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RETHINK

Rethinking the links between farm modernization, rural development and resilience in a world of increasing demands and finite resources

Organic farming and resilience

(Austria)

Case Study Report | D3.3 | February 2015

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The aim of the Case Study Report is to summarize the various issues raised by the farmers and stakeholders involved in the interviews and workshops, and to relate these issues to the four Cross Cutting Themes (Resilience, Knowledge and Learning, Governance, Prosperity) defined in the RETHINK project. The structure of the report builds on the structure that was established by the Core Theme Leaders. We also included references and weblinks where it seemed helpful, but there was no particular emphasis on relating the results to the scientific literature. This Case Study Report thus provides an overview of the whole case study and presents a preliminary analysis of the collected data. An in-depth scientific analysis of the empirical data will be made in the framework of subsequent scientific publications.

We would like to take this opportunity to thank Simon Kneebone (weblink) for the individual comics we used as illustration throughout the text, and Alexander Czernin (weblink) for the large comics we used in the workshops (see Fig. 3 and Fig. 5).

Summary

The contribution of the case study to rethinking farm modernisation and rural development

The **case study** focuses on the development and current dynamic of farmers and initiatives that contest the dominant views linked to modernisation and seek to develop diverse alternative development pathways. While most of these farmers are organic, this is not a precondition, and not all organic farmers necessarily contest dominant views. The data was collected in the province of Salzburg, which was selected because 49.3% of the UAA (incl. alpine pastures) is certified organic. Data was collected through interviews and workshops with both farmers and stakeholders.

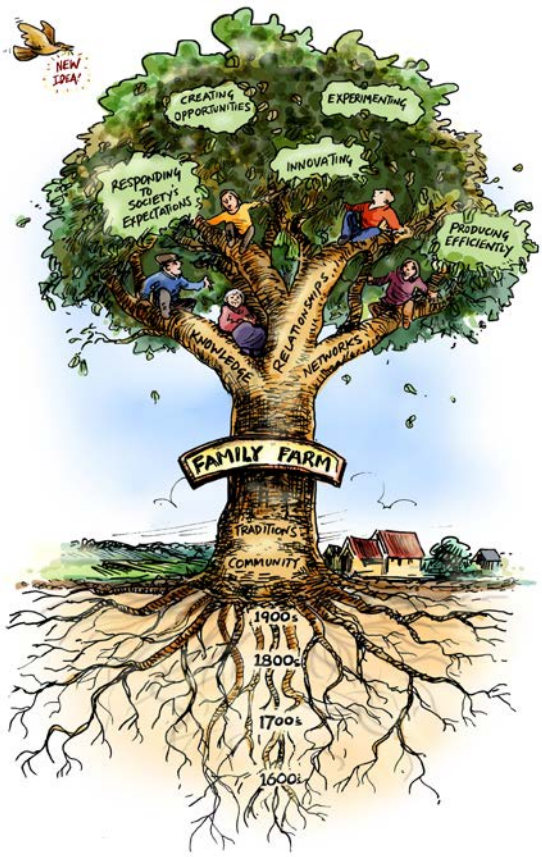
The results indicate that these innovative farmers are actively engaged in developing a modernisation of agriculture that builds on **social innovation** rather than on technical innovation. Modernisation in agriculture strongly built on technological innovation (e.g. in breeding, in larger machinery) that efficiently reduces the need for human labour while enabling farmers to benefit from reduced production costs through economies of scale. This approach to modernisation is still the model widely promoted in Austria, and encapsulated in the 'get big or get out' adage.

The innovative farmers in Salzburg are at the heart of developing an alternative approach to modernisation, one that very selectively uses technology, couples it with traditional elements and addresses societal and consumer needs through an **'artisan economy'**. Rather than focusing on economies of scale and supplying commodity markets, they focus on economies of scope and niche markets, they search for new business models, around creative ideas that allow them to use their skills and knowledge.

These farmers, as **'artisan entrepreneurs'**, take responsibility for the economic destiny of their farms, which sets them apart from those that feel powerless in the face of global markets and resentfully dependent on direct payments. They are involved in micro-businesses where goods and services are expertly and lovingly crafted based on local resources and the knowledge about their specific properties. While the business might grow from 'micro' to 'small', they do not aim for further growth or mass production. They are more likely to network with others, search for social innovation through novel cooperation models, among other with chefs in restaurants or hotels that emphasize the uniqueness of the region.

They cater to an increasing demand for **authentic products**, food from 'somewhere' and 'someone', fresh blends of old and new (e.g. in cheeses or chocolates). They cater to consumers who are tired of food from standardized industrial production, of anonymous products sourced globally, who search for an alternative in a digitalized and virtual world. They look for the authentic, the unique, the personal touch, the customized food. While these may be high-end food products, they are not elitist or particularly expensive, they are not seen or marketed as a luxury good. Rather, they are seen as part of an ethical consumption, one that expresses care for the environment and for territorial traditions. They are part of a movement that seeks to consume differently, with more time, more creativity, more social connection; slow food instead of fast food.

These farmers in Salzburg are at the centre of a **social innovation** that seeks to redefine the family farm, creatively merging elements from the old and the new, including various forms of retro-innovation. They want to preserve what is valuable in age-old traditions, question those traditions and values that seem narrow-minded, and use technology where it makes sense and makes physically demanding labour easier. It is reflective and selective rethinking, questioning both tradition and modernity, seeking to go beyond both, while preserving those elements that serve their purpose. This rethinking puts particular emphasis on the **work-life-balance** on-farm: they do not want to work 24/7, they do not consider that taking some personal time is a sign of laziness, nor vacations a luxury. They proudly wear traditional clothes (the Dirndl and Lederhosen), they cherish family bonds and working with family members on the family farm. They value the cultural landscape and will maintain it through age-old practices such as mowing



low-productive steep slopes and manning the houses on the alpine meadows in summer. They believe in the values of discussing problems and mistakes openly, so that they and others can learn from them, i.e. they frame a mistake as a stepping stone, not as a sign of failure and incompetence.

They seek **cooperation** allowing them to contribute their strengths to a group, while avoiding a work overload. They have a territorial understanding of farming, rather than a sectorial approach, thus seeking cooperation with others in the region, especially the service sector and tourism. In these cooperations they demand a fair partnership and will not be seen as junior partner or supplicant. They recognize how the internet has reduced the reliance on hierarchies and large organisations, seeing how it has enabled access to information and empowered small-scale, de-centralized, networked, ecologically-oriented entrepreneurs.

In this redefinition of family farming, **diversity** is a key characteristic. They do not seek to promote one clearly defined model, but welcome diversity, in farm size, in specialisation, in production methods, in philosophies. This enables each farmer to play on his/her strengths as well as reduces the competition by broadening products, services and qualities. This enables them to serve different niches and market segments. They see the strengths of large dairies and marketing through supermarkets, but do not want this to be the dominant – much less only – model that is promoted as ensuring a successful future.

While this modernization based on social innovation is emerging, it is not a smooth process. There is **resistance** and contestation from those who are tradition-bound and resent change, as well as from those who see the future in capital-intensive, large-scale farms brimming with the latest technology. Also, the high labour load on most family farms limits the time and energy available to express their creative potential. Moreover, constantly changing legal requirements, time consuming reporting obligations within the CAP and the strong market power of trading companies and retailers form a **'lock in'**. The path-dependency is also reinforced by the lack of skilled craftspeople (bakers, butchers, cheese makers) who are needed to develop new products. It is also reinforced by the lack of knowledge how to maintain a cooperation even in difficult times, how to cope with conflicts and turn them into an opportunity to find a new win-win situation. Furthermore, there is little support by traditional institutions (e.g. the Chamber of Agriculture) which tends to focus on agricultural production methods and farm economics, is tied up with time consuming CAP-related paperwork, and does not have enough employees to offer support for innovative ventures. Also, such innovations need a process-oriented approach, which accepts the fact that it is an open-ended process with various 'detours', rather than the implementation of a clearly defined business plan where the ends and means are set right at the outset. However the institutions are not well equipped to support open-ended processes, both due to their reporting and 'effectiveness' constraints and due to the training of their advisors.

Support is found mostly with consumers, who appreciate the specific quality of the food, who value the authentic, hand-crafted products, who want to contribute to maintaining the cultural landscape by buying foods produced using methods that preserve this landscape. The guests and tourists also value the innovative services: where else would they be able to relax in a hot tub made of stone pine wood that grew on the very same farm, with a panoramic view of the Alps, after having spent a day hiking?

1. Introduction: definition of the social-ecological system studied

1.1 What is the case study about and who are the key actors?

The **focus of the case study** is on farm resilience and the extent to which organic farming has the potential to strengthen it (Fig. 1). The case study is thus oriented towards a production system (organic farming) which has been ascribed a number of desirable qualities, especially regarding farmer knowledge, environmentally friendly production methods and a high level of animal welfare. Furthermore, the concept of closing nutrient cycles and selecting species and breeds that are well adapted to the specific environment has the potential to increase the ecological sustainability of the production system and the autonomy of the farm. Finally, organic farming is seen as one way to reduce the negative externalities of modernized conventional farming (Schader et al., 2013). We will thus try to better understand the mechanisms that allow farmers to strengthen their resilience either through being certified organic, or for conventional farmers in a region where a large number of farms are certified organic. Indeed, as the resilience of a farm is influenced by the context in which it is operating, we need to take into account the dynamics at the regional level (which will affect both organic and conventional farms).

Figure 1: Interactions between organic farming and resilience, with interactions at the farm and the regional level.

To assess the impact of organic farming on resilience, we selected for the **case study** the province of Salzburg, which has 49.3% of UAA (incl. alpine pastures) certified organic (BMLFUW, 2014a). The case study thus covers a relatively large area (over 7,000 km^2), a long time period (the share of organic farms grew strongly in the early 1990s, i.e. just before the EU-accession of Austria), and involves a diffuse and changing set of **actors** (e.g. while initially the Chamber of Agriculture played an important role in supporting organic farming, they are now rather 'neutral'; on the other hand there are a number of new initiatives that have emerged during the last decade). (For more details about the actors, see the governance section: p. 20ff)

Agriculture in Salzburg is characterized by small and medium-scale family-owned farms and almost half of farms are managed by part-time farmers (Statistik Austria, 2012a). The average size of farms is about 21.5 ha; the province is dominated by the Alps and about 60% of farms are categorised as 'mountain farms' (BMLFUW, 2013). **Dairy farming** is the most important branch of agricultural production and a dairy farm has on average 12 cows (BMLFUW, 2013). The total size of UAA in Salzburg is about 195,000 ha, the majority thereof is extensive permanent grassland (Tab. 1). Almost half of Salzburg's area is forest, and selling wood is an important source of income for many farmers (Statistik Austria, 2012a).

Tourism plays an important role in the province of Salzburg (about 20% of overnight stays in Austria are in Salzburg (Statistik Austria, 2013a)), which is partly attributable to the provincial capital (the city of Salzburg, which is the birth place of Mozart), and partly to its attractive cultural landscape and ski resorts. Advertisement for tourists often

feature pictures of traditional family farming and praise the regional, healthy and high quality food. Tourism and agriculture are linked, as many farms offer 'farm holidays', some also supply hotels with their food products.

Table 1: Key territorial characteristics of the province of Salzburg

Characteristic	Expression in Salzburg
Spatial type	Rural
Agricultural sector	0.99% of the regional GDP through agriculture and forestry 4.97% of employment through agriculture
Farm structure[1]	9,785 farms in Salzburg 51.4 % of farms < 20 ha 31.1 % of farms ≥ 20 ha to ≤ 50 ha 17.5 % of farms > 50 ha
Production system[2]	49.3% of UAA[3] certified organic (85,565 ha) 44.7% of farms certified organic (3,629 farms)
Farming system[1]	47.9% are part-time farms (4,685 farms) 60.8% of farms are classified as mountain farms (5,951 farms) 18.5% of farms offer 'holiday on farms' (1,813 farms)
Main ag. output	341,400 tonnes of milk in 2012 (avg.: 6,016 kg/cow)
Landscape characteristics / land cover[1]	283,570 ha of forests 195,154 ha UAA 64.0% of UAA is extensive permanent grassland, predominantly for grazing (124,885 ha) 32.8% of UAA is intensive cultivated permanent grassland (64,033 ha) 3.2% of UAA is cropland (6,236 ha)
Population[4]	Population density: 74.7 pers./km² Unemployment rate: 5.1% Outmigration: 41.2% of workers commute Ageing population: 17.7% over 65 years old

Notes: [1] Source: Statistik Austria - Agricultural Census 2010 in Statistik Austria 2012a, 2013a, b
[2] Source: IACS 2013 in BMLFUW, 2014
[3] UAA, including alpine pastures (50.5% of UAA excluding alpine pastures (52,477 ha))
[4] Source: Land Salzburg, 2014

Given this overall structure, while some **farms** specialize in milk production, most farms are diversified, i.e. engaged in various on- or off-farm gainful activities. This ranges from offering apartments to tourists through 'holiday on farm' (esp. around the ski resorts), engagement in direct marketing (esp. around the city of Salzburg), engagement in forestry, e.g. through the marketing of wood chips (esp. in more remote areas). As the province is fairly large and somewhat heterogeneous – with Alps in the south and more hilly areas in the north – we have focused data collection and analysis of regional dynamics in two regions: the Flachgau and the Lungau (Fig. 2).

The **Flachgau** is mostly hilly and has generally favourable production conditions; also it is close to the city of Salzburg thus offering the possibility of direct marketing. Many farms engage in fairly intensive milk production, supported by a number of dairies, with much of the milk being exported, especially to Germany. The **Lungau** is an alpine region with less favourable production conditions (long winters, steep slopes), where outmigration is an important issue as there is a lack of jobs (esp. qualified positions), yet the assets are forestry, tourism and a pristine nature (as testified by a UNESCO Biosphere reserve).

Figure 2: Location of the province of Salzburg in Austria (left); and physical map of Salzburg indicating the two regions where data was collected: the hilly Flachgau and the mountainous Lungau (right)

1.2 Demands and resource constraints that are addressed

Agriculture in Salzburg, as in the rest of Austria, is dominated by small- and medium-scale **family farms**. Maintaining family and regional traditions plays an important role in farmer's identity and motivation to maintain farming, even if part-time. Also, much of agriculture – especially in mountainous areas – is extensive and thus contributes to maintain a high level of biodiversity as well as the cultural landscape valued by both Austrians and tourists. However, this farming system is increasingly under pressure by modernisation.

Indeed, despite the political rhetoric expressing the intention of maintaining family farming, the pressure to **'get big or get out'** is widely felt. Large, mechanised farms, which focus on reducing production cost are often presented as the pathway to a successful future (e.g. by the Chamber of Agriculture). However, this model is resisted by most (not all!) farmers, as they fear the associated **treadmill** of investing in larger barns and larger machinery (thus increasing the debt load), pushing them to rent additional grassland for feed (with high – and increasing – rent prices) (see Quote 1). More milk cows also increase the labour load, thus leading to additional investments (e.g. in a milking robot) to reduce the labour demand. But to make the robot cost-effective, additional cows are needed (at least 40 cows are needed for a milking robot to make economic sense (Pelzer, 2012)). Thus the treadmill keeps turning, pushing farmers ever deeper into the intensification pathway, with few options to break out of the vicious circle. This is perceived as problematic, especially in a time when the future developments of the dairy sector is highly uncertain (e.g. the volatility of milk prices in the past, the abolition of the milk quota system in April 2015, the new CAP programming period (2014-2020), the discussions around a new regulation for organic farming)

Quote 1 – Pressure to build large barns

"In the last five years, there was a certain dynamic in the Lungau, where many barns were built. And those who built, they built at least three times as large than they were before. Some barely have own grassland, so it is all dependent on renting land (…). The tendency towards growth is certainly there. I am not sure whether it is healthy, the way that it is currently being done. But of course everybody needs to take that decision for himself. (…) If you invest, you also have to justify it based on economic calculations [to be eligible for subsidies]. And it is hard to justify building a new housing that costs 500-600.000 Euro for just 15 cows. So you have to play with the numbers, and you end up with 40 or more cows. Then you can justify the investment on an economic ground. And that's what gets built." Interview 24_KurtF:78-82, conventional

The modernisation treadmill (Fig. 3) not only undermines the traditional model of family farming, it also pushes them to increase the use of purchased input to intensify production, esp. feed for dairy cows. This increases the dependence on imported inputs (e.g. soy meal) and at the same time reduces the use of extensive alpine meadows in summer. However, if these alpine meadows are not mowed or grazed (for lack of time), they tend to afforest over time, thus **threatening** their rich **biodiversity** as well as the broader **cultural landscape**.

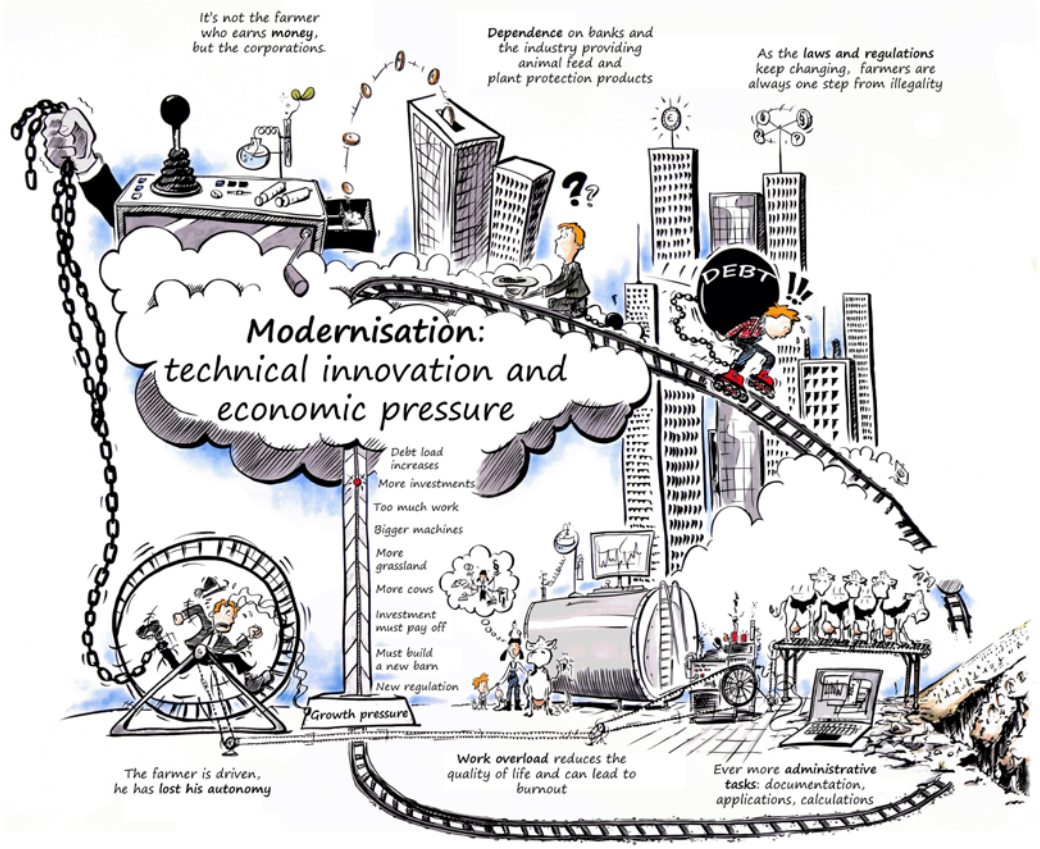


Figure 3: Modernisation is perceived as a vicious circle by dairy farmers, driven by the pressure to invest, the high workload and debt. They feel they are 'on tracks' with little autonomy

Farmers also point out the power of **supermarkets** as a challenge. They dictate not only prices, but also add to the production specification, especially for organic farming. Indeed, to attract customers and build customer loyalty, retailers position themselves as being more environmentally friendly (thus offering healthier products), to care more for animal welfare that competing retailers. As a result, requirements (and thus production constraints) to be implemented to supply retailers increase all the time. For example there are discussions regarding further restrictions of dehorning (compulsory use of anesthetic, subsequent pain therapy) or even ban of dehorning cattle (which is resisted by some as they fear the increase of accidents in the barn and increases the space needed per cow). There are also discussions regarding the need to source feed 'locally', which can be problematic in some regions. For example the Flachgau is very close to the German border, and many farmers have good and long-standing and trustful relationships with German farmers supplying feed (forage, silage maize, cereals). Yet some retailers now prescribe the acceptable suppliers of feed to those farmers who provide milk for their own-label organic milk brand. Farmers are thus asked to sever a long-standing cooperation, and become dependent on those suppliers that are prescribed by the retailer.

