

Adaptation strategies and performances of three producer groups in times of change: lessons learned from the application of the CSP framework in three case studies

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Abstract

This paper aims to contribute to the further development of the theoretical framework of the Conditions-Strategies-Performances (CSP) framework by testing it in three case studies. The CSP framework helps to explore farmers' conditions, strategies and performances in a context of multi-dimensional policy requirements, market imperfections and globalisation. The basic assumption sees conditions as drivers for farmers' strategies that then result in performances of the sector. The approach consists of four steps aiming to identify changes in framework conditions over time, resources among relevant groups of primary producers, adaptation strategies and finally, to explore the related social, economic and environmental effects. The practical application is based on three case studies, two farmers' cooperations in Germany and Sweden, and the carp farming sector in Franconia. Results show that the approach provides a suitable conceptual framework. Its particular strength is the holistic nature of the assessment and that it focusses on changes, dynamics, strategic decisions and impacts that matter in societal terms. However, a wider application requires the operationalisation of the framework with sufficiently meaningful indicators and data and other questions emerging from the application of the CSP concept.

Keywords

Agriculture, aquaculture, framework conditions, adaptation strategies, sustainability, performance indicators, farm management

1 Introduction

Producers in the agricultural, aquaculture and food processing/marketing sector face various challenges when they want to produce in more sustainable ways. Policy and legal frameworks, factor and product markets, as well biophysical and farm-specific conditions constitute a complex framework for food production, processing and marketing. Conditions that affect financial and risk management play a particularly important role as they impact not only on the current economic situation but also on the future competitiveness and viability of farms and food businesses.

The connections between framework conditions and the strategic and management decisions made by entrepreneurs are difficult to understand because of the diversity of constellations and the complexity of cause-effect relations. For the same reasons, it is difficult to design (policy) measures that are universally effective in supporting the introduction or maintenance of sustaina-

ble practices. Both together pose a major challenge for policy makers. Crop production, animal husbandry, or freshwater fish production and the related businesses need effective orientation and support in order to manage the increasingly difficult economic situation while at the same time counteracting environmental and climate change impacts. Societal expectations regarding the sector's sustainability, a more efficient use of resources, and product and process quality tend to be rather high while the willingness to pay more for higher qualities and more sustainable production systems is rather limited.

This paper wants to contribute to the elaboration and operationalisation of a CSP-based methodology for capturing the complex interrelationships between external and internal conditions, (adaptation) strategies and (sustainability) performance. The basic theoretical framework used is inspired by Porter's 'diamond of determinants' (**Figure 1**) (Porter, 1990).

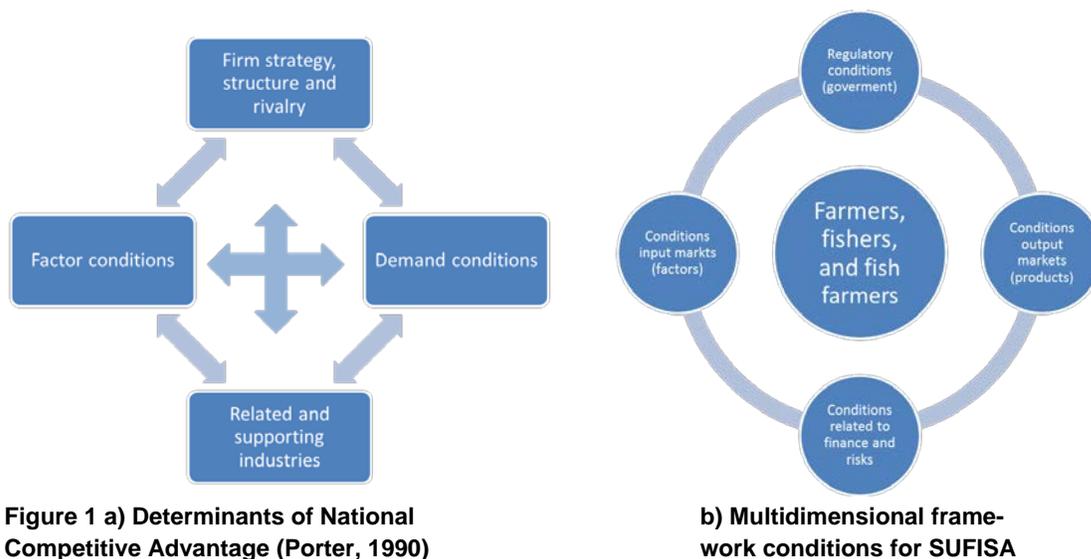


Figure 1 a) Determinants of National Competitive Advantage (Porter, 1990)

b) Multidimensional framework conditions for SUFISA

For SUFISA¹, we have expanded the multidimensional framework of conditions (SUFISA 2015). The basic idea is to make visible and better comprehend the complex interrelationships and feedbacks between conditions, strategies and performances (CSP).

