

Rural agricultural regions and sustainable development: a case study of the Allgäu region in Germany

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Abstract Since the United Nations Conference on Environment and Development in 1992 in Rio de Janeiro, sustainable development became an important issue. Sustainable development often focuses on a single sector or parameter such as tourism, energy supply, water management, different aspects of nature conservation, or economy. In this paper, we provide a comprehensive picture of the development of a region since the Middle Ages and discuss whether this development can be evaluated as socially, economically and ecologically sustainable. We carried out a combined qualitative–quantitative assessment where we use quantitative data and indicators when available, as well as literature sources and expert knowledge from the region for a qualitative assessment. We judge that generally a sustainable development in the Allgäu region can be found, although also some critical points and contentious issues exist. An overall good economic and income situation for most people, the good ecological conditions and rich biodiversity, the relatively well-established social structure, as well as the identity of the people with the region and comparatively low social discrepancy, can be positively stated. In contrast, different actual and future threats exist such as new or planned infrastructure, increasing traffic or tourism activities in certain areas that degrade habitats and reduce species richness, intensification of agriculture in certain areas, but also abandonment of agriculture in other areas, loss of traditions and customs, and declining numbers of smallholders. The objective for the region would be to minimise these negative impacts and reinforce positive trends to assure the sustainable development of the Allgäu.

Keywords Agricultural landscapes · LEADER · Local initiatives · Rural development · Sustainability · Territorial development

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1 Introduction

Since the United Nations Conference on Environment and Development in 1992 in Rio de Janeiro, Brazil, much has been written about sustainable development (e.g. Sinha 1998a; Srivastava 2004; Blewitt 2008; Rogers et al. 2008). The range of topics includes different global aspects of sustainable development, general theoretical considerations, social dimensions and policies, stakeholder cooperation, economics of sustainability, development of rural areas, and agricultural development (Goldin and Winters 1995; Volker 1997; Lawn 2000; Fleury et al. 2008; Friedel and Spindler 2009; Grober 2010; Lasry et al. 2010; Sedlacek and Gaube 2010). Also the question of how tourism could be organised in a sustainable manner (Becker et al. 1996; Vorlaufer 1996; Sinha 1998b; Weizenegger 2003; Honey 2008) and the selection and development of indicators for sustainable development are further important topics (Job 1996; Scott et al. 1996; Bossel 1999; United Nations 2008).

The literature about examples of sustainable development linked explicitly to a particular region or a landscape exists in a broad diversity, but the large majority focuses only on a single sector or parameter such as tourism, energy supply, transport and infrastructure, water management, different aspects of nature conservation or economy. In contrast, publications that use a more holistic approach in including different economic, social and ecological aspects are still relatively rare (e.g. Eglington et al. 1998; Gong and Lin 2000; Singh 2006).

In this paper, we provide a comprehensive picture of the development of a region, and whether this development can be evaluated as socially, economically and ecologically sustainable. We will describe how the Allgäu region—consisting of complex structures and landscapes, different economic activities and actors—evolved and developed. We will look at how the region used and uses its endogenous natural and cultural assets and its existing structures in order to react to changing conditions and external influences. We will briefly outline the natural and historical contexts of the region which led to certain types of (economic) activities and sometimes to particular adaptations of these activities. For the recent past, we will present some projects, programmes and instruments which have been established to foster and direct positive regional development and show that local and regional stakeholders play an important role in those processes. We will assess to what extent those activities and processes can contribute to sustainable development and to what degree we can generally speak of sustainable economic, social and environmental development in the Allgäu region. Finally, we will provide perspectives for potential changes in the future.

2 Methods

We carried out a combined qualitative–quantitative assessment. Where available, we used statistical data such as tourist overnight stays, unemployment rate, percentage of organic farming from public databases and different types of publications. Some of them were also used as indicators for the global assessment of the sustainable development in the region. A literature research delivered important input especially concerning historical development of the Allgäu, and an internet research provided a good picture of current projects and activities in the region. For the qualitative assessment, among others, the “Local Development Strategies” for the districts were evaluated. In their development, many different

stakeholders were included (also one of the authors in the respective steering committee), and they contain comprehensive SWOT analyses (strengths, weaknesses, opportunities, threats).

We look at certain aspects with different methods and from different perspectives in order to meet the challenge of the complexity of the topic (i.e. of the concept of sustainable development on the one hand and of regions on the other hand). Where critical or controversial points remained, we discussed them with experts from the region.

For the final evaluation of a sustainable development of the region, we selected different indicators to assess the economic, social and ecological development of the Allgäu.

3 The natural, land use and socio-economic framework in the study region

The Allgäu is located in the very south of Germany, sharing borders with neighbouring Austria (Fig. 1). Various delimitations of the region exist because different approaches are used such as political or administrative, landscape, or one that involves the identity of the people who live within its boundaries.

The administrative delimitation can be made with districts in the Federal State of Bavaria: Unterallgäu, Oberallgäu, Ostallgäu (standing for Lower, Upper, Eastern Allgäu) and Lindau (formerly Westallgäu). Together with three urban municipalities Kempten, Kaufbeuren and Memmingen, the four districts comprise an area of approximately 4,650 km². In the landscape approach, as used, for example, in Germany's National Atlas (Institut für Länderkunde Leipzig 1997), the Allgäu includes also a part of the district Ravensburg in Baden-Württemberg (the other Federal State in southern Germany); other

Fig. 1 Location of the Allgäu region in southern Germany



delimitations even include parts of Austria. The delimitations are flexible and often set temporally or topically according to preferences and needs, with regard, for example, to tourism or landscape planning (Jahn 1989; Klima 1989; Liedtke 1997).

