

RETHINK

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

Case study report *"Sub-urban food production systems in a Swiss agglomeration"* (Switzerland)

D3.3 | The example of the milk supply chain in Bern | FINAL/ 18 May 2015

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**List of abbreviations**

BLW (Bundesamt für Landwirtschaft): National Ministry of Agriculture

CSA: Community Supported Agriculture

FIBL: Forschungsinstitut für biologischen Landbau

GDP: gross domestic product

LANAT (Amt für Landwirtschaft und Natur Bern): Ministry for Agriculture and Nature

LOBAG (Landwirtschaftliche Organisation Bern und angrenzende Gebiete): Agricultural Organisation in Bern and surrounding Areas

OGG (Oekonomische und Gemeinnützige Gesellschaft Kanton Bern): Organisation for Agriculture and Society

PDO: Protected designation of origin

RKBM (Regionalkonferenz Bern Mittelland): Organisation for Regional Planning

SAK (Standardarbeitskraft): state work force

SBV (Schweizerischer Bauernverband): Swiss Farmers Association

SFSC: short food supply chains

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

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

The growing number of local agriculture initiatives and their diversity reflects, among others, the population's need to reconnect with basic values and their raising concern about sustainability. This trend is particularly strong in urban areas, where around 73% of the Swiss population and 27% of the farms are located.

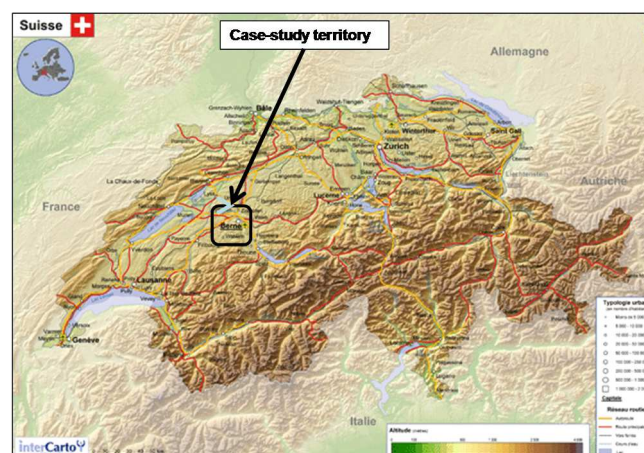
This case study is about the implementation in practice of this growing trend in the agglomeration of Bern. We have explored the question of economic and social links between local farmers and inhabitants, through supplying food products. Research has highlighted that only a minority of farms have developed direct strong links with the population, mainly the Community supported agriculture initiatives, delivering schemes (baskets and boxes) and various forms of direct sales (around 12%), and that most of the farms are delivering their raw materials (milk, vegetables) to long national food operators. According to Andreas Wyss¹, around 20% of the production is sold through direct marketing. The case-study highlights the different systems used by the farmers to deliver their products, in order to compare them in section 2 regarding the four transversal themes: resilience, governance, prosperity, learning & knowledge.

Section 1.1.1 presents the territory and the farmland characteristics. Section 1.1.2 shows that the proximity of the agglomeration provides interested farmers with opportunities of diversification and innovation. Section 1.1.3 highlights that most of the farmers do not have any links with the local consumers, because of their commercial strategy. Section 1.1.4 emphasizes how some initiatives develop new types of links with consumers.

1.1.1 The territory and the farmland characteristics

The case-study territory is located in the German speaking part of Switzerland, namely the agglomeration of Bern. Figure 1 shows the location of the case-study perimeter and indicates the altitude. The area is partly composed of flat lands and hills, and partly of mountain area I.

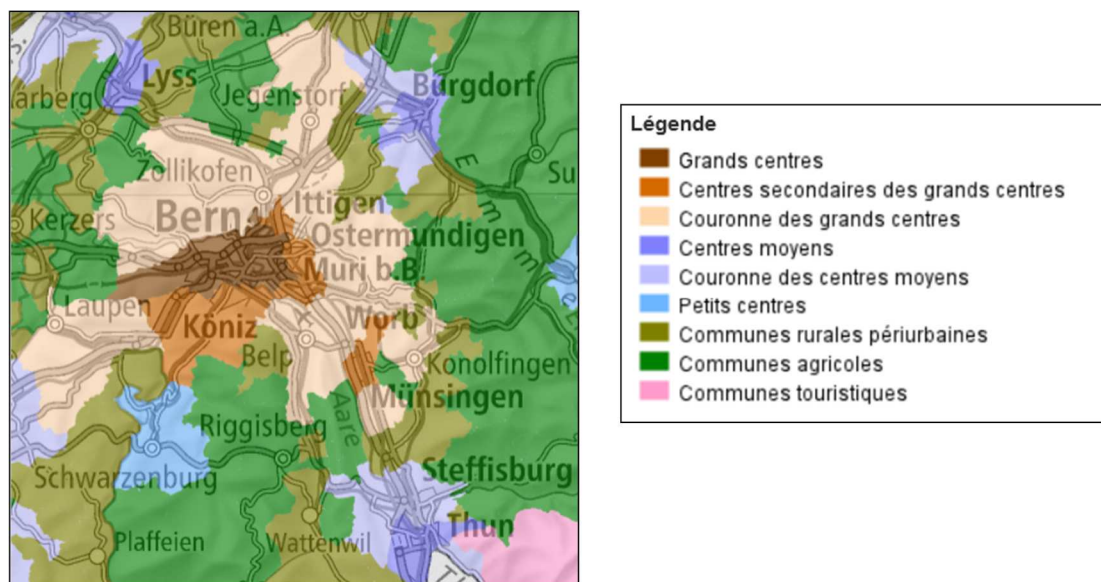
Figure 1 - Location of the case-study perimeter in Switzerland



¹ Head of LOBAG (Landwirtschaftliche Organisation Bern und angrenzende Gebiete), the syndicate/union of defending the interests of the farmers in the canton of Bern

The territory is comprised of 80 municipalities (Figure 2) with 415'000 inhabitants. We chose this territory as it is used to manage the spatial development and the regional development of the agglomeration. Strategic decisions are taken about urbanisation, landscape policy and regional policy in which agriculture is partly included. It is a recent governance structure in which agriculture is not yet strongly involved but new partnerships might be emerging within this structure in the future.

Figure 2 - The case-study territory



The characteristics of the territory are presented in table 1.

Table 1 - The characteristics of the territory

Type of territory	Agricultural sector	Landscape characteristics	Population	Spatial type
<ul style="list-style-type: none"> - Administrative region in which a project / programme / initiative can be implemented. Strategies are defined at the entire regional level and some projects are developed at a local level within this territory. 	<ul style="list-style-type: none"> - % of agriculture in the regional economic structure : 0.5 % of the GDP (Canton Bern 1.1% of GDP and Switzerland 0.8% of GDP) - Agriculture represents 2.9% of employment (while 5.6% in the canton Bern and 3.34% in Switzerland) - The average size of the farms is 16 ha (while 19.8 ha in the canton of Bern and 23.3 ha in Switzerland) but there are important variations according to the districts. 	<ul style="list-style-type: none"> - Bio-physical features: three physical regions can be distinguished, two hilly or mountainous regions (Gantrisch, Emmental), a plain hilly region (Mittelland) and the Aare valley. - Land cover <ul style="list-style-type: none"> o Agriculture 54% o Forestry 31. % o Infrastructure and housing 13% o Non productive areas (rocks) 2% - The agricultural land is composed of 65% of grassland. 	<ul style="list-style-type: none"> - Number of inhabitants: 415'000 - Density (410 inhabitants per sq km): - Slow growth compared to other agglomeration - Issues of ageing rural population 	<ul style="list-style-type: none"> - Urban and - Peri-urban

1.1.2 *The proximity of the agglomeration provides interested farmers with opportunities of diversification and innovation*

The agglomeration of Bern is a very active and wealthy area. It is the administrative centre of Switzerland and an important agricultural area from the agriculture point of view, but compared to other economic activities, it is a niche. As observed in other parts of Switzerland the canton of Bern has a deeply rooted small-scale farming tradition. In the agglomeration, house gardens and community gardens proliferate, and various forms of direct sale, on farm product processing and cooperation between consumers and producers are emerging. As highlighted by other studies in Switzerland and abroad, the proximity of a city is not only a space limiting or hindering agricultural activities, but also a space of innovation and diversification, providing new opportunities for farmers to sustain or even increase their income, through higher profit margins. New models of farming in terms of production systems, distribution channels, etc., arise, mainly characterised by short food supply chains (SFSCs).

In the framework of the present case study, one focus is on different forms of SFSCs that exist in our research perimeter, in order to assess the type of links and interactions between suppliers/producers and consumers. The cases study deals with questions such as "to which extent do short distribution channels generate greater autonomy for farmers? What are the links between consumers and producers which foster customers loyalty?"

Our inventory of existing initiatives favouring links and interactions between consumers and producers is not exhaustive, but it allows us to draw key trends and patterns of existing food systems in the agglomeration and their capacity to establish and strengthen relationships and interactions with consumers.

Beyond the production of agricultural goods and foodstuff, numerous SFSCs in the agglomeration provide diverse services responding to a growing demand of urban consumers for recreation activities. The website of "Rund um Bern" (<http://www.rundumbern.ch/>), an umbrella organisation and platform for agro-tourism, direct-selling and leisure activities, promotes various activities offered by farmers in the region:

- Sleeping on a farm
- Eating on a farm
- Farm events
- Direct selling
- And others

It is important to mention that other activities and services favouring interactions between farmers and non farmers, urban and rural spaces exist in the region. They are not registered and promoted on the above-mentioned website but existing and to some degree found through other sources (tourism office, etc.), namely horse pension, green care, school and work on the farm, etc.. In the framework of the present case-study we are not able to grasp the range of existing initiatives and interactions but they are part of the local dynamics contributing to the regions' and farmers' prosperity and reflecting farmers ability to innovate and adapt as a response to new demands and constraints.

We assume that different types of initiatives favour different types of links or interactions. In order to classify and qualify the nature and type of interactions we based our analysis on criteria developed by the EC IMPACT project (Marsden et al, 2000, Renting et al, 2003²).

² Source: www.foodlinkscommunity.net

The authors distinguish 3 main types of short food systems **"on the basis of the number of intermediaries, physical distance and organisational arrangements"** – see definitions in the footnotes:

- 1.) "Face-to-face systems" ³ (e.g. on farm sales, farmers markets, farm shops, Community supported agriculture depending on the type of organisation, etc.)
- 2.) "Proximate SFSCs" ⁴ (Community supported agriculture depending on the type of organisation, delivering schemes such as baskets/boxes, consumers' cooperative and collective organisations (in our case, regional associations promoting local agriculture & foodstuff such as "Förderverein Region Gantrisch", "Rund um Bern", etc.)
- 3.) "Spatially extended" SFSCs⁵ (Certification regional labels such as "Das Beste der Region", "Aus der Region, für die Region", specialised shops and wholesalers, public catering, restaurants, etc)

Table 2 presents the main characteristics of interactions for these 3 main types of short food systems.

Table 2 - Characteristics of interactions between farmers and consumers in short food systems

Characteristics	Face-to-face systems	Proximate SFSCs	Spatially extended SFSCs
Personal interactions between consumers and producers	xxx	x	(-)
Authenticity and trust in the product	xxx	xx	x
Identity with the place/region	xxx	xx	(-)
Social proximity/links	xxx	x	(-)
Commercial links	x	xx	xxx
Interpersonal relationships	(-)	x	xxx

Legend: xxx= strong; xx=medium, x=weak, (-)=non-existent

Reference: Marsden et al, 2000, Renting et al, 2003 (adapted by the authors)

In the framework of our case-study, we have classified and analysed the food supply systems of the milk sector in-depth concerning agglomeration of Bern. According to these criteria, we have highlighted the type of interactions favoured by each actor, and the benefits in terms of enhancing links between producers and consumers and mutual understanding of urban and agricultural realities .

The analysis has been extended to the vegetables sector, as a bench mark, in order to verify if the conclusions could be extended to other types of products. It has shown similar cohabitation of different subsystems in the supply chain and similar learnt lessons, which will developed in the policy paper to come. In this report, we focus on the milk supply chain with an in-depth analysis of the transversal themes.

³ "Face to face systems : SFSC "in which a consumer purchases a product directly from the producer/processor on a face-to-face basis and authenticity and trust are mediated through personal interaction".

⁴ Proximate SFSC "which extend reach beyond direct interaction and are essentially delivering products which are produced and retailed within the specific region (or place) of production. Consumers are made aware of the 'local' nature of the product at retail level".

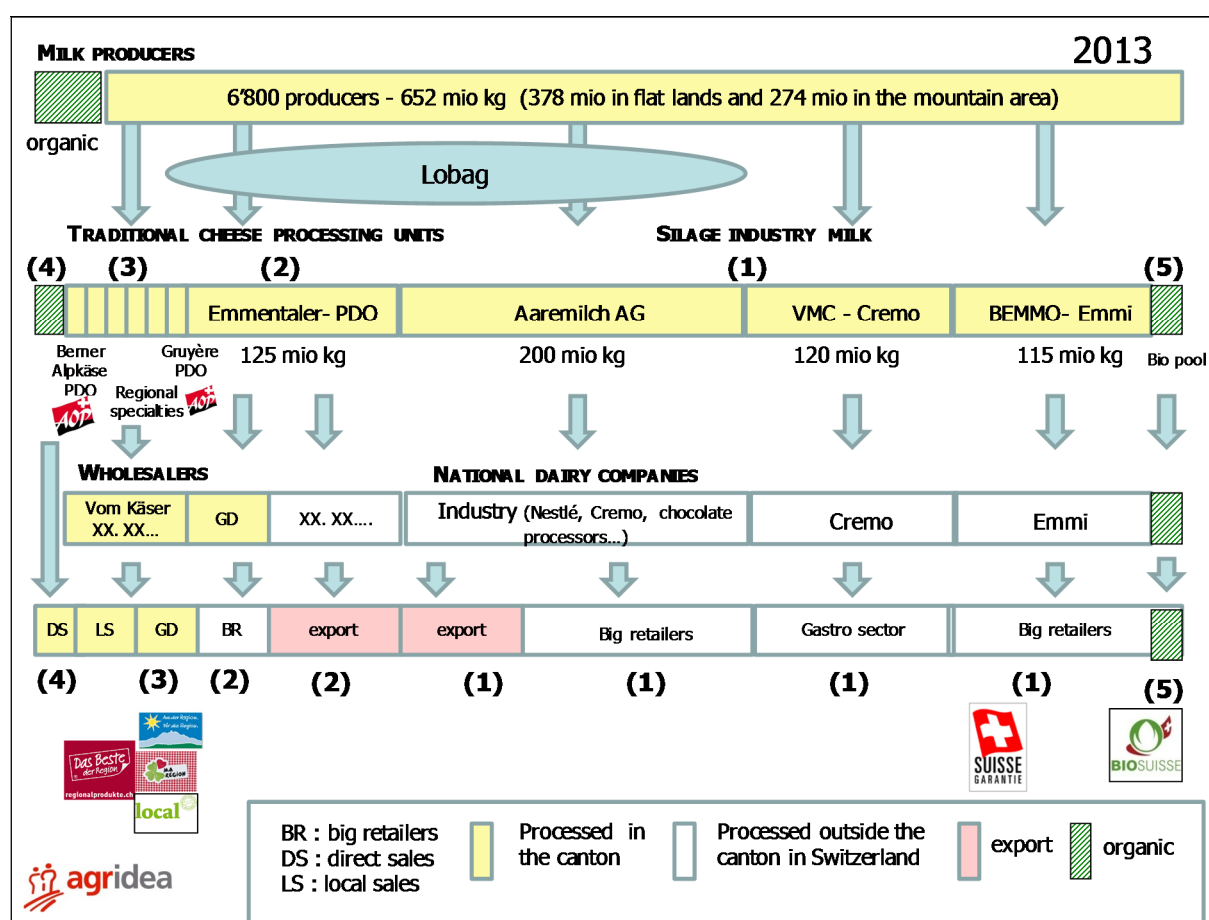
⁵ Spatially extended SFSC "where value and meaning laden information about the place of production and producers is transferred to consumers who are outside the region of production itself and who may have no personal experience of that region". Source of characterisation 3, 4 & 5: Marsden et al, 2000, Renting et al, 2003 in "Short food supply chains as drivers for sustainable development, evidence report.

1.1.3 Only a minority of farms have developed strong direct economic links with the population

The number of inhabitants in our perimeter as mentioned before amounts to 415'000. This means that, the resident population consumes 42 million kg per year eq. milk for consumption milk, dairy products and cheeses.

Research has shown that most of the agricultural products are delivered to national food chains. The map presented below (figure 3) presents the milk supply chain in the canton of Bern. It has been elaborated during the project by using some rare available statistics from the Ministry of agriculture and mainly by interviewing 3 experts who have a clear view about the chain organisation. This map has been validated by experts and the stakeholder group. The length of the rectangles is at the scale of the market share. This map highlights the different sub-chains and the major actors.

Figure 3 - The map of the milk supply chain in the canton of Bern



LOBAG (Landwirtschaftliche Organisation Bern und Angrenzende Gebiete), the syndicate/union of defending the interests of the farmers in the canton of Bern

Reference: Agridea, agri-food markets group, 2014

The canton of Bern is the first supplier of milk in Switzerland, with a production of 652 million kg per year (19.7% of the Swiss production). The map highlights 5 channels:

- Most of the milk - 435 million kg (67% of the production)- is delivered to **national companies** (Emmi, Crém, Nestlé...) for processing a large set of products (dairy products sold in the super markets, dairy products for the gastro sector, ingredients for the industry...), (1) on the map. The price of the industry milk has decreased a lot during the last 6 years due to a structural disequilibrium between demand and supply on the national market, following the milk quotas abolition.