Also, farmers are well aware that their farm income depends on **direct payments**. They do perceive these as payments for the production of public goods (Dax and Hovorka,

2012:18). At the same time they are aware that the rules change or are adjusted quite often; and they resent that some rules do not take natural variations into account. For example the dates when manure and slurry can be distributed on the grassland are fixed, yet this does not take into consideration the regional conditions or the unpredictability of weather patterns (see Quote 2).

Quote 2 – Bureaucratic rules vs. unruly nature

"When we're talking about restrictions, then we should talk about the manure application. According to the EU regulation [applications are not allowed between] 30 November and early March. But in nature, there are no dates. Because there may well be warm days in January, as was the case this year. If you would have gone to the meadow, you'd have seen right away that the grass was there (…). But in early March there might be 14 days or even three weeks of really bad weather, which ruins the whole spring. Then, there is no bureaucrat to tell you how to deal with it. He just tells you: that's your problem." Interview 26_GregorJ:333, organic

Farmers also feel uncertain about how **regulations** are to be interpreted and applied. Over the last year there has been a very public debate regarding the definition – and thus the assessment of the size – of 'alpine feed areas' that are eligible for subsidies. The way the criteria were interpreted by the Chamber of Agriculture (and thus payments applied and received by farmers) were not accepted by the European Court of Auditors[1], so that a large number of mountain farmers are now confronted with the demand to reimburse subsidies or even to pay fines (see LK Sbg and Quote 3).

Quote 3 – Intransparent regulations

"We have farms that need to repay 70,000 euro; retroactively and with penal sanctions. And in most cases it's completely unjustified. It is the result of changing and tightening regulations. I mean, it is a joke! (…). Of course you have to calculate your feed area. But if you have five AMA controllers, you get five different results. (…) Yet you get portrayed almost as if you were a criminal" Interview 22_BastianP:28-60;64, conventional

In the mountainous areas, part-time farming is made more difficult due to the **lack of jobs** in the region. As a result many families will have one out-migrating spouse which tends to be away for the whole week, and home only on week-ends. This has a negative impact on purchasing power in the valleys (people increasingly shop at large shopping centres around major towns), and on social networks (as many will only be around on week-ends, and thus cannot attend meetings on evenings during the week).

Overall, the **most important challenges** that farmers in Salzburg face are thus: high labour load; the dependence on volatile milk prices; and the power of supermarkets which dictate prices and production specifications. To face these challenges, many farmers engage in tourism, and look for ways to add value to the milk, e.g. through processing it to cheese, or by producing organic milk.

1.3 Cross-cutting themes analysed in-depth in the case study

Resilience. Farming based on the modernisation paradigm focuses on standardisation of production methods and on economies of scale. As a result local ecological conditions are not taken into account and 'biological overrides' (Weis 2010) are used to se-

[1] In 2013 the European Court of Auditors has pointed out a systematic weakness related to pasture feeding areas, i.e. eligible land was overstated, as grassland which in reality was covered with shrubs, bushes and trees, which should have excluded it wholly or partly from EU aid, which resulted in overpayments. The error occured because Austrian authorities classified such areas as eligible permanent grassland in the LPIS databases (see also link).

cure high yields (e.g. fertilizer, pesticides, herbicides). As an alternative model, organic farming focuses on farming systems which are adapted to their ecological context and seek closed nutrient cycles. It relies on low external inputs (e.g. through crop rotations, local breeds) and focuses on preventive measures (to ensure animal health, to keep weeds at bay). It thus promotes a systemic understanding of the farm, and inherently encourages autonomy and diversity. The study also aims to better understand the interrelationship between resilience at farm-level and at regional level and how this was influenced by the high share of organic farms. Indeed, a farm cannot be considered in an isolated manner but must be understood as embedded in a social, ecological and economic context which will constrain or enable certain development options.

Learning. Given that research and extension is still primarily focused on modernised agricultural production methods, organic farmers always have had to rely on their own experimentation to refine the production system, as well as identify or create niches for marketing their products. Organic farmers thus tend to be more open to cooperation and tend to build networks, which are valuable platforms for social learning and collective action. The case study thus contributes to better understanding the role of farmer-led networks, and how they are supported (or not) by formal institutions such as vocational agricultural schools or institutions of life-long learning (LFI – Ländliches Fortbildungsinstitut).

Governance. We will focus on two aspects: Firstly on the interplay of actors that enabled the establishment of such a high share of organic farming in the early 1990s; secondly on the current dynamics which seem to inhibit a further growth of the share of organic farming. This seems to be linked to the tension between the 'mainstream' organisations that promote modernisation based on technical innovation and economies of scale, and the resistance by various groups that seek to establish a modernisation based on social innovation and an 'artisan economy'.

Prosperity. Due to lack of time and resources we could not cover this theme. This is unfortunate as the definition of 'prosperity' seems central to define an alternative to a modernization driven by technological innovation and economic 'imperatives'.

1.4 Methodological approach

As the province of Salzburg (with 7,156 km^2) is somewhat heterogeneous, we have selected two regions to conduct the interviews and workshops: the **Lungau** (i.e. the political districts of Tamsweg) and the **Flachgau** (i.e. the political district of Salzburg Umgebung) (see Fig. 4). Data was collected through individual interviews with farmers and regional stakeholders, and through workshops with farmers and regional stakeholders[2]. The interviews were recorded, transcribed in full, and coded with the 'f4-analyse' software.

[2] The protocols or summaries of the workshops can be found on the website of the Austrian case study (in German): http://www.wiso.boku.ac.at/afo/forschung/rethink/

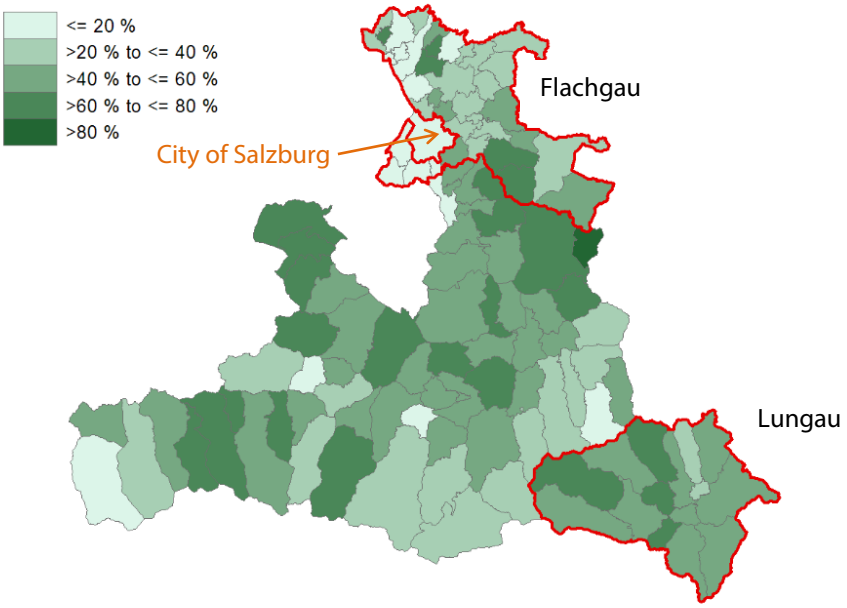


Figure 4: Map of the province of Salzburg with the share of organic farms per municipality. The map also indicates the two regions (Lungau and Flachgau) where data were collected

The **interviews** can be grouped according to the main question addressed through the interview:

- 30 interviews with farmers (14 conventional and 16 organic), focusing on the mechanisms that they perceive having enabled their farm to withstand shocks and to adapt, may be even transform their farm over the last 5-10 years. We covered all the dominant types of farms, e.g. full-time farmers, part-time farmers, farmers specialized in dairying, farmers who engage in direct marketing, and farmers who combine agriculture and tourism (esp. holiday on farm).
- 10 interviews with organic pioneers (i.e. farmers, dairy managers, officers from the organic farmer association), focusing on the reasons why organic farming was able to establish itself so successfully in Salzburg in the early 1990s (see Fig. A1 in the annex).
- 13 interviews with regional stakeholders (some of them are also farmers) focusing on the impact of such a high share of organic farms at the regional level.

The **workshops with farmers** were held to elicit farmer's values through selecting and discussing images. Between 50 and 100 images were laid-out and the participants asked to select 5 or 6 images that they associate with 'positive' feelings, and 5-6 images that have a strong negative connotation for them. Once all participants had selected their pictures, they were put on a pin-board and the associations evoked through the images were discussed. The workshops thus allowed to identify the values guiding farming, to assess what is desirable, what is 'thinkable' for farmers as well as perceived obstacles to implementing their preferences. This contributes to better understanding to what extent farmers hold traditional or modernist values, and how this relates to adaptability and thus resilience. A total of 10 workshops were held (3 full-day and 7 half-day workshops), involving a total of 81 farmers (49 women, 17 men, and 15 young farmers).

Two full-day **workshops with stakeholders** were held: one in Lungau with 12 participants, one in Flachgau with 15 participants. The aim was to capture the regional context that frames the activities of the farms. The main topics were: what are the biggest threats to the region, what was the regional impact of the high share of organic farms, and what are the strengths of the region that contribute to its resilience.

Stakeholder Partnership Group. As the case study is focused on Salzburg, it was decided not to have one group of stakeholders that would meet regularly for the whole duration of the project. Rather, it was decided to have a regional group in each study area, and a national group, which allowed to involve a larger number and more diverse stakeholders, both at the local and the national level. The **regional groups**[3] were invited to half-day workshops: on 9th Oct. 2014 in Lungau (23 participants) and on 15th and 16th Oct. 2014 in Flachgau (with 17 and 21 participants) where preliminary findings were presented, discussed and refined. To ensure intensive interactions the preliminary findings were presented in the form of three short movies where farmers speak about resilience, and in the form of two large comic-posters that depict graphically the results of the preliminary analysis (each poster is about 1 meter high and 3 meters wide, see Fig. 5). The preliminary findings and the outcomes of the workshops with the regional stakeholders were then presented and discussed with **national stakeholders** during a half-day workshop on 6th November 2014 (with 13 participants).

The short movies and the graphical representation of the preliminary results were very well received by all stakeholders, as these formats encourage discussions and are more accessible than lengthy reports. The fact that a total of 15 copies of the two **large comic-posters** were requested by various stakeholders (agricultural schools, Chamber of Agriculture, initiatives), and were provided by the project, can be seen as a measure of the 'success' of the comic-posters. Also, we were invited to hold a workshop with directors of the agricultural schools in Salzburg in January 2015, to present the project results and how it supports the current transition from content-centred teaching to competence-centred teaching (weblink).

Figure 5: Graphical representation of the preliminary analysis of the issues identified by the regional stakeholders during the workshops. Left are the current dilemmas, and how rethinking (centre) could lead to a more desirable future (on the right side). As the original graphic is 3 meters wide, it enabled interactions during the restitution workshop[4].

Overall much effort has been made to ensure the engagement of very diverse stakeholders with the project. While the focus of the research on resilience was pre-defined, we framed the specific issues in a way that it is relevant to both farmers and stakeholders. Also we ensured that **communication** with farmers and stakeholders as well as a wider audience was customized and attractive to them through a careful wording and profes-

[3] The stakeholders who participated presented following institutions: vocational agricultural schools (directors and teacher), rural institute for advanced training (LFI), Chamber of Agriculture (officials and advisors), organic farming association, farm-women organization, farmer representatives at district-level, farmer unions (affiliated with specific political parties), district administrative authorities, mayors, regional development, Biosphere park, interest/lobby group (regarding milk production), milk cooperatives, organisations such as 'holiday on farm' or 'association for cooperative agriculture', Raiffeisen cooperative, farm machinery cooperative, tourism organizations, local projects and initiatives

[4] The short movies, the large graphical representations and all protocols of workshops can be downloaded from the Austrian project website: http://www.wiso.boku.ac.at/afo/forschung/rethink/

sional layout of folders, as well as through the use of 'alternative' media, i.e. short movies and comic-posters which we felt were more likely to attract attention (and thus convey the key message) than comprehensive research reports. The aim was to make issues (and linkages between them) visible and thus facilitate future discussions at regional level. Much effort was also made to communicate in a timely manner, i.e. by organising the workshops where preliminary findings were discussed about a year after the project had started activities in the regions, and by offering all documents for download through a project website in German, where e.g. the protocols of the workshops were made available about a week after the workshop took place[4].

Relevant previous studies. In the EU-project **TERESA** ("Types of interaction between Environment, rural Economy, Society and Agriculture in European regions", http://teresa-eu.oir.at/) the Lungau was one of the case-study regions. The project focused on three supply chains: conventional milk production, wood production, and brandy (schnaps) production. The case-study report highlights the long history of part-time farming and that pluriactivity is a feature that is very relevant for mountain areas, like the Lungau. As Machold and Dax (2008) describe, a number of non-agricultural employment opportunities are linked to agriculture and forest activities. The study also investigated the social networks in the region. The formal and informal networks of the official representatives were described and some (farmer) groups were mentioned which act mostly independently from official circles. Pioneers, farmers and working groups with ideas and projects that did not fit the official line of the Chamber of Agriculture were not taken seriously. Therefore some 'shadow networks' developed, parallel to the official farmers' representation. Initially, the cooperation between these groups was very difficult. Since there have been changes in the staff of the Chamber of Agriculture, cooperation is improving and acceptance is growing slowly.

Another EU-project with connection to Salzburg is **TOP-MARD** ("Towards a Policy Model of Multifunctionality and Rural Development"; http://ec.europa.eu/research/fp6/ssp/top_mard_en.htm). The main aim of TOP-MARD was to enhance and to use the concept of multifunctionality as an instrument for rural development policy. This included an analysis of the economic, social, cultural, ecological and geographical effects of agricultural multifunctionality. The Austrian study area was Pinzgau-Pongau, a mountainous region in Salzburg, with a high share of organic farming. Surveys based on standardised questionnaires were made to assess the local perspectives and values relating to multifunctionality and quality of life. Both farm households, companies and entrepreneurs in the rural area were surveyed. In the project a system dynamics model (POMMARD) was also developped. The results show that the challenges and opportunities linked to multifunctionality are specific to regions, and these specificities need to be taken into account (Dax et al., 2009; Dax and Hovorka, 2012).

The Lungau, one of the two regions of the Austrian case study, includes an UNESCO Biosphere Reserve: 'Salzburger Lungau und Kärntner Nockberge' (weblink). In the interviews held in the Lungau, farmers and stakeholders expressed different perceptions regarding the impact of the Biosphere Reserve[5]. Nature protection, agriculture and regional development are strongly interrelated issues, resulting in new opportunities and projects, but also harbouring the potential of conflicts. To understand the perception of farmers living and working within Biosphere Reserves, including the Lungau, a project

[5] Broadly speaking, the interviewed farmers had two stances regarding the Biosphere Reserve. On the one hand it gave rise to new opportunities for the region (better marketing in tourism, publicity for the region), on the other hand farmers fear restrictions in farming (yet another institution that interferes with farming). However not all interviewed farmers in Lungau took a stand regarding the Biosphere Reserve, and it is not a focus within the Rethink project.

started in January 2014. "**Biosphere reserves** - Driver for innovation or hindrance. Perception and point of view of farmers in Biosphere reserves" (weblink). The project focuses on the analysis of the social structures, strengths and possible barriers that influences the work of different interest groups. The aim is to help improve the mutual understanding and decrease existing conflicts and barriers. Indeed, Biosphere Reserves serve as model regions for sustainable development, agriculture and nature protection are key elements and the support and commitment by farmer are essential (Humer-Gruber, 2013).

2. Results and discussion: addressing constraints, responding to change

2.1 'Resilience'-related findings

Adaptability and transformability at the farm-level

The analysis of the interviews shows that the strategies that farms in Salzburg follow to ensure their persistence can be grouped into two broad strategies (Fig. 6), which is roughly reflected in the **diversity of activities** on-farm.

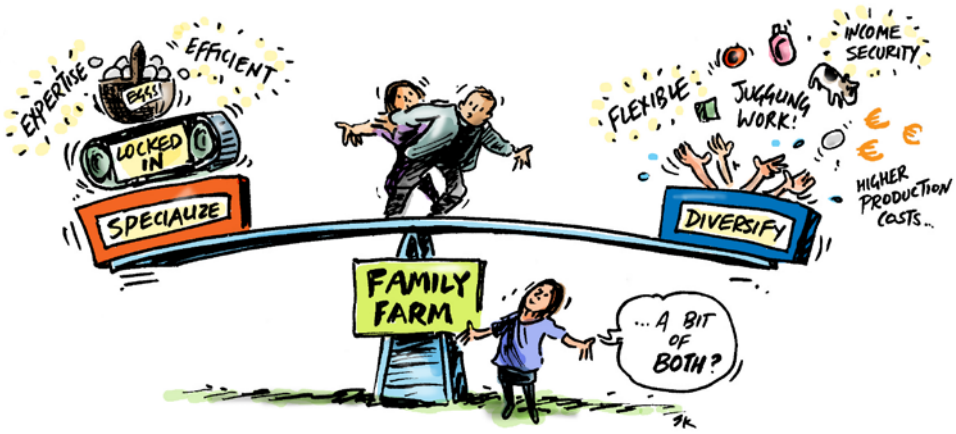


Figure 6: While some farms choose a clear specialisation strategy, most farms diversify to higher or lesser extent, thus balancing the strengths and weaknesses of both strategies

Some farms **specialize and intensify** milk production, focusing on growing so as to take advantage of economies of scale. This capital-intensive strategy is more frequent in the areas favourable to farming (i.e. the Flachgau). These farms tend to have a low level of diversity, i.e. often have only one activity on-farm (dairy cows / milk production) and no off-farm income (or it plays a small role). These farms are usually managed by full-time farmers, are technically and economically very efficient, and often have a high level of expertise in milk production. However, they face the negative environmental impact of their production methods (esp. groundwater pollution and soil compaction by heavy machines), and tend to have lower animal welfare levels (lower use of pasture, high level of productivity per animal which leads to a reduced productive life). Overall they are highly dependent on external inputs and on the price for milk paid by dairies. They are under pressure due to a higher debt load and have high labour demands, and sometimes feel 'locked in' a specific path. They also face limits to expanding production as it is difficult to find grassland for rent; and if they do, prices are very high. However to maintain their direct payment, they cannot exceed two Livestock Units/ha[6], so that increasing the number of cows necessarily implies finding additional land to rent. Interviewed farmers thus pointed out that "land is the new quota" that limits production levels (Quote 4).