In our contribution, we will use data from three case studies undertaken in the course of the EU-funded HealthyGrowth² and SUCCESS³ projects for a practical testing of the CSP framework.

¹ The Horizon 2020 project 'Sustainable Finance for Sustainable Agriculture and Fisheries – SUFISA' is funded by the European Commission (EC). The purpose of SUFISA is to identify sustainable practices, policies and markets in the agricultural, fish and food sectors that support the sustainability of primary producers.

² At the centre of the Core Organic II project HealthyGrowth are 19 case studies in 10 European countries and in Turkey. Research teams studied producer cooperations such as farmers' associations or cooperatives, food processing enterprises, wholesale and retail companies, as well as consumer initiatives - including the related supply chains for organic food. (www.coreorganic2.org/healthygrowth)

³ The Horizon 2020 project *Strategic Use of Competitiveness towards Consolidating the Economic Sustainability of the European Seafood sector* (SUCCESS) is funded by the European Commission (EC). According to the Blue Growth Strategy of the EC, SUCCESS aim to consolidate the economic sustainability and competitiveness of European fisheries and aquaculture sectors.

We expect that the experiences from this practical application will support the further operationalisation of the CSP framework.

2 Methodology

Background of CSP framework development

The Horizon 2020-project SUFISA wants to apply the CSP framework in order “to identify sustainable practices and policies in the agricultural and food sectors that support the sustainability of farmers in a context of multi-dimensional policy requirements, market imperfections and globalisation” (SUFISA, 2015). Our understanding of the term farm or farmer includes fish farming even without mentioning explicitly aquaculture. The basic idea is to capture the multidimensionality of conditions that influence farmers’ strategies, farm vulnerability and sustainability performance. We will use a systems approach in order to capture more effectively the diversity, complexity and dynamics in the interrelationships between conditions, strategies and performance. Related to this, a system approach will also support a more holistic integrated analysis, which in turn seems more commensurate for the complex policy-related questions addressed in SUFISA.

Our approach uses a combination of quantitative and qualitative methods. In its final application, it will also support stakeholder engagement and participatory assessments.

2.1 Conditions, Strategies and Performances

Conditions, strategies and performances of farmers are variously defined and understood, depending for example on the particular perspective of a stakeholder or researcher and the particular geographical or cultural context. In the following sections, we will briefly sketch out our understanding of the key terms and assumptions applied.

Conditions

Porter’s work on competitive advantages was the starting point for the development of the CSP framework. Porter argues that “competitive advantage is created and sustained through a highly localised process” and that “differences in national values, culture, economic structures, institutions, and histories all contribute to competitive success.” (Porter, 1990)

Figure 1 contrasts Porter’s competitiveness determinants (Figure 1a) with the framework conditions that affect decision-making in the agriculture, fishery and aquaculture sectors as applied in SUFISA (Figure 1b). In fact, primary producers in the farming and fishery industries face a wide range of regulatory, factor, demand and financial conditions at local levels (which in turn are affected by global, European, national, regional conditions). Legal and policy frameworks include those derived from the Common Agricultural Policy (CAP), environmental legislation, zoning laws, food safety standards, financial policies and competition policy. Factor conditions include access to land, labour, capital and external inputs (e.g. chemicals, fertilizers, energy) and the related costs.

Demand conditions refer essentially to the requirements as formulated by consumers, processors and retailers in various markets. The markets and outlets in which farmers sell their produce range from global food supply chains to local food systems, combinations and hybrids or nested markets (Van der Ploeg, 2015), and they imply a range of organisational arrangements such as supply contracts or marketing associations.

Strategies

“The core of strategy work is [...] discovering the critical factors in a situation and designing a way

of coordinating and focusing actions to deal with those factors” (Rumelt, 2011). A strategy starts with the definition of long-term objectives, and defines particular courses of action as well as the allocation of resources necessary for carrying out these actions. Even when decision-makers claim not to have a formalised strategy, the management of the enterprise (or chain) is normally oriented through strategic considerations and decision-making. There is a rich variety of possible strategies (Mathur & Kenyon, 2011).

(Sustainability) performance

The CSP framework relates to performance in the three sustainable development dimensions. Decision makers in policy and administration want to know if adjustments in legislation or a new policy programmes will have positive effects on farmers’ economic situation or the protection of national resources. The CSP framework therefore encompasses a performance assessment. In our testing, we build on the EU-funded GLAMUR project that aimed at assessing the contribution of different types of food chains to sustainability goals of the society. Di Masso et al. (2015) explain that economic performance indicators were relatively easy to agree. Indicators are based on the key business and financial ratios resulting from returns, costs, assets, etc. For sectoral or regional analyses, they highlight indicators like the number of farms surviving a trend of closures, the mean farm income and dispersion are relevant figures, as well as the number of persons living from farming (including family members, farm employees, and seasonal workers.) They saw economic viability as a primary condition for the assessment of farm or food business projects. (Di Masso et al., 2016)

For the assessment of environmental performances, a long list of indicators is available. The use of indicators depends on the particular situation of natural resource use and nature conservation (Kasperczyk & Knickel, 2006). Sustainability indicators offered by businesses usually relate with traceability and transparency of food chains and the communication of quality attributes. Policy programmes sometimes require the assessment of (positive) environmental effects. Data availability in respect to environmental indicators is a well-known constraint.