- Non silage milk is delivered by milk producers to **traditional cheese processors**. There are three PDO cheeses produced in the canton, partly in the case-study territory: the Emmentaler PDO, the Gruyère Switzerland PDO, the BernerAlpkäse PDO. The Emmentaler PDO cheese has serious market difficulties, leading to bad prices for milk and decreasing production volumes - **(2)** on the map.

Alternative systems have been developed to find new markets:

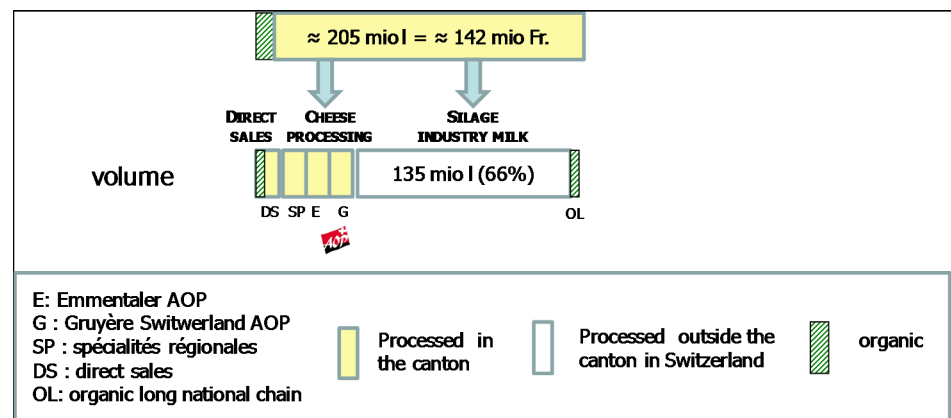
- Some cheese processing units have developed **regional specialties** in order to compensate the decreasing production volumes of the Emmentaler PDO cheese, to be sold in the agglomeration, also in supermarkets with a regional quality label ("Das Beste der Region" – *The best of the region*) and /or a private retailer label for local food - **(3)** on the map.

- Direct selling, mainly of organic products, targets consumers in the agglomeration - **(4)** on the map.

- Part of the organic milk is delivered to the "Biomilkpool" to be processed and sold on the national market - **(5)** on the map.

This map was established for the whole canton. The following map (figure 3 bis) highlights a similar structure in the agglomeration of Bern.

Figure 3 bis - The map of the milk supply chain in the agglomeration of Bern

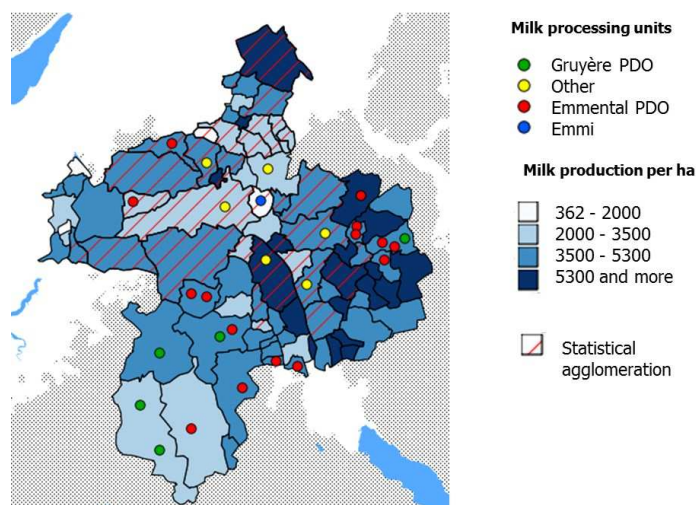


Reference: Agridea, agri-food markets group, 2014 (data for milk production in the 80 municipalities provided by TSM- fiduciaire)

Looking at the data highlights the dominance of a production strategy focused on the national and international markets. However, even if the quantities sold by the "alternative systems" are small compared to the overall production of the area, they merit to be explored in depth because we suspect a positive contribution to the quality of life of the residents in the agglomeration. We expect social value creation and awareness of consumers / citizens in regard to the local agriculture and farmland reality. We also suspect that they may have a high capacity of resilience in case of a very serious crisis.

The following map (figure 3 ter) indicates the localisation of the different milk processing units according to the main supply chains. The 6 "other" units are cheese or milk processing units that are targeting the local market with a diversity of milk products. It is interesting to note that the direct influence of the local market concern mainly the center of the agglomeration.

Figure 3 ter - The map of the milk processing units in the agglomeration of Bern



1.1.4 Some examples of initiatives focusing on direct links with consumers in the agglomeration of Bern

Our case study highlights some of these initiatives in the milk sector, which belong to the milk supply-chain. They are illustrated in detail in Annex 1. We have grouped them according to their commercial strategy:

- **Direct selling farms and members of a Community Supported Agriculture or basket delivery service (channel 4 above).** They are either small-scaled or medium-scaled farms (between 8 and 17ha) practicing diversified farming. Besides milk products, they also produce vegetables and fruits, cereals and meat products. They have in general several selling points (on farm selling, Market stands, supplying specialised shops in the city of Bern), but all belonging to face to face SFSC - personal interactions between producers and consumers - according to our classification of interactions between producers and consumers (see table 2).

All of these farms, which are either involved a CSA-initiative or in box or basket delivering scheme are biodynamic or organic farms.

- **Regional dairies and cheese making enterprises (channel 3 above)**

The sample of regional dairies analysed in the framework of our study differ in terms of organisation and functioning. Amongst the dairy cooperatives or private dairy and marketing units, some produce their own milk and process it, others gather the milk from regional producers to process it into cheeses, yoghurts or other milk products. There is also a marketing platform, selling regional cheese specialities through an online-shop and supplying specialized shops in the city and region of Bern. The observed distribution channels are ranging from direct selling (own selling shops, fairs, market stands) to more spatially extended channels such as big supermarkets. According to their interactions with the consumers we thus classified them as mostly belonging to a mixed form *between proximate and spatially extended SFSC*.

These are examples of operational initiatives in the milk sector within the agglomeration, and an excerpt from the diversity of existing and potential short supply milk-systems. Milk dispenser machines also exist on the farms, a project called "Stadtmilch" (City-milk) propose to install those machines in the city of Zurich; the first one in the main market hall in Zurich (source: <http://www.stadtmilch.ch/milch/>).

There are probably other interesting small initiatives. It is in fact difficult to assess the number of initiatives, especially those engaged in direct selling, as far as no systematic inventory is carried out and therefore there is no data base gathering all of them. Moreover many farms, practicing direct selling are not recognised as agricultural enterprises but fall in the category of "leisure farmers" because of the "State work force=SAK" (Standarbeitskraft) limit, fixed by the state, which in most Swiss cantons is below 1 SAK (source:<http://www.bauernzeitung.ch/news-archiv/2014/01/30/sak-direktvermarkter-sind-haessig.aspx>).

Core of our analysis

In reference to our milk-supply chain map (see figure 3), 5 main channels with different players have been identified: the industrial channel (#1), the PDO Emmentaler cheese channel (#2), the regional dairies and cheese-making units (#3), the direct selling channel with no or 1 maximum intermediary (#4) and the organic industrial channel (#5).

Our analysis on resilience and governance issues aims at comparing the 5 channels that deliver milk from the agglomeration. To facilitate our analysis we grouped the 5 channels in two clusters :

- "**dominants**" : Industry milk (#1) and the Emmentaler PDO cheese channel (#2)
- "**challengers**" : Regional dairies and cheese makers (#3), direct selling and CSA (#4), the organic industrial channel (#5).

This distinction is based on 3 main criteria: history, volumes and perception.

In this report, we will compare the resilience and the governance issues for these dominants and challengers in the milk sector.

1.2 Demands and resource constraints that are addressed by the case-study

The case study has been selected because it is a very good illustration of the Swiss peri-urban challenges. Most of the farms have no direct links with the agglomeration and do not even consider it. Producers are mostly involved in long national chains. But there are also very active short chains selling food products to the agglomeration.

Recently, various studies have been carried out on different short food supply initiatives that try to increase the part of local food in the urban areas, such as the private retailer label "from the region to the region" (Migros ⁶) or local food for the public community catering. Additionally, Agridea ⁷ has been involved in several projects to develop the peri-urban and urban agriculture. Food production is developing and promoted within cities in order to improve the quality of life. As the city gets larger, agricultural land is lost but new links between agriculture and cities are promoted. New farmers are looking for land and through the development of urban agriculture they have the opportunity to start business. New types of farms emerge that are questioning the traditional family farming.

Very recently, the question of "food sovereignty" has emerged as a key political issue. Switzerland is not self-sufficient for food products (the country imports 40% of the total consumed food calories) and there is a real concern regarding providing food to the Swiss population in a context of serious crisis on the world market. The proximity of big EU food producers reduces the risk but effort is made to reinforce the capacities of Swiss agriculture to deliver food products to Swiss consumers.

⁶ MIGROS is one of the two most important retailers in Switzerland. It is a consumer cooperative, created in 1925 - <http://www.migros.ch>.

⁷ AGRIDEA is an association for developing agriculture and rural areas, created in 1958, whose members are cantons, institutions and farmers' organisations, partly financed by The Swiss Ministry of Agriculture (Federal Office of Agriculture – FOAG). <http://www.agridea.ch/>

On the same topic, an issue is emerging in Switzerland, about increasing the amount of animal feed from grassland in order to reduce the imports of proteins. Integral grass based feed questions mostly the most intensive farms. The milk producers were able to qualify for the ecological requirements imposed since 1999 by the Swiss agricultural policy in order to get direct payments, Will they be ready to change drastically the animal feed practices?

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

Our case-study focuses on the two cross-cutting themes “resilience” and “governance” that are particularly relevant for our case. On the one hand the diversity of situations (different forms of agriculture, food supply systems, identities and visions), on the other hand the spatial context (agglomeration), which is characterized by various forms and processes of change (social, political, agricultural, landscape) and interactions between farmers and consumers/rural and urban spaces. It is therefore an interesting space to explore how change processes affect agricultural systems/farms, what mechanisms and processes are developed by farmers/producers to face new challenges, constraints, and to ensure thus the resilience of their farms or agricultural initiative. Or to express it in a more positive way, how do farmers/producers and consumers produce changes rather than undergo only changes? Considering both, conventional and alternative food systems or supply chains, we will analyse various factors (external and internal mechanisms) impacting their resilience capacity and compare them according to their degree of persistence (ability to face/buffer shocks), adaptability and transformability.

The inter-linkages between farm-resilience and regional resilience are also an issue that will be stressed.

In the second stage of our case study, we will specially focus on the social or community resilience. To date, most of our studied initiatives represent alternative systems, approaches or models of food production (compared to conventional systems and the model of economic growth), paying stronger attention to social and human components in terms of community development processes (relationship building with consumers and networks, participation, space for knowledge sharing.).

To a limited extend our case study will also contribute to the themes “prosperity” and “knowledge & learning”, for the latter especially on the existence and role of local knowledge and networking.

1.4 Methodological approach

The case study is divided in **two stages**. As milk production is the most important agricultural branch in the canton of Bern, the focus in the first research stage was on the analysis of this value chain as a whole. The second, ongoing stage of our case-study emphasises on actors and initiatives, farms, processing companies, retailers ... with distinct, strong links from production to consumption/producer to consumer, not only in the milk-sector but extended into the vegetable sector also. Therefore, an analysis of the vegetable supply chain as well as consumer surveys to explore their purchase behaviour, their perception and attitude towards agriculture have been carried out., however they will not be developed in depth in this report.

Overall used methods: Data collection through internet research, expert-discussion (external and internal), individual and group interviews with producers, processors, retailers and regional stakeholders, analysis and the use of relevant previous studies.

Approach and methods in the first stage:

- In cooperation with experts from LOBAG (www.lobag.ch) and other agricultural organisations, namely BioSuisse and Bärner Bio Bure, an analysis of the different

flows in the milk supply chain have been carried out. These experts also gave important background knowledge on the organisation and functioning of this value chain in the canton and agglomeration of Bern.

- Qualitative interviews had been carried out with different processing companies (Vom Chäser, Biomilk), distributing organisations (Bioabi) and regional agricultural organisations (Inforama, LOBAG, Bärner Bio Bure) to collect further data and determine the key actors in the different sub-chains of the milk supply chain.
- Additional statistical data was collected through Internet research and phone calls.
- A map representing the milk supply chain in the canton of Bern was developed, highlighting the different sub-chains, its major actors, the milk production location and the flow of volumes (see page 5). This map has been validated by professionals.
- Based on this map analysis and 3 main defined criteria (history, volumes, perception), a typology of the different channels was established by the project team. This typology will be presented to the stakeholders group for validation.
- Update information on on-going policies.

The second stage, comprising a deeper analysis on the various types of existing SFSC in the agglomeration and their interactions with consumers in both, the milk and the vegetable supply chain, is still ongoing.

Approach and methods in the second stage:

- Internet research on different initiatives, organisations, enterprises ... that have a specific influence on the link between farmers and consumers.
- Qualitative individual interviews carried out with selected farmers, initiatives ... to get informed about their governance structure and functioning and the type of interactions they have developed to farmers and consumers.
- Statistic data gathering and analysis on agricultural and economical characteristics, landscape and spatial planning related issues of the region (canton research perimeter).
- Telephone interviews with the members of the CSA initiative "Radiesli" had been realized on their motivation to engage in such an initiative, their purchase behaviour and other issues.

Stakeholder partnership group. A stakeholder partnership group was established in the beginning stage, before our "field investigations". Public and private stakeholders and decision-makers from various sectors (agriculture, spatial planning, foodstuff qualification and marketing), involved in policy development, strategic planning, training and advice, knowledge system were present at the first meeting in May 2014, namely:

- BLW/FOAG (National Ministry of Agriculture)
- LOBAG (Agricultural Organisation in Bern and surrounding areas)
- Inforama (Training, vocational Centre for Agriculture, Bern region)
- OGG (Organisation for Agriculture and Society)
- Regionalkonferenz Bern Mittelland (Organisation for Regional Planing)
- Das Beste der Region (Sub regional mark/association for promoting regional specialities)
- Agglomerationskommission Bern (Commission for the agglomeration of Bern)
- TerreABC (Collection of Knowledge in Agriculture)
- BLW (National Ministry of Agriculture)

The members of the group have an advisory/monitoring function in the scope of our case study. They played an important role in shaping and choosing the case studies issues and focuses. During the stage of carrying out the case study, members have been requested for additional information and advice on research questions, regional specific data, etc. Some participated as well in testing and refining the standardised questionnaires. A second meeting with the overall partnership group has ben hold at the beginning of December 2014 to present, enrich and validate the case-study results and plan further steps.

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

2.1 'Resilience'-related findings

This section compares the resilience capacities of the conventional dominant supply chains and the capacities of the different initiatives that try to open new paths for milk valorisation, mainly on the regional market. They have been proposed by the project team, and validated by the stakeholders team in November 2014. Table 3 compares the different aspects of resilience according to the different sub-chains observed in the agglomeration of Bern. Evaluation is based mainly on history.

Table 3 - Comparison of the different aspects of resilience according to the milk channel

Persistence (the ability to buffer shocks and still maintain function)	
Milk delivered to the national industry (1) (dominant)	<p>With minor shock, the conventional system has shown to be strong because of the size and experience of the food industry which is buying the milk products. The major risk relates to the decline of milk production due to a low price for industry milk. Direct payments are also a key issue for farmers to decide to continue production.</p> <p>There is presently a threat that comes from the protection at the boarder with EU for the industry milk, which could lower in case of a bilateral agreement.</p> <p>In the case of a very serious shock, such as a huge energy or economic crisis or in a context of war, the biggest supply chains would probably be the most vulnerable.</p>
Milk delivered to Emmentaler PDO cheese makers (2) (dominant)	<p>The PDO alliances get their value from reputation among consumers. In the case of the Emmentaler PDO, there is a serious market problem. This cheese used to be a tool to sell milk surplus with subsidies. It is still exported abroad but its competitive position has weakened.</p> <p>This crisis has led to tensions between members and a lack of discipline when marketing the cheese.</p> <p>The non-economic benefits of a PDO alliance (regional identity, pride, solidarity) seem to have been destroyed by economic problems, since 2000 (see the history of the institutional framework and PDO governance in section 2.3.1).</p>
Regional dairies and cheese making dairies (3) (challengers)	<p>The regional cheese making dairies are presently trying to buffer shocks and maintain function. Most of them are entering the regional market with new products, which is a challenge.</p>
Direct selling farms and members of a CSA or basket delivering system (4) (challengers)	<p>Direct selling is very labour intensive. It requires time and energy to find consumers and keep them. However, this marketing strategy allows increasing continuously the ability to buffer minor shocks such as milk price dropping or other crisis on the milk international market. Long term personal interactions with consumers reinforce trust and reputation.</p> <p>The ability to buffer major shocks depends of the robustness and skills of the enlarged farm family, which "relays on its own forces". The farmer families are often very flexible and able to tackle with various technical challenges in order to resist and maintain function, even in a very difficult context. However, a family crisis may lead to very serious problems to maintain activities.</p>
Organic: national industry (5) (challengers)	<p>The organic national supply chain has built a strong cooperation with the Swiss big retailers (mainly Coop). They have built a specialized channel that allows them to resist to minor shocks and even profit from them (for example food scandals such as the dioxin problem in milk). Consumers transfer their purchases, temporally or definitively, to organic food.</p>

Adaptability (the ability to deal with challenges, including uncertainty and surprise. The focus is on continuing to develop within the current stability domain, within the current regime.)	
Milk delivered to the national industry (1) (dominant)	Good, because of a strong chain, with a good portfolio of products and clients.
Milk delivered to Emmentaler PDO cheese makers (2) (dominant)	The present difficulties lower the ability to deal with challenges.
Regional dairies and cheese making dairies (3) (challengers)	Their adaptability depends of the capacities of the cheese maker and the ability to find clients in the agglomeration
Direct selling farms and members of a CSA or basket delivering system (4) (challengers)	The ability to deal with challenges depends on the skills, creativity, courage and perseverance of the farm family.
Organic: national industry (5) (challengers)	Good, because of a strong chain, with a good portfolio of products and clients.