[6] In the current agri-environmental programme the limit is defined in livestock units/ha. In the new programming period which starts in 2015, the limit is defined in kg N per ha UAA (170 kg N/ha for conventional farms, 150 kg N/ha for organic farms).

Quote 4 – Land is the new quota

"What is becoming increasingly visible here: the land is the new quota. No farm can increase milk production. A farm has to give up so its land [can be taken over by another farm]. The rent prices are crazy." Interview 15_MartinH:89, organic

Most of the farms **diversify** and search for alternative sources of income to secure family income. These farms tend to be smaller and often in areas that less favourable to agriculture. They often have a diverse set of activities on- and off-farm, including renting rooms or apartments to tourists, or using products from their forest. As the example of the interviewed farmers show, they are also more likely to seek niche markets, such as producing fish (in a former pig barn), geese, turkeys, bread or vegetables. If they are close to towns, they are also more likely to engage in direct marketing (e.g. of fruit and vegetables in the town of Salzburg). Off-farm gainful employment covers e.g. employment as a school teacher, at a factory, as a digger operator, office work for a machinery ring or driver of large machines, insurance agent, inspector for organic certification, offering winter services for the municipality, being a skiing instructor, or being self-employed in carpentry or ironwork. Next to engaging in a variety of on- and off-farm activities aimed – among other – at generating income, various members of the farm family also engage in community life, e.g. through the local fire brigade, music societies, societies that cultivate regional traditions, various church-related activities or informal groupings to pursue specific interests (Fig. 7). However, as the various family members juggle different tasks and activities, they often suffer from a high labour load, which might lead to a break-down in case of an unexpected shock such as a parent needing nursing care (Darnhofer and Strauss, 2014).

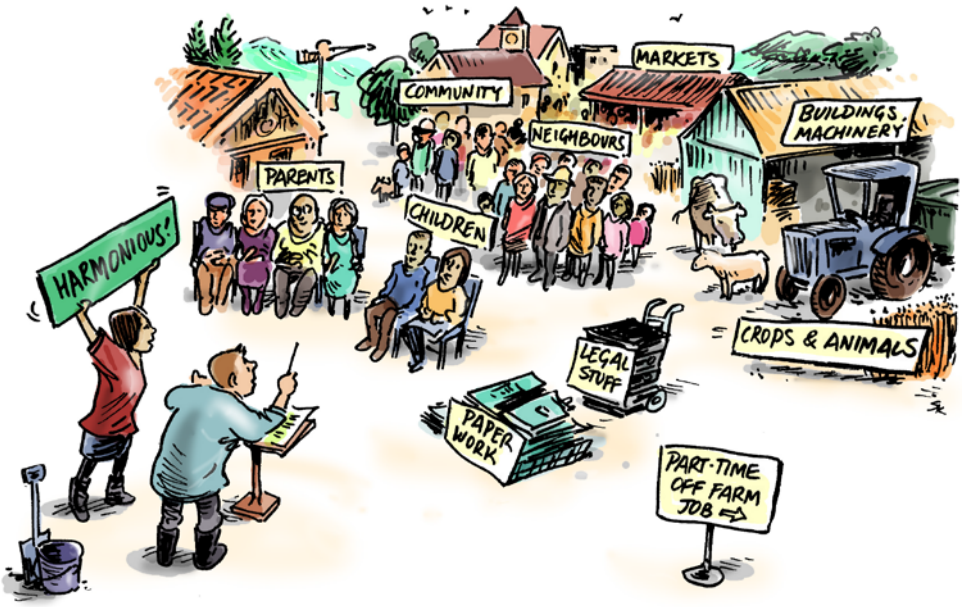


Figure 7: Farmers have to juggle many tasks, both in agricultural production, administrative matters, as well as within the family and in the community

Adaptability at the regional level

At the **regional** level the **economy** of Salzburg is dominated by the tertiary sector, which provides about 74% of employment (Land Salzburg, 2014). This comprises tourism, trading (such as the large supermarket chains Billa, Spar, Hofer, dm) and other services. The largest employer is the provincial government, followed by the city of Salzburg and the Salzburg AG for Energy, transport and telecommunication (AMS). However there is also some industry, with major plants e.g. by Bosch, Sony and Liebherr (AMS). Overall Salzburg offers a fairly diversified economy, which offers a broad range of employment

opportunities for part-time farmers as well as diverse marketing opportunities for farm products and services, which are fairly independent (i.e. a crisis in one area is not expected to spread to other sectors).

Regarding the **dairy sector**, especially the Flachgau is in the advantageous position to have a choice of larger dairies (both in Austria and in nearby Germany), as well as a broad range of smaller dairies, including cheese dairies. In the late 1950s the national Milk Board decreed some areas where the use of silage was prohibited ('Silosperrgebiet'). The aim was to reduce the likelihood that a specific bacteria which is found in silage (*Clostridium sp.*), contaminates milk destined for the production of cheese, esp. Emmentaler[7]. While the prohibition was lifted in 1993, many farmers upheld the practice to maintain the production of cheese. However, it is a production challenge, as the hay needs to be dried on the grassland, which means that a sunny period is needed at the 'right' stage of grass growth; and requires large machinery to be able to cut large areas in a short time. With the development of the drying technology, it became easier (if more expensive), as 'almost-dry' hay could be dried in the barn. However, it now allows to set 'hay milk' apart. In 2012 the 'ARGE **Heumilch**' submitted a request (weblink) for the protection of 'hay milk'[8] under the TSG - 'traditional speciality guaranteed' label (Council Regulation 509/2006). This is but one example of an initiative where farmers (both organic and conventional) seek to identify novel niches that allow value-added marketing of milk and dairy products.

Collaboration

Discussions during the workshops with stakeholders showed that **collaboration** remains difficult, especially across sectors (e.g. between farms and hotels or restaurants). This is exemplified by the UNESCO Biosphere Reserve in the Lungau (weblink), which is meant to promote an integrative regional development and is putting substantial energy at initiating participatory processes, but finds progress difficult.

Within conventional agriculture, there are fairly rigid structures, with clear **hierarchies** within established institutions such as e.g. the Chamber of Agriculture, vocational agricultural schools, or training centres (LFI). Workshop participants from these institutions complained about the lack of collaboration even within the institution (even for fairly basic items such as hand-outs explaining a new procedure, or information as to which courses are particularly popular).

Collaboration seems to be easier in informal institutions, in various associations (in Lungau most people will be members in several associations or societies and will contribute actively), and among organic farmers, which have a tradition of cooperating.

This is not the most favourable environment for **social learning**. During the workshops, participants extensively discussed the challenge to overcome the widespread fear of los-

[7] If spores of *Clostridium tyrobutyricum* are present in raw milk, it causes the 'late blowing' defect in semi-hard cheeses such as Emmentaler, Gouda or Edamer. The defect is characterized by eyes, slits and cracks in the cheese, as well as abnormal cheese flavour from butyric acid.

[8] Hay milk corresponds to the traditional way of feeding cows: in summer they graze or are fed freshly cut grass, in winter they are fed hay, and are supplemented with some concentrate. The use of silage is prohibited. This traditional production practice is promoted to preserve the cultural landscape as marginal grasslands (low productivity, on steep slopes) is harvested as hay, and to increase animal welfare as the cows often graze in summer and the heifers usually spend the summer on the alpine meadows (thus ensuring that the meadows disappear due to creeping afforestation). Also, the milk is seen as tasting better as the cows eat diverse grasses and herbs, and as being healthier as it contains a higher share of omega-3 fatty acids. As producing high-quality hay is dependent on having extended sunny periods at the 'right' time of grass growth, hay milk is only produced in regions where the use of silage was prohibited.

ing out, fear of failing or making mistakes (and thus losing face). This is expressed in the fact that problems are not discussed openly, but glossed over (see Quote 5). For example if a farmer built a new freestall barn, he is unlikely to openly discuss planning errors, which would allow the next farmer to avoid them. Rather, after the fact, the farmer would say: 'Ah, but I could have told you that this would not work!' Workshop participants also noted that often young women would have innovative ideas, which are too often crushed by the older generation who fear the disapproval of the community if something 'different' is done on their farm, especially given that there is always a risk that the innovation will fail, making them look 'stupid'.

Quote 5 – (Not) Learning from each other's mistakes

"As we converted to organic farming, there were working group evenings. I think they still exist, but not in our district. And there was an honest exchange of opinions [experiences]. If one of the farmers made a mistake, then he shared it, so that the others would not repeat it. That's not the case anymore. Between conventional farmers it was always like that: if I make a mistake, then I will not say so. Firstly, because then I look stupid, because I made a mistake, and it is not nice to make mistakes. And the others should also make the same mistake. That was always typical for conventional farmers. Between us organic farmers, as we started to come together, it was not like that. But I think it changed a lot. Now there are many farmers who are organic because they get more money for their milk, not because they are committed. (…) I think they are not so open. They only look at it: 'how am I going to make the most of it for myself?' Firstly regarding money. And second that I am well seen by the others. So if I admit to making a mistake, then the others will not think so highly of me. And why should I admit it, then the other has an advantage. Kind of like that. It's [the solidarity] just not as strong now between organic farmers, as it was when we started." Interview 07_HubertL:110,112, organic

Despite this generally unfavourable environment for social learning, there is a significant **minority** who is invested in **experimenting with new ideas**. There is also a widespread acknowledgement that a renewal is necessary, as traditional farming is not future-proof (esp. given the new expectations regarding quality of life on a farm such as not working all the time, having enough time for hobbies, going on vacation). At the same time, the model promoted by the established institutions ('get big or get out') is not attractive to many farmers. This translates into a broad range of more or less (in)formal networks and initiatives which seek value-added products (e.g. BioArt or Hochleitner which both produce chocolate), independence from large dairies (e.g. MiniMolk, initiated by four farmers in 1996 who process their milk, mostly to yoghurt, or Käse Rebellen which produce cheese using hay milk, or Mattigtaler Hofkäserei, a family farm producing organic cheese), small wellness spas on farms (e.g. Tonibauer), or hay-milk (Heumilch) and the associated 'organic hay region' that promotes regional cooperation between farms and tourism (Bio-Heu-Region, initiated in 1996 by 13 organic farmers), or Slow Food Lungau (which promotes among other the traditional mountain rye 'Tauernroggen', which is used for specialty bread and in a craft beer). There are also joint direct marketing activities by organic farmers. They may cooperate and run a common farm shop (e.g. Aglassinger Biobauern) or they supply the farm shop of one farmer, which then has a broader offer (e.g. Hofladen Joglbauer).

Most of these (in)formal networks are not only involved in **double-loop learning** (i.e. changing the frame of reference, calling into question the guiding assumptions) but also push for triple-loop learning (i.e. a transformation of the structural context and factors that determine the frame of reference, e.g. change in regulatory framework). Indeed, the leaders and associated 'shadow networks' contribute to preparing the system for change by exploring alternative system configurations. Such networks break away from existing power networks leading to a new understanding and new approaches to farming. They

offer informal settings that open innovative discourses (rather than the bargaining and defending of entrenched positions that characterize formal settings).

They promote an '**artisan economy**' that caters to the demand for 'authenticity' and to citizens who want to engage in ethical consumption. They promote creative micro-enterprises that offer 'authentic' products and offer a connection to the famer through communicating the skill required to produce the product and the time needed and spent to make it, they are indeed often handmade and linked to a specific place. This caters to the demand for mindful food experiences, in a 'throw-away' society, dominated by mass-produced industrial 'food from nowhere'. The products might not be cheap, but they convey craftsmanship and knowledge, authenticity and link to tradition and place. They not only redefine food products, but also linkages between producers. Indeed, mostly they are cooperative endeavours (rather than an isolated innovative individual promoting his/her own idea). While they may partly be competing with larger producers, they also cooperate with them, e.g. the Stigl brewery which produced a specialty beer using the mountain rye (Tauernroggen); the organic supermarket brand Ja!Natürlich heavily promotes the hay milk, securing the sales through nation-wide distribution. Thus, while most of these initiatives produce only small volumes and thus have very small market share, they tend to be highly visible, both in the region and with consumers nation-wide.

The balance between permanence and change

To be resilient, a farming system needs an appropriate balance between change and permanence. Absence of change results in the inability to adapt. Absence of permanence – and predictability – results in the inability of actors to coordinate collective action and improve routines and practices. Overall in Salzburg there seems to a sound balance between permanence and change, even if it might be tipped a bit in favour of permanence (Quote 6).

> **Quote 6 – Balance between permanence and change**
> "The famer is also a bit, a bit… it takes a little longer with farmers. That he [reaches the point where he] says 'I need to rethink, because it is not possible to continue like this.' (…) They say: 'well, some things I can still do myself, there I do not need the others' or something like that. You are kind of trapped in the routine. But you also have to be flexible, be able to rethink." Interview 14_SabrinaH:119, organic

Permanence has positive and negative aspects. Through the deep roots that many farming families have in the region[9], there is a real commitment to the region, to the cultural landscape, to farming. As workshop participants pointed out, this spurs innovation as families look for ways that enable them to keep farming, mostly by identifying new ways to communicate and promote the unique qualities of products from the region, i.e. seeking ways to address emerging needs in the broader society (e.g. offering hot-tub convenience on an isolated mountain hut to stressed urbanites; offering fresh milk, fresh homemade butter and cream cheese for hikers on a mountain hut; offering 'fairy tale hikes' or 'adventurous torch-lit hikes' in the surroundings of the farm). However, seeking permanence also has less positive aspects, as when the older generation on farm supresses innovation for fear that it might spur negative comments in the village community; or when extension agents keep promoting the same old recommendations and dismiss new ideas (as reported for example by one of the interviewed farmers, who was

[9] In the province of Salzburg, if there are documents to attest that a farm has been handed down within the same family for over 200 years, it receives the title of 'Erbhof' (hereditary farm). The oldest documented Erbhof has been in the family since the year 1331 (Salzburgwiki.at).

discouraged to build fish holding pens in a building formerly used as a barn for pigs… but he went ahead nonetheless and now successfully markets his fish).

Despite these pressures the broad range of initiatives – many of them initiated by organic farmers – show that it is possible to experiment with alternatives. However, workshop participants noted that it is getting increasingly difficult, as the number of regulations are constantly increasing. Many of these **regulations** (e.g. hygiene regulations applicable to processing food) are designed with industrial plants in mind and are almost impossible to implement in a cost-effective way in an artisanal setting. Similarly food labelling requirements (e.g. the EU Regulation 1169/2011) are designed for industrial settings where the mixture and process is entirely standardized, rather than for artisanal production where it is important to slightly adapt the recipe in each batch, based on the specificities of the products used. However, this implies that for each batch a new analysis of the nutrition information by a laboratory would be necessary, which is very expensive. Also, while support for investments is available, they are usually targeted towards large-scale investments, and involve substantial paperwork. This is not in line with the needs of farmers who are willing to engage in processing, but only at a small scale, who want to experiment and see how it develops, without engaging into a major investment right away.

Autonomy and (network) embeddedness

For a farm to be resilient, it needs – among other – to balance autonomy (enabling it to change) and embeddedness in networks (enabling efficiency and providing it with information). The small- and medium-scaled farms, especially the organic farms, have a fairly high level of **autonomy**. For example, they are more likely to keep cow breeds that are not genetically primed for a very high milk yield, so that they are still able to adapt their milk yield depending on the feed they receive. This enables the farmer to rely for a good part on the feed produced on-farm, in both 'good' and 'bad' years (e.g. low hay yield due to drought or due to a wet summer).

However, the vast majority of dairy farmers are dependent on dairies to collect their milk. Given the **liberalisation of the milk market** (i.e. the abolition of the dairy quota per 1. April 2015) it is unclear whether all dairy farmers (esp. those in remote mountain locations) can rely on their milk being collected, and if it is collected, under which conditions (i.e. frequency, separate collection of organic milk which affects the ability to achieve a price premium). Also, the liberalisation of the milk market is likely to further the concentration of dairies, making them increasingly powerful (lack of alternative dairy) and might make decision making – even in cooperative dairies – more oriented towards economic issues than serving the needs of the dairy farmers who collectively own the cooperative.

Also, all farmers are dependent on **direct payments** and need to comply with various **regulations**. These are perceived as payments for the provision of public goods (maintenance of the cultural landscape, of biodiversity) (Dax and Hovorka, 2012). The interviews and workshops show that farmers fully accept that regulations are necessary (not least to ensure a level playing field for all farmers), and that if payments are received, documentation and controls are necessary. However, farmers point out that over time the system is becoming dysfunctional and is increasingly constraining them[10]. Firstly, the way the regulations are formulated in the official documents means that they

[10] A report by the European Court of Auditors published in November 2014 pointed out that Austria is only 'partially effective' (Special Report 18/2013). Commentators attributed this less to the intent to deceive, and mostly as the result of the complexity of the rules.

are often incomprehensible to them. They thus have to rely on the 'translation' and interpretation, esp. by the Chamber of Agriculture and the controllers of the AMA[11]. Secondly, the rules are increasingly removed from the realities of farming, and what 'makes sense' to them in their specific environment, e.g. cut-off dates for certain tasks such as spreading slurry that are derived from 'average' years but do not take into account the variability in the weather for one year to the next. Thirdly, the way that rules are implemented is sometimes not transparent, e.g. when one controller criticises something that another controller, a few years earlier, said was fine; or the way the Austrian Controllers implemented it is not accepted by the Commission controllers… yet it is the farmers who have to pay a fine for rule transgression, not the Chamber of Agriculture or the AMA who recommended the approach. Fourthly, all rules are revised periodically. For specialized farms, which have only a few regulations to implement, it reduces predictability; however for diversified farms it means that they feel that they are always on the verge of illegality, as they cannot keep up with all the changes in the regulations linked to agri-environmental program, animal welfare, building code, hygiene, food labelling, food processing, tax regulations, organic farming, documentation, etc.

Overall there is a feeling that the non-agricultural population does not understand farming, yet imposes regulations and constraints on farmers that do not make sense (i.e. do not contribute to environmental protection, healthier food, etc.), mostly because e.g. in processing they have to comply with the same regulations as industrial processors. They are aware that the fact that the number of regulations they have to comply with and their on-going changes limit their entrepreneurial ability, and their adaptiveness. Also, the increasing number of regulations farmers are expected to implement also convey the overall feeling that farmers cannot be trusted (or the regulations and controls would not have to be upped all the time!?). Yet there is little communication about this in the public media, so that farmers feel that they keep having to explain why the direct payments are justified, as people might envy them for the financial support they receive. Moreover, successful farming is increasingly becoming dependent on doing a good administrative job, rather than on understanding natural cycles, crop and animal production (this led to a saying: "Wer schreibt, bleibt!", i.e.: 'Those who write, stay'). Yet most farmers are passionate about working with nature, and resent the increasing burden of their bureaucratic workload.