In this paper, we follow the landscape delimitation from the National Atlas (1997) for the Allgäu (see also map in Weizenegger and Wezel 2011), but we refer to the administrative units when it comes to statistical data as they are only available for these units. Unless indicated, statistical data refer to the four districts and the three urban municipalities from the Bavarian portion of the Allgäu.

Three main types of landscapes can be distinguished for the Allgäu. The most southern part belongs to the Alps, a large mountain range which stretches from south-eastern France, over Switzerland and northern Italy–Austria and Slovenia. Altitudes go up to 2649 m above sea level. The landscape of the prealpine lands and the foothills are located more in the central part (Fig. 2). The most northern part is mainly characterised by plains and smaller areas with gentle undulating lower hills (Fig. 3).

The Allgäu is part of the temperate climate zone. Precipitation is around 1600 mm/year in lower altitudes in the south and west and can reach up to 2500 mm/year in the higher mountains of the south. The northern and eastern parts receive less precipitation, between 900 and 1200 mm/year. Average annual temperatures range from 5.5 to 7.5 °C for the lower altitudes, with lower temperatures in the southern portion. The snowy winter period is, in general, relatively long (Deutscher Wetterdienst 2010; 2010).

Land use in the Allgäu is related to the different landscape types and the climatic situation. The dominant land use in the four Bavarian districts of the Allgäu is agriculture which is practiced over 58 % of the area (BSELF 2010). Only in the northern portion, a mixture of crops (mainly maize, but also some rape, wheat or potatoes) and permanent grassland can be found. The other areas are almost exclusively used as permanent grasslands (pastures, meadows) for livestock production (mainly dairy cows, fewer for meat production, very few goats and sheep for milk and meat). The second major land use is forestry, occupying 29 % of the area on average, but the share of forest areas increases to



Fig. 2 Prealpine landscape of the Allgäu (in the *foreground*) and the Alps (in the *background*)



Fig. 3 Landscape of the northern part of the Allgäu (in the *foreground*) and the snow-covered Alps (in the *background*)

36 % towards the south of the Allgäu. The rest of the area consists of towns, settlements or other urban land and road infrastructure (13 %).

The Allgäu is known for its relatively high species and ecosystem diversity because of a highly heterogeneous landscape with different types of forests, bogs, marshes and wetlands, ponds, lakes, grasslands and alpine ecosystems. About half of the Allgäu is classified by the German Federal Agency for Nature Conservation as an area which should receive certain protection (different protection levels being possible) because it has a high proportion of important ecosystems, endangered species and special biotopes (Bundesamt für Naturschutz 2004). Two out of 42 endemic plant species in Germany are endemic to the Allgäu. Different types of protected areas also are found in the Allgäu, such as nature reserves (8 %), landscape protected areas (15 %) or NATRURA 2000 areas (13 %) (LfU 2010). The latter may fall into more than one category, so that at present 24 % of the Allgäu is protected under different types of protection status. In 2008, the transnational Nature Park “Nagelfluhkette” was founded in collaboration with Austria. Parts of the Nature Park are protected areas in the strict sense (as nature reserves or landscape protected areas).

The four districts and three urban municipalities on the Bavarian side of the Allgäu comprise a population of approximately 645,000 people, about one-third of them living in one of the urban municipalities. The population density is 139 inhabitants per km² (Destatis 2010). The labour force is distributed among sectors including agriculture and forestry: 4 %, industry: 32 % and services: 65 % (Destatis 2010). Compared with other regions, this Allgäu region shows good performance in its economic development. One indicator is the low unemployment rate of 3.2 % in 2014 for the Allgäu, compared with the rate in Germany (6.7 %), with similar relations between the two percentages in preceding years (Kreisbote 2015; Statista 2015). This is due to a mixture of agriculture, tourism, crafts and industry. In the southern Allgäu, tourism is dominant, while in the central and northern parts, trade and industry play important roles.

Tourism plays a major role with 2.9 million arrivals and almost 11.2 million overnight stays in 2012 (Bayerisches Landesamt für Statistik und Datenverarbeitung 2013). More

than 2000 hotels or pensions offer about 70,000 beds (Allgäu Marketing 2010). The average length of stay is 4.2 days (compared with 2.9 in Bavaria). While most tourist destinations in Bavaria had a decline in arrivals as well as in overnight stays during the last years, the Allgäu showed a growth of 4.2 % for arrivals (the highest rate in Bavaria), followed by the Bavarian capital Munich (3.2 %) and a very small decline of 0.2 % for overnight stays (Allgäu Marketing 2010).

4 Changes in land use patterns and structure of agriculture from the Middle Ages up to the present

The historical perspective is very important in understanding the appearance of the present cultural landscape of the Allgäu. Different major changes in land use, particularly agricultural land use, occurred in the Allgäu from the Middle Ages up to the present. This often followed structural changes in agriculture such as changes in heritage rules, political systems and national or global markets. A more detailed history, also for the time before the Middle Ages, can be found in Weizenegger and Wezel (2011).