Social aspects represent an important sustainability dimension. GLAMUR teams tested several attributes e.g. livelihoods and social integration in the community and the need of generational replacement (e.g. the importance of young farmers/breeders associations to foster young labour). Partly, the social dimension emerged even as the most relevant aspect of sustainability performance for local stakeholders (Di Masso et al., 2016).

Other sustainability performances: Ethical dimensions can be of particular importance in the agri-fish-food sector. The assessment of food chains often lacks indicators referring to taste (Di Masso et al., 2016). Moreover, the issue of potential impact of food products on health is often subject to debates. This ‘performance’ requires at least an open dialogue.

2.2 CSP framework and practical application

The approach consists of the following working steps:

- (1) Identification of major changes in market, regulatory, institutional and territorial conditions over time.
- (2) Assessment of social, economic and other resources among relevant groups of primary producers.
- (3) Analysis of (adaptation) strategies pursued (e.g., regarding the management of the chain and risks).

- (4) Exploration of the related social, economic and environmental effects (sustainability performance).

Since the analysis focuses on the interrelationships between external and internal conditions, (adaptation) strategies and (sustainability) performance, the first important step is to express conditions, strategies and performances in absolute and/or relative terms, and – if possible – to relate them to different points in time. This will then allow us in a second step to relate the producer groups' strategies to changes in (framework) conditions on the one hand and to performances on the other.

For the practice test, we will apply the concept to three illustrative cases:

- *Öko-Korn-Nord* w.V., a farmers' association for organic cereals and legumes, located in Lower Saxony, northern Germany
- Uplands Bondens, an organic beef farmers' association in central Sweden
- Carp producers who run traditional low-intensity fish farms in Central and Upper Franconia (Aischgrund area), southern Germany

The empirical analysis presented in Section 3 is based on qualitative interviews with managers or other key persons who know the particular situation well and the strategic plans of primary producers.

Interviews with HealthyGrowth case study partners of *Öko-Korn-Nord* and Uplandsbondens took place between 2014 and 2016. The case study on carp producers is part of a pilot study⁴ carried out in the SUCCESS project.

3 Testing the theoretical framework with three case studies

The following sections briefly present each case study within its regional and sectoral context. In Step 1 of the CSP analysis, we identify periods that farmers perceived as particularly challenging or, in some instances, represented severe crises. The description of the conditions explains why the particular crisis hit farmers and/or the farmers' organisation. We will focus on those external and internal conditions that can be seen as central drivers (or determinants) of strategic adjustments. Other conditions play a role too but are only referred to as far as they are helpful in understanding the kind and scale of adjustments.

We pay particular attention to relate (adaptation) strategies with decision-making processes. Limitations in available data are identified and possibilities to overcome them discussed.

3.1 Farmers' association *Öko-Korn-Nord*

Until the early 1990s, the organic *Bohlsen* mill purchased grain directly from organic farmers. With an increasing numbers of suppliers, the mill's manager initiated the foundation of an independent producers association (*Erzeugergemeinschaft*). The aim of this cooperation was to make contracting, quality testing, grain storage and logistics more efficient for the mill while at the same time safeguarding the opportunity to sell the



Figure 2
Logo of *Öko-Korn-Nord*

⁴ This preliminary study on carp producers is based on a literature review and on personal communication with Dr Martin Oberle, Head of the Bavarian Department of Carp Farming, in 2015 and in early 2016. In-depth interviews with fish farmers and stakeholders representing various private and public agencies will take place in summer 2016 aiming to verify this preliminary analysis.

total harvest under fair price conditions for the farmers. Today, *Öko-Korn-Nord* is a so-called 'profit-making association' (w.V.). It constitutes a medium-size grain trading enterprise with significant storage capacities and quality testing facilities for a variety of organic cereal and legume crops. *Öko-Korn-Nord* is located in northern Germany and has around 100 member farms but also purchases from non-members.

Step 1: Identification of significant changes in conditions over time

We can cast two spotlights on the development of the farmers' association: the first focuses on 1991/92, and the second on 2003/4 (**Figure 3**).