Despite increasing labour demands, reducing the time that farmers can spend off-farm, there are numerous **networks** in the region. These include both processing and marketing initiatives, and associations that are non-profit oriented, e.g. associations to maintain traditions (often linked to church festivities), the voluntary fire brigade, choirs, hunters, etc. These offer valuable platforms to further the exchange between members, and they regularly organise fairs and events that contribute to integrating the whole community (i.e. farmers and non-farmers).

At the **regional** level, **autonomy** is difficult to assess. Salzburg is clearly embedded in global flows, both through exporting fresh milk and dairy products, importing feed (esp. soja-based), and through dependence on international tourism (e.g. Zell am See has successfully established itself as summer destination for tourists from the Arabian peninsula, through promoting the (relatively) cool and rainy weather and a green landscape).

[11] The AMA (AgrarMarkt Austria, i.e. Agricultural Marketing Austria) is the body in charge of controlling the payments in the framework of the CAP

Main tensions, fears, threats, challenges, and sources of resistance to change

Overall, at **farm level**, the main challenges were seen in:

- the high labour load: as there is very rarely hired labour on family farms, the workload is distributed among family members. In many families the older generation still works as long as they can, and the younger generation is dependent on their contribution. It is challenging to juggle different activities both on diversified farms and on those farms where one spouse works off-farm.
- farm succession and the joint work between generations: the different ideas and approaches to farming often leads to tension and conflicts, which were mentioned as a source of mental distress
- the dependence on direct payments, especially due to the uncertainties involved: will they be the same in the next CAP-period? Will the requirements and restrictions increase further? How will the new agri-environmental program be structured (esp. payments for measures and restrictions)?
- the need for high capital investments to adapt the farm so that it complies with regulations and market expectations
- the volatility of milk prices; and the fear that the prices might be even more volatile following the abolition of the milk quota system in April 2015
- the increasingly demanding (organic) production specifications, mostly driven by competing supermarket labels
- the high price of land (esp. renting grassland), and thus lack of availability of grassland that can be rented at a reasonable price
- conflicts with non-agricultural neighbours.

At the **regional level**, the stakeholder workshops showed that the primary threats were seen in:

- the power of retailers, esp. of those deciding which products will be listed and thus sold in supermarkets;
- the lack of knowledge of consumers, who are often blinded by idyllic and romantic pictures conveyed in advertisements for industrially processed food, which makes it difficult to market truly handmade, authentic products;
- bureaucratic 'red tape': there are too many regulations so that it is difficult to know exactly what is allowed in a specific setting, and innovative entrepreneurs often feel like they do not fully comply with the legal regulations; and farmers resent having to spend so much time with 'paperwork'. Also, while there are a number of programs that would fund initiatives, most of them are too complex, too rigid, or fund only large projects. There is thus a lack of 'venture capital' that can be accessed easily, especially since often only small amounts are needed as 'seed money'.
- Lack of cooperation, especially between sectors, i.e. between agriculture and tourism. There is still too much orientation along the food-chain in agriculture, or even an understanding that farmers are only in charge of producing raw products for the agro-industry, not of marketing or processing them. They thus do not quite understand the needs of e.g. restaurants, although they are often interested in local specialities and do not require large quantities.
- General fear of change, lack of willingness to try something new, even if it may fail, mostly because of the fear of malicious gossip in the village. Indeed, there is a lack of open discussion, where both successes and failures are discussed.
- Lack of time by all actors: administrators are overwhelmed with bureaucratic demands and reporting, extension agents are mostly busy with supporting farmers with their direct payment applications, farmers are overstretched as

they have to juggle various tasks on- and off-farm. This lack of time often leads to the inability to have enough time to see and seize new opportunities (Fig. 8).

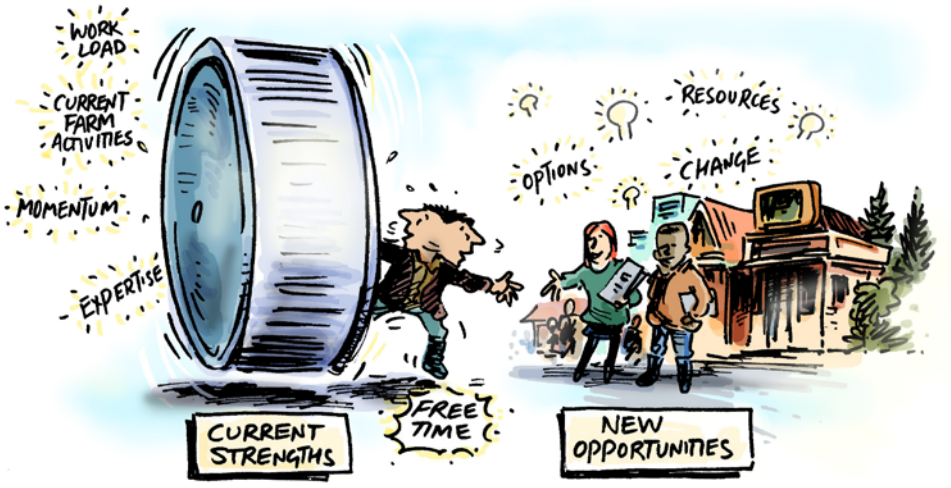


Figure 8: Many farmers face the dilemma between investing available time in developing current strengths, and discussing with others about emerging opportunities and how they may be translated into new activities

Main strengths of agriculture in Salzburg

While dairy farmers produce a commodity that is traded on global markets (and thus prices fluctuate based on global development or shocks in other countries), the high share of organic farmers does give them access to a niche market. Indeed, the demand for **organic milk** is high, and it does not seem likely that it will drop. Understanding that given the (relatively) small farm size and the constraints of a 'less favoured area', they cannot compete on price, farmers have developed new niches such as 'hay milk' which address the demand by urban consumers for authentic products. While the impact of the liberalisation of the dairy market is unsure, it is likely that niche products (hay or organic milk) will fare better than 'standard' milk.

During the workshops, a major strength was seen in the farmers' ethic of hard work and their deep roots in the region. **Farmers** appreciate the lifestyle and the beautiful landscape, and have shown in the past to be adaptable, i.e. been able to identify ways to take advantage of changes in the broader context such as technological change, economic incentives, or societal demands for public goods. The vast number of initiatives found are a pool of experiments. Through them farmers search for new pathways, new approaches, experiment with rethinking what it can mean to run a family farm. This has been bolstered by the high level of formal education of most farmers (on production methods, technology and farm economics), which they pair with traditional, experiential knowledge.

Generally, the fact that most farms are **small- and medium-sized** is seen as a strength, as they are seen as more flexible, more able to recognize and act upon a new opportunity that arises. Large-scale specialized farms might be efficient but are often locked-in, not least because the capital-intensive production method tends to increase indebtedness (Quote 7). Similarly, the fact that there are a number of small dairies is seen as a strength, as they tend to be able to respond quickly to new opportunities. Indeed, in the early 1990s, it was the small dairies that recognized the potential of the organic niche, thus securing their own survival as well as the sale of organic milk for the newly converted farmers (Schindecker et al., 2014).

Quote 7 – Bigger also means less freedom

"And then I think, like in our area, one of the largest farmers. He built himself a new barn a few years ago. Whether he is better off financially than us, the others, I doubt that. I don't know. Because you totally turn into a servant. He only has milk, is totally dependent, from it all. And has to follow that track." Interview 14_SeppT:80, organic

The farms' adaptive and transformative capacity

At **farm level**, the perception was that what allowed them to persist, adapt and prosper (Quotes 8) over the last 20-50 years was:

- the strong solidarity within the families, i.e. that the generations and spouses stick together, are committed to keep the farm going;
- the social network, i.e. the fact that there are helping hands from extended family, friends, neighbours when they were needed. This allows labour peaks to be managed without having to pay for labour;
- that the work is meaningful and fulfilling, that they do what they love and love what they do;
- the strong sense of identity: being a farmer is who they are, not just a 'job';
- that the smaller production units allow them to focus on product quality and customer service, and be more flexible, responding to customer demands;
- that the fact that the farms are small allows them to be more in touch, e.g. they can observe each cow and thus notice right away if a cow is getting sick;
- the high education level of farmers;
- that they are not heavily indebted, that they invest in small steps, thus they remain more responsive to changes in the context;
- that the farms are diversified, thus avoiding a one-sided dependency on the income from milk sales;
- the awareness that they do not have to grow bigger, but that getting better (i.e. producing better quality) is also a path to success.

Quotes 8 – The secrets of success

"Growth, yes. But as I said: we always grew in little steps. Not in big steps. We did not use outside capital. That is very important: first get better, then grow. (…) First be aware of what you have. Make the most of these resources. That is fundamental. And then consider growth. Don't grow madly without having a strategy. What is your productivity per cow? What could you sell per cow? First sell your milk. First make sure that your cows, that the resources you have are used and used well, and your land is used well. And then you can grow. Those are the fundamental principles. Don't just grow on one end, until (…) the sky. The trees will not grow until the sky. The trees that grew quickly sometimes fell down because they lacked roots." Interview 16_MaximilianH:92-96,98, conventional

"You always have to think ahead, don't stand still. Because if we had continued as before, as 20 years ago, then my son would probably not enjoy it. (…) You have to enjoy it, and you have to be a bit of an idealist, in this profession. (…) And keeping Sunday free, I must say that. That's when we have time for our hobby. And I am convinced that you have to do that. Because we'd have enough work for Sundays also. Some farmers just can't do that, that they do not work on Sundays. (…) But that way, on Monday we have energy for the coming week." Interview 21_BrigitteP:153,157, conventional

"Our advantage is certainly that we have a broad base. That is a key advantage. Because with all the changes, they do not affect all areas at the same time. May be at one time farm tourism doesn't work so well (…) then you can buffer that." Interview 15_MartinH:84, organic

2.2 'Governance'-related findings

In RETHINK **governance** focuses on the dynamic and complex mechanisms that structure the design and implementation of policy (Dwyer, 2011). The concept has been defined as "the development of governing styles in which boundaries between and within public and private sectors have become blurred" (Stoker, 1998: 17).

In our case study we could not identify a 'governance partnership'[12], possibly due to the size of the case study (organic farming in the province of Salzburg) and the long time period we are covering (from the establishment of organic farming in the early 1990s till now, see Fig. 9). Indeed, organic farming was more the result of emergence of an innovation process managed by some networks (Schindecker et al., 2014), and we found no indication that it is currently a (unified) 'project'.

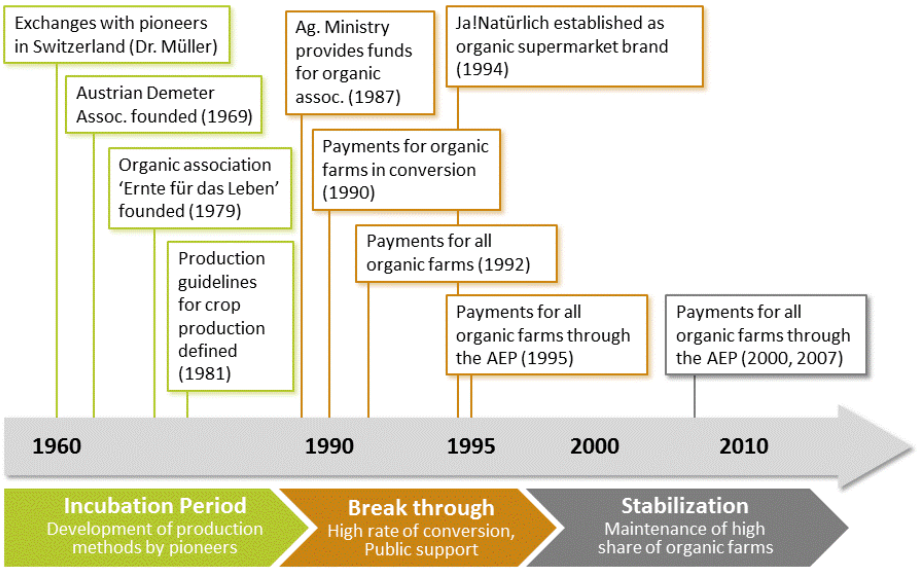


Figure 9: In the development of organic farming in Austria generally and specifically in Salzburg, three periods can be distinguished: a long incubation period, a very dynamic period in the early 1990s and a stabilisation since.

Establishment of organic farming in Salzburg

The number of organic farms in Salzburg increased strongly in the years 1992, 1993 and 1995 (see Fig. 10). The reason for this dynamic development was the interaction of several factors (Schindecker et al., 2014): (i) the knowledge about organic production methods was available, as there were organic pioneers since the 1950s (Jurtschitsch, 2010) and they spread their knowledge especially through the 'working groups' (Arbeitsgruppen) of organic farmer associations (BioAustria, Erde&Saat); (ii) there is a high share of grassland and alpine pastures which were managed extensively, so that the conversion to organic farming was not a radical shift in production practices; (iii) direct payments were offered since 1992, first from the provincial government, then by through the federal ministry.

[12] In the case study guidelines a 'governance partnership' was defined as a set of partners, often organized as a (multi-actor) network, who is steering a particular development, managing an innovation process, making decisions.

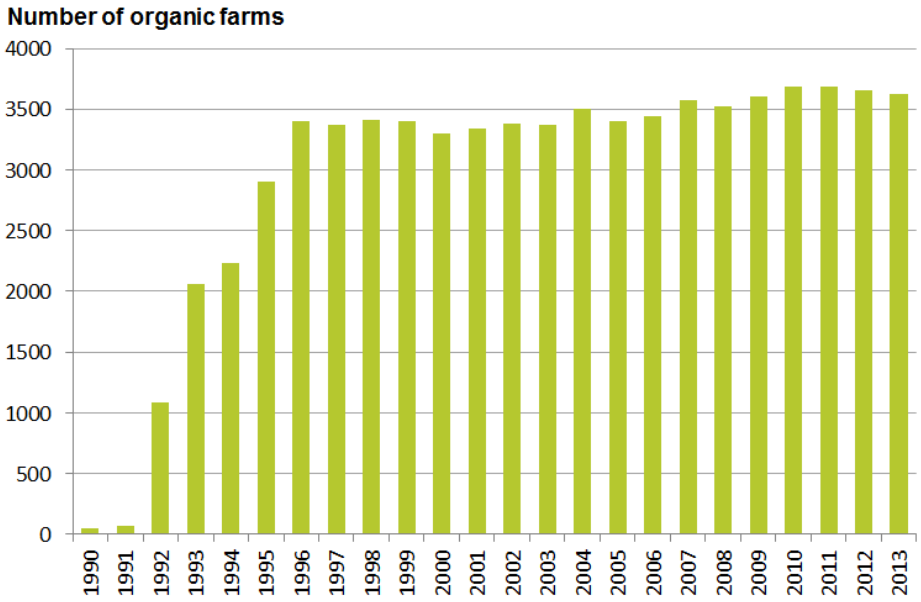


Figure 10: Development of the number of organic farms in the province of Salzburg, indicating the rapid increase in the early 1990s, i.e. just before EU-accession of Austria (in 1995) (Source: BMLUW, 2013).

When Austria became a member of the European Union in 1995 – which led to a radical change in agricultural policy – the extension agents of the Chamber of Agriculture advised many farmers to convert to organic farming, especially in the mountain regions highlighting that the changes required in the production practices were minimal. Also (iv) the sale of organic milk with a premium price could be secured, as the chairman of a small dairy in Salzburg (Pinzgau Milch) was able to arrange a contract with the organic label (Ja!Natürlich) of a large supermarket chain (Billa, later a part of the REWE corporation). The marketing through the supermarket chain secured the sales quantity of organic milk and the dairy could pay the farmers a higher price and ensured that much larger quantities of organic milk could be sold than through direct marketing. This led to the breakthrough of organic farming in Salzburg.

The role and interests of key actors

A wide range of actors are involved in promoting organic farming in Salzburg, and there are quite some overlaps with actors of conventional farming. It is also important to note that while actors are presented separately, in practice many individuals fulfil several roles, e.g. an organic farmer, may also be an elected official at the Farmers' Union (Bauernbund), have a part-time job at the local Chamber of Agriculture, be a member of an organic farmer's association and head a marketing initiative. In the following paragraphs, we list the main actors, their objectives and their role in the governance process. Representatives of most of these actors were involved in the stakeholder workshops or through interviews.

BioAustria (formerly 'Ernte für das Leben') is the largest organic farmer association in Austria. In Salzburg about 51.8% of organic farmers are members of BioAustria. Their objective is to support members, e.g. in their direct-marketing efforts and to address challenges in organic production methods. They also lobby for organic farming both at the provincial and national level. They were instrumental in the late 1990s when organic farming was established, as they provided advice to farmers through 'working groups' (Arbeitsgruppen) and through coordinating the organic farmers, enabling them to ne-

gotiate with retailers. Currently BioAustria is struggling with the diversity within organic farmers, making it difficult to reach an agreement, e.g. in discussions about the next steps to develop organic farming. Also, given the farmers' lack of time and the wider availability of information (e.g. through the internet), BioAustria finds it more difficult to mobilize farmers to attend workshops and evening presentations, although they would be important to convey values, and build a shared understanding of what organic farming is and discuss the next steps in its development. Young organic farmers have recently formed the group **BANG**: BioAustria Next Generation in 2011, which aims to provide a networking platform for young farmers, and is open to non-farmers as well (e.g. those who have grown up on a farm but have not inherited it) (weblink).

Chamber of Agriculture: Membership is compulsory for all farms, and its role is to represent the interests of farming and rural areas in the federal and provincial governments, by e.g. submitting proposals and expert opinions to authorities, especially in reply to draft legislation and regulations (weblink). At the local level, the Chamber of Agriculture employs extension agents and supports farmers when they fill out their application for CAP-related payments. Many services for farmers are offered directly by the Chamber of Agriculture (or in partnership with other institutions). This includes various training courses (ARGE Meister, LFI), the support for direct-marketing efforts (e.g. 'Gutes vom Bauernhof'), coordinates and supports farmers that offer a program for school trips (Schule am Bauernhof), an organisation for rural youth (Landjugend), and information (AIZ, the weekly newspapers such as the 'Salzburger Bauer'). Regarding the establishment of organic farming, the Chamber of Agriculture did play a key role in Salzburg, as it advised many farmers to convert to organic farming, pointing out that the changes required in the production practices were minimal (Schindecker et al., 2014). However, currently the provincial Chamber of Agriculture in Salzburg makes very little effort to promote organic farming. It might be symptomatic that in a recent overview-brochure of agriculture in Salzburg there is no mention of 'organic' whatsoever… although one might think that it would deserve mention that 49.3% of UAA is certified organic (weblink), but it may indicate an apprehension of conventional farmers, which might become a minority. At the national level, the Chamber of Agriculture plays an important role in politics, as it is one of the four member of the 'social partnership' (Sozialpartnerschaft, the three other being representatives of workers (ÖGB), the employees (AK) and the industry (WKÖ)). Many political decisions will be vetted with the 'social partners', who will seek a consensus. This implies a powerful position for farmers in the political decision-making process at federal level.