Transformability (radical change, i.e. the capacity to create a fundamentally new system)	
Milk delivered to the national industry (1) (dominant)	Producers are used not being in charge of the milk valorisation. They produce the best they can and deliver the milk to the industry. They were able to deal with new ecological requirements to get direct payments. There are presently projects aiming to further increase the part of grass and hay in the dairy cow fodder, in order to reduce imported proteins. They may transform their activity by changing their production strategy (for example from milking cows to suckling cows)
Milk delivered to Emmentaler PDO cheese makers (2) (dominant)	The Emmentaler PDO alliance recovers with difficulties from the major shock of the state retreat out of the market. In 10 years, the cheese production has decreased from 35'000 tons to 23'000 tons (- 34%). In order to increase the price, volumes have been recently reduced again.
Regional dairies and cheese making dairies (3) (challengers)	The commercial difficulties faced by the Emmentaler PDO have already pushed some cheese units to develop new strategies for the agglomeration of Bern (new products / new clients / local sales). They are assisted by regional wholesalers and most of the big retailers that have developed a regional product line and promotion through advertising.
Direct selling farms and members of a CSA or basket delivering system (4) (challengers)	Developing direct sales or a CSA requires human qualities and entrepreneurship skills. The farmers that were able to do it would probably be able to find new paths and strategies if necessary.
Organic: national industry (5) (challengers)	Farmers may transform their activity by changing their production strategy (for example from milking cows to suckling cows).

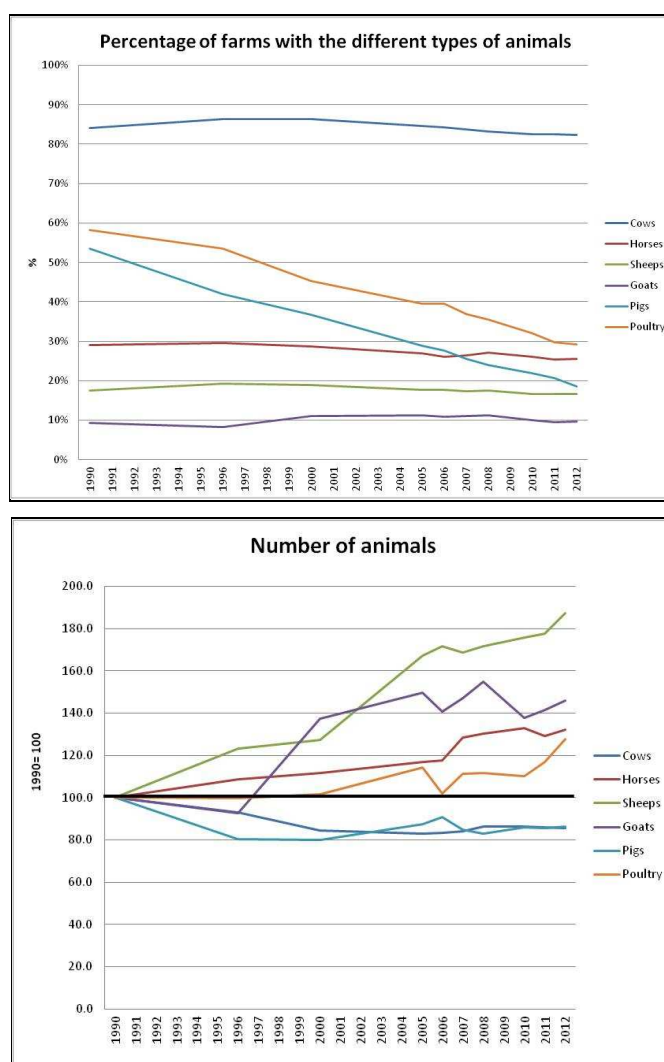
2.1.1 Adaptability and transformability

Adaptability is a constant process and farmers and processors are always constrained to adapt to political reorientations at national, regional and European level, but also to the specific peri-urban and urban context.

The farm structures are characterized as follows:

- 45% of the people working in agriculture are working fulltime (compared to 60% in 1996)
- The average size of the farms is 16 ha , but there are important variations according to the districts (see figure 6 below)
- 82% of the farms still have cows. Most of the farms are combining cattle and arable crops (wheat, barley, rape etc.). The traditional farm used to have additional poultry or pigs, but the trend to specialisation in the last 25 years resulted in giving-up pigs or poultry rearing or establishing bigger units for poultry and pigs husbandry.
- 60% of the farms have dairy cattle, the rest are beef cattle.
- The number of beef cattle, poultry husbandry, horses, sheep and goats are increasing while the number of dairy cattle and pigs are decreasing (figure 4).

Figure 4- Evolution of the percentage of farms with the different types of animals and the number of animals



Concerning the milk producers in the case-study territory, production has been maintained for 10 years, by increasing the dairy farm size and the yield per cow:

- 2002/03:
14.1 cows per farm, quota per farm 67'343 l, production per cow 4'776 l.
- 2012/13:
17.8 cows per farm, milk sales per farm 101'136 l, production per cow 5'681 l.

How to explain these trends :

- The number of cows has decreased but the production of milk per cow has increased, due to better productivity. The trend is evident in all Swiss cantons.
- Pig and poultry production are difficult to maintain in peri-urban areas, with problems concerning neighbouring residents. New regulation for animal husbandry leads to very high costs of renovation.
- Horse lodging had developed in all Swiss peri-urban areas, for urban riders.
- Sheep and goats are less difficult to handle in pasturelands than milk cows and for this activity, the direct payments system used to be profitable.. The trend is observed in all mountainous Swiss cantons.

Regional differences are important (figure 5). The two hilly and mountainous regions (Gantrisch and Emmental) are characterized by more grassland and cattle. Vegetable production is prominent in the Aare valley. Arable crops are more developed in the plateau (Mittelland). The size of the farms also differs from one district to another (figure 6).

Figure 5 - Part of pastureland according to the districts in the agglomeration of Bern

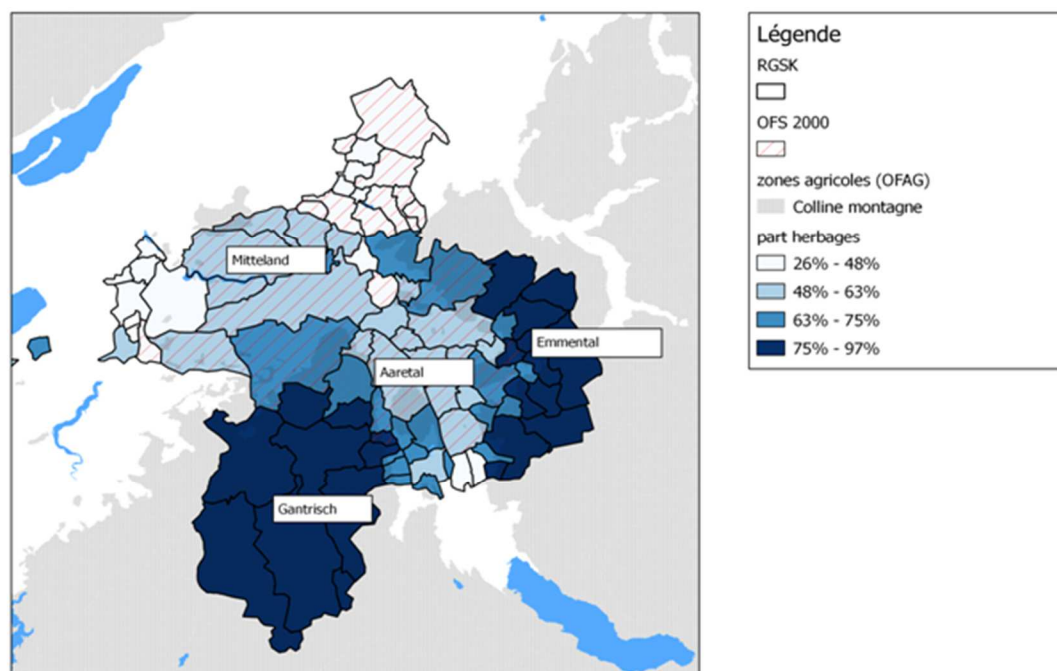
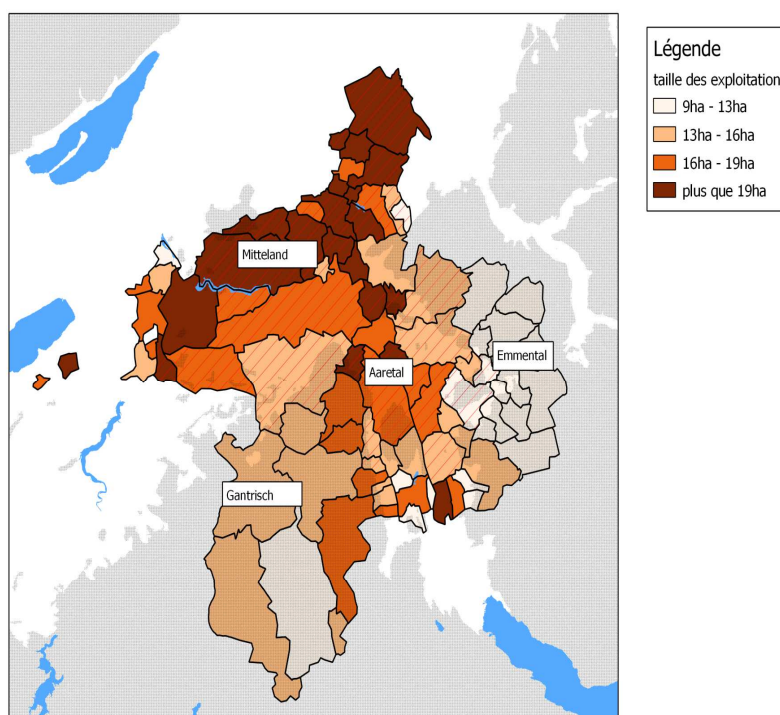


Figure 6 - size of the farms according to the districts in the agglomeration of Bern



Economic activities in the region

The third sector represents 80% of the employment and the second sector around 16%. The economy is quite diversified in the third sector with health, services for enterprises and public administration as the main sources of employment. The sector of public administration is vast, because the canton and especially the city of Bern is the administrative centre of Switzerland. There are some companies that produce agricultural machinery but heavy industry is lacking. There is also a little pharmaceutical industry and the Nestlé product technology centre for dairy products and health nutrition located in the region. As the landscape is perceived as beautiful by the general public, tourism is also a popular economic activity in the region.

This situation also translates and explains the fact that a majority of farmers only work part time in agriculture and have an additional job in other sectors. These job opportunities allow numerous farmers to maintain their agricultural business. The off -farm job opportunities allow farmers to maintain farming activities. It may create new opportunities for innovation and experimentation, different social links and interest for marketing products.

On the other side, the present vitality of the economy in Switzerland opens great opportunities for food supply and innovative commercial strategies that target the urban and peri-urban consumers.

Collaboration vs. hierarchies: this question is developed in section 2.2 - governance.

The regional public authorities are dealing with a productive agriculture which produces much more milk in volumes that the canton consumption needs (650 million kg of milk production for an estimated population consumption of 42 million kg eq. milk per year), and which is mostly focused on national and international

markets. They are quite powerless regarding the prices of agricultural products on these external markets. At the regional level, they play an important role in fixing some important rules, such as farmland protection. At the national level, the key issue is fixing the criteria for farmers to get the direct payments, mainly ecological requirements.

In view of these various factors, adaptability and transformability prove particularly complex processes, which associate individual decisions and a more or less favourable institutional environment, involving milk processors, extension services and producer unions. We have observed that the different systems have their own specific governance and that they are run in parallel with low interaction, except when there is competition for access to markets or access to raw materials or access to land.

It is important to rethink the collaboration between agriculture, public organisations, market institutions, political parties because agriculture will face different changes soon. To date, there is no elaborated common strategy existing and alliances between these various stakeholders and decision-makers are still rare

In the past, the so-called "intensive" farming has been transformed in-depth in Switzerland due to a critical change in the rules to get direct payments, which impose strict agri-environmental requirements. It highlights that the dominant regimes (and not only the alternative ones) may be adapted / transformed because of a political national and /or regional vision. It shows that conventional agriculture is able to carry out ambitious agri-environmental objectives.

Adaptability and transformability rely heavily on the diversity of the farms strategies of specialisation and diversification, processing and marketing activities, off-farm activities, availability of labour from family or paid employees, governance of the regional system... They are different pathways that have different characteristics and dynamics (see following sections).

Enabling social learning?

There is a good pool of knowledge: a lot of institutions (see detailed maps and comments for each of the 5 systems in section 2.3.2) are engaged in research and developing agricultural and rural development strategies and issues.

Regarding small – scale farms, according to our interview partners, the problem sometimes appears in the making of results available and accessible to farmers. There are different reasons; one of the most obvious and mentioned is the fact that research and studies are mostly not enough practice orientated and tangible for farmers. The learning processes for farmers are often linked to personal contacts and networks (ex-colleagues from the school or university, neighbour farmers, local associations of farmers, etc.) or through exchange with customers or through "learning by doing".

Does the governance system enable social learning?

See the governance section - 2.3.2, which highlights that the 5 different systems (dominant or alternative) have specific networks and learning systems.

Balance between permanence and change?

The farm structures are changing a bit slower in the agglomeration than in the rest of the canton and compared to the whole of Switzerland (table 4). Changes are more important in the two hilly regions than in the valley and the plateau. Compared to the rest of Switzerland the number of very small farms (smaller than 5ha) are less important in the canton of Bern. These very small sized-farms are those that disappear the fastest in the country.

Table 4 - Farm structure evolution between 1996 and 2012

	Agglo	Canton of Bern	Switzerland
Number of farms	-1.5%	-1.6%	-1.7%
Evolution of the total farmland /year	-0.19%	-0.18%	-0.17%
Evolution of the farms size per year	1.8%	2.0%	2.1%

Especially in the milk value chain, small sized dairies and firms are diminishing and bigger firms are set-up.

In the sector of organic production it is difficult to bundle the different interests because of the high diversity of farmers and farms and thus the strategic visions. . This slows down adjustments and development processes. The association "Berner Bio Bure", the regional association of organic farmers, for instance accounts more than 1'000 members. According to its president, it is often difficult to find consensus on strategic focuses, such as for instance on the use of alternative energy sources, because the point of views, constraints and needs of members are very diverse.

With regard to Switzerland and our specific case-study, we can stress that the system has undergone important changes in the past 10 years, both progressively and partly (ecological requirements, responsibility of the markets transferred to the private actors). One can consider that the critical change of the agricultural policy in 1992, followed by the new milk market regulation in 1999⁸ which abolished the price and volume guarantees and reduced the price support measures, had been a major shock for the farmers, especially in the Bern region, which is the first milk supplier in the country.

Are there informal networks?

Most of the networks are formal (see maps and comments on governance in next sections 2.3.2) with written agreements, engagements and contracts.

Combined with these formal networks, there are a lot of informal links between people involved in the different supply chains. Switzerland is a small country where people know each other well.

⁸ As part of the agricultural policy in 2002, this new milk market regulation system which entered into force in May 1999, was based on three main elements according to Koch 2002 : (1) on a limitation of supply in Switzerland by quota (milk quotas) associated with border protection; (2) the promotion of cheese sales by a general cheapening of raw materials (allowance for milk processed to cheese, allowance for feeding without silage) ; (3) a cheapening of butter and other dairy products (so-called subsidies). Its aim was to increase the competitiveness of Swiss milk production and to secure the highest possible sales of milk and milk products on domestic and foreign markets (Koch 2002, p 107f in Dr. T. Haller, 2014).

The region is well-known for its small-scaled network of producers, processing companies, distributors and consumers. In certain regional value chains (e.g. berries, milk, vegetables ...), short food supply systems are dominant and the stakeholders are well linked to each other. This networking offers good opportunities to strengthen the regional economic cycle and mutual confidence. Short value chains benefit as well consumers, because of the direct contacts and the informal exchanges. Consumers have the possibility to discover and better understand "the rural and agricultural realities" and especially to better know where their food comes from. In fact, food security and quality, foodstuff traceability and transparency are very important issues for today's Swiss consumers, in addition to ethical, social and environmental concerns. SFSC are known for favouring these different aspects as they are more likely to network and interact with other actors in the territory, largely using environmentally friendly and landscape maintaining production methods and the social proximity to consumers allows for the sharing of information on the origin, production methods and quality of the product.

Regarding short food chains, according to our interview partners, there is a lack of institutionalised cooperation between the organisations on regional level– there is no official collaboration; the networking and exchange is mostly informal.

2.1.2 *Autonomy and (network) embeddedness*

To what extent are farms autonomous? Autonomous in relation to what?