4.1 Transformation from blue Allgäu to green Allgäu

The Allgäu had never been well suited for cropping; difficult topography, watery depressions, moory soils, frosts, long winters and high precipitation were all reasons for not favouring cropping, at least from an economic point of view. Nevertheless, forms of agriculture existed. Alemann settlers had brought the practices into the region but never adapted them to the conditions in their new home, nor did their descendants up to the nineteenth century. They exclusively practiced subsistence farming because of the lack of transport, leading to a highly diversified agriculture (Thierer 1985).

Already in the early mediaeval ages, flax (*Linum usitatissimum* L.) for linen production and hemp (*Cannabis sativa* L.) for yarn production had been cultivated (the blue flower of flax providing the name “blue Allgäu”), for subsistence and trade. Over time, the region developed a high competence in the textile sector. Beginning in the fifteenth century, however, the climate changed. Average temperatures declined and precipitation increased. Overexploitation of soils had lasted for centuries, and the situation for the farmers became worse. With the colonial era and industrialisation starting in the middle of the nineteenth century, imported industrially processed cotton came into the markets, representing a serious competition for linen and leading to a decreased income for farmers.

Among other agricultural activities and processing, cheese had always been produced, but on a small scale and mostly for subsistence. When the engagement of farmers and their families in the textile sector started to become increasingly difficult from 1850 onwards, more and more farmers started to produce more conservable types of cheese (cheeses lasting longer periods of time). Pioneers such as Johann Althaus and Carl Hirnbein brought in new techniques they had learned in Switzerland and the Netherlands (Krattenmacher 1983; Hiemer 2012). Althaus introduced Emmentaler cheese (hard cheese) in 1827, and Hirnbein followed a few years later with Limburger cheese (soft cheese) (Güthler 2006; Hiemer 2012). For the production of hard cheeses such as Emmentaler, large amounts of milk were necessary, so that cooperation between the farmers was required, leading to the founding of cooperatives (Jahn 1989; Thiel 2000; Hiemer 2012). The production of soft

cheese demanded less milk and also was easier. The main objective, however, was to produce cheese of better quality, which lasted longer and could therefore be transported.

New means of transport such as the railway allowed for exportation of these products. This was the beginning of dairy farming on a larger scale (the colour of the pastures leading to the “green Allgäu”). The transition from the blue to the green Allgäu lasted until the beginning of the twentieth century when the last flax fields disappeared (Güthler 2006).

4.2 Changes in land use and the landscape of the green Allgäu in the nineteenth and twentieth centuries

In the middle of the nineteenth century, agriculture was a mixture of fields and pastures that prevailed in the southern part of the Allgäu (towards the Alps) (Güthler 2006). Potatoes, oats, barley and rye were cultivated for local consumption, whereas flax and livestock were produced to generate income. Schaffer and Zettler (1984) analysed the changes in the cultural landscape coming with changes in agricultural structuration in the Unterallgäu (northern part of the Allgäu). While around 85 % of the agricultural land in the valleys and smaller plains was used for cropping (flax, hemp, oats and spelt; Konold 1996) around 1840, it changed to 90 % grassland at the beginning of the 1980s.

The modernisation of agriculture in the Allgäu, with the introduction of machines, the establishment of agrarian markets and the transition from cropping to livestock breeding, started at the beginning of the twentieth century (Schaffer and Zettler 1984). But not before 1950, the cultural landscape was more significantly impacted. The large-scale use of machines on larger fields or meadows/pastures, the clearing of fields of many hedges, trees and creeks, the filling up of smaller depressions, hollows or creeks, and the intensification of use (drainage, fertilisation, purchase of fodder from outside the region or on the world market) led towards a homogenisation of the landscape over the entire Allgäu region (Schaffer and Zettler 1984; Güthler 2006). In the 1990s and 2000s, most settlements or towns expanded and roads were constructed, and in some places, infrastructures such as water basins for snowmaking with snow cannons were installed (Güthler 2006). This process also led to a loss of special or rare biotopes such bogs, fruit tree meadows, fish ponds and dry and humid meadows (Konold 1996; Güthler 2006). In contrast, in the southern Oberallgäu, forested areas increased by 13 % over the last two decades (Güthler 2006). As well, a change back from spruce dominated forests to more natural mixed forests (the dominating forest type in former times) can be stated for this period.

5 Today's agriculture and forestry

Forests cover 29 % of the Allgäu (BSELF 2010). In particular, the southern part of the Allgäu is characterised by small-scale forest ownership, which makes it difficult to reconcile the ecological function (e.g. protection against avalanches in the mountains) of the forests with a sustainable economic perspective for the owners (AELF 2010). In the districts of Oberallgäu and Lindau, 59 % of the forest area is owned privately with small forest parcels, 9 % is larger private forest areas, 6 % is community forest and 26 % belongs to the Federal State. The average size of the private woodland ownership is only 2–3 ha, and many of the owners lack technical equipment and skills.

More than half of the study area (58 %) is under agricultural use (four Bavarian districts) (BSELF 2010). In the most southern districts (Oberallgäu and Ostallgäu), the use is

almost exclusively (99 and 90 %, respectively) as permanent grassland (pastures, meadows) for livestock production. Parts of the grasslands, especially in the mountainous southern parts, cannot be cut with machines due to their steep slopes. In the climatically more favourable northern part of the Allgäu (warmer, less precipitation), there is a mixture of cropping (31 %) and permanent grassland (69 %). In the last years, an increase in cropped areas with maize took place (Bayerisches Landesamt für Umwelt 2011). This might be also due to an increasing number of farms having biogas plants.