In 1991/92, when the crop farmers' association was founded, commodity markets for grain had been in surplus for more than a decade. Each year, farmers faced the significant problem to market their produce. We summarise for the first spotlight:

- Market conditions were challenging for organic crop farmers in northern Germany. The market for organic food started to grow in line with the development of the green movement in the wider society. However, organic crops from relatively remote areas still received little public recognition.
- Policy conditions were relatively favourable with significant market intervention on the EU-level. On the regional-level, the Ministry for Agriculture supported strongly the foundation of farmers' associations.
- At farm level, capacities for storage and marketing were limited. Instead, farmers used to sell to local traders.

The second spotlight relates to the period 2003/4 when market conditions were completely different. Cereal imports were higher than exports, and the relationship had turned into a demand market. Moreover, the demand for organic food including flour and other cereal products surged in Germany. EU market policy had changed in the meantime with the introduction of per hectare payments and an alleviation of trade policy measures.

Step 2: Assessment of social, economic and other resources of businesses

In 1991/92, organic farmers were weak players on the market. Most organic producers were small and medium scale family farms. The economic dependency from the local organic mill that expanded significantly was obvious. Back at the time, sometimes farmers perceived the prices paid by the mill as unfair. On the other side, the mill enterprise itself was in a difficult situation like many other smaller mills because of the rapidly expanding scale of few larger-scale corporations who processed increasing volumes in central plants. The concentration in food processing was accompanied by the rapidly increasing market power of retail enterprises – all of it resulting in an increasing pressure on prices. Processors like *Bohlsen* mill suffered from this increasing pressure, which they (partly) passed on to the organic farms.

In 2003/4, the farmers' association had grown significantly with investments. Due to the substantial change in the general market situation, farmers now had the opportunity to sell independently and even sometimes realised higher prices than with *Öko-Korn-Nord*.

Step 3: Analysis of (adaptation) strategies pursued

In the early 1990s, farmers had expected the surplus situation to continue in European grain markets; rising prices were not in sight. Farm strategies therefore clearly focused on joint marketing. Their aim was to establish a stable strategic cooperation and to implement a fair pricing system. The 'pooling price model' introduced then consists of a baseline price for an annually defined

standard grain quality. The baseline price is guaranteed for all farmers even when natural conditions cause very poor grain qualities. Farmers receive top-up payments for above standard qualities (e.g., high protein content or particularly good baking properties). For farmers, the membership in the association and use of the pool price model was significantly reducing risks (*Öko-Korn-Nord* 2016).

With respect to the fairness argument, members even discussed a pricing model that takes the real costs of production into account. However, as such a strategy would have increased the sales revenues for the least competitive farms this strategy was rejected (*Öko-Korn-Nord* 2014).

In 2003/4, some farmers quitted membership aiming to regain control of their sales while the majority continued with the well-working joint marketing. Fairness and incentives for quality production are still central in the association's strategy. Farmers' decisions to stay with *Öko-Korn-Nord* have become one option among others. Now, it depends on individual conditions and capacities. Consequently, *Öko-Korn-Nord* started to reflect on strategies helping to remain attractive for members: excellent advice for growers, professionalisation of quality management, diversification of the product range, as well as improvement of marketing and communication have all become more important.

Step 4: Exploration of social, economic and environmental effects (performance)

The development of producer prices and of the income of member farmers compared to non-members might be suitable criteria for the assessment of the economic performance of *Öko-Korn-Nord*. The proportion of farms that continued with organic farming due to membership compared with the average reduction of all (or of organic) farms in the area could be another indicator. While currently, the related data for this quantitative assessment are not at hand, in principle they were available.

Qualitative assessments can for example show the positive impact of risk reduction in farming for family members. Regional level impacts include the effect the association has on the regional economy with its value added on the local level, the related tax payments, and the employment of 12 persons of different qualification levels.

Öko-Korn-Nord provides opportunities for organic crop farming with positive environmental impacts (in comparison to conventional farming).

The association has social performances through its engagement in the organic business network in the area, which supports organic start-ups, internships for young people, and supports environmental and cultural activities locally. However, these performances are difficult to assess due to the complexity of driving factors, and the lack of sufficiently disaggregated data.

We can also assume that the pool price had a direct effect on the farms' economic situation from the first year onwards. However, longer-term impacts on e.g. the viability of family farms in the area might be even more significant and should therefore be part of a CSP analysis.