Regarding ecological aspects and use of inputs, the agricultural policy in 1992 has been designed to improve the environmental performance of agriculture, but it has led to a high dependency for farmers on direct payments. Many farmers complain that they are constrained by the strict State rules and cannot innovate in their technical practices and express a lack of autonomy and motivation.

There is now a clear political vision in favour of milk production with little /no protein inputs. This means that important progresses have been made in all channels -dominants and challengers- at a very large scale to implement ecological requirements.

The organic movement has also been a key actor in developing environmentally friendly practices. Furthermore, most of the PDO alliances also made an important step towards more environmental and animal welfare practices; they have included in their code of practices strict constraints regarding animal feed and the preservation of natural resources/landscape.

Regarding economic aspects, many farmers are still nostalgic of the old system, which they felt was much more secure than the present one. For others, the increased insecurity has convinced them to develop other activities that could increase added value

What networks and platforms exist in the agricultural/farming community?

There are multiple formal networks and platforms for every value chain. Some of them are operating on a national level; others are active in the region. If farmers want to produce for a label it is necessary that they become a member of the corresponding certification organisation.

The following list shows a selection of networks and platforms in the milk sector:

- BVM, Professional Association of Switzerland Dairy Professionals (www.bvm-asl.ch)
- Swiss Milk Producers (Schweizer Milchproduzenten): www.swissmilk.ch
- Emmentaler Switzerland PDO, <http://www.emmentaler.ch>
- Biomilkpool
- Bio Emmental
- Ämmitaler Ruschtig
- Rund um Bern ("Around Bern")

A lot of direct selling initiatives, members of "Rundum Bern" or "Das Beste der Region" are also taking part in the annual famous agricultural fair in Bern, the biggest one in Switzerland, called BEA. This is not only a great opportunity for promoting their products, but also for networking with other producers, wholesalers and consumers. The yearly organised "Gourmet weeks" in various regions of Switzerland, generally takes place in the region of Bern from mid August till Mid-September and is co-organized by "Das Beste der Region". It allows farmers, but also actors in the field of gastronomy and commerce, to promote their regional specialities and connect with professionals and the public. There are also other localized events during the year (village festivals, etc.) favouring exchange between various actors. In the organic sector, a yearly organic market, the so called "Bio-Märit", is organised by the regional Union of organic producers (Berner Bio Bure) in the agglomeration. Even if these events are not reserved for the milk sector, they gather a lot of cheese and other milk product producers.

2.1.3 Development over time and adaptability

Tensions, fears, threats and challenges of agriculture and the region

Disturbance

The construction areas are more and more expanded, especially close to the agglomeration. On the one hand, this allows keeping the geographical area attractive for habitation which also benefits the local economy. On the other hand, this has a negative impact on the farms near the city of Bern. They are threatened to lose farmland, some to the point that they must abandon the farm. Additional land is needed for infrastructure (traffic, leisure ...) and construction is not dense enough. According to one of our interview partners, the main tensions and target conflicts are due to *"the use of land in general, agricultural production versus commercial business, resulting in tensions and conflicts related to the development of the agglomeration. Agricultural buildings may only be constructed if sufficient distances from residential areas are respected; it might even happen that a farm has to give up its business, if the agglomeration is expanding strongly towards the farm land"*

Renaturation leads to conflicts. *"Renaturing projects come into conflict with agriculture. Rivers are renatured, which often leads to the loss of the most productive farming land. Farming land must be sacrificed for construction (e.g. shallow-buildings) and transport infrastructures (e.g. tramway)."*

Basically, it is necessary to restore different locations to achieve a better biodiversity and structure in the landscape, to prevent for example the loss of nutrition by erosion. There are benefits for the agricultural sector through these measures but in most of the cases it means a loss of land as well. One problem is the insufficient communication between the organisations of site preservation and agriculture.

"Agriculture ticks more slowly compared to other sectors and everything around it, for instance zone-planing is too quick. Because of the nature, agriculture can not adapt so quickly to spatial and economic developments." In fact, development on farms needs time, it is a slow progress. The development of regional planning and

economic progress is fast, in comparison. These two developments are not harmonised in a useful matter, it needs a better mutual communication, coordination and matching.

A problem that occurs mainly in the agglomeration is the trend that farms are getting bigger and bigger. *Agriculture becomes bigger; especially the infrastructure, but the agglomeration wants to have a nice landscape, corresponding to the idyllic image of agriculture.*"

In fact, urban people often have a "romantic" image of agriculture and would like to find the perfect "traditional farm" and landscape with grazing cows; conflicts of interests may arise between urban or non agricultural residents' expectations and farmers' realities and constraints. In fact, agriculture cannot avoid producing emissions (smell, noise,) or certain practices (seasonal week-end work) which disturb and might create conflicts. *"Emissions produced by agriculture, such as noise, smells or nitrogen is a big problem because residents in the agglomeration do not accept it."*

"The rural area is not aware about the problems and concerns of the urban area and vice-versa" which is for several interview partners a main source for the divergences between the agglomeration and the rural "hinterland".

Shocks

See table 4 and section 2.2.2

What do you think are the main strengths of your region?

The region is on a small scale as this is typical for Switzerland in general. The city of Bern is one of the biggest cities in Switzerland, but it is easy and fast to reach the rural areas. Farms, processing firms and distributors have good opportunities to sell their products to suburban and urban consumers. The market chances are mostly intact when farmers and distributors are innovative enough to make them accessible. The possibilities for an efficient logistic system are broad as well. There are good roads to almost every little village or farm so they are accessible for companies that are collecting agricultural goods (e.g. milk). The production of organic cereals can be sold for a good price.

On the other hand the inhabitants of the city and the agglomeration are pleased to have places for informal local recreation quite close in their surroundings. Rural pathways that are used by farmers for their activities in the countryside are open to the public (pedestrians, bicycles, horse riding...). The landscape is appreciated by the majority of people. There are a lot of hills, forests, rivers, so tourism and various free activities in the nature are well developed.

Our interview partners largely mentioned as main strengths of the region:

- *"The topography of the region determines its diversity"*
- The diversity in terms of landscape, culture and services
- The local recreation facilities and tourism
- Good transport infrastructure and logistics
- Good agronomic suitability
- Short transport distances
- The rural character has been preserved; the agglomeration is small compared to other Swiss agglomerations
- Diversity of regional products and markets
- *"Good trading markets with a lot of customers"*

Moreover they perceive a strength in the overall *"trend to more regional products and moving away from industrial, standardized products"*. *"Young people (around*

30 years of age) start to purchase differently. They purchase more conscientiously, "I want to buy a regional product and accept to pay more so that the added value remains in the region". The new technologies such as smartphones, apps, internet, etc. also contribute to better informed consumers, and access to a range of offers and choices".

What allowed the farms in your case study to persist, adapt and prosper over the last 50 or 20 years?

Concerning the dominant channels, the governance system have probably been a key factor in relation to adaptability. Milk producers have also a real passion for their job. However, a new shock such as a new decrease in the price of milk, could finally push a large number of middle size milk producers to abandon milk production.

Concerning direct selling, one of the objectives is to have added value remaining on the farm by avoiding intermediate trade as much as possible. That means that storage, trading and processing are done on the farm. The consequences are related costs and extra work time. All farmers do not have the skills to be successful in this sector, but when it works, it has proved to work very well. Collective or group farming can enable this because the task can be partitioned and the farm has a better steadiness. Aspects that should be considered to manage an effective production and commercialisation on the farm are: not every farmer has a talent and vocation for this type of agricultural business; it is necessary to get continuing education on the subject of direct marketing; farmers should decide if they want to focus on production or more on agro tourism, direct marketing and processing (specialisation).

In the sector of organic farming, cooperation with the big retailers has been a key factor for development. But it is important to be aware that the market is not waiting for the farmers. They have to be innovative to persist and to find and keep trade channels. One possibility is to identify and develop niches as well as collaborating with big retailers.

Most of the farms are organised as a family business. It is very important that families find a way to balance work and leisure time and cultivate a sustainable communication. Especially for the direct marketing it is important to have a team to achieve a shared task. It is less easy for "lone fighters".

What are the main sources of resistance to change?

- Consumers are not solely responsible for the development of agriculture, not only consumer behaviour has an impact on the conservation or decrease of regional economic cycles or organic farming
- Consumer behaviour is controlled by the information of wholesalers, processors, policy, etc.
- The higher price for organic products or regional quality products can also be an inhibitory factor for the choice of the products
- Claim of consumers for livestock/animal welfare is high, regionality is important; but the purchasing behaviour is in average diametrically opposed to the setting

2.2 'Prosperity' - related findings

The canton of Bern is the first producer of milk and vegetables in Switzerland. These very high volumes of production contribute to farmers' income, through products sales and agri-environmental direct payments.

But most of the agricultural products sold from the canton (industry milk - see map page 9, confirmed with vegetables) are generic and are sold in the national markets

for home consumption and collective kitchens. There is no transparency about the final outlet and valorisation and there is also no clear and common strategy of agricultural politics in the canton of Bern. The farmers do not know what has been done with their product (low value or high added value processed products). Most of the products are delivered and processed outside the canton with little or no added value for the canton. The production of these "conventional" generic products is conducted according to strict agri-environmental requirements and the products are labelled "Suisse Garantie" (<http://www.suissegarantie.ch>), a label owned by the farmers' organisations. They benefit from the "swissness" value of Swiss food products among a large part of the Swiss residents (75% according to consumer surveys). These supply chains are piloted by strong intermediary companies that negotiate with retailers and wholesalers. The "style" of management is industrial.

Concerning the PDO Emmentaler cheese, the PDO registration has not led to expected results regarding economic prosperity. Contrary to some other Swiss PDO cheeses that have been real success stories regarding prosperity issues (economic and non- economic benefits) such as Gruyère Switzerland PDO or Vacherin Fribourgeois PDO, Tête de Moine PDO... (<http://www.aop-igp.ch>), the Emmentaler supply chain could not overcome the dissolution of the State controlled market board in 1999 - section 2.3 'governance' findings. The private interprofessionnal body failed in creating a new marketing vision and discipline among cheese processors. The milk price got very low despite strict production constraints for the farmers (no silage, daily deliveries to the cheese processing unit). When economic prosperity is not obtained, it is very difficult to maintain social cohesion and pride. Another important aspect of PDO Emmentaler is that the consortium is not member of the Swiss AOP-IGP Association and do not participate /benefit from the common promotion effort. But it is not evident that the not so good market results and development of the PDO Emmentaler cheese are related to this fact.

Concerning the organic supply chain, the vision and cohesion at the national and cantonal levels are very strong. The image among consumers is contrasted (some "believe" in organic food products but some do not...), and the market share is around 9% of the Swiss fresh food products market. The prices for farmers are 20% higher than for conventional similar products. The "organic spirit" and non economic objectives are shared by the members of this quite autonomous community. Many of the organic producers are direct sellers.

Direct selling producers have to be distinguished regarding 'prosperity' issues because they (try to) cumulate added values (production and selling) and are in direct connection and interaction with consumers. This requires very different skills (technical, commercial, social) and a lot of extra work. When it works, it leads to prosperity but to be successful a lot of conviction, adaptability and energy is needed. This form of selling is often successful when the producers are developing innovative ways to distribute their products. It is necessary to have a good and strong network – often so-called neo-rural producers bring good conditions for this. Another form of short food supply chains is community supported agriculture, which has seen a strong development in Switzerland's urban and periurban regions over the last 20 years. This form is linking producers and consumers in an even more intensive way as they are running the farm or the production together; a complex collaborative network where social, community and environmental benefits are the drivers and not "economic-profits".

Regarding "environmental prosperity, the Swiss agricultural policy is based on agri-environmental requirements and payments. Ecological requirements are implemented by almost all farmers and the global impact on environment is obvious. Organic farming has even higher requirements regarding agricultural practices. Direct and local sales, as well as other forms of SFSC (CSA, delivering schemes..) contribute to an improved carbon footprint due to short transport distances.

2.3 'Governance'-related findings

The governance involves different public and private actors. The Swiss agricultural policies are a result of debates between political parties, interest groups (WWF, Pronatura, and the industrial sector) and the Swiss farmer union. In our case-study, the private actors are facing the problem of coordinating producers and dairy companies' individual decisions. Since the liberalisation of the markets, the public authorities are powerless concerning fixing the milk price and limiting milk / cheese production. At a regional level, they play an important role in fixing some important rules of the game. At the national level, the key issue is fixing the criteria for farmers to get the direct payments.

We will start by the key private actors and will continue by presenting the key public actors.

2.3.1 The role and interests of key private actors

In this section the aim is to identify what factors in the development of the governance partnership are important to our case study. Focus is on the role and interests of key private actors in the most relevant governance constellations in the case studied.

What actors are involved and what is their role in the governance partnership(s)?

Some public and private actors are involved in all types of partnerships.

Major public actors that are involved in all types of partnerships

Who	Type of actor (e.g. farmer, inhabitant, local politician)	Objectives?	Role in the governance process?
FOAG	Ministry of agriculture at federal level	<i>Agriculture has to fulfill the multifunctionality goals defined by the art. 104 of the constitution</i>	<i>Design and implementation of the agricultural policy</i>
ARE	Federal office for spatial development	<i>To coordinate decisions regarding spatial development</i>	<i>In charge of the Federal regulation on spatial development.</i>
FOPH	Federal office for public health	<i>To guarantee food safety.</i>	<i>Control of food processing (hygienic rules)</i>
LANAT	Administration at cantonal level for nature and agriculture	<i>"Support a sustainable, productive and competitive agriculture (Guarantee a sustainable use of natural resources and support biodiversity)"</i> <i>Source strategy LANAT 2014</i> <i>"Support agriculture according to the different regions" (Richtplan Kanton Bern)</i>	<i>Implementation of the agricultural policy designed at a federal level</i> <i>Define the cantonal priorities</i>
LOBAG	Cantonal farmer union. The union represents the interest of all farmers of the canton.	<i>Lobbying, taking into account the interest of farming families: income, role of food producer, better balance between production and ecology, general conditions and requirements for farmers (source LOBAG website)</i>	<i>Negotiate and discuss the design and the implementation of policies: agricultural policy at federal and cantonal level, land planning policy etc.</i>
RKBM	Regional administration structure grouping 85 municipalities	<i>Coordinate the policy between the 85 municipalities in the field of spatial planning, transport. Culture, regional policy, energy</i>	<i>Regarding agriculture and supply chains:</i>

			<ul style="list-style-type: none"> • <i>Design and implementation of the regional policy</i> • <i>Design of the spatial planning policy</i>
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Major private actors that are involved in all types of partnerships

Who	Type of actor (e.g. farmer, inhabitant, local politician)	Objectives?	Role in the governance process?
Milk producers Union	Farmers union	<i>To defend the interests of the milk producers.</i>	<ul style="list-style-type: none"> • <i>Lobbying</i> • <i>Promotion of milk products to consumers</i>
Retailers	Commercial sector	<i>To develop activities and get margins.</i>	<i>Choose the assortment of milk products to be sold in stores.</i>
Agridea	Association (members are cantons, institutions and farmers' organisations)	<i>To develop all types of agriculture in favour of sustainable rural development</i>	<i>Carries out applied research for farming practices and regulations, training of extension services and tools for farms at national and international level</i>

Four main constellations have specific key actors:

- The industrial milk supply chain
- The cheese supply chain with Emmentaler
- The organic supply chain
- Direct sales and CSP

Each of the four constellations actors in the supply chain are different and price negotiation processes and volume management are specific, we will describe separately the governance mechanism and partnership of the three constellations. Regarding the initiatives of the challengers in terms of direct marketing, community based agriculture or innovative products from dairies, the description of the governance aspects can be found in the section 2.2.4.