The average farm size is 55 ha, of which up to 35 % of the area is leased land (BSELF 2010; Destatis 2010). Since the 1980s, both figures have strongly increased due to a focus towards fewer, but larger farms. The average number of large livestock units per hectare is 1.4 with a total of 8173 livestock farms in the four Bavarian districts. Approximately 69 % of the farms are full-time agricultural enterprises, compared with 46 % in the Federal State of Bavaria. The highest proportion of part-time farmers is found in the most southern districts of Oberallgäu and Lindau (35 %) with an average farm size of 18 ha. In these districts and the other southern parts of the Allgäu, the so-called Alpwirtschaft (mountain pasture operations) plays an important role as it is practiced on more than half of the agricultural land. This area underlies often difficult production conditions because of the steep slopes of many pastures and, in certain cases, because of the remoteness (low accessibility) of the pastures. Nearly 635 alps (a production unit with several mountain pastures) were registered in the Allgäu in 1972 (Jahn 1978). During the 1930s, butter and cheese were still completely produced directly on the alps, but later production moved to the valleys and even more north to be closer to towns with better traffic infrastructure. Today, in most of the alps, only young cows that have not yet been used for reproduction and therefore do not give milk are found. During the summer of 2014, there were 691 alps with about 28,000 young cattle, around 2700 milk cows, and a few horses, sheep, goats and pigs, with the numbers being relatively stable but with yearly fluctuations over the last years (Alpwirtschaftlicher Verein im Allgäu 2015). Due to governmental aid programmes, the alps are an agricultural unit in the Allgäu which remained more or less untouched during the generally strong structural changes in agriculture during the last decades, which is reflected by their stable numbers (Güthler, personal communication 2010).

The majority of the farms in the entire Allgäu produce milk from cows. In the four Bavarian districts of the Allgäu, the milk production is a bit <1.2 million tons per year (BSELF 2010). This milk is processed in famous dairy companies (e.g. Champignon, Allgäuland, Edelweiß) and transformed into well-known brand name dairy products (cheese, milk, butter, yoghurt, cream).

Organic agriculture is relatively well developed in the Allgäu. The share of organic agriculture enterprises over all agricultural enterprises is 4.7 % (5.1 % for agricultural land) for the district Unterallgäu, 8.1 % (7.9 %) for Ostallgäu and 11.3 % (9.9 %) for Oberallgäu, the latter two being clearly higher than the average share of 5.1 % in the south-western part of the Federal State of Bavaria (10 districts) (Bio-Ring Allgäu 2010; BSELF 2010).

The importance of agriculture in the Oberallgäu, besides the production of milk, meat and cattle breeding, is increasingly founded on the maintenance and conservation of the cultural landscape. Without extensive agricultural use, the economically important tourism sector in the southern Allgäu would be unthinkable (see also Güthler 2006).

In particular in the touristically more attractive southern Allgäu, many agricultural enterprises gain indispensable additional income by renting guest rooms or holiday apartments. For example, 23 % of all agricultural enterprises in the district Oberallgäu offer “Holidays on a farm”. They provide almost 5500 beds and have nearly 500,000 overnight stays per year.

6 Tourism: an important economic element

Tourism has a long tradition in the Allgäu. As early as 1856, a handbook for travellers was published (Buck 1856). Tourism continues to play an important role for the Allgäu (Meier et al. 2013). The location close to the Alps and the landscape diversity attract overnight tourists as well as excursionists. There are potentials for many activities during all seasons, the more popular ones are skiing and hiking, followed by mountain biking, swimming in lakes, or visits to traditional festivities such as a “Viehscheid” (the cattle returning to the valleys after a summer on the alpine pastures). Centres for tourism are located in the southern parts of the Allgäu, within well-known places such as Schwangau, where the famous Neuschwanstein castle is located, or Oberstdorf, where international competitions in ski jumping or cross-country skiing take place. In particular, the district Oberallgäu strongly profits from tourism with a share of 14 % of the total economic income generated in the district. Private hosts still play an important role in host structure. For the Oberallgäu, approximately one-third, for the rest of the Allgäu one quarter, of all overnights take place in private houses (DWIF-Consulting GmbH 2011). As mentioned before, farm holidays are particularly important for farmers in providing additional income by renting rooms or apartments to tourists.

In 1985, the concept of the community of Bad Hindelang for the integration of agriculture and tourism, later known as “Eco-Model Hindelang”, was launched. Its objective was to maintain or renew the diverse cultural landscape and at the same time produce income for the mostly small-structured farms in order to keep them in existence. The idea is simple: farmers receive economic compensation for maintaining the cultural landscape, which is of great importance for tourism. Müller (2005) stated that the Oberallgäu, and especially the commune of Bad Hindelang, has benefited from an extremely positive tourism development. Yet, completely realisation of the eco-model proved to be difficult. Today, Bad Hindelang follows a concept with softer criteria. For example, a historic car race that had been stopped for several years because it would not fit into an ecological concept (Maier 1996) is once again in operation. The present concept is based on ski tourism and health, as well as landscape tourism experiences.

