The return of large predators and the increase in the number of attacks on animals represent a great challenge. Wolves and bears are seen by many farmers as a grave threat to the preservation of Alpine pasture farming on account of the costly protective measures that must be initiated, which in some places are difficult or indeed impossible to implement (e.g. shepherding, guard dogs, fences).

5 Comparison of policies for Alpine pasture farming in six research areas

5.1 Overview of subsidies and their objectives

This chapter provides an overview of the subsidy programmes and regulations investigated in this article, which are of particular importance for the development of Alpine pasture farming. The goals of the regional and national subsidy programmes are described and the measures that they promote are explained.

Agricultural and environmental measures and contributions to the cultural landscape

A Subsidies for herding the animals onto the Alpine pastures, which leads to the livestock grazing the Alpine pastures with or without shepherding.

B Payments for farming practices, especially the mowing of mountain hay meadows or for measures that clear the Alpine areas of deciduous and coniferous trees, weeds and overgrown areas.

A and B should contribute towards keeping the Alpine pastures open and free of undesired growth, thus leading to positive environmental effects. They take the form of environmental payments within the framework of the European Agricultural Fund for Rural Development (EAFRD) as agricultural environmental measures, in some cases in specific national or regional programmes (and thus apply to all regional research areas equally). Noteworthy are the Austrian programme for environmentally sound and extensive agriculture that protects the natural habitat, Part A of the Bavarian mountain farmers and cultural landscape programme and the contract-based nature conservation programme, biotope type: pasture (*Vertragsnaturschutz programm,VNP, Biotoptyp Weiden*). They include pasture payments, payments for the working of mountain hay meadows, the mowing of mountain and steeply sloping meadows, and shepherding (cf. Fig. 4).

In Switzerland cultural landscape payments (Alpine pasturing, summer grazing and payments for keeping the landscape open) are made. The payments for keeping the landscape open are made according to zones so as to take into account the farming disadvantages in the mountain zones (short vegetation season, transport situation, accessibility, characteristics of the surface), and are paid per hectare. The farming of the summer grazing areas requires sufficient numbers of livestock, which the Alpine pasturing payments should facilitate (cf. Fig. 4).