The **Bauernbund** is the main political farmer union, and a sub-organisation of the Austria People's Party (Österreichische Volkspartei, ÖVP). There is a very close connection between the Bauernbund and the Chamber of Agriculture, so that in practice most positions at the Chamber of Agriculture are held by members of the Bauernbund. This applies to the local, regional, provincial and even national level, as many federal ministers of agriculture are (or have been) members of the Bauernbund, i.e. the ÖVP.

Federal Ministry of Agriculture[13] supports organic farming through working on an Organic Action Plan, providing funds for organic farmers through the Agri-Environmental Programme (ÖPUL). It also promotes regional products, through so-called 'delight regions'[14] (Genussregionen), which have been established e.g. for vegeta-

[13] The full name is: Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management

[14] These 'Genussregionen' have the same aim as the PDO (Protection Designation of Origin) and PGI (Protected Geographical Indication) labels at EU-level. However, PDO/PGI labels are so far not very widespread in Austria.

bles (Walser Gemüse), cheese made from hay milk (Flachgauer Heumilchkäse) or potatoes (Lungauer Eachtling). Also, the Ministry of Agriculture is in charge of the Agriculture and Forestry Colleges (HLFS, for children 14-19 years old), and thus influences the curriculum of these schools. Finally, the Ministry influences the research agenda of agricultural research stations.

The **city of Salzburg**, is supporting BioAustria in its efforts to actively promote organic farming, among other through increasing its visibility. An example might be the fact that for the fifth year in a row, the City Marathon in Salzburg is certified organic (weblink), and once a week there is an organic farmers' market in Salzburg (weblink) and there are now a wide range of shops in the city of Salzburg that sell regional organic products (weblink).

The **Provincial Government** of Salzburg (Landesregierung) played an important role in the late 1990s as it strongly promoted organic farming, among other through direct payment to organic farms. It is currently not strongly involved. The provincial government is also in charge of technical/vocational agricultural schools (LFS, for children 14-17 years old). Furthermore, matters related to nature and environmental protection are in the competence of the provinces.

Agricultural schools: There are four vocational agricultural school locations in Salzburg, which welcome children between the age of 14-17 and provide an education focusing on agriculture (usually they offer two disciplines: 'Agriculture' and 'Rural Household Management'). Most of these schools have a farm attached and all farms have been converted to organic farming. However, many organic farmers feel that there is a dearth of organic content in the course material, so that their children are not well equipped to manage an organic farm. Indeed, there is only one agricultural school in Austria that is dedicated to organic farming (in Schlägl, in Upper Austria). While the organic farmer association BioAustria had been lobbying for one of the agricultural schools in Salzburg to become a dedicated 'organic school', they are now shifting their emphasis and promote the strategy of increasing the organic-farming-related content in the course material used by all schools, arguing that it would benefit children from conventional and organic farmers to learn more about organic farming.

Research, especially the research station LFZ Raumberg-Gumpenstein, which is subordinate to the Federal Ministry of Agriculture, provides important advice for organic farmers, e.g. on the right application of slurry or how appropriate grazing management can reduce the incidence of dock (*Rumex sp.*). Indeed this research station is focusing on the extensive use of grasslands, and has promoted a focus on milk production in the lifetime of a cow, rather than maximising milk production per lactation. Thus while the research is applicable to both conventional and organic farming, the focus the extensive production methods is highly relevant to organic farmers.

Given the dependence on milk, **dairies** are a key actor in Salzburg. Some of the dairies are cooperatives others are private (owned locally or (partly) owned by international corporations). Especially the small dairies played a key role in the late 1990s when organic farming was established in Salzburg. Indeed while a large retailer was interested in selling organic milk, and dairy farmers were converting to organic farming, dairies were essential to organise the separate collection of organic milk and process it (i.e. pasteurisation and homogenisation) as well as package it for supermarkets. The smaller dairies were the first to see the potential, and later the larger dairies also entered the organic market.

Currently much of the dynamic in organic farming in Salzburg stems from **various initiatives**. The 'Bio-Heuregion Trumer Seenland' is a very good example: it was created by a group of farmers in 2004 and seeks to raise the awareness of the role of hay-based milk

production, e.g. through the crowning of a 'hay queen' each year; and actively promote locally manufactured dairy products made from hay-milk. Their efforts receive recognition, e.g. when they were awarded the Prize for Climate Protection in Agriculture (Klimaschutzpreis) in 2012, for reducing the 'food miles' as the organic hay milk is processed in the region, and for reducing CO_2 production, protecting soils and biodiversity through organic farming. Similarly the 'BioParadies Salzburgerland' promotes the networking of innovative entrepreneurs, be they farmers, processors, hotels, restaurants around the common touristic marketing of Salzburg as an organic region.

Given the importance of tourism in Salzburg, the association **Holiday on farm** (Urlaub am Bauernhof) is also an important actor. Offering rooms on farms was promoted especially in the 1980s as an additional source of income for farms. Over time farmers faced two challenges: the time required to take care of the guests (preparing breakfast, cleaning the rooms every day, discussing with guests), and the increasing expectations of guests regarding room standards. Many farms thus shifted to renting self-contained apartments. There is now also a (quality) label of 'holiday on organic farms', however not all organic farms seek that label. Holidays on organic farms are also promoted through an initiative of BioAustria (Bioferien).

While we covered a broad range of actors, two groups of **actors** are **missing** in the data collection of this study: the consumers and the rural residents that have no direct ties to agriculture. Their views are only included indirectly, i.e. through the statements of participants. Regarding **consumers**: there is an obvious demand for local, organic products, especially if these are simple 'substitutions' for other products, such as milk, yoghurt and cheese. However, it is less clear to what extent consumers can change their habits and accommodate products that are less convenience-oriented and thus require more time and skills for preparing and cooking. The **non-agricultural rural residents** were seen in an ambivalent light: they make up a sizable share of the rural residents, thus ensuring that the village does not 'die out' and securing the demand for services (e.g. shops, schools), and they appreciate the cultural landscape and the rural lifestyle. However, they are not always aware of the contradictions in their expectations towards farming: while they want to see cows grazing on the meadows, they tend to oppose such practices as driving the cows to the pasture through the village, as this might mean that the cows might drop some manure on the streets, or that side-streets are cut-off with a rope for a short while to ensure that the cows do not start exploring the village but head home. However, not all farms have their grassland in front of the barn door, making such practices necessary, if the cows are to graze in the meadows (see also Quotes 9).

Quotes 9 – Farmers and their neighbours

"As a farmer you have to take into consideration (...) of course there will be Saturdays where you need to get the slurry out. If it's not possible otherwise, it's just not possible otherwise. But you have to do your best. I mean when you know some are sensitive. We have one, where we know, and we call her ahead of time when we need to distribute the slurry. Just in case she wants to dry her laundry or something like that. Of course it requires a certain flexibility." Interview 13_LauraL: 215, organic

"And the apartment buildings grow ever closer to farms. (…) I mean in our village, the farms are all in the centre. It's all very close to one another. And around the centre, the apartments are being built. But you need to get out, to reach your meadows. (…) And for example with the dogs. I mean, they all think that every meadow, every forest is public domain. And that they can go in there at any time of day and night and trample it all down." Interview 17_OktaviaE:800-801, 917, conventional

The role of the institutional environment – policy strategies

To provide an overview of the most important policy strategies for agricultural and rural development in Austria, we selected as documents the federal agricultural law and the agri-environmental programme. Both state explicit aims that frame the actions of formal institutions.

Of the seven aims listed in §1 of the **agricultural law** (Landwirtschaftsgesetz), the top five are:

(1) Maintain an economically sound, productive, agriculture and forestry based on family farms, in a functioning rural area, while taking into consideration a social orientation, ecological compatibility and regional balance under special consideration of mountainous areas and other less favoured areas of agriculture in the entire national territory (i.e. including in less favoured areas and mountain areas)
(2) Extend the manifold income and employment combination between agriculture and other economic sectors,
(3) Ensure a market-orientation in agricultural production, processing and marketing
(4) Increase the productivity and competitiveness of agriculture, especially through structural measures, while taking into consideration a productive, environmentally friendly, socially oriented, family farm,
(5) Enable people who work in agriculture and forestry to participate in the social and economic prosperity.

Of the six specific aims listed in the Austrian **agri-environmental programme** (BMLFUW, 2014b), the top five are:

(1) Promote an environmentally friendly agriculture (and extensive use of pastures)
(2) Maintain traditional and particularly valuable agriculturally-used cultural landscapes
(3) Maintain the landscape (and historic characteristics on agricultural land)
(4) Promote the inclusion of environmental planning in agricultural practice
(5) Contribute to the implementation of national and common agricultural policy through promoting contractual environmental protection, surface water protection, soil protection and groundwater protection as well as promoting organic farming.

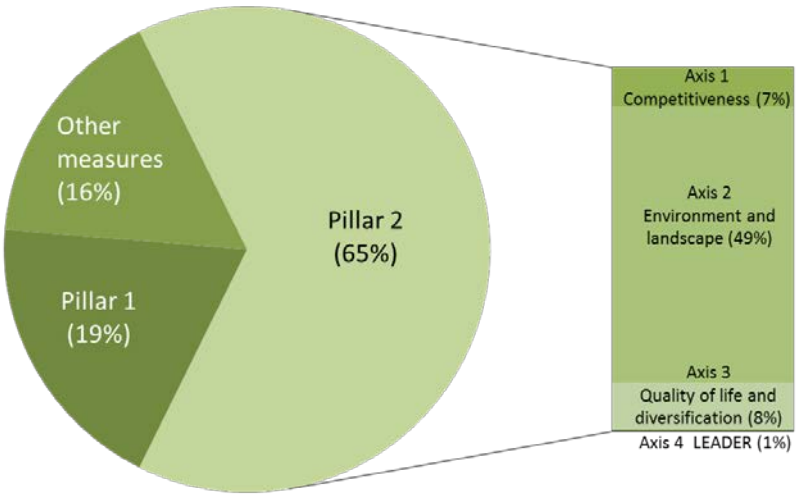


Figure 11: Distribution of public payments in agriculture in Salzburg in the year 2012 (total: 135.56 million €; source: BLMFUW, 2013:245)

These goals are mostly mirrored in the distribution of the payments in the framework of CAP in Salzburg (Fig. 11). The largest share of the budget (65%) is in Pillar 2 (i.e. rural development), and the payments within the agri-environment programme (in Axis 2) make up 49% of the total payments.

However, while the allocation of funds corresponds well with the political aims, workshop participants nonetheless point out the discrepancy between the political rhetoric (that seeks to satisfy all farmers, especially small farmers as these are an important pool of voters for the People's Party at provincial and at national elections) and the actual allocation of funds, which is **biased** towards larger farms (supported by the lobbies of the up- and downstream industry). It thus seems that the 'devil is in the details' and while funds are made available the requirements to access the funds are designed in such a way as to effectively make it hard for small farms to access them.

Indeed, the **dominant images** presented in various agricultural weekly newspapers is usually of a large machinery, articles promoting milking robots and generally promoting the advantages of technological innovation. This is also mirrored in the wide-spread discussion about the 'necessity' of 'structural adjustment' (Strukturwandel) in agriculture, which includes both the number of farms and the number of people active in farming. Indeed, with the lowering of the value of agricultural production (through lower prices for commodities), fewer families can remain in farming if they want to maintain a certain level of family income. Conversely, the current structure dominated by small farms is directly rhetorically linked to the high production costs, and thus the difficulty to compete on world markets. While small farms are not portrayed as problematic per se, implicitly their disappearance is the precondition for other farms to be able to grow and thus benefit from economies of scale and new technology. Promoting modern technology and structural adjustment thus benefits only the large farmers that want to grow further. It neglects the social costs incurred by small- and medium-sized farmers, the likely environmental impacts of production methods usually found on larger farms, the loss of cultural values linked to the upkeep of traditions by farmers, and the quality of life in rural villages.

It seems that in Salzburg the **'structural adjustment'** was effectively slowed down: in Austria about 2.500 farms stop farming every year (BMLFUW, 2013). However, between 2000 and 2012, there are 'only' 807 fewer farms in Salzburg (i.e. an average of 67 fewer farms per year). Thus while in 2012 – relative to 2000 – there were 9% fewer farms in the province of Salzburg, the number of farms has been reduced by 38% in Burgenland, by 25% in Lower Austria and in Styria, by 24% in Upper Austria, by 18% in Carinthia, by 11% in Tyrol and in Vorarlberg (BMLFUW, 2013:200). Salzburg is thus the province with the lowest loss of farms, and the participants in the workshops stated that organic farming had contributed to maintaining small and medium-sized farms.

There have been four National **Organic Action Plans** for organic farming in Austria (published in 2001, 2003, 2005 and 2008 (weblink)). The last action plan (initially covering 2008-10, it was extended without changes) aimed among other to achieve 20% of UAA certified organic by 2010, and to ensure that all organic produce is marketed as organic as well as striving to cover domestic demand based on domestic production (BMLFUW 2008).

The Agricultural Ministry has offered direct **payments to organic farms** since 1989, and since EU-Accession in 1995 through the Agri-Environmental Programme (ÖPUL). Next to the measures directly targeting organic farms, they also get either preferential treatments for some measures, or additional funds (e.g. within 'investment aid for modernisation of agricultural holdings', organic farms would receive an additional 5% for investments related to animal husbandry (Sanders et al., 2011:102). Similarly, the cost of

organic inspection and certification costs are refunded and organic farmers can benefit from measures to support producer groups (Sanders et al., 2011:1010)

The **governmental policies** were essential for the establishment of organic farming in the late 1990s, through e.g. support payments for organic associations, support payments for organic farms (in conversion or converted), the provision of attractive payment rates for organic farming in the national agri-environmental Programme (ÖPUL), and the continuity in the payments to all organic farms throughout the various programming periods since 1995. However, while these federal policies are still in place, there is little engagement by the Chamber of Agriculture at the provincial level to support the further development and spread of organic farming. This is partly linked to the individuals who are in charge of organic farming in various formal institutions and who may not perceive it as particularly relevant, and thus do not invest much effort in this particular aspect of their task portfolio. Indeed, there might be formal declarations and programmes, but these need to be implemented by committed individual. However, the pressure to reduce administrative costs has led to a reduction in the number of employees at e.g. the Chamber of Agriculture. As a result, the remaining agents tend to be overburdened with task and lack time and resources to engage in all of them. They are thus bound to prioritize some tasks and neglect others, and depending on their personal persuasion, organic farming might not seem a priority to them.

Over the past decades, the various **regulations** (esp. regarding hygiene in food processing rooms, as well as the labelling requirements) have become **increasingly complicated**, as have the requirements to access funds (lots of paper work, few funds for small initiatives). As an 'unintended side-effect' they have made it more difficult for individuals to experiment and develop new products or services, more difficult for small initiatives to start out. Thus while on the one hand organic farming is promoted, organic farmers who want to add value through processing and direct-marketing face high entry barriers. However, even those who market through dairies and supermarkets face an increasing list of requirements regarding their production methods. For example, farms in Flachgau – no matter what their size – that supply milk to Ja!Natürlich, need to comply with the 'Goldstand Milk', which includes obligatory loose housing, obligatory grazing of the dairy cows[15], and reduced use of concentrated feed.

The role of newly formed and/or innovative governance models

The current informal network of initiatives in organic farming benefit from the direct payments in the framework of the CAP. However, they receive little other support by formal institutions in the agricultural sector (such as the Chamber of Agriculture). Thus while initially organic farming was able to take root in Salzburg through the involvement of actors of various formal agricultural institutions, the stabilisation was mostly secured through direct payments by the Federal Ministry, and current development is mostly carried by bottom-up farmer initiatives, which build bridges directly to consumers through food and health (e.g. the certified organic city Marathon), and directly to tourism (esp. via landscape and environmental protection, see e.g. the networks in the Biosphere Reserve).

The organic farmers thus clearly create synergies between rural and agricultural development, however the 'innovative governance model' is still mostly informal, relying on personal relations and trust.

[15] Since January 2014 grazing is compulsory for organic farming. However, if a farm does not have sufficient available grazing area around the barn, equivalencies between animal types are possible, so that dairy cows do not necessarily have to be grazed (e.g. it might be sufficient to graze heifers in summer on the alps).

How does the objective of the governance partnership address the challenges of the region?

Bottom-up initiatives support small, networked structures. These are nimble and flexible, i.e. can quickly respond to shifts in consumer demands. At the same time they would contribute to maintaining the small- and medium-sized family farms in Salzburg. The small structures also seem better apt at communicating the unique regional qualities and traditions linked with the region.

Future development of organic farming in Salzburg

Currently no formal or centrally managed process to promote organic farming in Salzburg could be identified. An important formal institutions of the agricultural sector, the Chamber of Agriculture, is even openly sceptical about the future development of organic farming in Salzburg, expecting a drop in the number of certified organic farm with the new CAP programming period (and thus a revised agri-environmental programme), especially since its implementation will coincide with the liberalisation of the milk market in 2015 (Schindecker, 2015). They also are unsure about the impact of the current legislative proposal by the European Commission, for a new regulation for organic farming, which would replace the current council regulation (EC) 834/2007 (weblink). The timetable aims for the new regulation to be passed in 2016, and may come into force a year or so later. However, the new regulation for dairy producers might well have a large impact in Austria, as the current discussions indicates that e.g. the exemption for small farms (i.e. those keeping up to 35 LU) may not be upheld. Should the exemption be removed, even the organic farms with less than 15 dairy cows would face substantial investments to adapt their barns to the new requirements (loose housing, roaming area).

Despite the general uncertainty due to upcoming changes in the milk market, the new agri-environmental programme and the discussion about a new organic regulation, and despite the dearth of support from the provincial Chamber of Agriculture, organic farmers are very active, through their association and through the various initiatives. While there is no formal coordination or a unified project, there is often an **informal** networking between the various initiatives, as they are managed by a handful of committed individuals. Thus, in many ways, this 'governance' system can be described as bottom-up and **polycentric**, i.e. complex, modular, were different units and organizations interact to form a self-organized governance regime.

2.3 'Knowledge and learning'-related findings

Knowledge sources and dominant knowledge institutions

The current agricultural knowledge system in Salzburg is still strongly built around the 'knowledge transfer' approach, which focuses on issues related to production methods (i.e. grassland management, milk production) as well as on the farmer's need for support with the paperwork related to agricultural direct payments. This is an important help for farmers to master the challenges posed by the need to keep up with changes such as **new regulations and documentation requirements**. Indeed, farmers rely on the Chamber of Agriculture to provide information sheets and publish guidelines in its Newspaper on how new rules will be implemented and controlled (e.g. compulsory grazing for cows on organic farms), and for support on filling-out forms to get direct payments, which are revised continuously (e.g. a recent shift from paper-based to online forms), replete with confusing wording, often with implications that are not clear beforehand.