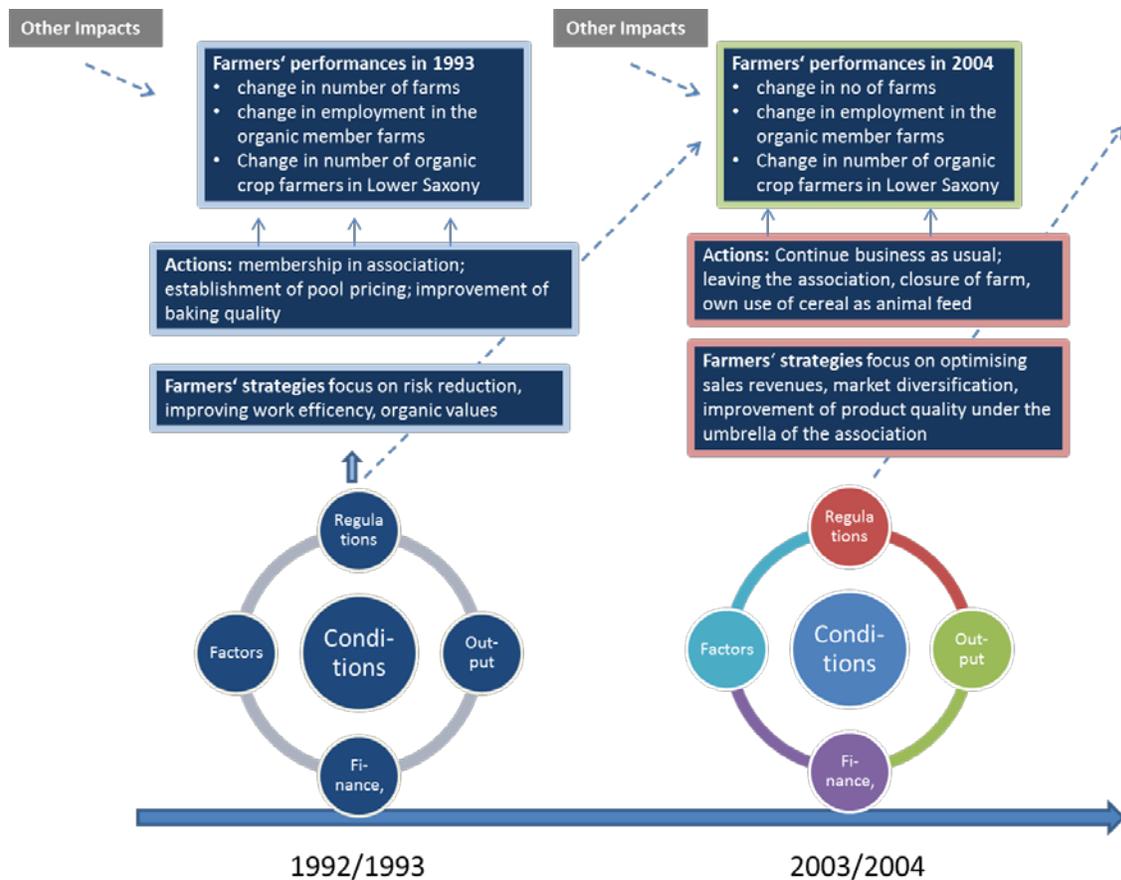


Figure 3

Visualisation of the CSP framework for two distinct points in time

3.2 Organic beef farming in Uppland, Sweden

Upplandsbondens (UB) is a farmer owned cooperative with approximately 100 members in the county of Uppland, Sweden. All member farms sell organically certified slaughter animals for beef, mutton, and pork production. The value chain in which the bulk of the meat is channelled consists of cattle farmers, the UB cooperative, slaughterhouses, meat wholesalers, retail shops and consumers. UB aims to produce, slaughter, pack and sell in the Uppland region alone. When doing this, UB uses its own brand "Upplandsbondens". However, since this is not possible (due to the market situation), UB sells the bulk of its meat on the national market. UB experienced several challenges in the course of its history since the start in 2006, the example we will focus on here was not due to external market or policy conditions. Instead, structural conditions and the stakeholders' differing strategies caused the problems.

Step 1: Identification of significant changes in conditions over time

In principle, conditions for organic cattle farming were and are good. The area has numerous slaughterhouses with organic certification – a fact that many other regions cannot boast. This makes it possible for UB to select slaughterhouses in a way that would not be possible for a similar cooperative elsewhere. The Swedish market for organic beef developed well during the last ten years.

Spotlight 1: Since the cooperative aims for production, sales negotiations and development of the (local) label “Upplandsbondens”, it has been seeking partnerships with several slaughterhouses, wholesalers and retailers in the region. This has proven a challenge since the start because it has been very difficult to find one or two suitable partners. This challenge continues over time. One promising partner went out of business, for example. The most important marketing channel is now a Stockholm-based meat wholesaler who delivers to retailers all over the country. It is a strong market partner. Together with UB, they have evolved on the organic meat market. COOP, one of the three dominant retailers, sells the UB meat under its own organic label, and thus, the consumer is unaware of the meat’s origin. While the farmers are paid premium prices, the brand and identity of the meat is lost and thus consumer loyalty cannot be developed.