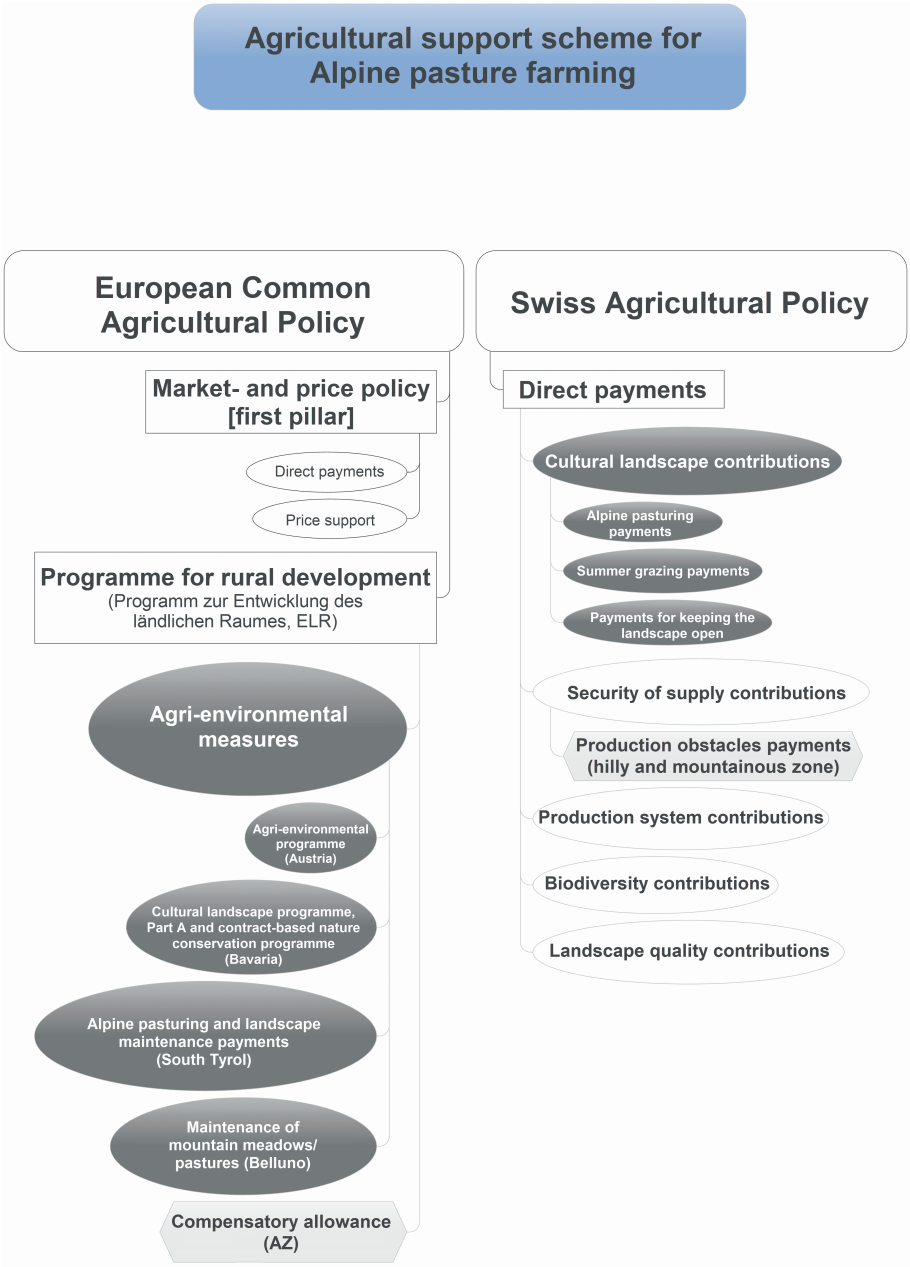

Fig. 4: Overview of the subsidy instruments for Alpine pasture farming in the EU and Swiss research areas / Source: The author, drawing on Regione del Veneto (2015), Autonomous province of Bolzano/ South Tyrol (2016a), Autonomous province of Bolzano/South Tyrol (2016b), BMLFUW (2017), StMELF (2017), BLW (2018)

Compensatory allowances and payments for obstacles to production

C Compensatory payments (EU Regulation 1305/2013) (cf. Fig. 4) are a financial compensation for topographical obstacles to the farming of areas in mountainous regions in comparison to more favourable locations. Such obstacles lead to higher production costs (fewer opportunities for mechanisation, shepherding, long access routes). They are relevant to Alpine pasture farming because in EU countries the Alpine areas are eligible for and can receive compensatory payments (assuming the areas are regularly farmed and well maintained).

This is not the case with the Swiss obstacles to production payments (*Produktionserschwernisbeitrag*) in the context of security of supply payments. This is thus a fundamental difference between Switzerland and the EU member states. The production obstacles payments are made for agricultural areas in hilly areas or in one of the four mountainous zones (in contrast to the basic payment for the valley zone) and represent fundamental financial security for the farms. It is included here as many of the farms with Alpine pastures are mountain farms. The summer grazing area within Alpine farming is thus considered separately both in spatial terms and in terms of subsidies. Alpine pastures as permanent pasture areas are not included in the payments for steeply sloping areas.

The subsidies do not always achieve their aims, such as sufficient grazing or maintenance. Thus, for instance, in Belluno the subsidised area is considerably larger than the area that is actually grazed (Aguanno 2006). Without the summer grazing payments, in Switzerland 30% fewer animals would be included in summer grazing and it would not even be possible to cover the costs of summer grazing (Lauber/Böni/Calabrese et al. 2014: 156). The summer grazing payments, which are so important for the income of the farms but only account for four percent of direct payments made to agriculture by the Swiss federation (2011: CHF 100 million) (Lauber/Calabrese/von Felten et al. 2011: 12; Lauber/Böni/Calabrese e al. 2014: 156) have been insufficient to stop the trend of Alpine pasture farming being abandoned (Mack/Flury 2008; Mack/Walter/Flury 2008). Statistically speaking, there has been a decline in summer pasture farms in Graubünden (expert interview, Riet Pedotti). However, this is linked to semantics as the farms which practise spring and autumn pasturing are no longer included in the figures for Alpine/summer pasture farms. There is then no real decline in the number of summer pasture farms.