Regarding advice on production practices, **extension agents** – when they find the time to provide advice to individual farmers – mostly take a 'transfer of information' approach, which focuses on passing on standardized recommendations, building on the 'one size fits all' approach underlying modernization. There are also extension agents who maintain working groups, particularly those focusing on how to increase milk yields, or on sharing their economic data (e.g. on labour productivity). In these groups, the focus tends to be on increasing production output and minimising costs, building on production methods that encourage market dependence, rather than encouraging young farmers to seek autonomy by making best use of the resources that they have on their farm and reducing cash flow.

Most extension agents still see their role as advising farmers in technical, bureaucratic or economic matters, rather than as knowledge brokers who facilitate links among actors and set up frames to evaluate and select relevant information; or as facilitators for local innovation, through building informal networks. Partly this is due to their self-image and job description, partly to the **lack of time**, both by farmers and by extension agents (which are bogged down with paperwork, i.e. supporting farmers in filling-out various applications for direct payments). As a result, farmers and extension agents are trapped in a treadmill where they focus on 'doing things right' rather than reflecting whether they are doing the 'right things'.

In vocational **agricultural schools** the hierarchy of knowledge that underlies modernisation is clear: the focus is on the technological and engineering knowledge underlying production processes and the economics needed to show that an investment is 'profitable'. Thus here too, the focus is still mostly on a 'transfer of information' type of teaching, i.e. telling students how it 'should' be done, rather than encouraging creativity and innovation[16]. Also, knowledge tends to be trapped in disciplinary 'silos' with little attention given to conveying the interrelations between disciplines and between various on-farm activities. As a result, the interrelation between various subject matters, which allows understanding a farm in a holistic way, is missing (Quote 10).

[16] However, the approach to teaching in agricultural schools is currently undergoing a fundamental shift, from content-based approach to a competence-based approach (weblink).

Quote 10 – Lack of systems thinking in agricultural education

"This learning about relationships is different [in organic farming]. (…) But it is completely missing in agricultural education. In plant production they do this, in animal production that, and in another subject this. And at totally different times: in the first, the second, and in the third year. But they do not learn about the relationships. So nobody knows anymore the relations between the cow, the manure, the soil, and fertility. Today in school there is the cow, and there is that much milk coming out underneath. And it's not just in school, it's everywhere with these computerized systems, which farmers are increasingly using. So: there is that much milk coming out, therefore this is what you must feed the cow, this is what do I have to do next. Silage and such, that's what I need to feed the cow. But what the soil says about that, most farmers do not ask themselves that question. And it is not really taught at the agricultural schools, at least not yet." Interview 13_LauraL:96, organic

Thus, while in Salzburg all farms attached to agricultural schools have been converted to organic farming, students get little insights in its principles and values, e.g. the reasons for closing nutrient cycles and taking a systems approach. Agricultural schools might thus well inadvertently support a 'reductionistic' approach to organic farming. They may contribute to reinforce the view that **organic agriculture** is 'just like conventional, but without the chemicals', rather than a fundamentally different approach to farming. While some perceive the problem (and there have been calls for a vocational school dedicated to organic farming), workshop participants fear that the **inertia** in the educational system makes it unlikely that there will be a radical change any time soon. Indeed, new teaching material needs to be developed, it needs to be integrated into the curriculum (thus leading to discussions about what is currently taught but can be removed from the curriculum), textbooks need to be rewritten, and teachers (most of whom have tenure) need to adapt their teaching content and possibly their teaching methods. This time-lag delays changes in practice, as young farmers tend to be strongly influenced by what they have just learned at school (Quote 11).

Quote 11 – Experiential learning vs. what is taught in schools

"I know one young organic farmer, his mother was one of the pioneers in organic farming. She was into wholefoods since the beginning, and I learned a lot from her. But the young one, he said: I want to work as conventional organic farmer, leave me alone with all that [the 'extras']. At the agricultural school he only learned about this track. He doesn't have anything else in his head, so to say. He saw a lot at home and kind of integrates it a bit. But the approach to farming, how much you need to produce, how much you need to do, and how much you need to intensify and so on, what he learned at the agricultural school, this is what he puts into practice now. (…) And I think it's a pity, because of the knowledge of the parents (…), it partly gets lost." Interview 13_LauraL:100, organic

If the **top five knowledge sources** were to be listed, these would be:

1. The Chamber of Agriculture:
    a. Newspaper published by the Chamber of Agriculture (twice per month) which updates the farmers on the new developments, new regulations, on how to fill out paperwork.
    b. Agricultural advisory services – this is less advice received from a person (e.g. the extension agents) and more the documents and summaries provided by the Chamber of Agriculture. Younger farmers (i.e. below say 40) increasingly use the internet, e.g. to download documents, to use on-line calculator tools.
2. Agricultural schools: for initial training, but also for the courses offered on specific issues (from half-day trainings to longer ones covering several days)

3. Other farmers, also to get information from the networks they are involved in (e.g. ask your neighbour, who works as an organic controller, about a specific regulation and how it is implemented and controlled).
4. Research institutes: farmers do not usually read research reports, but the summaries and fact sheets that are written by extension agents based on research reports.
5. Local municipality, esp. the mayor's office, for all issues related to land use: get a building permit, constructing a forest road, etc.

These knowledge sources clearly show that the 'linear model of extension' that is the foundation of modernisation is still very dominant in Salzburg (Fig. 12).

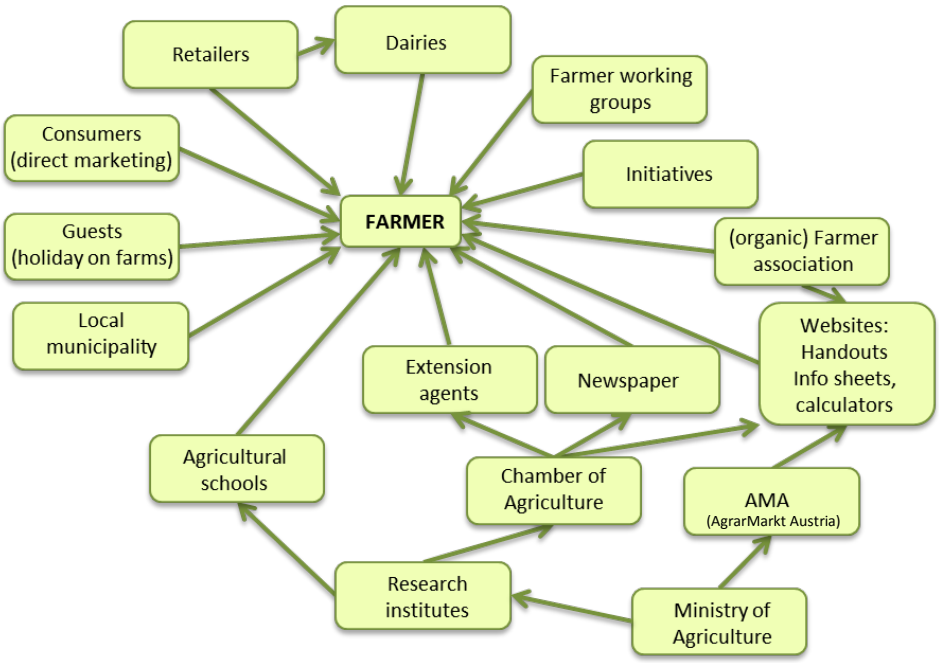


Figure 12: Key sources of knowledge, information flows and interplay of the different sources of knowledge/actors/institutions. While many channels are potentially available, most farmers will focus on a few that seem most relevant to his/her needs

Knowledge needs in a complex, dynamic world: what is currently missing?

While the information on production practices, on administrative procedures and on production economics is seen as important and needed, it is also increasingly clear that it is not enough. Knowledge about interrelations and the skills to manage processes of social learning are sorely needed to face the on-going change in the context (markets, regulations, consumer demands). It would be useful if there would be more space in the standard extension programme or curriculum of agricultural schools for **knowledge about processes** and related skills such as communication, facilitation, networking, time management (also to ensure work-life balance), or burnout prevention. The importance of these issues were recognized by stakeholders (see Tab. 2) and a few relevant courses are now offered at institutions such as the LFI (which offered courses following the call for life long learning).

At the **regional level**, stakeholders highlighted that one of the key challenges was the lack of well-trained craftsmen, e.g. bakers and butchers. Skilled craftsmen and -women are sorely needed to develop new products, i.e. products that can be produced using locally grown ingredients (e.g. mountain rye), rather than the standardized rye flour. Stakeholders saw the current lack of skills as the unintended 'side-effect' of an **educa-**

tion system that privileges a high-school education, thus discouraging many youths to attend vocational schools and an education based on apprenticeship. Given the lack of craftsmen, it is difficult to establish a cooperation along the food chain, e.g. between farmers and a baker. Yet, farmers who are interested in e.g. direct marketing, may be reluctant to engage in it, as they often feel overwhelmed by having to do it all, and do it all themselves. Indeed, while they may be interested in direct marketing, this does not necessarily imply that they want to produce, process and market the products themselves. A cooperation between farmers and craftsmen would thus be a more promising approach. However, such social innovation is hindered by the lack of skilled craftsmen; as well as the lack of trust, the lack of skills on how to structure and manage the cooperation.

Table 2: Knowledge that workshop participants felt is important and missing

Rank	Type of knowledge and skill
1	Creativity, e.g. for new business models, new forms of cooperation
1	Knowledge on how to build and maintain a cooperation (build trust, structure communication processes, find compromises)
2	Ability to handle conflicts (recognize an emerging problem, talk about it, identify constructive solutions)
2	Production methods in organic farming
3	Experiential knowledge (in production methods, in cooperation, …)
4	Farm management and farm economics, strategic planning of a project or for the farm
5	Direct marketing and advertising
6	Brokerage of experts (what kind of experts are there that could help me with my issue? Is there a specific individual that you can recommend?)
7	Ability to apply for funds, subsidies, direct payments
8	Production methods in conventional farming
9	Draft contracts (e.g. for cooperation: which legal structures, tax implications)

Source: Participants in the stakeholder workshops were presented with a poster that listed the above 11 options. Using 'sticky dots', they were asked to indicate which knowledge they think is important, and which is missing in their region. The rank is derived from the total number of sticky dots from both workshops.

Role of informal networks, tacit and endogenous knowledge

An example of the limitations of the transfer-of-knowledge approach and the focus on **standardized information** is the experience of some farmers in Salzburg in the wake of the 'blue tongue' immunisation programme. As the vaccination was made compulsory, a number of farmers fought this imposition, as they felt poorly informed. Indeed, the official agency in charge (Austrian Agency for Health and Food Safety - AGES) did not provide them with information about potential side-effects of the vaccination (e.g. on occurrence rates, precautionary measures, etc.). Yet, it was known that the vaccination had side-effects, such as fertility problems with cows, still births or even death of animals. Moreover, it was clear that should one of these 'side-effects' occur on their farm, they would not receive any compensation. Farmers thus created an association in 2008 (Schöpfungsverantwortung Tier und Natur) and together they fought against the obligation to have their animals vaccinated[17].

While this is a good example of self-organisation as a response to intransparent information by authorities, farmers also note that **interpersonal exchanges between farmers** are not as frequent as they used to be. While earlier on there used to be a range of informal groups that met regularly, the frequency of these meetings is decreasing, as is the

[17] Through the association and joining forces, they raised enough money to pay a lawyer. In court they successfully fought against having to pay fines for not having their animals vaccinated, and other court cases were dropped.

regularity in the attendance of group members. This may partly be due to farmers feeling that the group and the exchanges are not relevant or worthwhile; but mostly it is due to lack of time and energy. Indeed, larger farms and more dairy cows increase the labour load and thus reduce the free time that can be used to meet peers and to maintain networks (Quote 12).

Quote 12 – Lack of time reduces personal exchanges

"Before, the men would meet once a week at the inn. The women would meet at the milk collection site, or elsewhere. But those are the things that are happening less and less. A farmer who has a hundred cows, he and his wife will be busy all day long in their gumboots, and in the evening they will be tired. Even between organic farmers: before, we would meet once a month. Now it is a little less." Interview 26_SigismundH:105, organic

Working groups were an important feature of organic farming when it developed in Salzburg, and organic farming associations do try to maintain the tradition of **working groups**, i.e. a group of farmers in an area that meets regularly to discuss various issues, thus exchanging experiences and building trust. However, farmers report that in many areas these working groups no longer play the role that they once did. This is partly due to the diversity, i.e. the disparity between those organic farmers who want to go 'full speed ahead', mostly following a substitution strategy and staying within a technological modernization paradigm built on technological innovation and the economic 'imperative'; and those organic farmers who seek a fundamental redesign of their whole production system, building on alternative values, and oriented towards a modernization built on social innovation and a production system adapted to the local conditions. But here too, lack of time (due to larger farms or due to off-farm jobs) seems to play a key role in the progressive dissolution of working groups.

Moreover, there seems to be a shift from relying on group meetings and discussions towards searching the **internet** for information. Indeed, there is now a wide array of information that can be accessed by farmers individually and when they need it, such as trade journals, newsletters, fact sheets, brochures or on-line forums, all of which can be accessed through the internet, and might provide targeted answers to one's problem. The internet is thus increasing in importance as a source of information and to communicate with customers (Quote 13), however the 'side effect' of trust building and of identifying potential cooperation partners is lost if there are fewer personal discussions.

Quote 13 – Increasing role of the internet for holiday on farms

"Or like with the reviews, on platforms such as HolidayCheck or TripAdvisor. We are in all of these. Because today, without internet presence, you can't do much anymore, you fall into the 'also ran' category. And when you get your review back, of course it is a nice thing. Today it's – and it's increasingly becoming – a criterion to choose whether to take the vacation on a specific farm or not." Interview 26_GergorJ:291, organic

Another factor that reduces the sharing of information are **traditional values** that equate an error with 'failure' and thus a clearly negative connotation. If a project did not work out, it is seen as an indication that the farmer was more ambitious than is proper, indicating that s/he did not respect the limits, did not conform to how things 'should' be done, who thought s/he is 'better' and thus wants to do it 'differently'. There is thus very little support for trial-and-error learning, despite the fact that when innovating it often does not work the first time. There is no positive connotation of making an error, as useful because it provides insight what does not work, which is often as important and informative about why and how something does work.

Only **women** reported that their networks of personal communication are still fairly active (Quotes 14). This may be linked with the fact that in Salzburg it is often the men who work off-farm, meaning they have various social contacts off-farm. The women

remain on-farm to care for the family and for the cows need, so that they seek social contacts outside the family and thus engage in local working groups and networks.

Quotes 14 – Network of women farmers

"Each village farmer has her helpers. That way in each neighbourhood there is one person. And if you want to do something, then you have your network. You have them all together easily and you have quickly passed on information. I am sure, I think, this is unique, I mean among farmers, that there is such a full coverage." Interview 10_PamelaR:161, organic

"Well, we have large [farms], with a milking robot, and small ones, as I am. And some are organic, others conventional. We have a bit of everything. We make no difference. On the contrary, everyone can do her own thing, as she sees fit. And we really share, if you have a problem or whatever. Each shares her worries. And I think this is a little, yes, nice in a way. Because often, in the family, you cannot really say it, if there is something that worries you." Interview 20_LuisieE:319, conventional

Also, women remaining on farms, esp. smaller farms, might be more inclined to experiment with alternative methods (e.g. homeopathy, herbal medicine) for which there is limited information, strengthening the need to share experiences (Quote 15).

Quote 15 – Experiential learning

"We really share experiences, what works and how. The other time they [experimented] with leeches. (…) They had the leeches on the bar. (…) And the one asked: 'what do you do with them?' And the other answered: 'well, I had them on a cow, which had a bulge. She had some kind of muscle inflammation.' And then the first said: 'I also have one [cow], which has an inflammation on her udder, she has something on it.' And the other said: 'wait I'll take one out'. And then they fished around for a leech." Interview 20_LuisieE:401-405, conventional

But not only do the farmers and the regional stakeholders feel that there are clear deficits in knowledge offered by the relevant institutions, also **consumers** want to know more: they tend to be sceptical about the information they have about food production and processing, and are interested in learning more (Quote 16).

Quote 16 – Critical consumers and their knowledge needs

"You would not believe it, those that come to us to buy food or the foreign guests: they are really interested. (…) Production and how it all works. There really is a huge interest. And also very critical – in a positive way. (…) And I am happy when they are critical and I take the time and go outside to explain it, and show it all to them. The other time the litter was not so nice and I put wood chips in the barn. They [the turkeys] could not go outside on the outdoor run. But I went out anyway and explained it to them, why it was like that. Then they understood. And you have to do that, rather than being afraid of the evil consumers." Interview 07_HubertJ:136

Contribution of various knowledge sources to innovation and resilience

Organic farming was initially developed by farmers, who fine-tuned the production methods to fit their local agro-ecosystem, developed appropriate tools, and adapted machines for their purpose. They also processed their food and built direct links with consumers. However, today organic regulations are defined and revised at EU-level, not by the local organic farming association, and the role of paperwork and of production economics is increasing. Yet, despite the demands on farmers' time of these activities, the further development of organic farming, especially at regional level, continues to depend on the (social) innovations by farmers. Indeed, experiential knowledge still plays an important role, especially when engaging in non-standard practices. For example, one of the interviewed farmers experimented with free-range geese, inspired by her grandmother who used to raise geese a long time ago.

The case study clearly shows that **knowledge occupies a central place** in rethinking and reorienting modernization. Identifying alternative models of modernization, is not going to be confined to innovations by individual farms, but is bound to be a collective enterprise. It will build on a variety of experiments, not all of which are going to be successful. Thus having an institutional environment, and cultural norms that encourage learning (esp. an open mind, a framing of 'errors' as stepping stones rather than stumbling blocks) is essential for developing new approaches to modernization. In Salzburg there is a tension between traditional norms – which frame a failed project as an indication of the incompetence (or over-confidence) of the farmer – and entrepreneurship, i.e. individuals which recognize the need for change and are willing to take the risk inherent in trying something new. While the current agricultural education and the extension system provides little – if any – support for this trial-and-error approach to experimentation, there are enough farmers (often organic farmers) who identify new ideas and implement them.

The wide range of **initiatives** that can be found in Salzburg (see examples on p. 13) can be understood as that many 'experiments' to try out a different approach, enable a different future than the one that seems 'prescribed' by modernization that focuses on technological innovation and production economics. Such initiatives might be seen as 'communities of practice' (or 'networks of practice'), within which learning interactions co-create new meanings. This rethinking also involves questioning the dominant power relations between farmers, agro-input supply industry, research institutions, extension agents, supermarkets, etc. At the core of most of these initiatives is the aim to establish a fair partnership, which takes into account each other's needs and possibilities.

As the case study illustrates, the type of knowledge needed to rethink modernization is implicit and **emerging**. Indeed knowledge is only partly pre-existing, much is created through the interaction, the joint reflection and the experiments. It is often not possible to know what knowledge one will need in advance. It is not amenable to be transferred in a linear transfer of information. It is co-created, context-specific and emergent. It depends on individuals engaging in an open-ended process of trial and error, on honest discussion about what works and what doesn't, on a joint reflection on where to go from here. It also implies that one recognizes one's limits and is willing to seek an expert for advice when needed (Quote 17).