7 Current rural development programmes, projects and initiatives in the Allgäu

Rural areas all over Europe are facing similar problems. The absence of job options and perspectives, especially for young people, leads to a steady out-migration or, in the worst case, to rural exodus. Declining numbers of inhabitants leads to a reduction of infrastructures, which in turn results in a loss of quality of life. Structures in agriculture also often change. Rural areas that want to react to those processes need a development strategy suitable for their specific situation and problems. To meet those challenges, the European Union and national institutions provide financial aid. In many regions, structures are created to support development activities and projects. Here, we present a number of projects and initiatives that have been implemented in the Allgäu in order to meet the challenges.

7.1 Von Hier (From Here) products

One example are the “Von Hier” products (from here). The label was developed already in the 1990s by the regional German supermarket chain Feneberg located in the Allgäu—at a

time when such initiatives were far from common. The objective was to promote and sell food products, which are both from the region and organic. The regional aspect of Von Hier products is very important. Only products that are produced within a radius of 100 km around the central Feneberg site in the town of Kempten, Allgäu, are considered under the label (Feneberg 2015a). The initiative proved successful: today, about 300 different Von Hier products exist including cheese, dairy products, eggs, vegetables, fruits, meat, sausage, flour, bread, fruit juice and beer (Feneberg 2015b). More than 600 organic farmers and 23 processing enterprises deliver their products to Feneberg (Siegel 2010). Under the Von Hier strategy, an added regional value has been established in linking regional farmers and processing enterprises via the supermarket to the consumers (Kippes 2008). A yearly turnover of 16 million Euro for Von Hier products was calculated for 2009 providing an added value of 3.22 million Euro for the contracted organic farmers (on average, 5000 Euro per year and enterprise; added value = price difference paid to the organic farmers compared to prices of conventional products) (Feneberg 2015a; E. Wirthensohn, personal communication 2010). Approximately 500 additional jobs have been created by the Von Hier program.

7.2 LandZunge: the taste of the countryside

LandZunge (LandTongue) is a network of producers and restaurant chefs promoting and using regional products in restaurants according to their own criteria (Landzunge 2014). The initiative started in 2001 in one district in the Allgäu and has continued to develop ever since. Each restaurant in the network is obliged to offer at least three meals with beef or cheese from certified producers of the region. Beer and certain soft drinks must be produced within the region as well. The initiators also founded their own magazine, in which the participating restaurants and partners are presented. Topics comprise not only the ecologic and economic aspects of such a project, but also the social ones: appreciation for clean structures in the villages, a restaurant as a meeting point for local people, or quality of life. Today, about 80 restaurants participate in the network, and many of these purchase all their beef and cheese from regional producers, so that a superior category, LandZunge Plus, was developed for them. The project unifies the different local breweries, which normally are in competition with each other. Quality control has been handed over to an external institute, and a LandZunge Foundation was founded. Restaurant owners report that clients are ready to pay a bit more if they know about their contribution to the development of the region.

7.3 Allgäuer Alpenuss: eating on mountain pastures

“Alpen” (singular: Alp) is not only the name for the mountain chain, but also for the mountain huts in which the herdsmen stay during summer months when the cattle graze in the alpine pastures in the mountains. It is quite common that small-scale gastronomy is attached to those Alpen, where visitors can get dairy products and basic meals. The project “Allgäuer Alpenuss” was initiated with the objective to bring more regional products to the menus in order to stimulate added value for the region—very similar to the LandZunge approach. Currently, a pool of more than 40 Alpen have formed an association, in which producers and other partners also are represented. They have defined a set of criteria for participation in the network, and the association initiated a cooperative agreement with the regional newspaper to provide public attention for their activities.

7.4 Allgäu brand: an initiative for sustainable development by local stakeholders

In 2011, the Allgäu GmbH was created. The board of management of this limited liability company consists of district chief executives, mayors of larger towns and other mayors from the districts, representatives of the tourism association and chambers of crafts and industry, and private members of the Allgäu GmbH company (Allgäu GmbH 2014a). The major objectives are tourism management (development of new tourism strategy), location management (e.g. development of regional economic clusters, development of innovation systems, creation or establishment of enterprises) and the management of the Allgäu brand.

Different types of companies and organisations from tourism, regional industry enterprises and food production can become partner of the Allgäu brand when they can proof that they fulfil four out of six different priority criteria of sustainability (Allgäu Marke 2014). In addition, they have to proof progress in two selected criteria over 2-year periods. The six priority criteria have been selected in different workshops with the participation of stakeholders from over 60 companies or organisations. The six criteria cover (1) the economic criterion “significance of the company for the regional economy”, (2) two ecological criteria “energy use and climate conservation” and “provenance of raw materials and other materials” and (3) three social criteria “responsibility for partners and suppliers”, “education and training” and “respecting rules and norms” (Allgäu GmbH 2015).

Examples for which the Allgäu brand is already used are different types of milk and dairy products, bread and bakery products, meat and sausage, beer, wine, juice and mineral water, other food products such as honey, jam, oil, eggs and liquor (Allgäu GmbH 2013). For the different products using the Allgäu brand, additional specific criteria are defined beyond the six priority criteria, e.g. quality criteria for milk are that the milk must be produced without genetically modified forage, and OMEGA 3 values must be equal or above 0.9 g per 100 g fat content.

Recently, an initiative with the tourism sector led to the definition of quality criteria for sustainable outdoor activities (Allgäu GmbH 2014b; Verband Allgäuer Outdoorunternehmen 2014). Therefore, the Allgäu brand can also be used for those companies following these criteria. Moreover, “Mir Allgäuer” an association of 511 certified hosts for holiday on a farm joined in 2015 the Allgäu brand (B4B Schwaben 2015). Thus, many tourist hosts follow now the six different priority criteria of sustainability under the brand.