While for a long time there were no specific regulations for the Alpine pastures in Belluno, the multifaceted subsidy system in the German-speaking countries does not appear to be sufficiently effective. Since 2000 additional measures have thus been introduced, like specific Alpine pasturing payments in Austria, a mountain farmers programme in Bavaria and the Act for the Relief of Agriculture (*Gesetz zur Erleichterung der Landwirtschaft*) in South Tyrol (Niedermayr/Wagner 2015). Most of the payments have had a primarily positive effect on Alpine pasturing and thus on the livestock utilisation of the Alpine pastures, but have had less of an impact on mowing activities. The latter is, however, of central importance for maintaining the openness of the landscape.

Despite the similarity of their goals, the conditions and criteria used to grant the subsidies and determine the size of the payments vary, in some cases greatly.

5.2 Conditions, requirements and criteria

The approaches, conditions and requirements that the farmers have to consider in order to receive payments for Alpine pastures differ greatly in the research areas. This makes it almost impossible to accurately compare what is subsidised, where and to what extent. What follows is therefore exploratory in nature and is intended to provide an insight into the similarities and differences.

Agricultural and environmental measures and contributions to the cultural landscape

A fundamental difference between the research areas is found in the basis of assessment (hectares or number of livestock) and specific requirements which are used as criteria for granting payments. They allow conclusions to be drawn about how restrictive the subsidy policy is (possibly then acting as an obstacle to the farming of Alpine pastures), how intensively the areas are used/farmed and which regions provide more or less support.

In Oberallgäu in the Italian and in the Austrian research areas the agricultural and environmental payments are made per hectare of pasture. In contrast, in Graubünden the summer grazing and Alpine pasturing payments made as part of the cultural landscape payments are based on the number of livestock per standard pasturing unit (*Normalstoß*). The standard pasturing unit (*Normalstoß*) refers to the effective pasture use of one foraging livestock unit (= 500 kg, corresponding to one cow or 3–4 sheep) over 100 days (*BLW* [Swiss Federal Office for Agriculture] 2016b) and is stipulated by the canton. The pasturing payments are the same in all zones (CHF 370/ standard pasturing unit). The summer grazing payments are paid at different rates for each livestock category per standard pasturing unit. If the standard pasturing unit, the number of livestock and/or days are undershot or exceeded then deductions are made. The Swiss system thus focuses subsidies on the way in which the areas are farmed. Outside of Switzerland the focus is on the size of the farmed areas.

In the context of a possible modification of the Swiss subsidy system, Zimmermann, Ferjani and Flury (2012) see economic and ecological advantages to the area-based approach as opposed to the livestock-based approach for the mountain regions. Transforming the system from livestock-based to area-based payments would lead to a decline in livestock and thus in the density of the stock. This would in turn enable a gradual decline in the intensity of use and improvements in the promotion of biodiversity in the meadows and pastures. Consequently, the authors take a positive view of the payments for keeping the landscape open, which are paid per hectare (Zimmermann/Ferjani/Flury 2012). On the other hand, the area-based approach means that simply owning Alpine pasture and including it in subsidy applications can generate income.

Experience in Austria shows the effects the area-based system can have. The EU objected to discrepancies between the forest pastures (forest areas used as pasture) that were actually used and the larger areas of the Austrian Alpine pastures that were included in applications for payment. In 2009 Austria lost this case against the European Commission at the EU Court of Justice, which led to numerous demands for the repayment of subsidies as too much EU funding had been paid. The European Commission ordered aerial images of the Alpine pasture areas, from which it emerged that about 900 Alpine farmers throughout Austria had registered oversized areas so that they could profit from the area-based subsidies. For both approaches effective control and monitoring measures are clearly necessary, including the use of satellite pictures and other remote sensing instruments.

In Belluno yet another method is used: experts estimate the time needed to implement the agricultural-environmental measure by a specialised agricultural worker. An hourly rate of € 17 is stipulated and the additional work necessary in comparison to favoured areas/levels is taken into consideration (*Regione del Veneto* [Venetia] 2015: 615). This generates fixed payments the level of which depends on the vulnerability of the area (cf. Section 5.3).