Spotlight 2: In 2014/2015, UB set up cooperation with a local meat wholesaler. The idea was that UB meat remained in the region with local slaughtering, cutting, packaging, and sales to local supermarkets via this wholesaler. However, UB and this wholesaler did not share the same view on the importance of organics and they had difficulties to build trust between themselves. Consequently, the UB label is hardly used, and the local market is not catered for, as was originally the idea. This situation is challenging because UB does not have any resources for self-organised marketing activities. Thus, UB seeks for alternative solutions.

At the same time, conditions on the organic market are strong. The demand for Swedish organic meat is high on the national market – in supermarkets and in public procurement. In 2014, the organic market grew 38% (Ekoweb, 2015) and in 2015, the growth was just as strong. Thus, the national market could absorb all the meat from UB. However, the structure and the orientation of processing and sales enterprises make conditions difficult for the farmers’ cooperative.

Step 2: Assessment of social, economic and other resources of businesses

The fact that UB has attracted so many members (107) is a strength when negotiating with any business partner. On the other hand, the cooperative does not have any employees but works with voluntary labour and with a working board. The farmers in charge are always responsible for both the cooperative and their own farm business. Management capabilities at UB have often been lacking due to limited experiences or lack of time of the key persons. In addition, the age of most board members – as well as the member farmers - is quite high, which is another issue for UB.

Board members have difficulties to keep the cooperative together; they need to satisfy members who want to go for the best price (slaughterhouses outside the Uppland region) and members who care more about developing the local “Upplandsbondens” label and the local embeddedness of the meat sold via the UB cooperative.

Step 3: Analysis of (adaptation) strategies pursued

Spotlight 1, 2006: Farmers founded the cooperative Upplandsbondens (UB) in response to the poor opportunities for organic beef farmers to get a fair price for their products. The strategies of the cooperative have been focusing on the identification of suitable market solutions, the negotiation of the highest possible price for its members (vis à vis slaughterhouses and wholesalers) and the locally-based quality production, processing and marketing the organic meat under the own label “Upplandsbondens”. However, UB had always problems to find a stable and reliable local partner enterprise that would support the cooperative’s local sales strategy.

Since inception, more and more farmers decided to join the cooperative, mainly because the board members have been able to negotiate good prices for the slaughter animals. In 2015, most

organic beef farmers in the region were members. In addition, the UB board helped farmers from other regions negotiate prices for the national market.

Spotlight 2, 2015: The strategy of UB focuses on meat sales in large supermarkets, but also as meat boxes available via the homepage. Due to the ongoing issue of a lacking local partner, UB has accommodated its volumes of meat via a national wholesaler that caters one of the largest retail chains in Sweden. In this value chain, the UB meat cannot be identified as such, but only as organic meat from Sweden. Due to the large number of slaughterhouses used by UB, sometimes slaughter animals travel longer distances. For some members, this is a natural thing, for others, this is unthinkable because UB's animal welfare strategy focuses on travels that are as short as possible. Thus, UB tries to take into account the different strategies of its members and combine them with the cooperative's own strategic orientation. This is often difficult due to potential inconsistencies. However, the strong market for organic meat absorbs UB' produce despite the weaknesses in management and marketing.

Step 4: Exploration of social, economic and environmental effects (performance)

UB is able to realise high prices due to the strong demand for organic meat in Sweden and due to the successful cooperation with the national wholesaler. Both organisations work well together. Farmers are satisfied with the negotiation of a good price with the wholesaler. According to UB itself, the fact that the cooperative negotiates with one voice vis à vis slaughterhouses and wholesalers makes a world of difference. Slaughterhouses would prefer individual negotiations with farmers but UB works hard to prevent this. Thus, UB is able to influence the future of organic farms in the region in a positive way. It helps to improve the economy of the member farms, to increase awareness about high quality meat among consumers and farmers, it helps to sustain semi-natural grasslands (which are high in biodiversity) and it is able to provide the Swedish organic market with domestic products.

In contrast, UB has not yet been able to establish a stable marketing concept with the UB label building on the local origin. While there is a good slaughterhouse infrastructure in the Uppland region, and while it is adjacent to the larger Stockholm metropolitan area, the number of potential market partners (wholesalers) is very limited and the partnership established in 2014 did not take off. The identity of the UB meat is thus lost. The consumer cannot distinguish it from other organic meats. This implies that UB cannot build either consumer loyalty or communication with its consumers. In a situation where the organic market does not grow as it does today and where competition between producers and retailers intensifies, UB has no means of profiting from its local embeddedness.

3.3 Carp farming in ‚Karpfenland Aischgrund‘

Carp aquaculture has an almost 1,000 years old history in Germany (Füllner et al., 2007). Today and after trout, carp is the second important species farmed in German fresh waters (Destatis, 2014). In 2013, carp had a self-sufficiency rate of 76 % in Germany. This is remarkable, because it contra-trends the picture of the total German fish and seafood market, where 88 % of the products come from abroad (FIZ, 2015). The Aischgrund is one of two important carp producing areas in Germany. In contrast to Upper Lusatia (Saxony), the Aischgrund in Central and Upper Franconia (Bavaria) is predominated by smallholder farmers who make their living from both, aquaculture and agriculture. According to local fishery authorities, around 3,500 carp farmers produced between 2,000 and 3,000 MT of carp in 2013 (Vordermeier, 2013). The average per farm ac-

counts for less than two ha⁵ of ponds. Only 21 of the local fish farms were large enough for the specialisation in carp production.