7.5 Effects and success factors of local projects, programmes and initiatives

Apart from the examples given for the field of the valorisation of products of the region, many projects can be found in other sectors as well: for example in the energy sector the creation of the EZA (Energy and Environment Centre Allgäu) or local initiatives for renewable energy production such as the village of Wildpoldsried (2500 inhabitants) which now produces twice as much energy as it consumes, and which calls itself “Energy village” (Die Zeit 16. August 2012).

Three of the projects described above have received funding through the LEADER programme of the European Union for an initial phase or for the first years of the projects and were then continued completely on a private basis. LEADER stands for Liaisons Entre les Actions de Développement de l’Economie Rurale (Links between the rural economy and development actions European Commission 2012 and is a programme that focuses on

participation of local populations in the development activities and high quality of the measures supported: a Local Action Group has to be founded and a development strategy to be developed. Alone in the last funding period 2007–2013 in the Allgäu, 170 projects received financial support through the LEADER programme.

Compared with other regions in Bavaria and Germany, the Allgäu has a very high quota of cooperative projects. Among them are, for example, the creation of the Allgäu brand, Allgäuer Moorallianz—an initiative for the conservation of bogs, VitalZunge—regional products for large-scale catering and health region Allgäu, In.Silva—clustering of wood supplies from small forest owners (for the later more details can be found in Weizenegger and Wezel 2011).

A success factor common to all these projects is that an individual or group of people see the project as “their” own. The necessity of networking also has proved to be an important factor for the success of such projects. A comparison of different development activities in the Allgäu and in Vorarlberg (a neighbouring region in Austria) showed that regional development is a slow process in which results are not necessarily seen quickly (Mayer et al. 2008). Therefore, one of the success factors is that the long duration of regional development processes leads to a fruitful exchange of knowledge, ideas and experiences (Mayer et al. 2008), mutual learning, capacity building, setting-up of networks and also to redefine objectives of projects (Fleury et al. 2008). Actors learn that they have the ability to find innovative solutions, and networking and cooperation improve through the projects—although the ability to cooperate may be needed even more in the future. And not to be forgotten, regional institutions are of high importance in this process (Sedlacek and Gaube 2010).

The general problem with most subventions from the European Community (direct payments from the Common Agricultural Policy) is that, in most cases, it slows down or inhibits innovation in agriculture. There are several interesting innovative projects or initiatives in the Allgäu that are linked with agriculture or forestry (From Here or other local and regional products, In.Silva, ecotourism, farm holidays, projects from other sectors with indirect links to agriculture), but many farmers still depend enormously on subventions and the market prices for milk and cereals.

Even the LEADER programme, which seeks to foster innovation, motivate actors and create networks, has its limits, due to its focus on specific or pilot projects. Yet, even this can serve as a best practice, although not often solving problems of a whole sector such as agriculture. The development of the Allgäu brand seems to be an important initiative, but even in this project the situation for the agriculture sector remains difficult. In contrast to tourism or the general marketing of the Allgäu region, no well-established structures or appropriate authorities exist in the region to establish the above-mentioned programmes on a larger scale.

8 Allgäu: A development towards sustainability?

In general, it is very difficult (or even impossible) to completely answer the question of whether a certain region is developing towards sustainability (1) due to lack of sufficient reliable data to evaluate most of today’s potential indicators for the three pillars of sustainability (economic, social, ecological), (2) an evaluation reflects the present situation which can change rather quickly within a few years and (3) inherent to the concept of sustainable development is a conflict of objectives between the three pillars, so that there is

Table 1 Positive and negative points related to economic, social and ecological sustainable development in the Allgäu region

Positive points	Negative points
<i>Sustainable economic development</i>	
Existence of a broad diversity of employment in the primary, secondary and tertiary sectors	Some farmers, in particular smallholders, have large problems in generating sufficient income and have partly or completely abandoned their work over the last years.
Relatively low unemployment rate in the districts of the Allgäu	Also difficult to find a successor
Fewer farmers abandoning agriculture compared to other regions in Germany because of good possibilities for receiving a diversified income from agriculture (from conventional and, in particular, organic agriculture), from direct or regional sales of their products, from tourism (accommodations or part-time engagement in the tourist sector), from full-time or part-time engagement of family members in local industries or tertiary sectors and from financial support payments by the Federal State or the EU	Low milk prices over the last years, and probably also over the coming years, will prevail among the farmers who focus on milk production, and this is the highest proportion of all farmers in the Allgäu. They will be pushed to complete abandonment, to look for alternative sources of income or to intensify or rationalise production (more land, more fertilisation, extra fodder, more cows)
A stable or even slightly increasing number of farmers producing milk and livestock on alps, the alpine summer pastures. This type of production is strongly supported by different financial aid programmes	The last remnants of the textile industry changed to new products, but have difficulties in continuing except for very specialised production (e.g. traditional costumes for locals and tourists)
An increasing tourism sector, although initiatives and concepts for eco- or sustainable tourism still remain quite limited. A lot of the money remains in the region because of the many family enterprises engaged in tourism and a highly diversified small-structured tourism market	Many of the smaller tourist accommodation facilities such as pensions or bed and breakfasts need modernisation to meet today's tourist demands for quality
Positive income evolution for organic farmers through higher prices for their products and a relatively stable market (example of the added value for Von Hier farmers)	
A rural region with a stable or increasing population (depending on the districts) in contrast to most situations elsewhere in Germany and Europe. This does not per se mean an improvement of the economy of a region, but reflects the attractiveness of the Allgäu to stay or move there, which is not the case in other rural areas in Germany or Europe	
High potential for local or regional food products (dairy and cheese products in general, from here products in particular). For example, quite a lot of local breweries have existed for decades and still find their consumers	
Existence of local dairies of which most work profitably and independently of national and global milk prices	