Research area	Reference size	Maximum livestock density (livestock unit/ha)	Minimum pasturing period (days)	Differentiated according to livestock type
Oberallgäu	ha	1.2	90	yes
Belluno		0.2*	60	no
South Tyrol**		1	60	yes
East Tyrol		2.0	60	yes
Pinzgau-Pongau		2.0	60	yes
Graubünden	Standard pasturing unit	1	100	yes

* Minimal density, maximum not specified; ** for basic payment 1.6–2.3; degressive related to altitude <1,250 to >1,800 metres a.s.l

Table 2: Current criteria for the Alpine pasturing payments in the research areas / Sources: Regione del Veneto (2015), Autonomous province of Bolzano/South Tyrol (2016a), Autonomous province of Bolzano/South Tyrol (2016b), BLW (2016a), BLW (2016b), BMLFUW (2017), StMELF (2017), BLW (2018)

In all research areas there are cut-off points for specific parameters to ensure the protection of water quality, ecosystem resilience and the biodiversity of the Alpine pastures. The minimum values aim to ensure effective farming that maintains the

openness of the landscape (cf. Table 2). These parameters must be adhered to by the farmers in order to receive the sum calculated on the basis of the parameter in question. The maximum livestock density and minimum pasturing period are crucial. The former captures the intensity of use by measuring the number of animals (calculated in livestock units) per hectare (usually grazing area, i.e. accessible for pasturing). In Graubünden, Belluno and Oberallgäu the requirements are more restrictive than in the other areas. In South Tyrol the greatest number of animals per unit area can be kept up to 1,250 m. The requirements concerning the pasturing period are highest in Graubünden (at least 100 days) and in Oberallgäu (at least 90 days). With the exception of Belluno the payments are also based on the type of livestock. In Oberallgäu the degree of accessibility also plays a role. In Germany and Italy all types of livestock are considered; in Austria and Switzerland dairy cows and dairy sheep are excluded from the payments.

Compensatory allowances and payments for obstacles to production
These subsidies are based on a system of criteria for the obstacles, the level of detail of which varies from region to region. The mountain farm cadastre (*Berghöfe-Kataster*) is used as the basis for assessment in Austria, the agricultural comparator (*Landwirtschaftliche Vergleichszahl*) in Bavaria and a variously defined points system in South Tyrol and Belluno (or *Indennità compensativa in zona montana,* EAFRD measures 13.1). In Switzerland the location of pastures in a hilly zone or in one of the four mountainous areas is decisive (excluding the summer grazing areas, cf. Section 5.1).

Criteria (selection)	Research areas
Slope	all
altitude above sea level	all
Accessibility, distance from the nearest settlement, location	Graubünden, East Tyrol, Pinzgau-Pongau, South Tyrol
Soil quality	Oberallgäu, East Tyrol, Pinzgau-Pongau
Climatic conditions	Graubünden, Oberallgäu, East Tyrol, Pinzgau-Pongau

Table 3: Criteria for determining the obstacles to production in the research areas / Sources: Regione del Veneto (2015), Autonomous province of Bolzano/South Tyrol (2016a), Autonomous province of Bolzano/South Tyrol (2016b), BLW (2016a), BLW (2016b), BMLFUW (2017), StMELF (2017)

According to Ringler (2009), owing to the degression (the level of subsidies declines with increasing area) the compensatory payments are particularly relevant for farms with few valley areas and large Alpine areas. The payments increase with the number of points achieved and the difficulty of the farming conditions (Anzengruber/Brandstetter 2014).

As a rule, the areas are assessed according to the criteria of slope, altitude above sea level, and various forms of location or accessibility (cf. Table 3). Due to the detailed classification of the obstacle-based points system in Austria, the calculation of obstacles is more differentiated here than in the other research areas (cf. Hovorka/Groier/Ortner et al. 2010). In Bavaria, the majority of Alpine pastures receive a similar level of subsidy even though, unlike in Italy and Austria, slope and altitude above sea level are not taken into consideration. In Belluno, a combination of only altitude and slope is used, although at least one livestock unit must be kept per hectare (Regione del Veneto 2015: 603 et seq.). In South Tyrol, the livestock density (1.8–2.5) is dependant on altitude (digressive relation, <1,250 and >1,800 metres a. s. l) (Autonomous province of Bolzano/South Tyrol 2016b: 2).

The contributions and payments are only made if the stipulations are adhered to and the EU-financed measures are correctly implemented. An Integrated Administration and Control System (IACS) is therefore used to administer and monitor payments (cf. European Commission 2018).

