

Research Paper

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Factors in the decision by Swiss farmers to convert to organic farming

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Abstract

Demonstrated economic benefits of conversion to organic agriculture, combined with solutions to technical and production-related problems, suggest that farmers in Switzerland should have converted in large numbers to organic production. However, the number of organic farms in Switzerland has remained virtually constant in the last 10 yr, so it appears there are other factors that influence the decision of whether or not to convert. Several studies have sought to identify the factors that influence the decisions by farmers whether or not to convert to organic, but have found a range of factors that appear to be context dependent, while others can be seen as context transcendent, which makes it difficult to draw generalizable conclusions. The aim of this study was to identify how Swiss farmers' decisions reflect the interaction of perceptions, relationships, policies and economic factors, which either enable or provide barriers to conversion. Semi-structured interviews were conducted in 2015 with 39 farmers of mixed and arable farms in the German- ($n = 24$) and French-speaking ($n = 15$) parts of Switzerland. The interviews were recorded, transcribed and analyzed according to their content. The results show that the decision of whether or not to convert relies on belief that technical problems have been sufficiently solved, as well as a range of social factors. Farmers perceive social pressure for them to be productive, but non-organic farmers often incorrectly perceive organic farming as not being oriented toward production. Furthermore, 'official' advice, which could correct this misperception, is sought about how, rather than whether, to convert and typically comes after farmers have made their decision. Major barriers in an area with a low density of organic farms are the lack of supply and delivery points within an acceptable travel distance, and lack of peer networks to provide informal support. On the basis of these findings, we propose that strategies to encourage conversion should be based around two main pillars: investment to create a network of supply and delivery points in areas with low density of organic farms; and actions, such as information events, to encourage dialogue between conventional and organic farmers to counteract feelings of 'us vs them'.

Introduction

Many countries have expressed an interest in promoting sustainable agriculture, and organic farming is at the forefront of the sustainable agriculture movement. In Switzerland, the ordinance on direct payments in agriculture contains provisions relating to payments for organic farming and is an expression of the Swiss agricultural policy objective to promote organic farming (Willer and Lernoud, 2012). However, despite favorable government policy, the number of organic farms in Switzerland dropped between 2005 and 2010 from 6420 farms (10% of all farms) to 5659 farms (9.6% of all farms) (BfS 2016). To address the falling numbers of organic farmers, BioSuisse: the federation of Swiss organic farmers, launched a program entitled 'Bio-offensive' in 2010, which sought to combine consulting, education, public relations, conversion support, procurement, marketing and policy revision (Flückiger, 2010). These efforts to promote organic production have been successful on the demand side, with 13% growth in 2016 (Willer *et al.*, 2017). As of 2016, Switzerland had an organic market share of 7.7% that was second only to Denmark (8.4%) (Willer and Lernoud, 2017).

However, promotion of organic production has been less successful on the supply side. The number of organic farms in Switzerland grew by 10% to 6244 organic farms (11.7% of all farms) over the 5 yr between 2010 and 2015, and has almost reached the level of 2005 (BfS 2016), but the number and proportion of organic farms has not kept pace with the growth in demand (Willer *et al.*, 2017). Ferjani *et al.* (2010a,b) found that the situation in terms of the production, processing and marketing of organically grown foods can basically be rated as very positive. An economic evaluation of organic farming in Switzerland found that the income on organic farms was approximately 25% higher than on comparable conventional farms (Sanders *et al.*, 2011). If financial considerations were the deciding factor in whether

to convert to organic farming, we could expect the majority of farmers to do so. The modest increases in the numbers of organic farmers suggest that farmers are either unaware of the financial benefits should they convert or are not solely motivated by income maximization. Given the importance of subsidies to the financial survival of Swiss farmers and the amount of effort given by farmers to understanding the system of subsidies, the latter appears more likely, so it is reasonable to assume that factors other than financial considerations are included in the decision-making process.

Lamine and Bellon (2009) concluded that decisions related to conversion to organic agriculture are multidimensional and involve both production and social practices. Padel (2001) used the diffusion of innovations model (Valente and Rogers, 1995) to analyze the decisions by farmers of whether or not to convert to organic and concluded that the model is well suited for understanding conversion. Wisdom *et al.* (2014) pointed out that many theoretical frameworks aim to describe the dynamic process of the implementation of innovations but little is known about factors related to decisions to adopt innovations and how the likelihood of adoption of innovations can be increased.