Table 1 continued

Positive points	Negative points
<i>Sustainable social development</i>	
<p>Less social discrepancy and fewer social problems because of the relatively low unemployment rate</p> <p>Many family farms remain with the possibility to generate income from other types of work which allows for the maintenance of traditional family structure</p> <p>The population of the Allgäu has a generally positive image and identity and is proud of its region (Sieth 2006; Siegel 2010)</p> <p>The continuing existence of local traditions (e.g. traditional festivities and clothes; local or regional customs)</p> <p>The LEADER projects and other local programmes have improved the network of stakeholders as well as provided a more common vision on different topics. These social networks have good sustainability potential</p> <p>Healthy social structures and involvement lead to a high sense of community and voluntary commitment</p> <p>Local stakeholders' initiative for development of Allgäu brand</p>	<p>A trend of younger people is to leave the smaller villages to live and work in the towns. Although this trend exists, it is much less pronounced in the Allgäu compared with many rural areas elsewhere. In contrast, in many larger villages, there is a positive trend of many young families staying in the village, or even new installations of young families from outside the Allgäu. In many communities in the southern Allgäu, an increasing number of retired people have settled in the villages because of the attractiveness of the landscape, leading to an ageing of the village population</p> <p>Ground-breaking projects like Eco-Model Hindelang do not lead automatically to successful implementation because of diverging interests of stakeholders and lack of a defined common vision</p>

Table 1 continued

Positive points	Negative points
<i>Sustainable ecological development</i>	
<p>Relatively high species and ecosystem diversity because of a highly heterogeneous landscape with different types of forests, bogs, marshes, ponds, lakes, grasslands, alpine ecosystems and occurrence of endemic species</p> <p>High share of protected areas in the region</p> <p>Low-intensive livestock breeding created and still preserves many alpine and lowland pastures and meadows with a diverse fauna and flora. Some of them might be abandoned in the future because of insufficient profitability for farmers if they are not remunerated for this activity either via agri-environment scheme payments or direct payments from the communities to keep the cultural landscape open for tourism (attractiveness of the landscape)</p> <p>No nitrate or pesticide pollution of the ground water (and drinking water) because low-input agriculture dominates, and lakes have good water quality</p> <p>A high share of organic agriculture, which has a lower impact on the environment and is seen as favouring higher biodiversity compared with conventional agriculture</p> <p>Increasing forested areas with a more natural composition of tree species (mixture of broadleaf and needle trees) and higher non-woody species diversity</p> <p>Some negative trends such as expansion of ski lifts and skiing areas, and damage to natural vegetation by hikers have been reversed over the last two decades in certain areas, but only in smaller spatial areas. Also, some rare species such as the beaver and Golden eagle have increased in numbers over the last years</p> <p>Existence of initiatives/projects for sustainable development such as EZA (Energy and Environment Centre Allgäu) or Allgäuer Moorallianz (an initiative for the conservation of bogs)</p>	<p>A loss of valuable ecological areas has occurred over the last two decades, brought about by intensification of agriculture, construction of new roads, ski lifts and water basins for snowmaking and expansion of settlements. Although this concerns larger spatial areas in only a few cases, this loss can be found in many areas of Allgäu</p> <p>The intensification of land use in valleys or lowland areas as a consequence of low milk prices often leads to less diverse vegetation. The abandonment of the use of some summer alpine pastures can lead to bush and forest encroachment (Güthler 2006, Güthler 2008). In addition, these vegetation changes decrease the attractiveness of the landscape as flower-rich open areas for tourists because they are replaced by forests and bushland, or by less diverse grasslands</p> <p>Some rare species such as grouse (a group of birds) and the Moorland Clouded Yellow (a butterfly) decreased in numbers over the last years because of increasing landscape homogeneity (less landscape structure, spruce cultivated forests) in certain areas</p> <p>In the past, larger flooding events occurred in some valleys which caused much damage to many areas including human settlements which are in some areas too close to major rivers and lack sufficient natural water retention areas. After the last flooding, such natural water retention areas have been re-established to allow “natural flooding”, during peak flood events</p> <p>Increase of maize areas and along with this often higher inputs (fertilizer, pesticides) compared with precedent agricultural use</p>

not always a broad agreement if a certain aspect of development is sustainable or not (e.g. economic development versus protection of natural areas). Nevertheless, in the case of the Allgäu, we can provide a comparatively good picture of the present situation. Here, we take also into account more specific evaluations contained in the Local Development Strategies for the districts in the Allgäu (Bergaufland Ostallgäu 2014; Kneipppland Unterallgäu 2014; Regionalentwicklung Oberallgäu 2014a, b; Regionalentwicklung Westallgäu-Bayerischer Bodensee 2014).