The industrial milk supply chain

Who	Type of actor (e.g. farmer, inhabitant, local politician)	Objectives?	Role in the governance process
Milk producers	farmers	<i>To produce milk and get a regular income.</i>	<i>Quite passive, except for choosing the production techniques. They also have the power to decide to abandon milk production.</i>
Milk collection organisations		<i>To collect the milk and check milk quality.</i>	<i>Quite passive.</i>
Extension services		<i>To train the farmers and help them to make their decisions.</i>	<i>Very helpful in the production techniques and also to get the direct payments.</i>

PO LOBAG	A regional milk producers organisation	<i>To maintain milk production in the area. To defend the producers and negotiate with the processors.</i>	<i>Very active in order to defend the producers and negotiate with the dairy companies.</i>
National dairy companies	Dairy companies	<i>To buy the milk, organise logistics, process the milk and sell the milk products.</i>	<i>Valorisation of the milk, product innovation, commercial skills. Their influence on the price of the milk is indirect for a generic product, whose price depends on the gap between supply and demand at the national level. They may import some specific dairy products for processing.</i>
Retailers	Retail companies	<i>To propose a profitable assortment to consumers.</i>	<i>Some are processing milk and selling generic dairy products; all have lines of products with different private labels.</i>
Agroscope	Research institute (except organic agriculture)	<i>Carrying out research and advisory work in the field of farming</i>	<i>Carries out research for farming practices and regulations, advisory services and tools for farms at a national and international level</i>

The cheese supply chain with Emmentaler

Who	Type of actor (e.g. farmer, inhabitant, local politician)	Objectives?	Role in the governance process?
Milk producers	farmers	<i>To produce milk and get a regular income.</i>	<i>Strongly linked to their village cheese processor.</i>
Cheese processors	Cooperatives or private managers	<i>To process and sell a line of products, at a good price.</i>	<i>Commercial strategy for cheese sales.</i>
Emmentaler - interprofession	PDO consortium	<i>To increase the value of the cheese in order to pay a higher price to the milk producers.</i>	<i>Coordinating the members in order to control volumes and cheese quality.</i>
LOBAG	A regional milk producers organisation	<i>To maintain milk production in the area.</i>	<i>Very active in order to help the modernization of cheese processors.</i>
Wholesalers		<i>To sell the products, with a correct margin.</i>	<i>To sell to the retailers and gastro sector.</i>

The organic supply chain

Who	Type of actor (e.g. farmer, inhabitant, local politician)	Objectives?	Role in the governance process?
Milk producers	farmers	<i>To produce milk and get a regular income. Most of them are very concerned by environmental issues.</i>	<i>Some are strongly involved in the selling of their products and some are quite passive in terms of commercialisation.</i>

Berner Bio Bure	Cantonal organic farmer union. The union represents the interest of all organic farmers of the canton	<i>Lobby to take into account organic farmers at cantonal and regional level Support networking between organic farmers</i>	<i>Organisation of networking activities Lobbying in agriculture related policies, milk prices, especially in the organic sector Trainings, advice and promotion activities</i>
Biomilkpool	Private company	<i>Trade organic milk at a national level</i>	<i>Is involved in discussions about prices and volumes with the retailers</i>
Biosuisse	Private national umbrella organization of Swiss organic producers	<i>Regulations, lobby, technical and economical expertise and training.</i>	<i>Design and implementation of the agricultural policy and organic regulations Networking, Trainings, advice and promotion activities</i>
FIBL	Research Institute of Organic Agriculture	<i>Carrying out research and advisory work in the field of organic farming</i>	<i>Carries out research for farming practices and regulations, advisory services and tools for farms at national and international level</i>

Direct sales and CSA

Who	Type of actor (e.g. farmer, inhabitant, local politician)	Objectives?	Role in the governance process?
Milk producers	Farmers and their family	<i>To produce milk and get a regular income. Through their selling strategy they aim at setting up and strengthening links to consumers</i>	<i>Some are strongly involved in the selling of their products and linked to regional processors and consumers</i>
Milk processors	Farmers and processors (cheese-makers, ..), either private managers or cooperatives	<i>To process and sell a line of products, at a good price and keep the added value in the region</i>	<i>Commercial strategy for cheese sales, linking producers and consumers.</i>
"Rundum Bern-Around Bern", The Best of the region, association of Gantrisch region	Private regional organisations	<i>Promoting and supporting short food supply systems, regional specialities and agritourism activities</i>	<i>Organisation of networking activities, Lobbying in agricultural and promoting sales related policies, providing trainings, advice and promotion activities</i>
Platform of CSA initiatives	Private regional union/network.	<i>Promoting the concept of community supported agriculture as an alternative foodstuff procurement system. Support networking between CSA initiatives in Switzerland and abroad</i>	<i>Representing and defending interests of its members, public relation work to raise awareness among the general public on the principles of CSA; organisation of networking activities. Participation in lobbying activities on food sovereignty at national level and in the context of the movement "La Via Campesina"</i>

Local retailers	Private companies or individuals	<i>Trade/distribute local milk and vegetables at regional level, satisfy local demand</i>	<i>Is involved in discussions about prices and volumes with the producers, contribute in promoting local products and offering local producers an alternative market for sale</i>
Local consumers (individuals)	Inhabitants, urban and rural citizens	<i>Buy the products and express their needs.</i>	<i>Require and thus create demand for local, healthy food and contribute to maintain producers and added value in the region.</i> <i>In the framework of CSA they are taking part as equal partners and have thus an active role in decision-making on the production system (products and methods) and management.</i>
CSA-initiatives	Association, cooperative	<i>Producer and consumers together, aim at defining conditions on products (quality, quantity, diversity) and production methods (organic, etc.) on financial issues (fair and lucrative prices ; shared risks) and delivery.</i> <i>Common engagement and commitment.</i>	<i>Offering and promoting an alternative sytem of foodstuff production and procurement; have exemplary function, ensure producers fair prices, living wages and work conditions, provideits members insight into agriculture and practical skill, contribute to diversified and multifunctional agricultural systems</i>
Uniterre	Independent union of farming families, organized as an association and composed or various independent regional sections and commissions	<i>The economic and social defense of farmers and the rural society towards the political authorities, the economy, administrative and legal partners.</i>	<i>Lobbying in agricultural related policies, milk, cereals and meat prices, food sovereignty etc. Is consulted and intervenes in changes and application of laws and ordinances governing agriculture but also the environmental, landscape management, water and animal protection, quality foodstuff and farmers income related issues. Promoting and supporting direct sales, CSA initiatives. Organizing various campaigns and public relation events for raising awareness on the above mentioned issues, active at a national but also an international level, etc.</i>

Direct selling and CSA initiatives are largely engaged in organic farming principles. For those ,some key actors highlighted in the table on the organic milk supply chain are also relevant, namely the Berner Bio Bure, Bio Suisse or FiBL.

How was the governance partnership established?

Milestones for all farmers

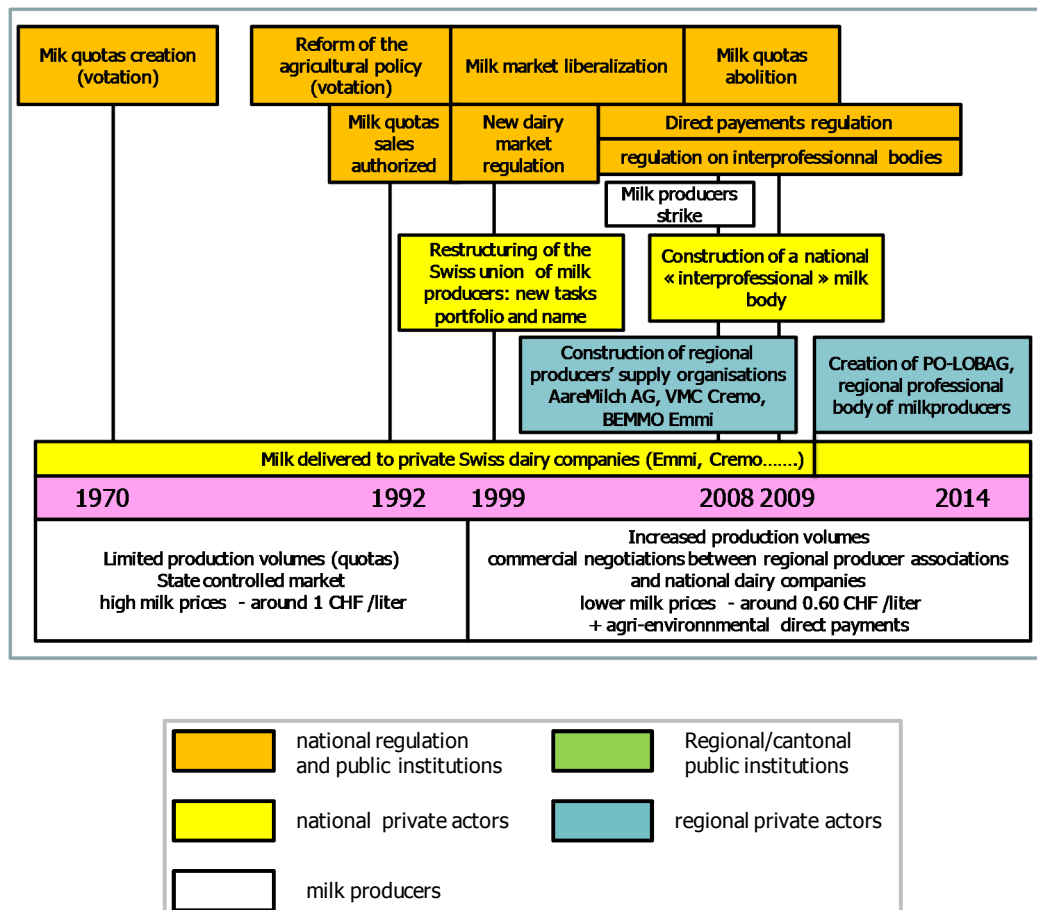
In the 90's the agricultural policy based on price support had been replaced by an agricultural policy based on direct payments, multifunctionality and eco-conditionality. The successive reforms of the agricultural policy are more and more orientated towards eco-conditionality: biodiversity / landscape / resources / animal welfare. This process is led by the Ministry of agriculture (FOAG).

Conventional milk

- 1970 introduction of the milk quotas, management of the volumes by the Swiss milk producer organisation
- 1999 liberalisation of the milk market within Switzerland and new dairy market regulation abolishing the price and volume guarantees and reducing the price support measures
- 2009 suppression of the milk quotas and introduction of the milk buying contracts,
- 2009 creation of producer organisations to monitor the volumes (private)
- 2009 creation of the national milk interprofessional body (private with special rights to monitor the markets according to a national regulation)
- 2014 discussion of a free trade agreement for milk products with the EU

The different milestones indicate how the liberalisation of the milk market had taken place. The Ministry of agriculture (FOAG) has a leading role in that process and farmers struggle to organise themselves. The main private actors, Emmi and Cremo have a very strong role in the governance process at the national level. The pressure on milk prices leads to a strong restructuring of milk producing farms. Regional and cantonal organisations have very low power to influence the process.

Figure 7: dynamics of the canton industry milk organisation

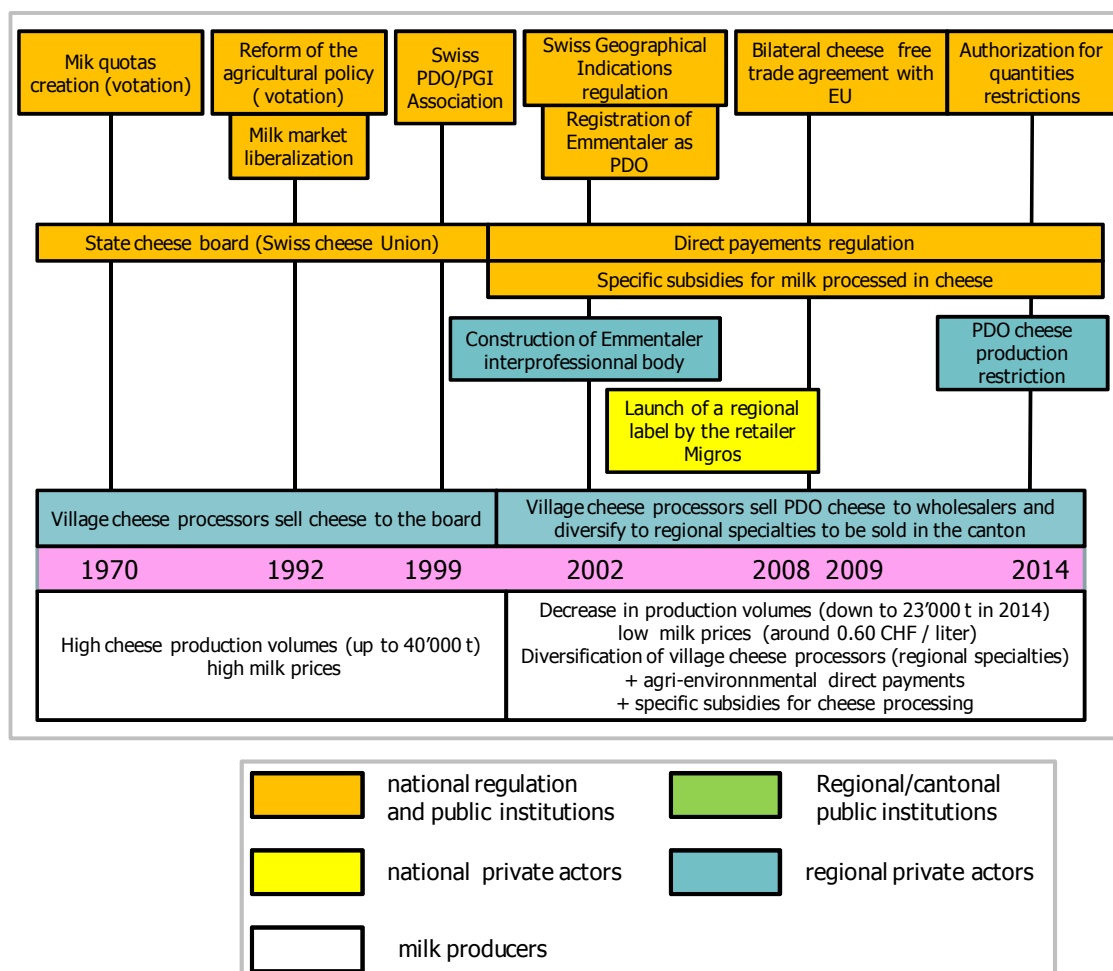


Non silage milk for cheese factories and the case of Emmentaler PDO

- Development of the cheese processing units at the beginning of the 19th century
- 1914 creation of the Swiss cheese union to export cheese
- 1985 peak of production of Emmentaler
- 1999 dissolution of the Swiss cheese union
- 1999 Introduction of the financial contribution for milk processed in cheese and for milk produced without silage
- 2002 Emmentaler recognised as geographical indication PDO in Switzerland
- 2002 Creation of the Emmentaler interprofessional body
- 2007 free trade agreement for cheese with the European union
- 2011 agreement on the mutual recognition of protected designations of origin and geographical indications for agricultural products and foodstuff, but Swiss PDO Emmentaler cannot benefit from this protection because its name became generic.

Historically, Emmentaler was characterised by a strong export tradition. In the 80's, Emmentaler from Switzerland was not able to compete with other Emmentaler producers and started to loose market shares. Parallel to this process, FOAG changed the agricultural policy and promoted a liberalisation in two phases in 1999 within Switzerland and in 2007 with the EU. Moreover, the Euro-crisis starting in 2009 also had a negative impact on the margins which dropped significantly due to a reduced purchasing power in main PDO Emmentaler export countries in the Euro zone (Italy, Germany, France). Those trends led to an Emmentaler crisis which still exists today.

Figure 8: Dynamics of the Emmentaler PDO organisation

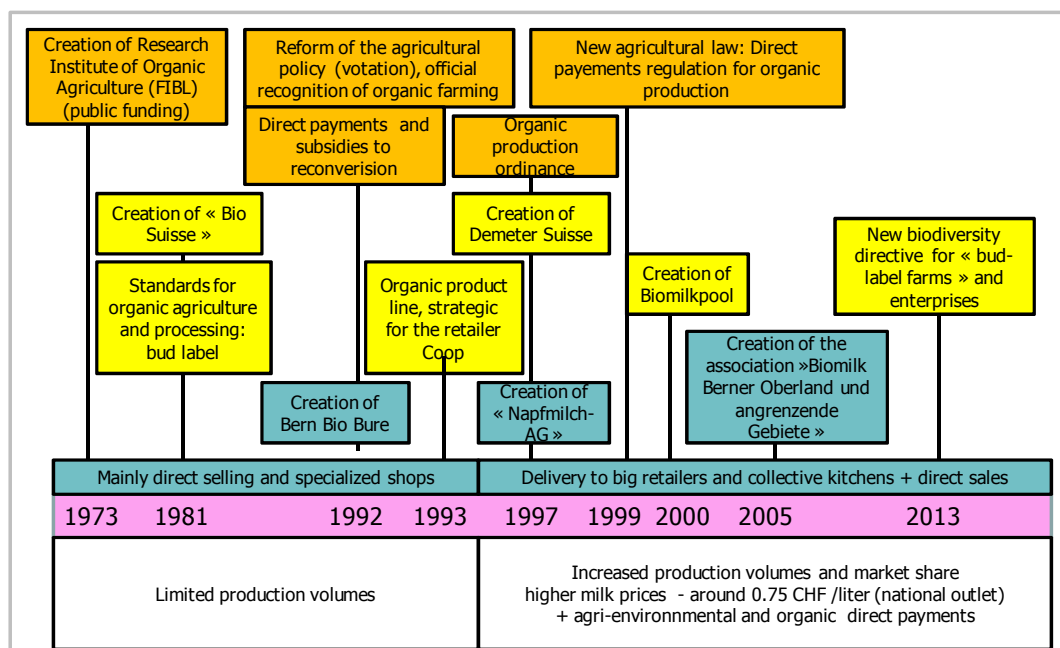


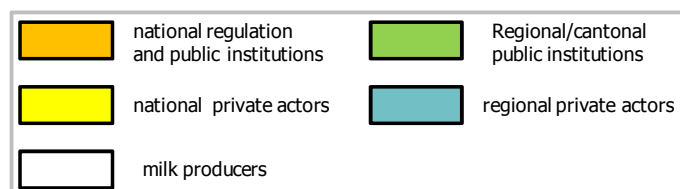
Organic milk (source Hungerbühler and Staubesand)

- Before 1950's organic products are sold through direct marketing
- 1950's development of specialised shops for organic products
- 1970's Creation of several organic products cooperatives
- 1973 Creation of the Research Institute of Organic Agriculture (FiBL)
- 1981 Creation of Bio Suisse (a private national-sector organization of Swiss organic farmers - www.bio-suisse) and the bud label (first standards for organic agriculture and processing)
- 1992 Organic producers can benefit from direct payments for reconversion, before this no state support was existed (support to compete with prices of conventional products)
- 1993 -1995 the two main retailers coop and Migros start to sell organic products (own organic product lines/marks)
- 1999- introduction of an additional direct payment for organic farms
- 1999, in Switzerland, the two main retailers (COOP and Migros) have 65% of market share and the turnover is 654 Mio Fr.-
- 2009, in Switzerland, the two main retailers have 76% of market share and the turnover is 1'500 Mio Fr.-
- 2000 Creation of Biomilkpool, a private enterprise for managing, trading and marketing biomilk, with an average trading volume of 50 million kg biomilk from around 500 dairy farms and 2013 New, more demanding biodiversity directive from Bio Suisse for bud label farms, are to be implemented until the 1st of January 2015

Before the 90's, organic production was considered as a full alternative production and commercialisation system. The positioning of the two main retailers in Switzerland and the integration of organic production in the agricultural policy led to a boom in the 90's. The governance system is characterised by at the same time very local systems with farmers having direct links with consumers and a national system managing large quantities through the main retailers.