This paper aims to build upon Lamine and Bellon's (2009) analysis by rising to Wisdom *et al.*'s (2014) challenge to identify the factors related to the decision of whether or not to adopt an innovation, specifically to convert to organic farming. Specifically, the aim of this study is to gain an understanding of what motivates or hinders conversion to organic certification on Swiss farms. Such an understanding could be incorporated into appropriately designed and effectively targeted strategies (Rodriguez *et al.*, 2009) to strengthen existing or intrinsic motivations and remove barriers for conversion to organic, thus easing the decision process for farmers who are considering conversion in the future.

Contextual background: the Swiss system of agricultural subsidies

The study took place in Switzerland, so some understanding of the Swiss system of agricultural subsidies is needed to interpret this study. Swiss policies that are intended to encourage farmers to implement ecological measures are based on a subsidy system, which is characterized by two pillars: general and ecological direct payments. All Swiss farmers qualify for general direct payments if they meet a number of prescribed ecological standards (Jenny *et al.*, 2013), which are collectively considered to be proof of ecological performance (PEP). The key elements of PEP are an appropriate proportion of ecological compensation areas (at least 7% of the utilized agricultural land), balanced nutrient use, crop rotation with four different crops, soil protection, targeted use of plant treatment products and animal welfare measures. Almost all Swiss farms qualify for these payments. The system of direct payments changed in 2014 to include seven categories, which are linked to the achievement of specific policy objectives and the provision of public goods (FOAG 2012). These are: payment for ensuring food supply, farmland payment, biodiversity payment, payment for landscape quality, payment for production systems, resource-efficiency payment and transitional payment.

Organic farming is additionally subsidized under the 'production systems' category. The federation of Swiss organic farmers: BioSuisse, requires additional biodiversity measures that go beyond the legal requirements but which are mandatory for all BioSuisse organic farms. A parallel label is IP SUISSE, which is a joint NGO/private initiative for integrated pest management.

IP SUISSE is an association of farmers who use environmentally and animal-friendly production methods, including being GM free and with minimal use of synthetic pesticides. Concerning biodiversity, IP farmers have to follow a system of points that are allocated to ecological measures, from a pre-defined list. Implementation of these measures demonstrates the ecological performance of the farm. A farm must achieve a certain number of points to gain the IP SUISSE accreditation label and qualify the farmer for higher product prices (by certain major retailers). Both organic and IP SUISSE labelled farmers have some freedom to decide which measures they implement to meet standards, or gain sufficient points, to gain their respective label (Jenny *et al.*, 2013).

Factors in the decision of whether to convert to organic farming

Garland *et al.* (2010) point out that it is particularly challenging to promote change in routine practice when decision-makers do not perceive change to be necessary; particularly when the decision-makers feel the decision is sufficiently complex to make the outcomes uncertain. In the case of conversion to organic farming, it indeed appears that the factors influencing an individual farmer's decision are complex, which is typical for organizational- or system-level adoption of an innovation (Garland *et al.*, 2010), so farmers may use heuristics to reduce the complexity of the decision.

Wilson and Dowlatabadi (2007) propose a range of influences on decision-making that appear to be relevant to the complex (and major) decision of whether to convert to organic or otherwise. These influences include time inconsistency, framing, reference dependence and bounded rationality. Time inconsistency refers to the decision-maker doubting that a decision taken to maximize utility in the present will also maximize utility in the future (O'Donoghue and Rabin, 1999). In the case of conversion to organic, this implies doubt in the stability of the ambient system, including market and subsidies, and the suspicion that conditions might change. Framing and reference dependence refer to individuals tending to be selective in the information they use, and 'anchoring' on certain types of information, rather than searching for and processing all relevant information when making a decision (Tversky and Kahneman, 1974). People tend to choose information with which they are familiar, which leads to a tendency to favor the status quo (Baron, 2004). Bounded rationality refers to decision-makers using rules or heuristics (which can be understood as 'rules of thumb' or intuition) to reduce cognitive or computational requirements, rather than systematically seeking to maximize utility (Gigerenzer and Todd, 1999). These heuristics can include 'recognition heuristics', which is a tendency to make a choice that will result in a familiar outcome; 'elimination heuristics', in which a choice is rejected on a pre-decided principle; and 'emotional heuristics' in which choices are based on gut feeling (Wilson and Dowlatabadi, 2007).