In general, a range of positive points can be mentioned concerning sustainable economic development (Table 1). The economic situation for many people has improved over the last decades (and centuries if we look at regional history) as most people have sufficient income to make their livelihoods in different activity sectors. However, these positive points also are accompanied by some negative points such as difficult income generation for farmers or lack of modernisation of some smaller tourist accommodation facilities.

Similar to economic development, some positive points can be stated for social development. Important positive points are cultural traditions and identity with the region as well as healthy social structures and comparatively low social discrepancy. Negative aspects, for example, are younger people leaving small villages and an increasing number of retired people settling in the Allgäu.

Related to sustainable ecological development, the Allgäu region still has high ecological value and will likely generally maintain it in the future. Nevertheless, also negative points have to be mentioned such as loss of valuable ecological areas due agriculture, tourism activities and expansion of settlements.

During the last years, the people living in the Allgäu seem to become more conscious of the concept of sustainable development. In contrast to many other regional brands that are little more than a logo, the Allgäu brand has been built around the pillars and objectives of sustainable development. And although sustainable development was included more or less implicit in all previous development strategies, it was only in the latest strategy dating from 2014 when the Oberallgäu systematically applied the concept of sustainable development for setting its regional development objectives (Regionalentwicklung Oberallgäu 2014).

9 Conclusions and potential future development

Given that something like “100 % sustainability” may be as hard to define as to actually achieve, do we find sufficient evidence for sustainable development in the Allgäu? We would say yes, because many points can be listed for positive economic, social and ecological development in the region. We are aware that many negative points exist as well and some conditions should be improved; thus, some people may not agree with our judgement. Barring catastrophe over the coming years, the overall good economic and income situation for most people, the good ecological conditions and relatively rich biodiversity, the relatively well-established social structure, as well as the identity of the people with the region and relatively low social discrepancy indicate that sustainability for the region can be maintained and improved. If we consider ecological sustainability, for example, it is obvious that some crucial points still exist, but it appears that the Allgäu still has high ecological value and probably can maintain it in the future. The ecological situation was probably better some decades ago with more pastures or meadows having high species diversity and less use of manure. Yet, the negative trends have been much

reduced or even non-existent in certain areas of the Allgäu compared with many other rural areas in Germany or Europe.

Although we find relatively positive development in the Allgäu, different actual and future threats exist. These are (1) potential negative impacts related to the tourism sector such as construction of new infrastructure in natural areas, increasing traffic and mass tourism in certain areas that degrade habitats and reduce species richness, (2) intensification of agriculture in certain areas, but also abandonment of agriculture and declining numbers of smallholders in other areas and (3) loss of traditions and customs. The objective is to minimise these negative impacts to assure the sustainable development of the Allgäu in the future. If, for example, the negative impact from tourism (construction of infrastructure, traffic, etc.) continues with the same dynamic as over the last 10 years, future development will probably not be sustainable anymore. Clearly then, there are limits or thresholds for such improvements, after which the effects begin to work against the original intentions.

The Allgäu is a typical rural region which had to undergo many changes and adaptations in its history and where living conditions were not easy until the middle of the twentieth century. Yet, in contrast to other regions in Europe, several factors have helped such that today there are relatively favourable conditions for sustainable development. One factor was that transition from the blue to the green Allgäu was not abrupt, but gradual, and supported by pioneers who established innovative cheese making techniques. The textile industry did not collapse suddenly (within few years), so farmers more easily shifted their practices from cropping to livestock maintenance.

Another factor is that since the nineteenth century a certain amount of industry has always existed, so that at least some part of the population did not completely rely on agricultural production. This industry seems to have been able to adapt to new economic realities in changing from textiles to a more diverse and modern set of industries (e.g. high-tech firms, dairy farms, packaging industries, textile industries, machine construction). In addition, tourism became more and more important to the region, which generated a great deal of work in this sector either as full-time jobs, or in combination with agricultural activities. The diverse structure of economic activities, but especially the combination of agriculture (in creating and maintaining the largest part of the present landscape) and tourism (in profiting from the high tourism potential of the region during summer and winter), seems for us to be one of the most important factors in determining that the Allgäu is better off than other rural landscapes.

Another important factor is that with the change from the blue to the green Allgäu, the new agricultural products (in particular milk) were processed in the region and created a dairy “industry” which is well established today. These quality cheese and dairy products from the Allgäu have found a good market niche even beyond the region, but the producers are presently struggling with low milk prices. To help compensate, some of the dairy and cheese products produced and processed on the farms or in local dairies can be sold directly to tourists or the tourism sector (e.g. restaurants, festivities). Historically, and in most cases, the different alternatives that have fortunately been available for adaptation in the Allgäu have been indispensable in its continued drive for improved sustainable development.

One last reason that leads us to our optimistic judgement: development—whether sustainable or not—is always driven by man. The people in the Allgäu have for a long-time experienced changes and are therefore used to deal with new situations and to develop solutions. One could say that this is the best precondition to further develop the region towards sustainability.

Finally, lessons learned from this study are that sustainable development remains a slow process, but that indispensable factors that facilitate this process are exchange of knowledge, ideas and experiences among stakeholders, setting-up of initiatives and networks, cooperation through projects and initiatives, and the active role of local or regional institutions. Comparable research in other regions would allow the development and selection of a set of the most significant indicators for sustainable development of regions. Such commonly accepted indicators could be used not only to assess in a more focused way whether development is sustainable or not, but also to steer or govern a region in a way that makes its development more sustainable.

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