Quote 17 – The need for soft skills and the value of professional support

"But we learned from that crisis, and we said we have to change something. What are our options? And those were the things, where we built on the foundation we got in the first organic courses. We did a course once, with Professor Lobmüller, a management course. And that gave me the basic structure, be it at the crisis back then or during the handing over of the farm, it gave me the basic structure: identify problems, structure them and make a plan, rather than trying to solve them all at the same time. And when it really does not work out, as it was the case during the handing over, then get help from a professional." Interview 03_SimonJ:28

Rethinking modernization is a social innovation. It is not only about recognizing the value of local knowledge regarding the local agro-ecological system, and experiential knowledge in production practices, but also about rethinking and reimagining social relations in rural areas and along food chains.

2.4 'Prosperity'-related findings

No data was collected or analysed in relation to prosperity. Still, we would like to mention a few aspects, especially as **prosperity and resilience seem interlinked**. For farmers, it seems that prosperity is tightly related to keeping the farm going. So a prosperous farm would be one that is doing well, both financially and by offering the farm family a good quality of life (esp. a sound work-life balance); and a farm that will be taken over by the next generation, i.e. where there are harmonious relations between generations. Thus prosperity is linked to ensuring the resilience of the farm, i.e. to ensure that it is maintained over the long term.

Over the shorter term, prosperity is also linked to a **recognition of one's work**, of a farmers' contribution to societal well-being. This includes a recognition for the food products, a recognition for the high labour inputs that is required to manage a farm, an appreciation that the cultural landscape is shaped and maintained by farmers, and a recognition of their contribution to broader social life in rural areas. In this aspect, prosperity is mostly undermined by the low food prices, seemingly implying that the food is worth little, and by extension that farmer's work is worth little (as low food prices translate to a low hourly wage). To many farmers the implicit message conveyed, is that what they do is of little value, as consumers value mostly industrial goods (e.g. electronics, cars, a new kitchen). This poses a problem of identity, as most farmers see themselves primarily as supplying food, with landscape and environmental protection being 'by products'. However these 'by products' are now what society offers direct payments for, in effect turning proud and independent food-producing farmers into publicly paid 'landscape gardeners', which is not compatible with how farmers see themselves. Prosperity is thus related to both values and meanings shared by farmers, and to the relations between farmers and the broader society.

3. Interrelations between the themes

3.1 Interrelations between 'resilience' and 'governance'

In many ways, the case study in Salzburg mirrors the **changing role of the state**. While the government sets incentives, stakeholder partnerships play an important role in the design and implementations of the policy (Dwyer, 2011). Indeed, in the late 1990s, the government was heavily involved in promoting organic farming through the extension service of the Chamber of Agriculture, and securing funds for direct-payments to organic farms and organic farmer associations. However, currently, the government has a more passive role, mostly through securing direct-payments. The new initiatives come from organic farmers, who seem more adept at overcoming sectoral boundaries and addressing multifunctionality, i.e. the provision of services such as recreation, maintaining the cultural landscape, and ecosystem services. The initiatives involving organic farmers thus create linkages between farming and rural nature, cultural landscapes and local resources, thus re-socializing and re-localising food production (Renting et al., 2003).

The initiatives in Salzburg tend to by-pass established institutions and with them the actors involved in producing, processing and marketing commodities. The **networked** nature of most of these initiatives, i.e. the fact that they are made up of loose linkages between fairly small units, strengthens their **flexibility and adaptability**, which are essential for resilience. They can respond fairly quickly to shifts in consumer preferences, based on their direct feedback from consumers. The farmers involved in these initiatives seem to be more in touch with societal demands, needs and fears, and are thus better able to tailor their communication to address these needs, be it for environmental protection or for authentic products that are handcrafted using traditional processing methods. This network and the feedback they receive from citizen-consumers strengthens the collective effort to re-imagine a region and identify more effective, socially accepted solutions.

Indeed, it can be argued that a governance based on networks is strengthening the **'potentiality' of a region** (Shucksmith and Rønningen, 2011), i.e. its ability to keep options open – social and economic as much as environmental – allowing differences and variety so that in future other paths are possible. This is key for resilience of organic farming as an approach to rural development, given that it enables room for experimentation and social innovation, encouraging cooperation and solidarity rather than one-sided economic competition. This strengthens the ability of the region to respond to stresses and shocks, in whatever form these may emerge.

To some extent the network of organic initiatives in Salzburg have characteristics of **polycentric systems**. These have been defined as involving many centres of decision-making at different levels, and are argued to have "a higher adaptive capacity and to be less vulnerable to disturbance" (Pahl-Wostl 2009:357). Indeed, power is distributed over multiple actors, and both their connections and membership remain flexible. This too can strengthen the resilience of organic farming in Salzburg.

However, while the potential for the establishment of polycentric systems is present, it seems that the (informal) networks and their potential contribution to regional resilience is not perceived by formal institutions and policy makers which seem to be heavily committed to a clearly defined idea of modernization. As such there is little room for diversity and the potential synergies it would enable. Similarly, the established institutions and policy makers have limited appreciation for non-capitalist practices. As such they focus on capitalist enterprises producing for the market and the various market-based

transactions, i.e. they focus on formal commodity markets. They have little appreciation for the 'hidden economy'. Farmers and many stakeholders however have a broader conception of the 'economy' and include various kinds of transaction and multiple ways in which exchange is negotiated. They frame farming as more than a submission to 'the bottom line' or the 'imperatives of capital' and welcome economic diversity (see Gibson-Graham 2006). There is thus a tension between how formal institutions frame farming (thus influencing governance mechanisms) and how it is framed by those actors that are engaged in a variety of initiatives that strive for bottom-up change.

3.2 Interrelations between 'resilience' and 'knowledge & learning'

Learning is central to resilience, indeed, the four-dimensional framework (Fig. 13) suggests that in the face of either sudden or slow burning disturbances, systems can "*become* more or less resilient depending on their social *learning* capacity" (Davoudi et al. 2013: 311, emphasis in original).

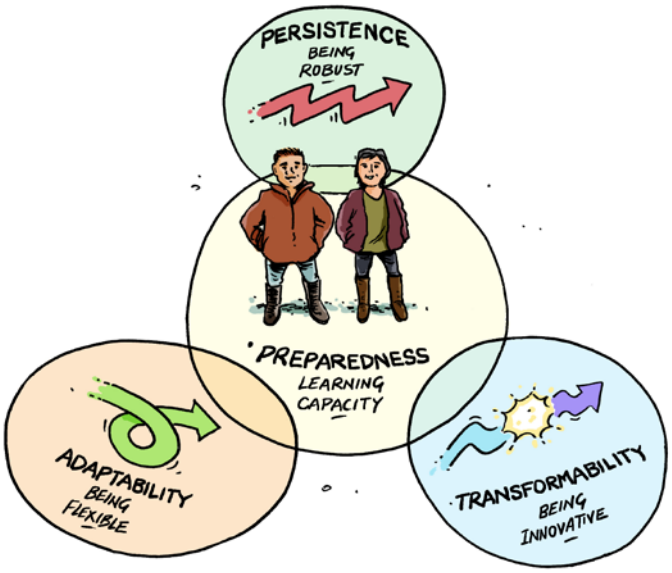


Figure 13: Learning as the dimension that links the three aspects of resilience (based on Davoudi et al. 2013:311)

The initiatives by organic farmers in Salzburg seek to establish multi-actor and multi-sector rural development trajectories. However, they often lack the support to structure and steer these development trajectories, and do not always have the skills, especially the **'soft skills'** involved in managing the group dynamics involved. They often rely on a few visionary, skilled and engaged individuals and it has served them well so far. However, to broaden the initiatives and ensure continuity, it is important that more people acquire a broad range of soft skills, especially as these are a key tool to reflect on those values that are no longer suited and negotiate a new understanding, within the family, in the local community and in the initiatives and networks. The empowerment of organic farmers thus would be strengthened if soft skills would be taught in vocational agricultural schools and trainings offered in the framework of Life Long Learning.

Strengthening the learning capacity would strengthen resilience as in a continuously changing environment, the priorities of stakeholders will shift, and actors in multi-stakeholder partnerships will have to **modify and renegotiate** their goals in an on-going fashion (Davidson and Lockwood, 2008). As a result one needs to manage tensions, between various individual interests, as well as between individual interests and the collective good. This requires the ability to engage in contextual learning and exchange of ex-

periential learning, rather than relying on skills and knowledge that was acquired during formal training and education.

However, while this need is felt, there is no support for it by formal institutions (which focus on 'delivering content', i.e. courses with a specific information that is delivered to participants), rather than coaching groups that want to explore social innovations but see it as an **open-ended process**, i.e. start out with a general idea of what they want to achieve but no specific plan on how to implement it. Indeed the institutions usually follow the mainstream idea that projects are mechanistic, i.e. can and need to be planned, have clearly delimited steps, and can be calculated. This is in contrast with a more organic understandings of entrepreneurship, encapsulated e.g. in the 'effectuation' approach (see e.g. Sarasvathy, 2008; Harmelin et al., 2009), which acknowledges that the future is unknowable and thus ventures rarely turn out as expected. This need not be a problem, as uncertainty can be managed productively. Thus one of the problems faced by the farmers is the lack of support (e.g. in the form of 'coaching'), but also the lack of time. Indeed, as economic pressure and the documentation demands increase, farmers have less time for informal networks, for experimenting, for 'thinking out of the box'.

The impact of **lack of time** is even more pervasive on learning, as less time in informal networks weakens trust, reduces the opportunities to have positive experiences from cooperation and collective action, fewer experiences on how to create win-win solutions with others. However, it is this experiential knowledge, this information flow that strengthens resilience. Indeed one of the values is the diversity of information one collects through being engaged in a variety of networks, e.g. information on what consumers want, what their environmental or animal welfare concerns are, or what others are experimenting with. The increasing **reliance on the formal institutions** is likely to reduce resilience through narrowing the range of information received, reducing the opportunities to hone 'soft skills' required for cooperation, and increasing a sense of dependence.

This is all the more problematic as the formal institutions tend to have a **narrow sectoral understanding of farming**, i.e. mostly frame the farmer as a provider of raw products for the food industry. As such they emphasize information on production methods and cost reduction and provide assistance for filling out forms. Yet a farmer managing a diversified farm needs to cover a much broader spectrum, including: processing, marketing, identifying new opportunities, manage cooperations and networks (including conflicts), understanding legal texts and regulations, know how about filling out applications, time-management (not least to ensure work-life balance). The Agricultural Knowledge and Information System (AKIS) also underestimates the fact that farmers are not just recipients of information, but also information providers, e.g. when explaining production conditions to direct marketing customers or showing children how farming works in the framework of 'schools on farms'.

It would seem that **formal and informal institutions complement each other**, by ensuring both persistence and change. Indeed, while formal systems tend to be system-preserving, thus stabilising the system and providing predictability and continuity, informal institutions are highly dynamic and flexible. If both types of institutions are present in a balanced way, this is likely to contribute to adaptability at both farm and regional level.

Overall it seems that **knowledge strengthens resilience** through enhancing the ability to recognize and seize opportunities, and **resilience feeds knowledge** through experience on how shocks can be overcome, how change processes can be successfully managed, how decisions can be taken despite uncertainty regarding future developments. In particular resilience strengthens a processual understanding of change, the ability to man-

age flows. As such it is a contrast to conventional approaches embodied in modernisation which focus on control and predictability and focus on stocks at specific moments in time.

4. Conclusions

4.1 Links between farm modernization, rural development and resilience

The case study focused on analysing the impact of modernization on farms in Salzburg. As the province is characterised by the fact that almost half of its UAA is certified organic, it was of particular interest to try to assess how this context affects modernisation, what strategies it enables and how this may affect farm resilience[18].

Overall no clear difference could be found between **organic and conventional farms** as in both production methods there is a broad range of farms (along the spectrum of large- and small-scale; intensive and extensive management, full- vs. part-time farms, etc.). Regarding farm resilience there is thus limited differences between an organic vs. conventional intensive dairy farm managed full-time. Of course there are differences, such as the management of the grassland, and this is likely to strengthen the ecological aspects of farm resilience on organic farms. However, both tend to have invested heavily (i.e. are likely to have a certain level of debt which creates path dependency), both tend to be dependent on off-farm inputs (esp. purchased feed), both tend to have only one marketing outlet and thus be dependent on the price for milk offered by the dairy, both tend to have a very high work load, etc.

However there is quite large difference between the farms that have committed themselves to modernisation (focusing on technological innovation and economies of scale) and those that are seeking alternative pathways. And due to the evolution of organic farming (which was after all developed by farmers, not scientists), **organic farming in Salzburg** as a whole, and individual organic farms are more likely to seek autonomous trajectories rather than remaining in the mainstream. Indeed, in Salzburg the first organic farmers started in the 1950s and formed working groups to exchange their experience. These working groups, as a key channel for information on organic production methods and solidarity, were key to the very strong development of the number of organic farms in Salzburg in the years 1993-1996: There was an established network of committed pioneers that recognized the opportunities linked with the EU-accession of Austria (in 1995). They managed to both convince a number of farmers to convert to organic farming and to convince a large retailer to cooperate with them, thus ensuring that the organic milk was marketed as organic, thus securing the price premium. The success of this collaboration impressively displayed the power of bottom-up initiatives and empowered organic farmers. A very similar process has been repeated recently (albeit at a smaller spatial scale) around the 'organic hay region' (Bio-Heu-Region), again a bottom-up initiative by committed organic farmers.

There is thus a **self-reinforcing feedback loop** between successful organic initiatives and committed farmers being attracted by organic farming as they perceive that it will offer them a way out of the modernization-treadmill. Because organic farming is no longer a small minority in Salzburg, it also implies that it has become 'normal', as such the initiatives linked to organic farming have a lower threshold, i.e. need to invest less energy in overcoming social barriers of acceptance. This again emboldens more farmers (organic and conventional) to try something new, to do something 'crazy'. As a result, over the last 20 years, the large share of organic farming has created an atmosphere, a

[18] The usual caveat applies, as this is not a comparative study, i.e. we cannot compare Salzburg with/without organic farming, nor do we compare Salzburg with another province. This analysis is thus based on what farmers and regional stakeholders perceived and how we interpreted this data.

context in which farmer-led initiatives are relatively common place. This attitude strengthens autonomy and adaptability, thus strengthening resilience.

Indeed, the farmers do not see themselves as passive and helpless victims of broader, external transformative forces. While acknowledging the influence of various other forces, many farmers seem themselves as one **force of transformation**. They are actively engaged in creating change so as to benefit from better working conditions, higher work satisfaction, etc. Farmers initiate, design and realize their own projects, despite and in response to various constraints. They learn, they adapt what they do and how they do it, both to express their creativity and accommodate their changing needs, and to respond to external impulses and opportunities. These manifold activities often remain invisible to outsiders, because they are usually not amenable to being measured, thus they rarely show up in statistics; and because the modernisation framework lacks the conceptual tools to capture them. Yet, innovative farmers in Salzburg are engaged in initiating a silent transformation 'bottom up'.

At the same time farmers are aware that there are a range of broader societal trends, that constrain their ability to experiment and be innovative. These constrains are linked on the one hand to the increasing speed of societal change and on the other hand the increasing need for justification, traceability, certification and control (see Beck, 1992). Indeed, it seems that stewardship and trust are no longer the basis of farming, but that everything needs to be documented, measured and accounted for. This is an accountability as defined by accountants, where only that counts which can be objectively documented, the 'hard facts', thereby leaving aside all the 'soft processes' that give meaning to tasks and projects.

Resilience at farm-level can be both strengthened and weakened by **governance** and the various formal institutions linked to it (Sysak, 2013). The governance approaches may differ in specifics between different sectors linked to farming (e.g. Chamber of Agriculture, food safety, tourism, regional planning), but most still take a top-down approach. Indeed, the institutions linked to knowledge and learning, as well as the broader AKIS are mostly still conveying the tenets linked to the modernization paradigm. Yet a number of aspects of modernization tends to undermine farm resilience. Interviewed farmers perceive 'modernization' as putting the farm 'on (railway) tracks', a metaphor for the uni-dimensional conceptualization of modernization: there is but one way to be 'modern' and there is but one direction (progress); farmers must be forward-looking, must take the next step (in increasing farm size, in adopting the next technology, e.g. milking robots). The only alternative is regress, is backwards looking, which is not desirable.

This framing by various institutions involved in governance is in contrast with the **diversity of ways to be 'modern'** as perceived and lived by farmers. Many farmers see their trajectory as a reflexive, open process, and a process they can influence and will shape; they do not want to be 'on track', driven by externally imposed 'imperatives'. These farmers question modernity because they value many aspects of farming that are devalued or outright ignored by modernization (quality of life, environmental protection, traditions, experiential knowledge, on-farm innovation, collaboration, networking with consumers, shaping processing and marketing, etc.).

Moreover, farmers that were interviewed and participated in workshops perceive the **need to adapt to a changing world** more than the institutions that were designed to support them. While most formal institutions are still adhering to and promoting the modernisation paradigm, farmers understand its weaknesses and the need to work together in different ways to address both environmental and social issues linked to modernity. Especially diversified farmers (through their off-farm job, through their children, through guests on their farms through customers in direct-marketing) seem more

in touch with the changing demands of a changing world than the formal institutions. The latter – often due to lack of time – seem to ignore or downplay much of these societal transformations and maintain that to face the future there is no alternative to technology-led modernization, maintain the 'economic imperative' of scale increase and productivity growth. While farmers take into account how modernization affects their locality, their community, modernization does not have a framework to take it into account. Farmers are more connected to society and want to create new relations that enable them to respond to the societal challenges, in contrast to institutions, which sometimes seem trapped in a modernization mind-set, unresponsive to societal changes (Diaz et al., 2013).

While many farms in Salzburg display a number of attributes linked to resilience, to them resilience is not an end in itself, but a means to an end: **prosperity**. Indeed, the question is: to be resilient for what? What do farmers what to achieve by maintaining their adaptability and occasionally engaging in transformation? Broadly speaking, they strive to meet changing preferences and resources within the family, and they want to maintain their ability to meet exogenous changes while maintaining the quality of life, among other by securing family income.

4.2 What are the main lessons learned from the case study?

Resilience needs diversity and diversity needs balance. While diversity has many advantages, it needs to be well thought through, i.e. there needs to be a sensibility regarding the trade-offs involved. At the regional level, the 'right' amount of diversity strengthens buffer capacity and enables synergies (e.g. processing and value chains). At the farm-level diversity allows to buffer shocks and enhances adaptability, but may become a burden (emotional, time pressure, burnout). This implies that it is necessary to know when it is 'enough' as more diversity is thus not necessarily 'better', and what type of diversity is conducive to synergies (see Stirling 2007 and 2008).

Resilience means engaging in an on-going and open-ended learning process. Resilience is not so much a state characterized by certain (measurable) attributes, but a process (Darnhofer, 2014). The question is thus less about how a farm is currently structured (which is mostly important for buffer capacity), but what potentialities it has, how the various elements are linked, and how this enables the farm to adapt. For a farm to be able to adapt and transform, the farmer – i.e. his/her openness, creativity and reflexivity – is crucial, as is his/her ability to build relationships and be part of various networks. This allows ideas to be refined and substantiated, to hear about others' projects and identify potentials for cooperation, to learn about new political, economic and social developments, about different lifestyles, thus receiving new impulses. These will shape the farmer's ability to learn based on own experimentation and interactions with others, and his/her ability to have an influence on the regional context through processes of social learning.