However, the decision of whether to convert is sufficiently important that heuristics will be inadequate to inform the decision in many cases and multiple factors may be considered. Lamine and Bellon (2009) called for more research into the factors that influence conversion decisions and a range of criteria have been found in several studies. Much of the study of conversion has focused on deterrents, which can be broadly classified as technical, economic/political and social, with the logic that removal of deterrents will enable farmers to convert.

Technical issues

Läpple and Kelly (2013) suggest that perceived technical issues are factors that influence decisions of whether to convert, with commonly nominated barriers relating to technical difficulties in cultivation. For example, Ferjani *et al.* (2010a,b) and Goy and Waibel (2005) reported that farmers considering conversion were concerned with the extra work burden that they perceived to be associated with organic farming. Furthermore, the difficulty of cultivation of some crops, such as potatoes for which copper-based fungicides remain the best alternative for the treatment of late blight infestations (Bangemann *et al.*, 2014), may be seen as a barrier for farmers considering conversion. Ferjani *et al.* (2010a,b) found that the greatest fears expressed by farmers considering conversion were the risk of weed infestation and the unknown amount of extra work needed for their control, and problems in nutrient supply.

However, Schneider (2001), on the other hand, found that farmers generally overestimated the difficulties, which supports Heinze and Vogel's (2017) recommendation to offer an extended advisory service both before and during conversion. Latruffe and Nauges (2013) found that the probability of conversion of French crop farms depends on the technical efficiency preceding the conversion, but that the direction of the effect depends on the farm size and type of production. Andreasen *et al.* (2015, p. 173) reported that many problems in the organic sector have been solved by targeted research efforts in that enable 'higher yields, weed and pest control, animal health and welfare, the potential for phasing out the use of antibiotics in Danish dairy herds and reducing the problems caused by seedborne diseases'. In the case of Switzerland, Ferjani *et al.* (2010a,b) pointed out that the technical situation in terms of the production, processing and marketing of organically grown foods could basically be rated as very positive. However, studies by Khaledi *et al.* (2010) and Padel *et al.* (2009) concluded that conversion barriers cannot be removed by simply finding solutions to economic and technical problems.

Technical barriers can also have a strong social component. Läpple and Kelly (2013) pointed out that the importance of technical barriers varies between contexts, but that the social acceptance of organic farming is a consistent constraint to conversion to organic. Illustrative of this complexity is a fear of weed infestation, which is among the known barriers to conversion (Khaledi *et al.*, 2007; Ferjani *et al.*, 2010a,b). Like most farmers, organic farmers do indeed face a significant challenge with weed control, but the fear of a possibly increased weed infestation after conversion may also have a social component for organic farmers, in that the challenge is heightened by the consideration of what other farmers might think of weeds in the organic farmers' fields (Cranfield *et al.*, 2010). An extension of such consideration of what other farmers in the community may think is the reluctance to enter situations in which conflict with neighbors may occur.

Koesling *et al.* (2012) identified a need by organic farmers to perceive acceptance within their communities, and several well-publicized conflicts between organic farmers and their neighbors create an understandable degree of apprehension, and therefore a barrier to conversion (Madelrieux and Alavoine-Mornas, 2012). A further example of a technical barrier with a strong social component was found by Karki *et al.* (2012) who identified a reluctance to convert by farmers who live far from regional markets because the longer distance means a separation from their customers. On the other hand, Läpple and Cullinan (2012) found that, while the

availability of organic market outlets is important for organic farming, their presence or otherwise had no clear effect on the density of organic farmers. In addition to separation from customers, longer travel distances to delivery points could create a barrier to conversion by increasing transport costs, and thus create a financial deterrent.