Step 1: Identification of significant changes in conditions over time

In the long-term, the German carp market is following a decreasing trend. However, the shrinking differs between periods and regions. According to estimates of the local authority, Aischgrund production fell from around 7,000 MT in 1992 to around 6,000 MT in 2004 (Vordermeier, 2013). Since 2005, this trend has been weakening resulting in a relatively stable supply and demand on the local market for carp. In the same time, the steadily decreasing trend continued on the national market. Although the situation seems to be more favourable than in other regions, we identified four significant challenges, which Aischgrund carp farmers are facing.



Figure 4
Logo of the corporate carp marketing association

- Low profitability reduces the attractiveness of the sector (Oberle, 2010). Young talents move out, and the average age of farm owners rises constantly (Bätzing, 2014).
- Low price imports from the neighbouring Czech Republic put pressure on local markets.
- Increasing losses characterise production. Due to environmental conservation objectives, the population of several fish predators recovered and lead to high fish losses (Brämick, 2013). In particular, the cormorant causes a high predation pressure. Another concern is the growing beaver population.

Step 2: Assessment of social, economic and other resources of businesses

Since mediaeval times, carp ponds characterize the landscape and local culture in the Aischgrund. Local fisheries authorities provide support for the community of carp farmers. Carp farming is a cultural asset for the area enhancing the identification of local dwellers with smallholders' carp production. Due to the long-term tradition and the favourable image of the production system, carp meals are common in the areas. Local people, who eat carp since childhood, continue to consume it (Bätzing, 2014). They contribute significantly to ensuring the local demand. Significant carp imports even show the potential for an increasing local supply. Traditionally, carp farmers use earth ponds and rear carp in polyculture with other species. This ensures a variety of sales products and a significant potential for a further differentiation of the product range. All these conditions improve farmers' opportunities.

In contrast, the smallholder structure is a problem. Farmers with small farms tend to slow down the diffusion of innovations, in particular when they need to address risk taking and financial investments. Access to finance is a particular issue.

Step 3: Analysis of (adaptation) strategies pursued

Since the middle of the 1990s, the different stakeholders of the region have critically analysed their market situation. Along with other engagements, the association '*Karpfenland Aischgrund e.V.*' was more and more active. Since 1999, the association has linked stakeholders such as carp producers, county authorities, fisheries authorities, tourist managers, gastronomy, farm stores, processors etc.). (www.karpfenland-aischgrund.eu)

⁵ Statistics of Aischgrund fish production: average pond size - about 0.4 ha; total of cultivated ponds - around 7,000 ha (Oberle, 2014)

The association has been aiming to enhance and coordinate the marketing of regional carp. All actors of the value chain were involved, including tourism and gastronomy. In 2013, the association changed significantly. Professional staff has been hired for the first time aiming to enforce the honorary engagement of the member organisations. Today, the association coordinates different cultural and re-creational activities related to carp production in the 17 Aischgrund districts (www.karpfenland-travel.com).

Regional stakeholders developed the strategy to certify the regional carp species “Aischgründer” as Protected Geographical Indication (PGI) according to EU law. This local value chain cooperation established new processing techniques and developed simultaneously innovative carp products like fillets with cut fish bones, smoked carp fillets, carp burger and other new (convenient) fish products. Since 2014, the regional marketing strategy even encompassed the establishment of a local TV programme that, since summer 2015, informs about local farm production, cultural heritage, or leisure activities (Lb Localbook Dietesheim, 2016).

Protection measures for fish stock against predators and for beaver damages are very limited in traditional ponds. Wildlife conservation legislation is conflicting fish farmers production. Under current legal framework conditions, farmers seem to be unable to establish any related strategies.

It is remarkable that traditional carp farmers did not develop strategies focussing on organic carp production. The rate of conversion is outstandingly low, although the niche market for organic fish is expanding (Lasner and Hamm, 2014). Even influential nature protection NGOs communicate to the consumers that carp farming is an ecological friendly aquaculture (Lasner et al., 2010).

Step 4: Exploration of social, economic and environmental effects (performance)

So far, it is difficult to conclude on sustainability performances. Information on the different types of performance is lacking, in particular regarding social, economic and environmental effects. Currently, it is impossible to give evidence of any causal relationship between actions taken and the demand for local carp and related tourist attractions.