5.3 Financial endowment of the subsidies

The differences in structure and substance described above lead to large regional discrepancies in the financial endowment of the subsidies. The regional differences between the area-based payments are lower than those of the livestock and investment payments. According to the experts interviewed, the public payments have generally increased somewhat. However, little has changed with previously existing regional differences in the level and grading of the funding.

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In Belluno and in Graubünden the Alpine pasturing payments are considerably higher (cf. Table 4). In Oberallgäu and in the Austrian areas there are also shepherding payments. The lower limit for payments for farming activities is generally between € 350 and € 450 per hectare. Graubünden is an exception, as € 340 is the maximum payment. The highest payments are in Belluno and in East Tyrol depending on the obstacles or the diversity of the livestock.

Research area	Alpine pasturing, pasture grazing, shepherding	Farming, mowing of mountain meadows*
Oberallgäu (Bavarian Mountain Farmers and Cultural Landscape Programme, part A)	€ 30/LSU; Constant shepherding: € 90/ha, max. € 2,750/shepherd**	€ 400–600/ha***
Belluno (EAFRD, measure 10.1.4)	Preservation of mountain meadows: € 280/ha	€ 450/ha, semi-natural and species-rich meadows: € 780–740/ha
South Tyrol (EAFRD/agricultural and environmental measures, Alpine and landscape conservation payments)	€ 35/ha additional payments for herder pastures (*Sennalm*): € 53/ha	€ 350/ha****, species-rich mountain meadows (Natura 2000): € 525/ha
East Tyrol, Pinzgau-Pongau (Austrian programme for environmentally sound and extensive agriculture that protects the natural habitat)	€ 40–60/ha; Shepherding: € 20–190/LSU	>1,200 m: € 350–800/ha, Steep areas >50%: € 370/ha
Graubünden (payments for Alpine pasturing, summer grazing and keeping the landscape open)	€ 320/SPU € 100–350/SPU	€ 200/ha (mountain zone 1) – € 340/ha (mountain zone IV)

Swiss payments converted to euros (CHF 1 = € 1.15916)
*generally mowed at least once per year for steep areas, once per two years for mountain pastures; Belluno: at least 90 pasture units and 0.2 livestock units/ha; ** non-permanent: 50%; *** steeply sloping pasture, dependent on the gradient; **** premium for obstacles to farming: € 200/ha;
LSU = livestock unit; SPU = Standard pasturing unit

Table 4: Subsidies for Alpine pasturing and farming per year according to the measures in the research areas / Sources: Niedermayr/Wagner (2015), Regione del Veneto (2015), Autonomous province of Bolzano/South Tyrol (2016a), Autonomous province of Bolzano/South Tyrol (2016b), BLW (2016a), BLW (2016b), BMLFUW (2017), StMELF (2017), BLW (2018)

Compensatory allowances and payments for obstacles to production

The amount of the compensatory allowances is based on an evaluation of the degree of the obstacles to farming the areas (cf. Table 3). The comparatively low values for

the lower limits in Oberallgäu and in the Austrian areas are striking (cf. Table 5). The highest compensatory payments can be made in South and East Tyrol and, with considerable obstacles, in the province of Belluno.

Research area	Compensatory allowance*
Oberallgäu	> 1000 m: € 200/ha, otherwise: € 42–200/ha
Belluno	€ 270–500/ha
South Tyrol	max. € 900/ha; average: € 450/ha
East Tyrol, Pinzgau-Pongau	€ 25–450/ha
Graubünden (*Production obstacles payment*)	€ 260/ha (mountain zone 1) – € 310/ha (mountain zone IV)

Swiss payments converted (CHF 1 = € 1.15916)
* Amount of payment dependent on extent of obstacles

Table 5: Compensatory payments per year in the research areas / Sources: Niedermayr/Wagner (2015), Regione del Veneto [Venetia (2015), Autonomous province of Bolzano/South Tyrol (2016a), Autonomous province of Bolzano/South Tyrol (2016b), BLW (2016a), BLW (2016b), BMLFUW (2017), StMELF (2017), BLW (2018)

Although the number of Alpine pastures stabilised from the 1990s, the extent to which the package of measures affected the ecological state of the Alpine pastures and encouraged their widespread use is disputed (cf. Ringler 2009: 450 et seq.). In addition, it seems that overgrown Alpine pastures can only be saved with special pasture revitalisation measures, vague definitions allow livestock densities to be too high, and conflicts about the remoteness of protected landscape elements can emerge (Ringler 2009: 450 et seq.). It is often the case today that only young livestock are herded onto the pastures. This causes the loss of the herder pastures where milk is made into cheese. This leads to more extensive farming of the Alpine pastures that privileges the use of the easily accessible areas, the abandonment of shepherding and pasture maintenance, and reforestation and the spreading of heathland and scrubland (Trixl 2006).