Economic issues

Financial and political motivations are difficult to separate because of the importance of subsidies, which are inherently political. Häfliger and Maurer (1996) found that the massive conversion to organic farming in the mid '90s mostly consisted of farmers who were primarily economically motivated but who also wished to maintain their standing and acceptance in their community. The wave of conversion in Switzerland followed official recognition, in 1992, by the Swiss Government of organic production as a production form to be encouraged, and the introduction of direct payments in 1993, which resulted in financial advantage for organic farmers (Biosuisse, 2017). With regard to economic deterrents, Sahn *et al.* (2013) identified economic reasons as the main motivation for farms to revert to conventional production, while Karki *et al.* (2012) offered increased transport costs as an explanation of the reluctance to convert to organic by farmers who live far from regional markets. Khaledi *et al.* (2010) identified transaction costs as a barrier to conversion to organic production, with significant transaction costs associated with infrastructure and services. They explain their finding that farmers with smaller farms have a smaller barrier to conversion, which is probably because of the lower transaction costs.

Lamine and Bellon (2009) pointed out that social scientists' studies of conversion often focus on the classical opposition between market and values orientations, but perceptions of risks related to policy can also be found in the literature. Daugbjerg *et al.* (2011) identified six policy measures in the UK and Denmark that had an influence on whether farmers converted to organic, which included subsidies for certified organic farmers, organic subsidies for non-dairy farms, promises of the extension of subsidies and support for the costs of marketing services. Khaledi *et al.* (2010) reported that risks associated with uncertainty of future political and regulatory support were considered to be too high by many farmers, and therefore form a barrier to conversion. Ferjani *et al.* (2010a,b) similarly nominated insufficient trust in the stability of policy, with too strict or too frequently changing guidelines, as a barrier to conversion. Furthermore, Koesling *et al.* (2012) found that farmers perceived that regulations related to organic farming are being strengthened over time. Lamine and Bellon (2009, p. 102), however, criticize approaches to studying the factors leading to conversion that 'consider farmers as relatively isolated rational actors, whereas they are, of course, involved in complex social and professional networks'.

Social issues

Khaledi *et al.* (2010) and Padel *et al.* (2009) identified that social norms, the social situation on the farm, personal values and attitudes held by the farming family are likely to be dominant decision criteria. Burton and Paragahawewa (2011) argued that the status and prestige within farming communities generated by particular behaviors is a non-economic form of capital, which can be

an effective motivation in the decision of whether or not to convert to organic cultivation. On the other hand, Padel (2001) described the early adopters (Valente and Rogers, 1995) of organic farming practices as being primarily motivated by ideology and only weakly motivated to remain integrated in village structures. Conversion to organic in the earlier stages of organic farming diffusion often meant some degree of alienation from the conventional farming community (Padel, 2001), which may have been too high a price for other farmers who were considering following (Läpple and Kelly, 2013).

Schmidtner *et al.* (2011) pointed out that the density of organic farmers in surrounding areas is an important factor in the organic farming sector, which may be due to social networks and the ability to receive peer advice, approval and support. Läpple and Kelley (2015) found that farmers exhibit similar choice behavior to their near neighbors, with local norms and attitudes also influencing adoption decisions. In addition to the social influence of neighboring farmers, a further potential source of conflict, and therefore a strong influence on decisions, are the attitudes held within the farmers' own family, which can be positive or negative toward the concept of organic cultivation (Alexopoulos *et al.*, 2010; Goy and Waibel, 2005). Ferjani *et al.* (2010a,b), on the other hand, reported that the attitudes held by neighbors and family were only a minor influence on the decision by farmers to convert to organic production, with the exception of the group that they called 'optimizers' for whom social acceptance remained important.

Mann and Gairing (2012) pointed out that conversion, or otherwise, is an ethical decision, with farmers being loyal to either organic or conventional agriculture, although a third group optimize between systems. Darnhofer *et al.* (2005) allocated Austrian farmers to a similar typology, which included committed conventional and committed organic farmers as their equivalent to 'loyal' farmers, and with less commitment explained by differing degrees of pragmatism and environmental consciousness. Cranfield *et al.* (2010) identified health and safety concerns and environmental issues as the main factors in the decisions by Canadian organic vegetable and dairy farmers to convert to organic production, with economic motives playing a less important role. Mzoughi (2011), in a study of French farmers, reported that those with strong social concerns, such as environmental commitment and moral concerns, tend to favor conversion. Similarly, Läpple and Van Rensburg (2011) identified environmental attitudes and social learning as important determinants for converting farmers. Furthermore, Läpple and Donnellan (2010) found that farmers with higher degrees of environmental concern are more likely to convert and less likely to revert back to conventional farming, which highlights the importance of a pro-environmental attitude as a motivation for organic farming.