Indicators of the tourism sector such as numbers of overnight stays and of visitors at the new carp museum will help with the socio-cultural performance assessment. Despite the mentioned restrictions, the lessons learned so far indicate that

- returns from agriculture attenuated the pressure from the (stagnating) carp market. The additional income from arable farming helped to ensure fish farms' viability, measured in the number of remaining farms in the area.
- Aischgrund fish farmers are bond to traditions. Due to low profitability, farm succession, measured in young people trained and/or working in the sector, is a significant issue for the aging farmers' population. Consequently, the sector's performance to the employment of young people is low.
- the corporative marketing of *Aischgrund e. V.* contributed to stopping the downward trend in demand for carp in the area while in general, the average trend of carp consumption continued to fall.
- carp production ensures the protection of the typical fish pond landscape in the valley of the river Aisch. This landscape represents the image for the socio-culture identity of the region, and it is the key feature for the rural development strategy.

4 Concluding reflection on the use and further development of the CSP framework

The lessons learned from the practical application of the theoretical framework are as follows:

- **Unit of analysis:** We selected clearly defined groups of farmers for the testing of the CSP framework. However, for a sound application of the framework, the definition and delineation of the unit of analysis will be crucial. The object of investigation could be an economic cluster, a network or even a supply chain. The development of policy recommendations might even require much broader categories like the national dairy industry or low-intensity crop farming in southeastern Europe. Similarly, the description of conditions tends to be complex and the related strategies of individuals differ even between neighbours. For that reason, it is of core relevance to define clearly the object of investigation.
- **Researchers' perspective:** It will be very important to discuss and make explicit different understandings and interpretations among researchers. Experiences from earlier projects with sustainability assessments show that transdisciplinary working groups are able to discuss and define suitable assessment approaches (GLAMUR, Sustainability A-Test). Such a participatory process, though, requires resources and time.
- **Farm versus sector perspective:** the CSP analysis can either focus on the analysis of the perspective of individual farmers or farmer groups or instead, take into account more the regional trends.
- **Economic perspective:** A fixed set of market, policy support and legal frameworks does not exist and conditions influence each other. Moreover, it will be impossible to relate directly conditions with certain actions and sustainability outcomes. Instead, other economic sectors, international markets and speculation might drive the costs of land, machinery or fuel. Commodity prices depend on global demand and trade policies. It will not be possible to capture all sectors of the economy and their interferences. How can we delineate the sector analysis in meaningful ways?
- **Dynamic perspective:** Conditions, strategies and situations or performances are never static. Producer and input prices follow short and long-term trends and are characterised by price volatility. Time lags due to e.g. information gaps and inertia take place and hamper the analysis of causal relations between conditions (as perceived by farmers), their strategic planning and actions taken. Sustainability performances are sometimes difficult to connect with individual farmers' actions.

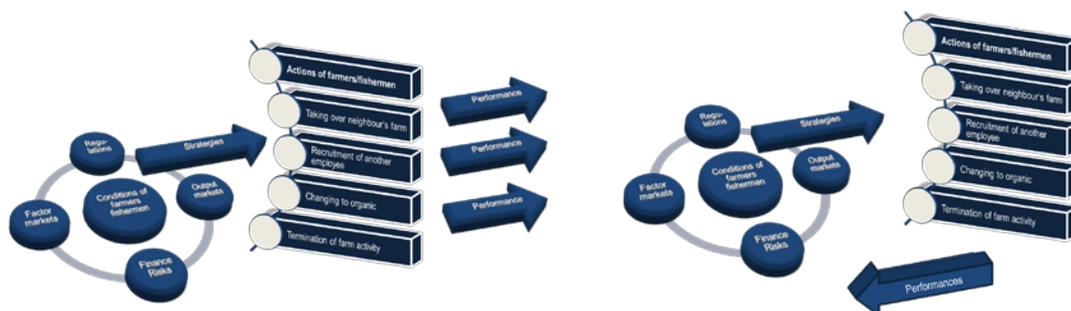


Figure 5
Different interpretations of interrelationships between conditions, strategies, actions and performances

We highlighted the particular importance of business-level actions and their dynamics as an additional level in the analysis. Strategies are not always consistent with subsequent actions. The analysis of strategy documents, e.g. financial investment planning, might explain what was expected to happen but they do not necessarily provide evidence of real actions. This issue is of particular importance for the application of the CSP framework in projections and in ex-ante policy impact assessments (see Figure 5).

With our discussion, we highlighted the challenges that we need to overcome when applying the CSP framework. The stepwise application of the CSP framework shows that the theoretical approach helps – in principle – to capture the complexity of the external and internal conditions and their impact on decision-making processes. The systematic analysis of the interrelationships between conditions, strategies, action(s) taken and sustainability performance is more difficult than assumed initially. However, an approach that takes into account changes in farmers' decision-making and their (potential) impacts on the sector's productivity and sustainability represents a promising further development of the common methods for policy or market projections.

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