5.4 Other factors influencing the sustainment of Alpine pasture farming

In addition to the EAFRD funding, the demand for products and services in the field of semi-natural tourism and the securing of access to the Alpine pastures are significant for the continuation of Alpine pasture farming in Austria (expert interview, Hovorka). This is also the case for South Tyrol (expert interview, Rinner). Alpine pastures and mountain huts are often used by tourists as resting points and for the direct sale of Alpine products. Their share in the Austrian regions stands at over 10% and in South Tyrol at 16.4% (Niedermayr/Wagner 2015: 38). Tourism and Alpine pasture farming are often economically connected in another way. The farmers receive compensation for land that they make available to the ski resorts; this makes

a reasonable contribution to agricultural income (*LFI* 2014: 12). In addition, the experts point out that the farmers may also be active in tourism themselves, e.g. when they are members of agricultural communities that have an interest in a cable car company.

These intersectoral links between tourism and agriculture can also be captured statistically (cf. Streifeneder 2010). There is a significant spatial connection between developments in the number of farms and the intensity of tourism (cf. Fig. 5). Regions that register a moderate trend of farm abandonment show a strikingly high intensity of tourism, while the opposite is true in regions with strongly declining numbers of farms. The agricultural situation in Salzburg, South Tyrol and Tyrol, which are the most visited tourist areas in the Alps, is stable. In contrast, Veneto shows high rates of farm abandonment and a low intensity of tourism. Direct tourist demand for products and services (e.g. direct marketing, food services at the farms, tours) and indirect demand (trade and food outlets) seem to have a positive effect on the agricultural sector. Agritourism is an important additional source of income in these areas (Streifeneder 2016b).

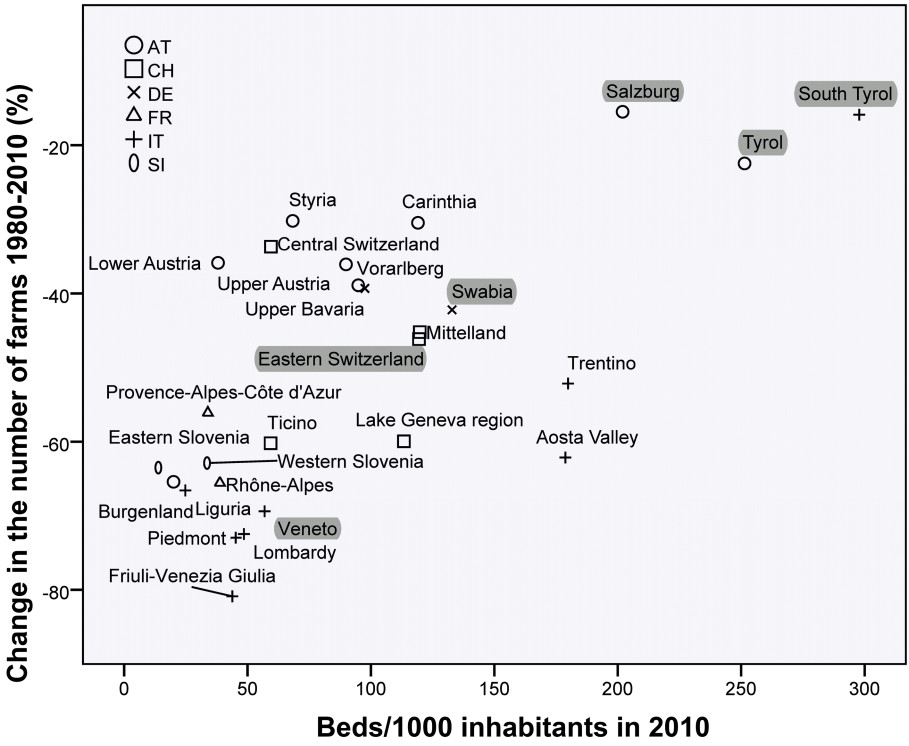

Fig. 5: The intensity of tourism and changes in the numbers of farms / Source: EURAC (2017a)

Regional surroundings with non-agricultural employment opportunities are a stabilising factor for agriculture (Streifeneder 2010). Areas where a proportionally large number of farmers practise farming as a part-time or second occupation are characterised by lower numbers of farms being taken out of production than areas where farming is the full-time occupation (cf. Fig. 6). This can be seen on the one hand in Tyrol, Salzburg and South Tyrol and on the other hand in Belluno.