Läpple and Van Rensburg (2011) identified three groups, who they labelled early, medium and late adopters, with each group influenced by different factors in their decisions of whether or not to convert. They further found that younger farmers were more likely to be early adopters and their decisions were less profit oriented than medium and late adopters. Late adopters tended to be older and were constrained by risk considerations (Läpple and Van Rensburg, 2011). Farmers with strong economic concerns (Mzoughi, 2011) and those who are risk-averse (Läpple and Donnellan, 2010) are less likely to convert. Läpple and Donnellan (2010) explained that increasing profitability of conventional farming slows the adoption of organic farming by decreasing the willingness to take the risk. Alexopoulos *et al.*

(2010) and Karki *et al.* (2012) each found that older farmers, educated farmers and those with larger farms are more likely to adopt organic production. In contrast, Khaledi *et al.* (2010) reported that farmers with smaller farms were more likely to convert and that education levels had no significant effect on the probability of conversion, which underlines the notion that many factors are context specific. This dependence on context of the factors that influence the decisions by farmers whether or not to convert to organic makes it difficult to draw generalizable conclusions. Given that the aim of this study is to identify how Swiss farmers' decisions reflect the interaction of perceptions, relationships, policies and economic factors, which either enable or provide barriers to conversion, it appears that primary research is necessary.

Materials and methods

Lamine and Bellon (2009) included agricultural and social scientists' viewpoints in their critical appraisal of the literature on conversion to organic food and farming. To add to their review, and given that the aim of this contribution is to gain an understanding of the barriers and enablers perceived by farmers, we survey the viewpoints of farmers—specifically, those farmers who have expressed an interest in less input-intensive farming, and who have made the decision to convert to organic or not. In this study, we adopt a case study approach, which Lamine and Bellon (2009) argue is the favored approach to studying conversion to organic cultivation because conversion factors are site specific and case studies explicitly consider context.

A total of 24 interviews with full-time farmers from the German-speaking part of Switzerland and 15 interviews with full-time farmers from the French-speaking part of Switzerland were conducted. All of the participating farmers, from both language regions, operate within the same system of subsidies and regulation. Around half of the interview partners were organic farmers, meaning they had converted to organic farming and been certified as organic producers by BioSuisse, and the remaining farmers were IP Suisse certified. In 2015, there were a total of 53 232 farms in Switzerland, of which approximately 20000 (37.6%) were IP Suisse certified and 6244 (11.7%) were organic. The average farm size in Switzerland in 2015 was 24.1 hectares. IP Suisse farmers were selected in the sample because they had made a decision to adopt more (than conventional farmers) environmentally friendly production methods, but had not chosen organic certification as their preferred path. Organic farmers were selected in the sample because they had chosen organic certification and so were assumed to have a relevant perspective on the enablers and barriers to conversion.

Farmers from the German- and French-speaking regions of Switzerland were included in the sample because these language regions combine to represent approximately 90% of the Swiss population. All of the farms selected were in the Swiss lowlands because the majority of alpine farms are predominantly grazing farms, and so are not affected by the possible problems associated with crop farming. The individual farms were selected according to a maximum variety of sampling strategy (Patton, 1990) to include a wide variety of farm sizes and types (based on what is produced), and thereby to gain a wide range of opinions on enablers and barriers. However, sampling a variety of farm types proved to be difficult because the vast majority of organic and IP Suisse farms in Switzerland are mixed farms, with both animals and crops, although some farmers could be found who solely produce crops. In practice, the farmers were selected on

the advice of on-farm advisors who could recommend farmers in light of the maximum variety principles. A detailed description of the sampled farmers is shown in [Table 1](#).

The selected farmers were contacted by telephone and a time for an interview was arranged at their convenience. All of the 39 farmers who were approached agreed to be interviewed. Interviews took place on-farm, using interview guidelines that had been created within the project team in consultation with the financing body (BioSuisse). The interview guidelines included questions about:

- The farmer, such as marital status, education level and age;
- The farm, such as size, farm type, number and type of animals, conversion date;
- Attitudes, such as why they had chosen the production system and whether their expectations had been fulfilled;
- Conversion difficulties, such as what facets were easier or harder than anticipated, what problems appeared and how they were solved, what were their best and worst experiences, what advantages and disadvantages had become apparent after conversion;
- Conversion enablers, such as what had smoothed the conversion process to their particular production method;
- General attitudes toward farming, such as their perceived role of farmers, how they see the future of their farm, and what they do similarly or differently to farmers with other production systems;
- Information exchange, such as how they give knowledge to or gain knowledge from other farmers;
- Their opinions of the markets, such as how they perceive the stability, and what strategies they have in cases of instability;
- Their perceptions of barriers to conversion and, in the case of organic farmers, whether there had been unforeseen barriers to conversion;
- The importance of neighbors and family in the decision-making processes; and
- Their thoughts about farm succession, the future of organic farming and how organic farming could be made more attractive.

The interviews in French-speaking region were conducted, transcribed and translated into German by one of the authors of this paper. The interviews in the German-speaking region were conducted, recorded and transcribed by two of the authors of this paper. The analysis was conducted on the interview transcripts, in the German language, by the researchers who had conducted the interviews. The outcomes of the analysis were collated in an iterative process based around discussions between the researchers until a categorization scheme was created that could accommodate all of the identified constructs.

Results and discussion

For brevity, we refer to the participating farmers simply as ‘farmers’ throughout the presentation of results and discussion in this paper. Direct (translated) citations from farmers are shown in italics followed by an identification of the farm type (IP or organic).

Maintaining identity as a producer

Many farmers reported that they first needed to make a change to organic in their own minds. To accompany the process of ‘mental conversion’, it is important that farmers believe they will be able

to maintain their self-image after conversion. One farmer used the analogy of converting to organic as changing religion, which would cause a similar amount of consternation within the family: ‘*When you change to organic, you change your religion. In farming, that’s not something that’s understood by everybody*’ (organic). In theory, this should not be a particularly difficult step to make because a common characteristic of both organic and IP farmers is that they not only see themselves primarily as producers but also perceive a responsibility to pass a viable farm to their successors, who are usually their children. However, in practice, the prospect of conversion was often seen as a challenge to the established system.

After the conversion, and as [Khaledi et al. \(2010\)](#) and [Ferjani et al. \(2010a,b\)](#) might have predicted, some farmers found it hard to farm without synthetic chemical inputs for controlling weeds: ‘*I never thought that there would be so many weeds (...) you convert, and don’t spray anymore, and you straight away get so many*’ (organic). For IP-Suisse farmers, the problem was not with fighting weeds: ‘*With a herbicide treatment you get through. That’s no problem at all*’ (IP), but rather that the crops no longer look as beautiful: ‘*That naturally hurts a bit. (...) I am a farmer who wants to have fields that look very nice*’ (IP). One farmer found it difficult to accept diseases that came with not using fungicides, though he hardly noticed any financial implications: ‘*even though it hurt a bit to look at, it wasn’t a tragedy. Economically, it was just as good*’ (IP).

Older farmers, who had experienced the massive reduction in workload and increase in yield that came with the introduction of synthetic inputs, were skeptical that conversion to organic could be seen as progress: ‘*For [my grandfather], it would be a step backwards to convert to organic, because everything would have to be done by hand again*’ (IP). This result echoes the findings of [Ferjani et al. \(2010a,b\)](#) and [Goy and Waibel \(2005\)](#) who reported that perceived extra work burden was a barrier to conversion. Farmers expressed understanding that their parents could not just put aside something that they had been working on for decades:

‘*My father went to agricultural college in the 60s, when there was another mentality (...). The appearance of herbicides was seen to be a release (...). The yields were good, and they were told in school that that’s how you have to do it. It was really hard for them to accept it when people began to say that the produce was dangerous; as if they’d been doing something wrong all those years*’ (organic).

Predecessors also expressed concern that the farm would not be able to produce a sufficient harvest after conversion: ‘*My parents don’t really understand what organic is (...). They’re worried we won’t be able to support ourselves with the farm*’ (organic). However, many farmers found that their predecessors learned to accept new management forms after some time, and after they had seen that the new production method was successful.