Figure 9: dynamics of the canton organic milk organisation

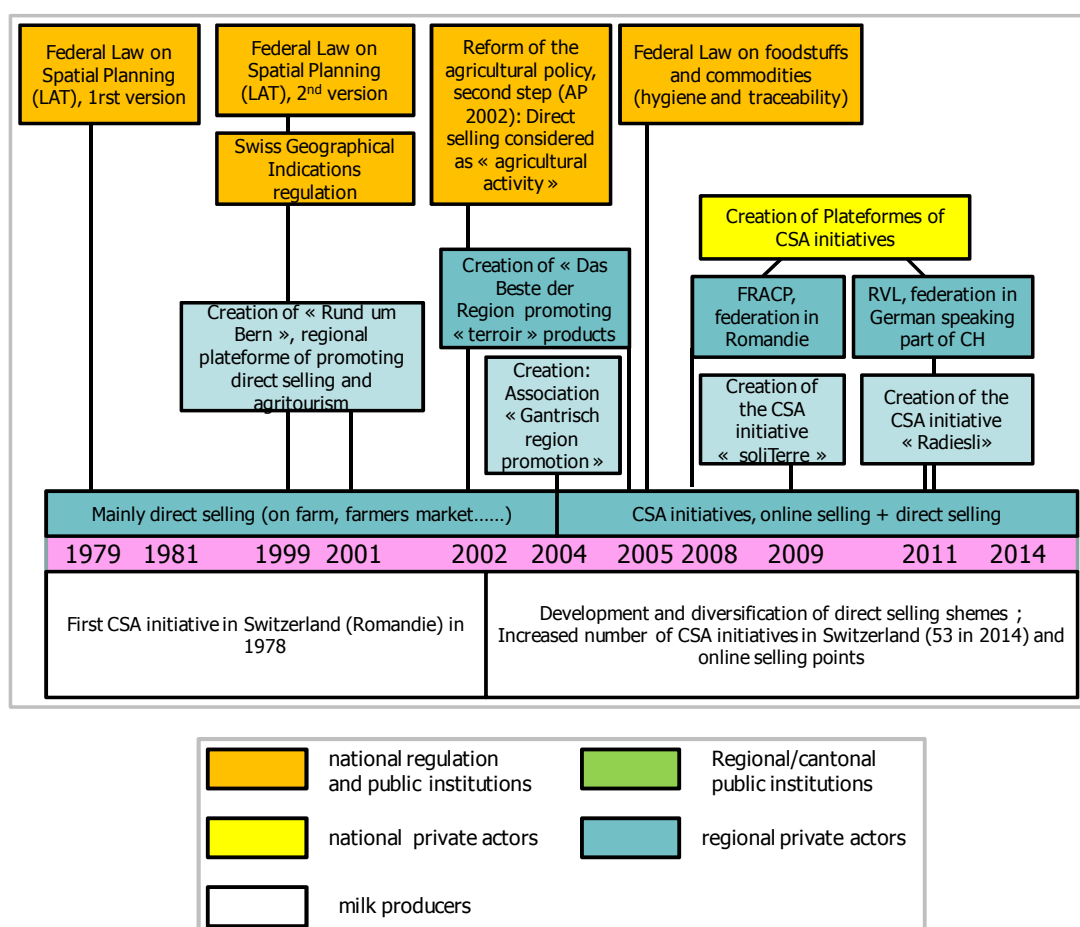




Short food supply chains organisation: direct selling & CSA initiatives

- 1979 Federal law on spatial planning (LAT 1st version), allowing constructions on the farm to implement inseparable non-agricultural secondary activities (direct selling, guest-catering) in already existing buildings if the farm cannot continue to exist with an additional income.
- 1999 1979 Federal law on spatial planning (LAT 1st version)
- 1999 Swiss Geographical indications (PDO/PGI) regulation: the official recognition of PDO and PGI contributed to giving stronger sense and credibility to direct selling
- 2002 Reform of the agricultural policy, second step (AP 2002): direct selling was finally recognised as agricultural related activity
- The development of CSA initiatives in Switzerland, especially in the last 10 years, have been crucial for strengthening the relations between producers and consumers and the promotion of short food supply systems (SFSCs)
- At regional level: Creation of a platform of promoting direct selling and agritourism (2001) and a regional mark for promoting regional specialities (terroir products) in 2004.

Figure 10: dynamics of the short food supply chains organisation: direct selling & CSA initiatives



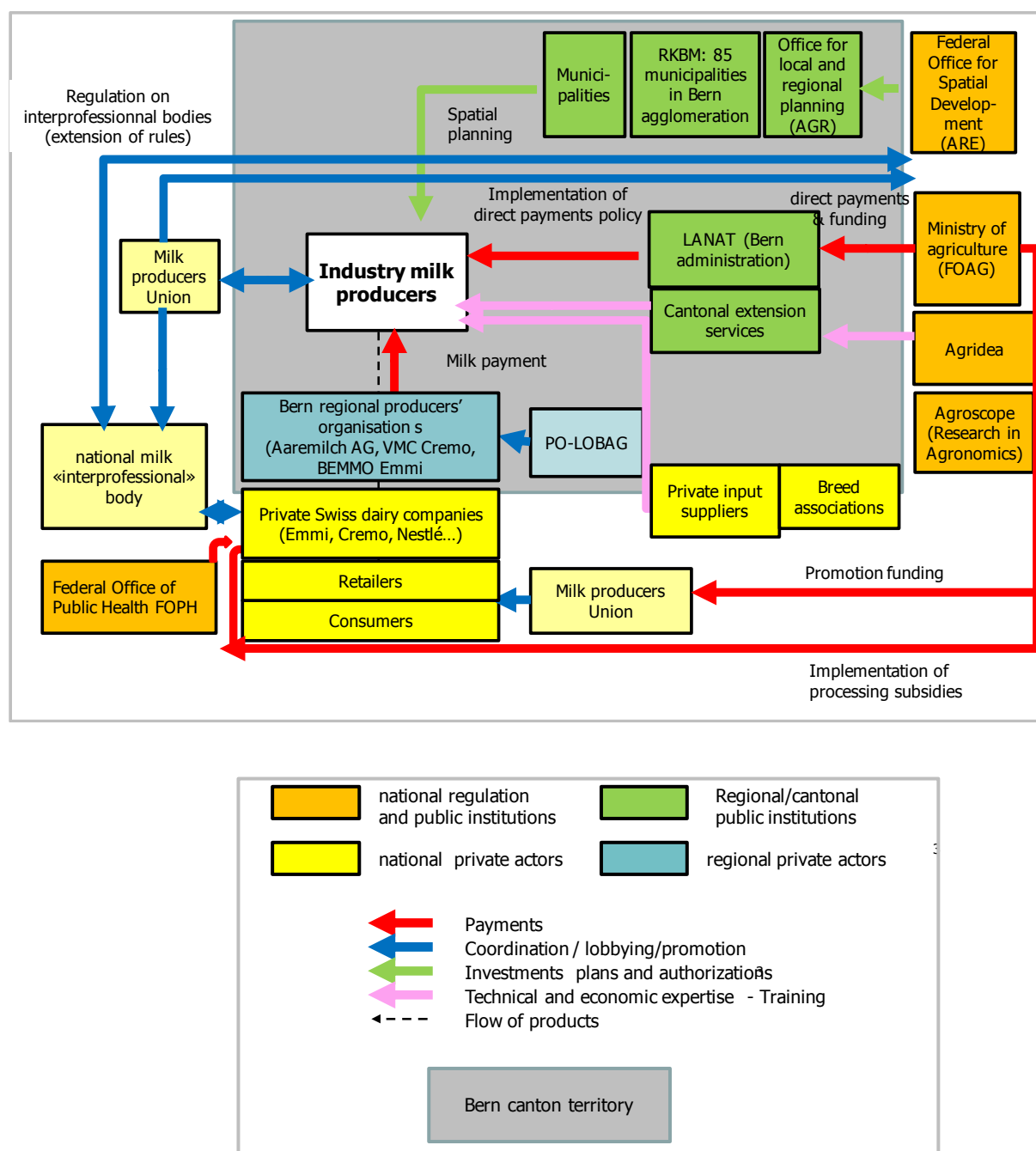
2.3.2 Organizational characteristics of the most relevant governance mechanism(s)

The three main constellations need to be considered separately, because they are quite independent, except regarding the cantonal governance that concerns mainly spatial planning and processing units investments.

The governance relationships seem to be quite well settled in each constellation and should not change so much in the next years. They have crystallised since 1992 and do not seem to be presently challenged by the farmers or other professionals.

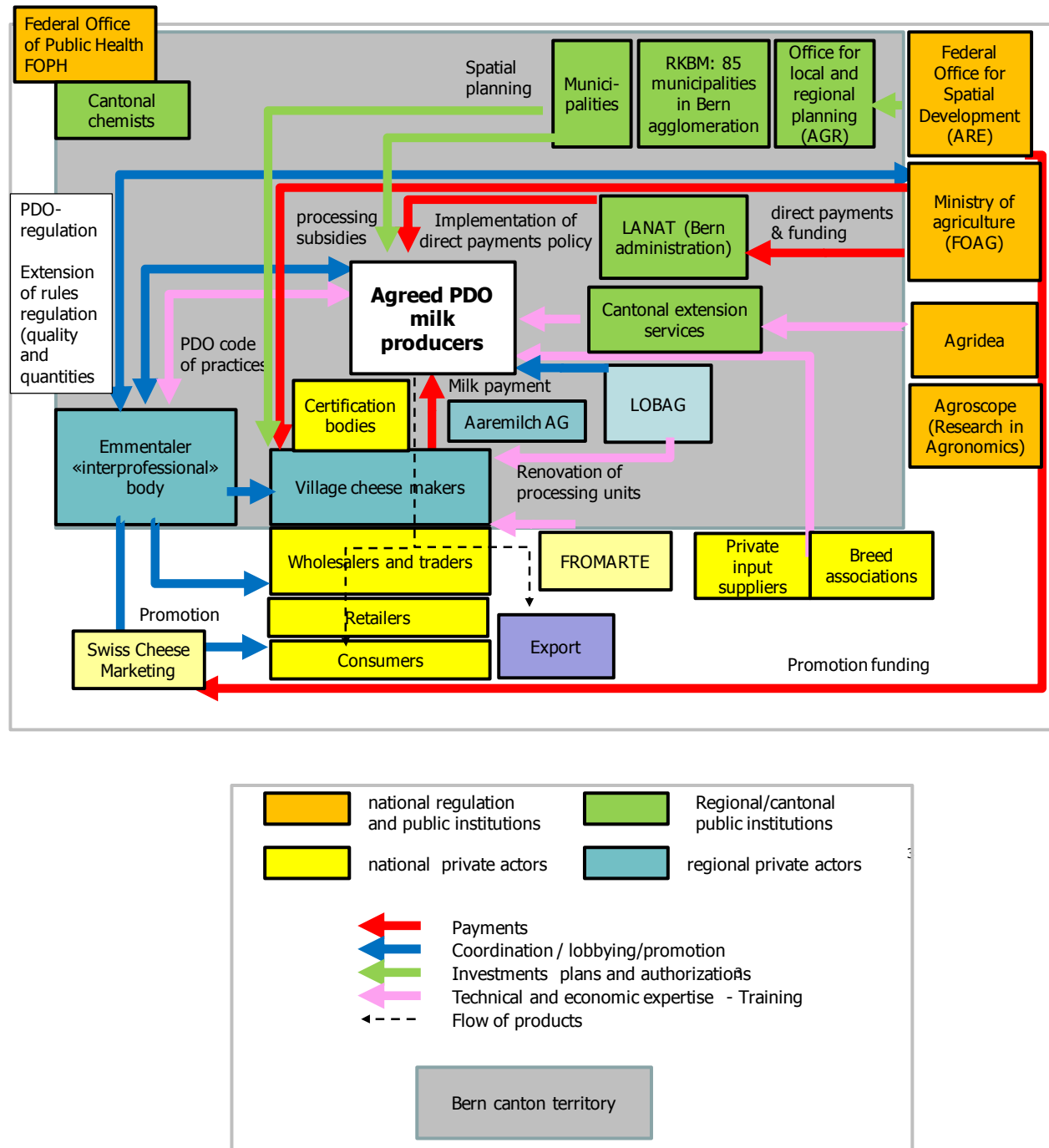
Industry milk: the centre of the decision process is mainly in the national producer organisations, the milk companies and the big retailers. But the coordination within the milk industry channel is low. Direct payments and the milk price are the two main criteria for farmers to make their decisions.

Figure 11: organizational characteristics of the industry milk supply chain



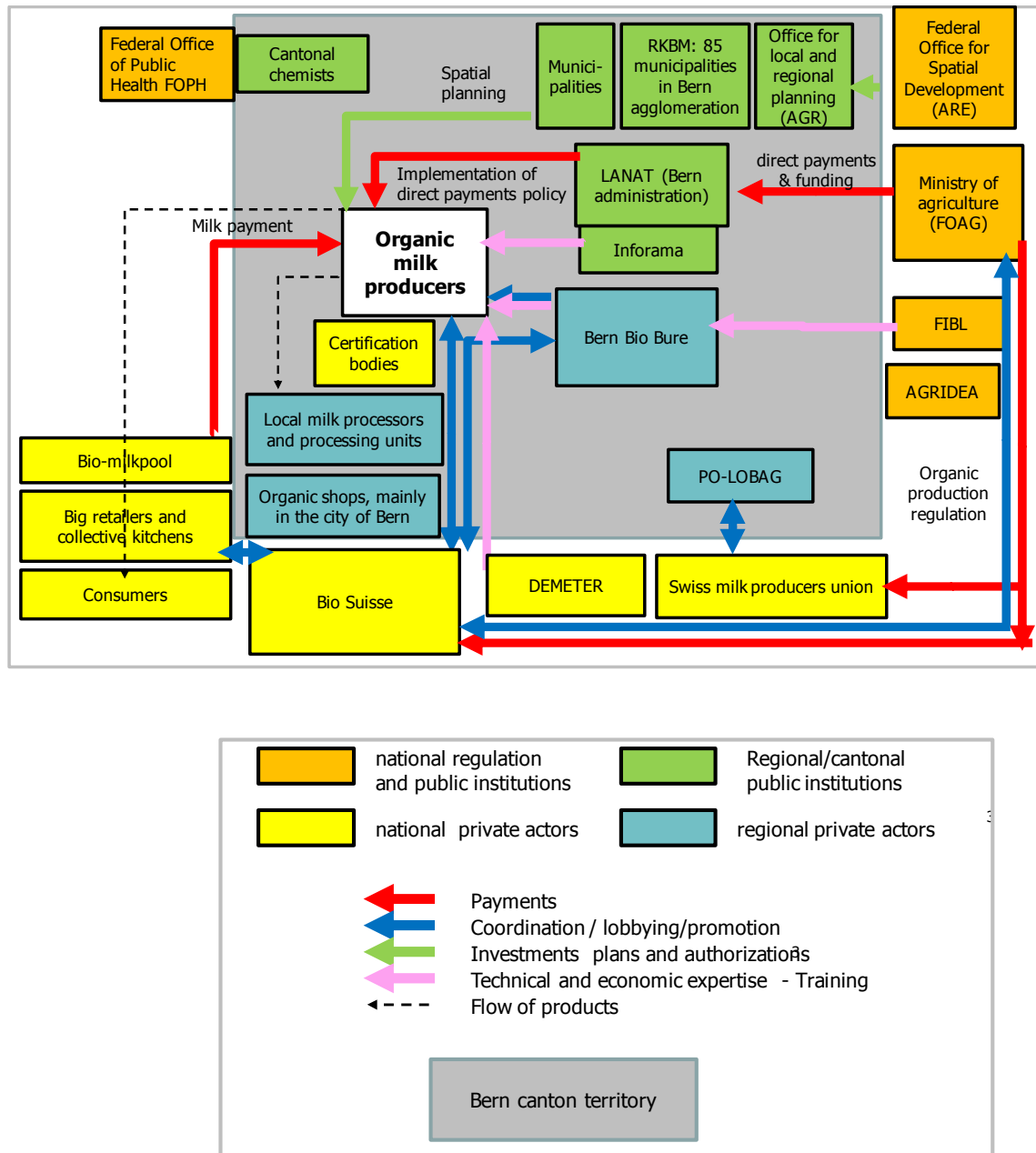
Cheese PDO milk: The interprofessional body has also a key role in coordinating its members' activities and commercial decisions. But the centre of the decision process is also in the cheese processors' hands. Two types of governance systems are observed: private owner of the factory and cooperative based cheese factories (members are farmers).

Figure 12: organizational characteristics of the Emmentaler PDO cheese supply chain



Organic milk: the supply chain is piloted by the organic organisations such as Bio Suisse and the organic milk pool. The big retailers also have an influence on the volumes delivered and prices paid. The national policy that decides the direct payments is also a key factor of the governance.