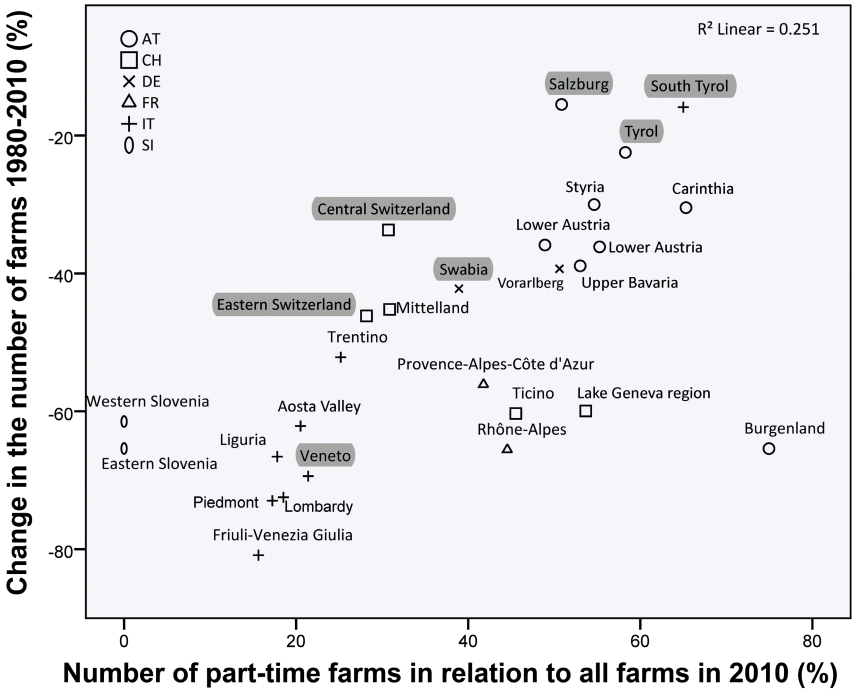

Fig. 6: Farming as a part-time or second occupation and changes in the numbers of farms / Source: EURAC (2017a)

Despite the extent of the funding described and the at least partly favourable regional economic conditions, for many of the Alpine pasture farmers the future is uncertain, as it is for all mountain farming. Agricultural representatives of the regions of Tyrol, Bavaria, Vorarlberg, Trentino, South Tyrol, Valle d'Aosta/Vallée d'Aoste and Friuli Venezia Giulia have therefore cooperated closely with one another across the borders for years. They campaign for mountain farmers to be appropriately considered by the European agricultural policy (CAP). Numerous joint declarations and resolutions have been issued in this context. The Resolution on Mountain Farming (Krün, 10 July 2009) and the Memorandum of Strasbourg (10 March 2015) are particularly noteworthy. They contain concrete demands concerning the form of agricultural policy measures of the first and second CAP pillars and for a sustainable future for the milk sector in mountain regions. The situation for milk-producing farms became particularly volatile

in 2015 when the milk quota was abandoned. Furthermore, there are annual public conferences on mountain farming at which scientists and stakeholders discuss urgent problems concerning agriculture in mountain regions. Last but not least, experts from the Alpine states and representatives of non-governmental organisations have their own platform from which to tackle future issues for Alpine pasturing and mountain farming. This cooperation has led to a series of recommendations for political decision makers, including on marketing issues (cf. Permanent Secretariat of the Alpine Convention [*Ständiges Sekretariat der Alpenkonvention*] 2017). There is awareness in Brussels of the situation of the primary sector in mountain regions. However, the agricultural actors in the mountain areas are not the only ones in the EU who have to deal with unfavourable conditions. Moreover, they represent a fringe group in Europe who are unlikely to be able to push through their demands in the future in the face of the agro-industrial lobby. Such demands include compensatory payments for common Alpine pastures organised by associations or the introduction of special programmes to promote cooperative marketing organisations and strategies for producer associations.