Organic farming is no guarantee for a resilient farm. While organic farming has the potential to strengthen various aspects that contribute to farm resilience, it is only effective if the principles and values underlying organic farming are implemented, and if organic farming is understood as a 'living system', i.e. one that keeps changing and developing. If organic farming is reduced to being a production method as stipulated in the organic regulation, it is likely to have only a very limited potential to strengthen farm resilience. However, at the regional level, the high share of organic farms has contributed to diversity, through maintaining small farms and encouraging initiatives.

The resilience at farm-level is affected by processes at a lower level (family and individual activities) and at a higher level (context/region). When analysing farm resilience, it is important to distinguish several spatial scales, all of which interact and thus create conducive or unfavourable conditions at farm-level (Fig. 14). It is thus important not just to assess the structure of the farm, but also the dynamics within the farm family (and especially those between generations), the dynamics of individual activities on- and off-farm, as well as the dynamics in the broader context (e.g. milk market and policies) and at the regional level (initiatives, networks, cooperations). These are in turn affected by dynamics at the national and international scale (e.g. world market prices, CAP reform, trade agreements, climate change).

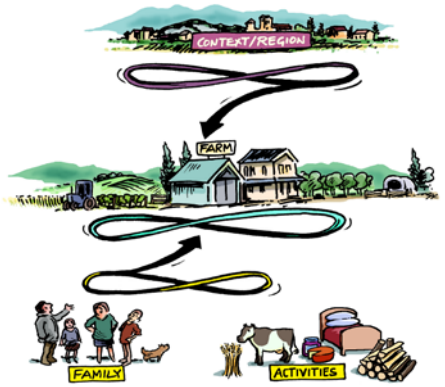


Figure 14: Farm resilience as dependent of processes at lower and higher scales (based on the concept of panarchy, see Holling, 2001)

4.3 Particularly interesting issues for the comparative analysis

The impact of a high share of organic farms. The province of Salzburg has been selected for its high share of organic farms. As this is not a comparative study, it is unclear to us how much of what we have observed is linked to the high share of organic farms in Salzburg, or whether it is linked to other influencing factors (e.g. regional history, culture and values, geography and topography). It would thus be very interesting to compare our results either with another region that has a high share of organic farms to see if similar processes can be observed; or with another region where similar processes have been observed but with a low share of organic farms.

The impact of the context. We studied dairy production in a very specific agro-ecological, geographic, cultural, social and economic context (Salzburg). It would be interesting to compare our results with a similar study on resilience of dairy farms under a different context. This would allow identifying to what extent the context enables or constraints strategies that farms can implement to strengthen their resilience.

The impact of the specificities of dairy production. We focused our analysis on dairy farms as it is the dominant activity in Salzburg. Milk production has a range of specificities, e.g. the fact that usually cows stay on a farm for several years, dairy farms are often involved in breeding (unlike e.g. pig production); the investments in barns and milking parlour are high thus contributing to a lock-in (once the decision to invest has been made, the debts must be serviced and building and equipment cannot be resold). The factors that contribute to farm resilience are thus likely to be specific to the dominant activities on farms, and it would be interesting to compare the factors contributing to farm resilience across a range of activities.

Relationship between resilience and learning. Learning is central to change, and change is central to resilience. In our case study we identified a number of ways in which the formal and informal institutions involved in learning enable or constrain resilience. It would be important to compare and contrast our findings with other case studies that assessed the interrelations between farm resilience and knowledge/learning, both regarding the (social) learning processes, the kind of information needed and provided, as well as the influence of the involved institutions and their structures/priorities.

4.4 Implications for policy

While a number of implications for policy can be derived, we focus here on the 'top four', based mostly on the needs expressed by the farmers and regional stakeholders in the framework of workshops.

Provide 'seed funds' in the form of venture capital, without red tape. Initiatives often need fairly small amounts of money to get started (e.g. to organise a workshop and pay for a professional moderator and/or key speaker; to pay for the editing, layout and publication of a small brochure or of a website). Yet, there is currently a dearth of opportunities to get funds for these activities as budgets are cut in those organisations that used to provide it (e.g. Chamber of Agriculture, Raiffeisen, private companies). Also, there is an increasing need to 'justify' funds based on measurable impacts, esp. impacts that are in line with some specified policy goal. This limits the availability of funds to those initiatives which are fairly mature (and thus can 'prove' that they are trustworthy and have impact), and/or have experts who can write the application with the right 'key words'. On the other hand, initiatives that are radically innovative – thus with unproven ideas – will find it difficult to find support, despite their potential contribution to renewal.

Reduce the complexity of regulations. The rules and regulations are getting increasingly complex, both due to them going through multiple revisions and due to their interaction on diversified farms. This increases the risk of a transgression on farms, as farmers need to keep abreast of all the changes and updates. The fear of penalties for having overlooked a detail (e.g. the appropriate font size on the food label) is pervasive, not least as the text of the regulations are not self-explanatory and there are few experts who can 'interpret' them and advise farmers on the implications in their specific case. It seems that if the maintenance of family farms is important, the rules they have to comply with will need to be appropriate, rather than using a 'one rule fits all sizes' approach. If the aim is to inform consumers and to ensure food safety, the rules and regulations should be appropriate to the risks of various production settings (personal information from the farmer vs. supermarket shelf; small-scale artisan, vs. industrial mass production).

Expand the range of courses offered both as part of vocational agricultural training and in the framework of life-long learning. As a rule farmers in Austria have an excellent training in matters related to production methods (crop and animal production) and to handling technology (e.g. maintenance of machinery). They also have very good training in farm accounting and production economics. However, in a world characterized by rapid and often unpredictable change, it would seem as important to provide training in entrepreneurship, and to strengthen soft skills such as supportive communication and conflict management. Similarly it would be important to raise the awareness of the cultural norms that promote risk aversion by framing a failed experiment as indicating a 'stupid' farmer (based on the logic that if s/he was not stupid, s/she would have been successful). By discouraging experimentation for fear of 'failure', many valuable opportunities to learn from mistakes are foregone, and many potentially successful experiments are never attempted. A more open attitude towards 'failure' should be promoted, by emphasizing that one learns as much from attempts that were successful than from those that were not. Social learning is enabled through sharing experiences and talking openly about what worked and what did not work so well.

Frame innovation as open-ended learning processes. Innovation is about identifying a new way to tackle a social, economic or technical problem. It rarely follows a 'planned' trajectory where both the process and outcome can be predicted. And indeed, many innovations – while initially looking promising – will not work out, and many innovators will fail several times before identifying an approach that 'works'. A culture that is risk

averse, therefore emphasizing the need to thoroughly justifying every expenditure, and focusing on short-term impact/returns, will not promote innovation. Farmers in Salzburg have proven time and again that they can identify successful (social and technical) innovations. It would be helpful if they were supported by facilitators and coaches, rather than limiting support to 'tried and true' (and thus standardized) approaches. While this is very helpful in the diffusion stage of an innovation (i.e. to spread adoption rates), it is not what innovators need, especially in the early stages of their journey, when the aim is yet diffuse and the path there unpredictable. Yet the seed is there, what it needs is to find a nourishing soil and conducive environment to germinate and develop.

5. References

AWI (2013). Vollständiger Tabellenteil Grüner Bericht 2013. Tabellensatz 3: Agrarstrukturen und Beschäftigung. (weblink)

Beck, U. (1992). *Risk society: towards a new modernity*. London: Sage

BMLFUW (2008). *Aktionsprogramm Biologische Landwirtschaft 2008-2010*. Wien: Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft. (weblink)

BMLFUW (2013). *Grüner Bericht 2013*. Bericht über die Situation der österreichischen Land- und Forstwirtschaft. 54. Auflage, Wien: Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft. (weblink)

BMLFUW (2014a). *Grüner Bericht 2014*. Bericht über die Situation der österreichischen Land- und Forstwirtschaft. 55. Auflage, Wien: Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft. (weblink)

BMLFUW (2014b). ÖPUL 2007 (2014). Sonderrichtlinie des Bundesministers für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft (BMLFUW) für das Österreichische Programm zur Förderung einer umweltgerechten, extensiven und den natürlichen Lebensraum schützenden Landwirtschaft. Wien: BMLFUW (weblink)

Dax, T. and G. Hovorka (2012). Multifunktionalität und die Entwicklung des Ländlichen Raums – Ausgewählte Ergebnisse des EU-Projektes TOP-MARD. Wien: Bundesanstalt für Bergbauernfragen (weblink)

Dax, T., G. Hovorka, V. Hocevar and L. Juvancic (2009). Comparative analysis of territorial impacts of multicuntional agriculture in Austria and Slovenia. In: Neuwirth, J. and K. Wagner (eds): Multifunctional Territories: Importance of Rural Areas beyond Food Production. Rural areas and development Vol. 6, European Rural Development Network, Warschau 2009: 29-46.

Darnhofer, I. (2014). Resilience and why it matters for farm management. *European Review of Agricultural Economics* 41: 461–484.

Darnhofer, I. and A. Strauss (2014). Resilience of family farms: understanding the trade-offs linked to diversification. Proceedings of the 11th European IFSA Symposium - Farming systems facing global challenges: Capacities and strategies, held 1-4 April 2014 in Berlin (Germany), pp. 1777-1787. (weblink)

Davidson, J. and M. Lockwood (2008). Partnerships as instruments of good regional governance: innovation for sustainability in Tasmania? *Regional Studies* 42: 641–656.

Davoudi, S., E. Brooks and A. Mehmood (2013). Evolutionary resilience and strategies for climate adaptation. *Planning Practice and Research* 28: 307–322.

Diaz, M., I. Darnhofer, C. Darrot and J.-E. Beuret (2013). Green tides in Brittany: What can we learn about niche-regime interactions? *Environmental Innovation and Societal Transitions* 8: 62–75.

Dwyer, J. (2011). UK land use futures: policy influence and challenges for the coming decades. *Land Use Policy* 28: 674–683.

Gibson-Graham, J.K. (2006). *A postcapitalist politics*. University of Minnesota Press.

Harmeling, S., S. Sarasvathy and R.E. Freeman (2009). Related debates in ethics and entrepreneurship: values, opportunities and contingency. *Journal of Business Ethics* 84:341-365.

Holling, C.S. (2001). Understanding the complexity of economic, ecological and social systems. *Ecosystems* 4: 390-405.

Humer-Gruber, A. (2013). Biosphärenparks – Innovationsmotor oder Hindernis. Wahrnehmung und Sichtweisen von Bäuerinnen und Bauern. IGG Jahresbericht 2011-13: 91-103. Innsbruck. (weblink)

Land Salzburg (2014). *Salzburger Zahlenspiegel 2014*. Salzburg: Land Salzburg. (weblink)

Pahl-Wostl, C. (2009). A conceptual framework for analysing adaptive capacity and multi-level learning processes in resource governance regimes. *Global Environmental Change* 19: 354–365.

Renting, H., T. Marsden, and J. Banks (2003). Understanding alternative food networks: Exploring the role of short food supply chains in rural development. *Environment and Planning* 35: 393–411.

Sanders, J, M. Stolze and S. Padel (eds.) (2011). Use and efficiency of public support measures addressing organic farming. Study report. Braunschweig: Institute of Farm Economics, Johann Heinrich von Tühnen-Institut. (weblink)

Sarasvathy, S. (2008): *Effectuation: Elements of entrepreneurial expertise.* Cheltenham: Edward Elgar.

Schader, C., P. Petrasek, T. Lindenthal, R. Weisshaidinger, W. Müller, A. Müller, U. Niggli and M. Stolze (2013). *Volkswirtschaftlicher Nutzen der Bio-Landwirtschaft in Österreich*. Beitrag der biologischen Landwirtschaft zur Reduktion der externen Kosten der Landwirtschaft Österreichs. Diskussionspapier. Frick und Wien: FiBL (weblink)

Schindecker, S.M. (2015). *Die Entwicklung des biologischen Landbaus in Salzburg: Rückblick und Ausblick*. Master Thesis, University of Natural Resources and Life Sciences, Vienna (weblink)

Schindecker, S.M., A. Strauss and I. Darnhofer (2014). Biolandbau in Salzburg: Warum so erfolgreich. Paper presented at the 24th conference of the Austrian Society of Agricultural Economics, held 25-26 Sept. 2014 in Vienna (Austria) (weblink)

Shucksmith, M. and K. Rønningen (2011). The Uplands after neoliberalism? The role of the small farm in rural sustainability. *Journal of Rural Studies* 27: 275–287.

Sysak, T. (2013). *Drought, power and change: using Bourdieu to explore resilience and networks in two northern Victoria farming communities.* PhD thesis submitted at the Dept. of Resource Management and Geography, University of Melbourne. Supervisors: Prof. Ruth Beilin and D.S. Garden.

Statistik Austria (2012a). Agrarstrukturerhebung 2010: Nebentätigkeiten der land- und forstwirtschaftlichen Betriebe 2010 nach Bundesländern. Online (weblink)

Statistik Austria (2013a). Wirtschaftsatlas Österreich – Österreich und seine Bundesländer. Online. (weblink)

Statistik Austria (2013b). Agrarstrukturerhebung 2010: Gesamtergebnisse. Bundesanstalt Statistik Österreich, Wien. Online (weblink)

Stirling, A. (2007). A general framework for analyzing diversity in science, technology and society. *Journal of the Royal Society – Interface* 4: 7007–719.

Stirling, A., (2008). Resilience in rural development. Some key concepts and challenges in policies for sustainability. Presentation at the conference of the TERESA project, on 27 Sept.. 2008 in Vienna (Austria) (weblink).

Stoker, G. (1998). Governance as theory: five propositions. *International Social Science Journal* 50(155): 17–28.

Pelzer, A. (2012): Herdenmanagement in wachsenden Milchviehbetrieben. 39. Viehwirtschaftliche Fachtagung, 25.-26. April 2012, Bericht LFZ Raumberg-Gumpenstein 2012: 19 – 21.

Weis, T. (2010). The accelerating biophysical contradictions of industrial capitalist agriculture. *Journal of Agrarian Change* 10(3): 315–341. (weblink)

6. Annex

Table A1: Key territorial characteristics of the case study areas in comparison with Austria and Salzburg

Characteristic	Expression			
Area (in km²)		total area	permanent settlement	
	Austria	83,878.99	32,439.53	
	Salzburg	7,156.03	1,451.43	
	Flachgau	1,004.78	498.82	
	Lungau	1,019.93	112.37	
Population and unemployment rate[1]		people	unemployed in % (2011)	
	Austria	8,451,860	6.7	
	Salzburg	531,898	4.5	
	Flachgau	144,288	3.7	
	Lungau	20,668	6.2	
Population density		per km² area	per km² perm. settlement	
	Austria	101	261	
	Salzburg	74	366	
	Flachgau	144	289	
	Lungau	20	184	
Number of farms, share of part-time farms		all (2010)	part-time farms	%
	Austria	173,317	93,895	54.2
	Salzburg	9,785	4,685	47.9
	Flachgau	2,635	975	37.0
	Lungau	1,080	535	49.5
Utilized Agricultural Area (UAA)[2] in ha		all (2013)	organic	%
	Austria	2,645,495	522,232	19.7
	Salzburg	173,698	85,565	49.3
Agricultural Area[3] in ha		all (2012)	organic	%
	Flachgau	37,082	13,649	36.8
	Lungau	9,520	6,036	63.4
Number and share of organic farms		all (2013)	organic	%
	Austria	125,588	21,161	16.7
	Salzburg	8,120	3,629	44.7
		all (2012)	organic	%
	Flachgau	2,138	747	34.9
	Lungau	768	408	53.1
Number of mountain farms and farms with 'holiday on farm'		Mountain farms[4]	'holiday on farm'[5]	
	Austria	66,516	10,293	
	Salzburg	5,851	1,835	
	Flachgau	824	210	
	Lungau	741	251	

Sources: Statistik Austria 2012a, 2012b; BMLFUW, 2013, 2014; Land Salzburg, 2014, Statistik Austria 2013: Statistisches Jahrbuch 2014 (weblink); Wirtschaftskammer Salzburg 2012: Salzburgs Bezirke in Zahlen - Daten zu Wirtschaft und Bevölkerung (weblink)

[1] The unemployment rate of 6.7% for Austria is based on the national definition. Following the international definition (ILO), Austria has an unemployment rate of 4.3%.

[2] UAA according to IACS 2013 (source: Grüner Bericht 2014)

[3] Agricultural area excluding alpine pastures according to IACS 2012 (source: Gemeindedatenbank 2012)

[4] All farms with a rating of 1 to 4 in the 'Berghöfekataster' (BHK) (source: Statistik Austria)

[5] Farms offering accommodation in the framework of 'holiday on farm' (i.e. agro-tourism) (source: Statistik Austria, based on the Agricultural Census of 2010)

Tables A2: Assessment of specific aspects

How dominant is the conventional understanding of 'agricultural modernization'? i.e. selling commodities (large uniform batches of crops/milk), maximizing productivity (high yield), increasing scale and/or specialization to reduce production costs and ensure economic viability		
	In (official) advisory system	Among farmers
Very dominant: there is a clear view that there is one right way to do things	**X**	
Dominant: most elements are promoted, but a few not because they are not suited to the area (which elements are not suited? ….)		
Mixed: some elements are promoted, others not; it mostly depends on the individual farm		**X**
The various elements of the modernization paradigm play a minor role in the technical and economic advice provided		

What shares of farms implement most of the elements of the modernization paradigm?	
X	0 – 25%
	25 – 50%
	50 – 75%
	75 – 100%

Are there 'alternative' networks/associations that promote a 'different' way to farm? (e.g. use on-farm resources as far as possible, low-external inputs, reduce capital intensity, direct-marketing, extension agents are facilitators rather than providers of expert knowledge/solutions	
X	Yes, there are 3+ different networks promoting a variety of approaches. They are well established, everybody knows about them (e.g. through fairs, events, publish newsletters/magazines)
	Yes, there are 1-2 networks. They are well-established and active (at fairs, events, publish newsletters/magazines)
	Yes, there are 1-2 networks, but they are struggling or emerging, and not very visible (i.e. many/most farmers are not aware of them)
	No, a farmer who would search for a 'different' way to farm would not find a network in the region. But there are a few individual farmers who are 'different'
	No, a farmer who would be interested in something 'different' would not find an established network, or individual farmers who are 'different'. S/he would need to seek advice outside the region

How strong is the integration of agriculture with other sectors/activities in the area? (i.e. is agriculture rather a sectoral or a territorial affair?)	
	Very limited: agriculture is the dominant activity in the area, so most rural inhabitants are farming families
	Limited: agriculture is definitely dominant. There are some towns or people with urban roots living in the area, but farmers do not really interact with them.
	It is mixed. Some farmers interact mostly with other farmers (i.e. follow the modernization paradigm); but others have close links with non-farmers and other sectors of the economy (i.e. are multi-functional)
X	High level of integration: farms are clearly multi-functional: many farmers are part-time (thus have an off-farm job) or there is tourism, direct-marketing, care farming, etc.