Figure 13: organizational characteristics of the organic milk supply chain



Short food supply chains: The centre of the short food supply chain is the producer (of milk and vegetables) and generally its family. Almost on the same level of importance are the consumers. The relationship between these two actors is important to run a good supply mechanism that has benefits for both sides. The supply of relevant information and learning options by the cantonal information centres, by private organisations promoting SFSC (Rundum Bern, Das Beste der Region, CSA umbrella organisations, etc.) and informal networks is also very important.

Figure 14: organizational characteristics of the direct selling supply chain

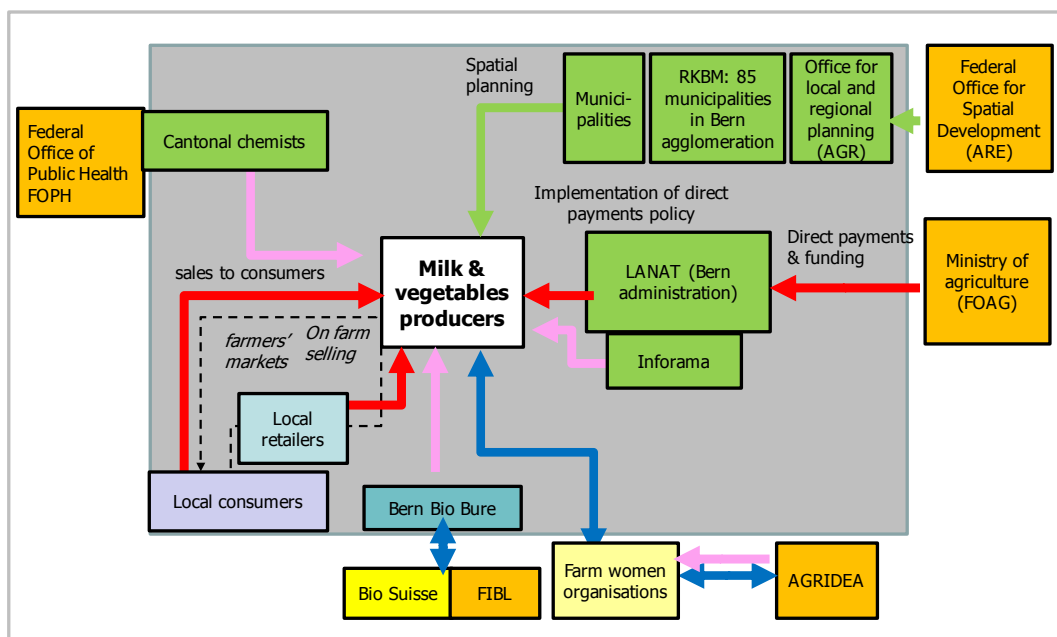
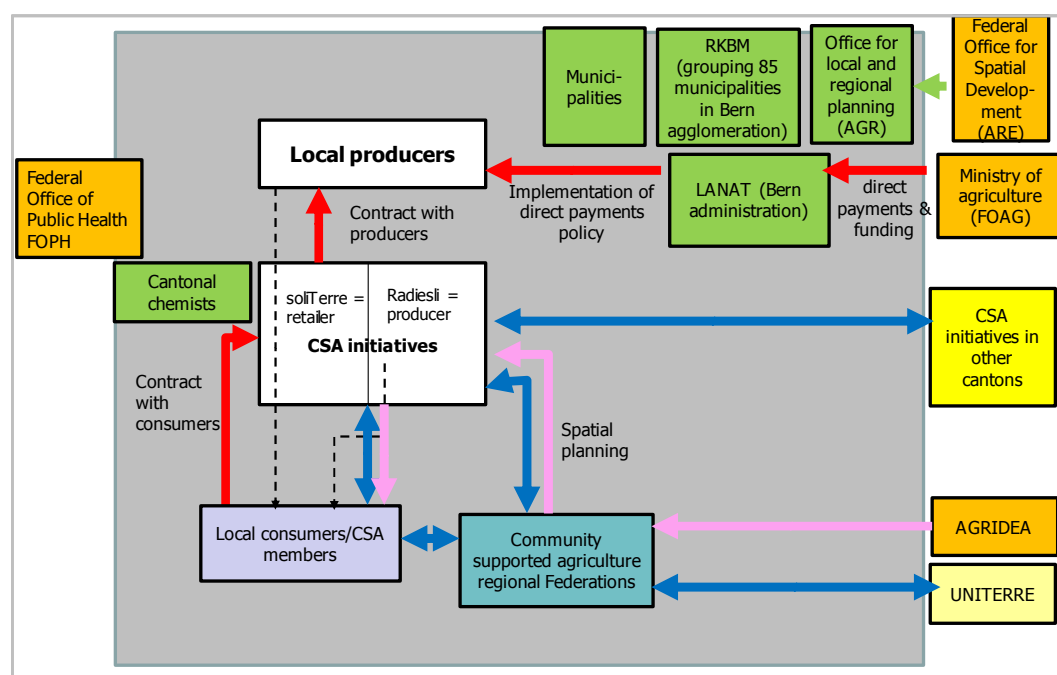
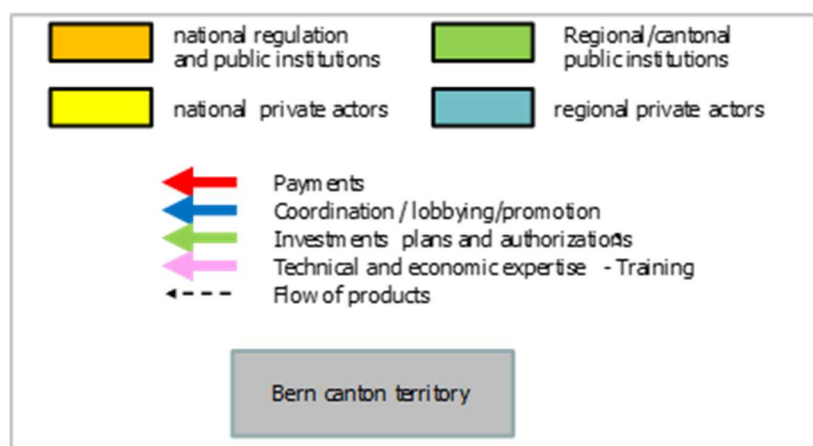


Figure 15: organizational characteristics of the Community Supported Agriculture initiatives





2.3.3 The role of the institutional environment

The main goals in terms of agricultural developments are those of the agricultural policy. In terms of rural development, as the region is strongly urbanised, the goals mentioned (see-below) are those formulated in terms of urban-rural relationships.

Agricultural development	Rural (regional) development
Support a sustainable, productive and competitive agriculture <ul style="list-style-type: none"> support to environmental benefits through the direct payments (such as biodiversity, reduced use of inputs...). support investments in farms and dairies support to the milk markets 	Support a sustainable agglomeration <ul style="list-style-type: none"> urbanisation and arable soil protection support regional economy and green tourism landscape protection

The table indicates figures **at the cantonal level**

Goal	Budget (at cantonal level)
<ul style="list-style-type: none"> support to environmental benefits through the direct payments, which are linked to ecological constraints. Support investments in farms and dairies support to the milk market urbanisation and arable soil protection support regional economy and green tourism landscape protection 	<ul style="list-style-type: none"> 83% of total budget (553 million francs) 3% of total budget (20 million francs)... Around 7.5% (between 40 to 60 million francs) A few million francs 1.5% (10 million francs) A few million francs

Support

Most of these instruments are designed at national level, managed at cantonal level. Local farmers can decide to participate or not. Accepting participation means adaptation to criteria decided at the federal level for most of the programs (grass based products, organic production).

It is important to notice that some payments are directly targeting the "challengers". It shows that the liberalisation of the milk market is not complete and that the state provides direct support (organic specific direct payments and recently grass-based milk/meat production direct payments, payment for milk processed in cheese, payment for non silage milk).

Other measures that are not important in terms of amount but are important in terms of support to initiatives have been developed to support the liberalisation of the markets through more entrepreneurship and more differentiation of products:

- Support to marketing at the regional level: das Beste der Region,
- Recently a new programme has been designed to support quality and sustainable products initiatives
- Geographical indications.
- Regional projects (investment programmes)

Other policies provide opportunities for challengers to develop their activities (regional policy, regional natural park) in particular for marketing and labelling projects (project Rund um Bern, project natural park Gantrisch) and marketing of regional products.

In terms of governance, rural development and agricultural development support to the differentiation and the marketing of products are based on the bottom-up principles. The initiative must come from farmers and private companies and part of the cost of the project is financed by the state. In reality, most of the projects combine bottom-up and top down components.

Coherence

As the political decision was to liberalize the agricultural market and to focus the State support through the direct payments based on multifunctionality and eco-conditionality, from the State point of view the allocation of the budget can be considered as coherent.

Policy constraints

Constraints for the development of the governance partnerships are quite strong in terms of land planning and building permits for on farm diversification activities and direct marketing as well as for farmers that are in the modernisation paradigm and want to scale up.

Change of the agricultural policy every four years means permanent uncertainty and a continuous adaptation for farmers and cantonal administration to the new direct payments. The resources and capacity left for strategic thinking in terms of commercialisation are therefore low.

Expectations

Cantonal organisations should develop a pro active strategic analysis and a clearer positioning regarding dominant versus challengers.

A vision for the territory more than a sector approach could foster the recognition of the contribution of agriculture to sustainable urban/rural development

2.3.4 *The role of newly formed and/or innovative governance models*

At this point we will just briefly describe the CSA initiative Radiesli, in which governance is based on participation, democratic principles and social interactions, relying on civic engagement and sharing common values.

Community supported agriculture (e.g. CSA initiative Radiesli located in Worb, 12 km away from the city of Bern) is one specific model of an agricultural initiative that is based on an innovative governance model. Created in 2011, it gathers more than 200 consumers who together manage the organic vegetable garden. For the professional technical work 2 skilled gardening specialists (2 part time jobs) have been engaged. The members assume logistical and administrative tasks as well as the cultural care. The weekly preparing and delivering of the vegetable baskets is managed by the gardeners and the members. Membership is compulsory at least for 1 year and all members share the production costs. In order to better understand the functioning and the involvement of the members, we carried out qualitative guideline-based individual telephone interviews with around 10 members of this CSA. The issues addressed concern their motivation being engaged in this type of initiative, their relation to agriculture and their everyday consumption patterns. Moreover, these interviews allowed us to get a better insight in their role and responsibilities in the management of the initiative, and thus in the governance system.

The motivation and voluntary commitment of our sample concerns various layers and is independent of income and education level. It is strongly based on values of self-determination, assumed responsibility, trust, community and sharing (resources, experiences, tasks and responsibilities). Moreover, the quality, origin and the cultivation methods of the agricultural products, mainly vegetables, are also a key issue. Organic, regional and seasonal vegetables and resources-sustaining production methods is what they require and what this community garden guarantees. Fair prices and the sociocultural learning effect represent as well motivational reasons for their active involvement.

The objective of this model is to have a mostly equal participation of everybody on almost every decision in the production. This is often difficult to coordinate and needs more time to make decisions, especially concerning discussions, but the model has different advantages:

- The farm belongs to everybody as it is a cooperative
- Investment capital is provided by the members. Thus no dependence on external donors such as banks, credit institutions or public funding and a self-confident and autonomous functioning and decision-making system
- Creation of awareness, because the farm belongs to everybody, it is necessary that all members run the business together
- Responsibility is on the consumers side
- Changes are realised easily, when a large majority agrees
- Knowledge is distributed equally.

2.4 'knowledge and learning'-related findings

2.4.1 *Knowledge needs*

Knowledge needs differ in the different stages of the value chain and according to different sub-chains (conventional, organic, short food supply systems):

- Milk production:
- Milk processing
- Marketing

Milk production

Technical knowledge remains an important skill, management knowledge and farm strategic knowledge needs are getting more important as the market and agricultural policy context has been losing stability in the last 15 years (new rules, new regulations, prices getting lower). The requirements regarding milk quality and food safety are getting higher, and milk is paid according to quality criteria. Genetics, animal fodder and milk yield are still main criteria of performance for many producers.

Milk processing

Competition is increasing within Switzerland (milk) and with the EU (cheese), marketing knowledge for product development, differentiation strategies are getting more important. Especially the Emmental PDO production which is under even more pressure, so milk processors are invited to create a really good quality of Emmentaler cheese. To ensure the transfer of knowledge is important to maintain the skills in the region. This allows for the generation of more value in the region.

Marketing

The proximity with the city offers the possibility for a diversity of marketing strategies both for farmers involved in direct marketing, short supply chains and cheese processing units. Collaboration with retailers and the development of new products is also a great opportunity for milk industry and cheese processing units. The capacity to develop new types of contracting between the actors is a challenge for the future for all actors in the supply chain. The region of Bern is very diverse concerning the possibilities to interact directly with consumers, retailers and also the candidness for new products is not the same everywhere. It is important to develop and offer a variety of education and further training especially for producers and processors to provide a good base of marketing knowledge adapted to the changing context.

In the *organic milk production-sector*, the constraints of standards and the inspections for compliance with defined production and processing methods are far more demanding than that of the conventional sector. According to representatives of FIBL, the focus nowadays is on "compliance checks" but there is a need to shift on the impacts and development of the farms, for instance, checking the health of a dairy herd and the measures undertaken by the farmer to improve livestock health and longevity (Ott, 2012). In a general view, a "break-up of the traditional division of roles between experts and practitioners" and thus giving up the "traditional one-way knowledge transfer" would allow to favor "equitable participation of all players in the knowledge exchange system." There are still a lot of needs in research and innovation to foster knowledge creation and dissemination to practitioners, requiring strong networks of innovative farms that work together with scientists (Zollitsch, Ott and Plagge, 2012)⁹.

2.4.2 Knowledge sources

The actors:

- Political actors: agricultural service
- Public funded AKIS actors: Inforama, Agroscope, AGRIDEA, Profi-lait (national network on milk production between actors from research, extension and practice to provide knowledge and intensify its transfer)
- Farmers associations : Lobag, national milk producers association
- Medias : specialized magazines.
- Private actors: input suppliers (equipments forage etc.)
- Breed associations.

⁹ in FIBL activity report 2012

- Milk industry and cheese processing organisations delivering training and education.
- Universities and schools: HAFL, Bern university of applied sciences, ETH
- Organic sector : public funded actors: FiBL
- Organic farmers organisations: Bio Suisse, Demeter
- Organic sector: Specific school on organic farming (Bioschwand, Münsingen BE)

The actors are well organised and structured with a mix of private oriented actors and public funded actors.

Technical knowhow is well available. Efforts are made to develop management and strategic knowledge to support the so called "farmers entrepreneurship".

The knowledge gap is probably on marketing issues and on contracting:

- Capacity of farmers to negotiate
- Capacity of farmers and processing units to market their products

There is a large difference between industrial processing units (Emmi) linked to retailers that have a great marketing capacity (promotion and product development) and cooperatives or farmers based structures that may have a lack of knowledge and capacity.

2.4.3 *Effective forms of learning and knowledge sources:*

Different national programs involving several AKIS¹⁰ actors are targeting milk production combining technical, management and strategic aspects (Profilait, Optimilch).

Actors that are not in the agricultural knowledge system can contribute to the development of innovative products. For example web based supply chains, community supported agriculture, local procurement in restaurants.

Several internet platforms for information, knowledge sharing and exchange, as well as regular newsletters (AGRIDEA, Bioaktuell.ch, Bärner Bio Bure-Blatt-the regional organic associations newsletter) provide useful information for various actors (producers, agricultural advisors, consumers), and contribute thus to effective learning and updated knowledge on agriculture in general, and sector specific related issues and data, such as the milk price evolution and determination for instance (www.swissmilk.ch; www.tsm-gmbh.ch). For producers who want to develop direct selling or other services on the farm, specific information and knowledge is also provided by yearly updated publications dedicated to self-control in direct marketing and guest catering¹¹ and on-farm gastronomy and tourism¹². Producers and consumers engaged in the organic direct-selling sector, can find useful information on various websites, for instance on www.knospehof.ch and at the regional level, the "Berner Bio Bure association" also organises 2 days-meetings on direct marketing issues.

In summary, the national and regional knowledge systems are well developed and knowledge is available at all levels (schools, scientists, advisors, farmers..) but its dissemination and implementation is sometimes lacking.

¹⁰ Agricultural Knowledge and Innovation Systems (AKIS).

¹¹[http://www.agridea.ch/de/publikationen/publikationen/betrieb-familie-diversifizierung/direktvermarktung-agrotourismus-dienstleistungen/direktvermarktung-selbstkontrolle-direktvermarktung-und-gaestebewirtung-ordner/](http://www.agridea.ch/de/publikationen/publikationen/betrieb-familie-diversifizierung/direktvermarktung-agrotourismus-dienstleistungen/direktvermarktung/selbstkontrolle-direktvermarktung-und-gaestebewirtung-ordner/)

¹²<http://www.agridea.ch/de/publikationen/publikationen/betrieb-familie-diversifizierung/direktvermarktung-agrotourismus-dienstleistungen/agrotourismus/gastronomie-bauernhof-ordner/>

2.5 Interrelations between these different dimensions

2.5.1 *Interrelations between 'knowledge & learning' and 'governance'*

Knowledge & learning is part of the governance characteristics, as shown in the maps presented above. As it is for industrial districts, systems cannot live without a permanent flow of learning and expertise.