6 Recommended actions for the future of mountain and Alpine pasture farming

Consideration of even just the six research areas reveals how differently defined the measures for Alpine pasture farming are and how their financial resources vary. Institutions such as the Federal Institute for Mountain Farming Issues in Vienna and Agroscope in Switzerland assess the effectiveness of such measures. Ringler's definitive work (Ringler 2009) essentially leaves no question on this form of Alpine farming unaddressed. There are also atlases of Alpine pastures and numerous specific analyses.

Compared to these studies, the added value of the present article lies in its focus on the cross-border analysis of the distribution of specific subsidies relevant to Alpine pasture farming in six regional/national areas. The authors concentrate their analysis on the regulations, criteria and definitions of the measures described in Section 5.1, which experts have also defined as relevant: subsidies for livestock utilisation, farming and compensatory allowances. This takes the analysis to a deeper level. It can therefore be viewed as an extension of and supplement to the international comparison undertaken by Ringler (2009).

Despite the similarity of the objectives (e.g. maintaining the openness of the landscape), different approaches and instruments are used, leading to similar but also diverging consequences. Interestingly, the conditions are not linked to measurable objectives, for example a specific percent increase in the next ten years of the share of dairy cows annually grazed on the Alpine pastures with the aim of improving animal welfare and the quality of the milk. Another objective could be clearing the overgrown marginal areas by a specified annual percentage.

Research is required on the many different possibilities for achieving the objectives (combination of types of livestock, numbers of livestock, period of pasturing and

farming methods) in order to determine what is economically and ecologically preferable. More cross-border and transdisciplinary discussion of good practice examples involving farmers, lobbyists and scientists would be valuable. Better accessibility of data would improve the transparency and efficiency of the use of public monies.

Representatives of the cooperating Alpine areas who promote the interests of mountain farming and the experts interviewed believe that it is necessary to maintain the existing subsidy instruments in order to sustain mountain farming and Alpine pasture farming in the future. The subsidy opportunities of the second pillar of the CAP – payments for areas disadvantaged by nature or other specific reasons – could be extended or designed in a more targeted manner. The fact that the area-based system leads to large farms in favourable locations receiving considerably larger direct payments from the EU than the mostly smaller mountain farms, is viewed very critically. For instance, in 2013 the direct payments were distributed as follows: 'Two per cent of the farms received 30 per cent of the total sum, which is more than € 1.7 billion. The vast majority of the recipients – three-quarters – received less than € 20,000' (Brühl 2014). FInally, it is recommended that the farmers' commercial competences should be further developed and internal and external diversification options should be used to sustain mountain farming (Streifeneder 2016c).

In comparison to conventional milk the products from Alpine pasture farming contain a larger amount of healthy omega-3 fatty acids, antioxidant and anti-carcinogenic linoleic acids. This combined with animal welfare advantages gives such products their high quality and makes them extremely marketable. Product labels, possibly combined with informative marketing campaigns, would therefore be effective and, as the Permanent Secretariat of the Alpine Convention points out, represent 'the next logical step to clearly differentiate ourselves from the products of other regions, whereby the quality of the products of mountain farming should be emphasised and the marketing strategy targeted to this aim' (Permanent Secretariat of the Alpine Convention 2017: 22). Such efforts have thus far failed. Too many milk products are marketed using features of Alpine pastures or mountain farms, even though in many cases the production or processing of these goods does not occur in the areas in question. Changing this situation would trigger opposition from large dairy operations. One example of a successful label is the Swiss Mountain (*Schweizer Berg*) or Alpine pasture product label which is based on clear-cut criteria for milk and meat products that are produced and processed in mountain regions or on Alpine pastures.

The aim must be to develop Alpine strategies that increase local value added and that better exploit the value of the regional and economic potentials of Alpine farming (Lauber/Böni/Calabrese et al. 2014). This includes approaches that rely on direct marketing and aim to integrate the products more strongly in tourist operations, food services and retail. There are also ways to make better use of the specific natural landscape (e.g. holidays on the Alpine pastures). Future studies on the preservation of mountain and Alpine pasture farming should focus more closely on the development of sustainable models of cooperation and local value creation partnerships between farmers and stakeholders in tourism, retail and the food industry. These approaches are contrary to the ¾ board that has been introduced by many hotels as this leads to a clear decline in consumption at the mountain huts.

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