In all systems, the governance analysis has identified a high number of potential advisors, public and private. Anyway, discussions with farmers have shown that they relay a lot on informal networks and "strong social links" (according to Granovetter, 1973) such as family, friends, neighbours and colleagues. But some of them, mainly those involved in direct sales and CSA, are searching for innovations in Switzerland and abroad, through "weak links" and are more able to develop new initiatives.

2.5.2 *Interrelations between 'prosperity' and 'resilience'*

The link between prosperity and resilience is complex. We have identified some critical questions:

- **The time frame (short term – long term)** : the system may be presently prosperous and seem to be adaptable, however may be unable to resist a serious external shock. If there is no shock, it may maintain activities and prosperity without problems.
- **The risk management awareness and capacities** : a prosperous system may invest to secure the future and to anticipate / prepare to resist external shocks. But when the sky is blue, it is common not to conceive a possible storm and most of the operators do not prepare themselves for a serious shock. When farmers or processors are struggling to pay their debts and maintain activity, they cannot even imagine an external shock.
- **Specialisation vs. diversification** : specialisation, when successful, profits from economies of scale, authorizes scaling-up, increases yields and volumes and often increases prosperity, but it is fragile and may be strongly affected by an unexpected crisis. Diversification leads to a better risk management by developing a set of products and clients. But the production costs may be higher and the strategy is profitable when added value is generated.

2.5.3 *Contribution of 'knowledge & learning' and 'governance' to 'prosperity' and 'resilience'*

The quality of the governance characteristics and the ability to conduct collective action seems to be a key factor of prosperity and resilience. Capacity building and exchange of experience among farmers and processors and organisation facilitators seems to be a path to success. Informal *networks* are key in knowledge and experience sharing and thus *mutual learning*; central dimensions for resilience and governance strengthening.

Analysis has shown that *key charismatic leaders* in the systems (private and/or public) play a crucial role in buiding up a successful strategy and convincing their peers to anticipate possible even in uncertain problems in the future. *Trust, transparency and adapted communication* are key elements of success. It may be maintained in formal networks but scaling-up requires new tools, beyond the pionner period (see the organic system).

In some channels, the contribution of *operators downstream* in the supply chain, such as first processors (eg. cheese dairies) or vegetables packers play a crucial role in identifying promising innovative, technical and commercial paths, developing activities and getting a fair price for the producers. These operators get the signals from the markets and the institutional context very fast and may alert the farmers. Some *public officers* may play also a "godmother" role in developing new promising initiatives.

3. Conclusions

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

- **The majority of the regional production shuns/turns it back on the city.** It is really impressive to observe that such a huge agricultural canton is not so interested in supplying the agglomeration. Production has developed by delivering milk outside the region. It is similar in the vegetables sector. This strategy comes probably from the high competitive position of the canton, which is able to produce and sell much more than the population needs in the canton. The effort has been deployed to produce high quantities for the national market, especially big retailers. This strategy has led to a certain prosperity, even if presently threatened by the deceiving price of the industry milk. Few milk processing units located in the center of the agglomeration developed a marketing strategy targeting the local market.
- **The “challengers” create a stronger link/relationship with the local consumers** compared to the “dominants”, where products are delivered on the long national chains, controlled by big players. But this requires very different skills (technical, commercial, social) and a lot of extra work. Short supply chains develop mainly when intermediaries in the supply chain (milk processing units and/or wholesalers) develop a marketing strategy targeting the local market. It may be prosperous when well driven but this prosperity is strongly linked to the personality of key managers of the initiatives, farmers and/or processors.
- **Governance characteristics differ largely according to the systems, which are run in parallel.** If some crucial tools are common, such as the direct payments regulation or the spatial planning regulation, most of the governance is completely designed for the system and do not interact with other systems. This is similar for the knowledge and learning aspects. The quality of the commercial strategy, the marketing capacities of the farmers and processors, and the collective action know-how seem essential to get prosperity, beyond the important support through direct paiements. The governance characteristics cannot explain alone the level of prosperity. For example, the PDO governance template is similar for different products in Switzerland but the commercial and social performance differs dramatically from one case to the other. The history of the chain, the personal quality of the managers and key leaders are often mentioned to explain such different results.
- **Each sub-chain is focused on its own governance system and ignores the others.** It is impressive to observe that there are almost no connections between the different governance systems. Farmers do not belong to the same professional networks. The farmer unions are mostly involved in the conventional farming on long national channels. The PDO cheese “family” has specific worries and ways of conducting their chains. The very strong organic movement has developed against the dominant regimes and has developed its own style and networks.
- **Public cantonal policies :** the farmers are surrounded by a lot of different public authorities that are following their own agenda and objectives such as direct payments policy, spatial planning, public health, etc... They are not necessarily in conflict but are often blind to other institutions. *The cantonal level seems to be a good territorial level to develop a common vision for agriculture because it may mobilize key leaders and informal networks.* In Bern, the cantonal vision /policy for agriculture is coherent with the federal one. The federal agricultural policy is designed to develop different farming strategies with a set of public tools and the canton relays and implements these policies. The regional brand “Das Beste der Region” benefits from the federal promotion of sales programme. However the cantonal agricultural policy seems to have a major interest in nature preservation rather than developing agriculture prosperity and resilience.
- **Transformability and adaptability can occur in all channels.** The issue of resilience is very complex and has to be nuanced. The adaptability of the dominant regimes is quite good, when the stress is not too strong. However, in case of a very serious problem, the dominant systems will probably be more of a trouble than a challenger. The challengers are more diversified. They master various technical and commercial skills and are more flexible ; they may adapt faster than the dominant. But it would difficult for them to increase fast their production volume if necessary. This means that different regimes (large scale/ small scale ; long /short chains) are complementary and should not be opposed. *A two speed policy may be a solution, with clear size thresholds and adapted rules regarding labour units calculation or hygienic rules (similar to the distinction that exists in the Swiss regulation for slaughterhouses). This is a real challenge for the federal and cantonal agricultural/spatial planning policies to answer to this diversity and to consider it as strength.*

SOME ADDITIONAL INFO:

Please indicate the most appropriate answer by cross (X). The answers reflect your opinion in the RETHINK team (you're the experts!), they are not necessarily based on statistical data.

How dominant is the 'modernization paradigm' in the (official) advisory and extension services? (esp.: purchase inputs from markets (fertilizer, pesticides, etc.), sell commodities (large uniform batches of crops/milk), focus on maximizing productivity (high yield), scale increase and/or specialization seen as necessary to ensure economic viability, adopt latest technology, relevant knowledge is provided by scientists)	
	Very dominant: there is a clear view that there is <u>one</u> right way to do things
	Dominant: most elements are promoted, but a few not because they are not suited to the area (which elements are not suited?)
x	Mixed: some elements are promoted, others not; it mostly depends on the individual farm
	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?	
	0 – 25%
	25 – 50%
x	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 (animal feed, nutrient cycles, crop rotations), low-external inputs, reduce cash flow, on-farm processing, direct-marketing, promote knowledge exchange between farmers ('extension agents' are facilitators rather than providers of knowledge/solutions),	
	Yes, there are 3+ different networks promoting a variety of approaches. They are well established, everybody knows about them (e.g. through fairs, events, published newsletters/magazines)
x	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' and who could share their experience.
	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 have 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.
x	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)
	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.

3.2 Particularly interesting issues for the comparative analysis

Our case highlights the relevance of the transversal themes to analyse a regional supply-chain and actors. It is a very original and promising approach.

Regarding resilience, the approach has helped us to look back in the past and to highlight the transformability and adaptability of the Swiss farmers and enterprises, which had already to face various shocks. It appears that different strategies were implemented in parallel on different channels.

Regarding governance, the approach has invited us to discuss about the power / or lack of power of the different private and public actors, and their influence to change the systems when needed. Even if the public authorities claim that they cannot interfere with the market forces, in practice, the regional and national policies change the rules of the game and influence the farmers' strategic decisions.

3.3 Implications for future research and policy

This case study opens very interesting questions about the capacity of sub-chains to transform, adapt and resist to shocks. Are the challengers more able to persist than dominant regimes and why? A scenario approach could be very useful to alert professionals and public authorities on these potential events.

The link between governance and resilience should be developed further.

The question of policy design to fit to very different types of farms (dominant and challengers) is a key issue. This concerns mainly the spatial planning regulation and the direct payments requirements for small size farmers.

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Results of the meeting with the local stakeholder group, Bern 28th of May 2014

Annexe1: Initiatives in the milk supply chain focusing on direct links with consumers in the agglomeration of Bern

Type 1: Direct selling Farms and members of a Community Supported Agriculture or basket delivery initiative

	Examples	Main characteristics	Distribution channels/marketing strategies	Specificities
1	<p>The Biofarm Zaugg, located about 10 km in the north of the city of Bern www.biohofzaugg.ch</p> 	<p>Organic-dynamic- farming Small scale farm: 8.4 ha</p> <ul style="list-style-type: none"> • Milk-products: Raw milk, 75% of the milk production provided by 9 cows is transformed on the farm to fresh cheeses, cottage cheese, sour milk, whipped cream, yogurt. • Other products: vegetables (1.6ha), potatoes: 0.35 ha, cereals: 1.6 ha, meat-products, flour, bread, herbs... 	<ul style="list-style-type: none"> • Market stands at five locations, • Supplying the “Hallerladen” (organic product shop in the city of Bern), 2 restaurants (1 in Bern and another outside of the agglomeration), • the organic wholesaler “Horai” in the city of Bern (specialised on fresh organic products) and the “Verein Soliterre (Community supported agriculture initiative- CSA in the agglomeration of Bern) 	<ul style="list-style-type: none"> • Member community supported agriculture (CSA) of <p><i>face-to face SFSC</i></p>
2	<p>The Biohof Marti in Rapperswil, located 13 km north of the city of Bern www.biohof-marti.ch</p> 	<p>Organic-farming Medium-sized farm</p> <ul style="list-style-type: none"> • 17 ha land (average size Switzerland) + 9 ha forest, 80 are of table-cherries (800 espalier trees). • Main production: Milk (23 milk cows) 	<ul style="list-style-type: none"> • The entire milk-production is delivered to BIOMILCHPOOL GMBH¹³, and enters into the national organic industry circuit. • On farm-selling for other products: potatoes, apples, pears, plums, cherries, walnuts; own produced apple , timber and firewood; • Vegetables & fruits delivered to specialized organic shops in the city of Bern, the wholesaler “Horai” and to market suppliers, also delivering the CSA initiative “Verein Soliterre 	<ul style="list-style-type: none"> • Member community supported agriculture (CSA) of <p><i>face-to face SFSC</i></p>


¹³ Largest independent marketing organization for organic milk in Switzerland, gathering daily the milk from around 500 organic farms and delivers it to the customers throughout Switzerland. www.biomilchpool.ch




3	<p>Biohof Heimenhaus, located in Kirchlindach, about 10 km in the north of the city of Bern</p> <p>http://heimenhaus.ch</p> 	<p>Organic-dynamic- farming</p> <p>Small scale farm: 8.4 ha</p> <ul style="list-style-type: none"> • Main production: milk, meat (cattle and fattening pigs), vegetables, potatoes, cereals, fruits and cut flowers • Milk-products: The whole milk production is processed on farm into various cheeses (hard soft and fresh), cottage cheese, sour milk, whipped cream, yogurt. • Other products: vegetables (1.6ha), potatoes: 0.35 ha, cereals: 1.6 ha, meat-products, flour, bread, herbs..., 	<ul style="list-style-type: none"> • Ramp sale every 2 weeks, • Delivering orders to consumers homes, • dairy products (cheeses, yoghurt, sour-cream, curd-cheese, fresh cheese, cream...) & meat baskets every week (called Q-Klub) • vegetable boxes every 2 weeks 	<ul style="list-style-type: none"> • Pioneer in delivering vegetable baskets/boxes in the Bern region. Since 1986 they deliver in Bern and the surrounding area directly in front of consumers doors. • Since 2003 event catering with their regional and organic products • Member of BIOABI¹⁴ <p><i>face-to face SFSC</i></p>
4	<p>Biohof Hänni, located in Noflen, about 18 km south of the city of Bern</p> <p>www.haenni-noflen.ch</p> <p>www.dorfchaesi-noflen.ch</p> 	<p>Organic farming system & marketing unit</p> <p>Middle-sized farm</p> <ul style="list-style-type: none"> • No own milk production but bio-milk-products provided from the cheese dairy of Noflen: Milk, yoghurt, natural and fruit curd, cream, butter, panna cotta, sour cream, etc. • 12,5 ha: 6.5 ha vegetables, 1.5 ha potatoes, 0.7 ha fruits, ecological and green areas 	<ul style="list-style-type: none"> • Organic Farm shop in Thun • Weekly basket subscription – delivered by bike courier to the consumers 	<ul style="list-style-type: none"> • Member of BIOABI <p><i>face-to face SFSC</i></p>

Common characteristics: All of these farms, which are either involved a CSA-initiative (first 2 farms) or in box or basket delivering schemes (farms 3 and 4) are biodynamic or organic farms.

¹⁴ Bioabi is an subscription-initiative especially developed for consumers in the city of Bern who wish to have organic, fresh and healthy products directly delivered at home. Created in 2009 and working with 4 organic farms in the region, they deliver weekly organic boxes/baskets containing vegetables, eggs, meat and cheese. (www.bioabi.ch). This initiative will be highlighted in the second phase of our case study as one of interesting examples for emerging initiatives in an urban context as a response for new demands of consumers.

Type 2: Regional Dairies and Cheese-making dairies

	Examples	Main characteristics	Distribution channels	Specificities
1	<p>"Chäsi Worb", located about 12 km of the city of Bern</p> <p>www.chaesiworb.ch/</p> 	<p>Dairy cooperative & cheese dairy unit</p> <ul style="list-style-type: none"> • Own milk-production: Raw milk, pasteurized milk, pasteurized milk based drinks, yogurt, butter, whey drink, skimmed curd, cream, dessert cheese, cream cheese, castle cheese, goat cheese, Ziger • Processing milk from other farmers: Currently, 14 farmers (12 from Worb and 2 from another community) deliver a quota of 2.5 million kilograms of milk in the Chäsi Worb, which is processed in the cheese-dairy unit in Worb 	<ul style="list-style-type: none"> • Own on-sale-shop in Worb • 73 delivery points in the agglomeration, namely in the city of Bern (23), Worb itself (8), comprising of bars, restaurants, community catering, specialized shops & retailers (cheese-shops, butchers, bread-shops,..) as well as supermarkets/bigger stores in the region (COOP, MIGROS, Landi, Eurospar, Loeb..) 	<ul style="list-style-type: none"> • A large range of distribution channels, comprising specialised shops and big supermarkets <p><i>Mix between face-to face and proximate SFSC</i></p>
2	<p>Biomilk in Münsingen, located about 14 km of the city of Bern</p> <p>http://www.biomilk.ch/</p>	<p>Dairy cooperative</p> <ul style="list-style-type: none"> • Milk-products: Sheep milk, yogurt, cottage cheese, whipped cream, desserts, sour cream. • Processing: 400,000 kg / year of cow milk from 6 regional organic farms and 80,000 kg / year of sheep milk from 3 regional organic farms • Moreover organic cow milk is purchased by another dairy and the Biomilkpool (both located outside of the region) 	<ul style="list-style-type: none"> • Organic Food Stores in Bern and the surrounding area (e.g. Langenau); • Supermarkets: Manor, COOP national-wide 	<ul style="list-style-type: none"> • Existence of the enterprise depends on the 2 supermarkets, Manor und COOP, according to the manager <p><i>Mix between proximate and spatially extended SFSC</i></p>

3	<p>Chäs Klauser in Belp, close to the city of Bern www.chaesglauser.ch</p>  <p>Own cheese creation „BelperKnolle“</p>	<p>Cheese-processing enterprise & cheese marketing</p> <ul style="list-style-type: none"> Numerous cheese varieties made from cow, sheep, goat and buffalo milk; a lot of own creations such as the “Belper Knolle” 	<ul style="list-style-type: none"> Own big selling-shop: own production and around 200 cheeses from the “Gantrisch regional park” are available in this shop Catering service Demonstration cheese-dairy 	<ul style="list-style-type: none"> Partner of “Gantrisch regional Park” <p><i>Mix between face-to face and proximate SFSC</i></p>
4	<p>Berner Molkerei, located in the city of Bern http://www.bernermolkerei.ch</p> 	<p>Private Dairy & marketing unit</p> <ul style="list-style-type: none"> Processing milk from regional milk producers Milk-products: Raw milk, pasteurized milk, pasteurized drinkable milk, yogurt, butter, various cheeses, butter, skimmed curd, The assortment comprises also imported cheeses 	<ul style="list-style-type: none"> Direct selling Party and catering service 	<ul style="list-style-type: none"> Oldest dairy in Bern, since 1894 <p><i>Mix between face-to face and proximate SFSC</i></p>
5	<p>“Vom Chäser”, located in Ostermündingen, not even 1 km away from the centre of Bern http://www.chaeser.ch/de/vom-chaeser.html</p> 	<p>Cheese-Marketing Platform</p> <ul style="list-style-type: none"> More than 350 cheese specialties from different regions of Switzerland, but 80% originates from the Bern region 	<ul style="list-style-type: none"> Currently have 70 different Clients which they supply in all parts of Switzerland: supermarkets (Manor, Loeb, Migros, COOP), wholesaler as Emmi and Horai, specialized shops and cheese dairies in Bern and the region Online Chäs Shop 	<ul style="list-style-type: none"> They participate regularly in fairs, and organise tastings in supermarkets, namely in COOP and Migros Cooperate only with village dairies <p><i>Mix between proximate and spatially extended SFSC</i></p>