Although both organic and IP farmers see themselves as producers, the IP farmers sometimes see organic farmers as living from subsidies rather than production. Non-organic farming is considered to be the ‘normal’ way of production: ‘*The attitudes towards the productivity they want, and it’s just still based around having clean fields, but it’s all about production and yield, yield, yield*’ (organic). An organic farmer reiterated, however, that organic farming is also production oriented and that ‘*direct payments make up a much smaller part than the product sales, so organic farming is also productive agriculture*’ (organic). Some

Table 1. Overview of participating farmers

Farmer	Production form (since when)	Language region	Age	Marital status	Education	Farm takeover	Productive area (in ha)	Animals (number and type)
1	IP (1994)	German	47	M	Master farmer	1993	35	35 cows
2	Bio (2005)	German	42	S	Master farmer	2002	20.7	30 cows
3	Bio (2005)	German	44	M	Farmer	2004	28	36 calves, 2000 hens
4	Bio (1988)	German	57	M	Farmer	1984	20	26 cows
5	IP (1993)	German	46	M	Master farmer	1999	33	40 cows, 5 horses
6	IP (1997)	German	49	M	Master farmer	1991	31	80 cows
7	IP	German	64	D	Farmer	1984	98	100 cows
8	Bio (1994)	German	52	M	Farmer	1985	44.4	20 cows
9	IP (1990)	German	53	M	Master farmer	1984	30	15 cows, 100 hens, 22 pigs
10	Bio (1997)	German		M	None	1983	20	13 cows, 2000 hens
11	Bio (2012)	German	50	M	Farmer	1991	7.14	None (vegetables)
12	IP (1996)	German	57	M	Farmer	1987	23.5	18 cows
13	IP (2011)	German	49	M	Farmer	2008	18	20 sheep and lambs
14	Bio (1997)	German	62	M	Farmer	1977	11	2000 hens, 20 horses
15	IP (2003)	German	35	M	Master farmer	2004	58	60 cows
16	IP (2000)	German	41	M	Master farmer	1995	44	23 cows
17	IP	German	61	M	Farmer	1977	22.5	100 pigs
18	Bio (2008)	German	42	M	Farmer	1999	20	10 cows, 2000 hens
19	Bio (2000)	German	61	M	Master farmer	1988	16	27 cows
20	Bio (1996)	German	41	D	Master farmer	1994	16	35 cows
21	Bio (1983)	German	63	M	Farmer	1983	8.5	9 cows
22	Bio (2012)	German	39	M	Master farmer	2006	16	32 cows
23	IP	German	31	M	Master farmer	2012	19	20 cows
24	Bio (1992)	German	51	M	Master farmer	1990	33	24 ewes, 27 cows
25	Bio (1985)	French	50	D	Farmer	2004	28	No animals (crops)
26	IP (2011)	French	29	M	Master farmer		42	50 cows and calves
27	IP (2005)	French	51	S	Master farmer	1999	23	54 cows and 50 calves
28	Bio (2013)	French	43	M	Master farmer	2005	20	15 horses, 30 hens
29	IP (1991)	French	60	M	Farmer	1990	19	21 cows
30	Bio	French	48	M	Farmer	1996	13	Cows, hens
31	IP (2006)	French	30	M	Farmer	2011	85	125 cows
32	Bio (2012)	French	50	M	Master farmer	1993	6.5	None (grapes and fruit)
33	IP (1991)	French	41	M		2012	63	75 cows
34	Bio (2000)	French	57	M	Farmer	1995	6.5	None (wine grapes)
35	IP (1991)	French	50	M	Farmer	1985	70	23 cows, 5 pigs
36	Bio (1986)	French	41	D	None	2003	9	None (vegetables)
37	Bio (1985)	French	60	M	None	1985	3	2 horses, 7 cows, 45 hens
38	IP	French	46	M	None	2009	86	None (crops and wine grapes)
39	Bio (2013)	French	48	M	Farmer	1992	22	None (crops)

IP farmers anchor (Tversky and Kahneman, 1974) on their perception of organic farmers as those who abuse the direct payment system: 'If I can't produce, and I would say this very provocatively, I might as well go organic' (IP).

Farmers consider which changes they should make after each change in policy: 'What should I do? Put my foot down and produce like crazy, or do I leave some land fallow?' (organic). Several arguments are included in the considerations, including a

motivation to produce, but also financial aspects: *'As long as the organic prices hold, I can earn easily as much with produce as with fallow land'* (organic). Other farmers place financial aspects in the foreground and seek to maximize their financial benefit from the existing payment system: *'The goal is to profit from the subsidies: To claim all the possible direct payments'* (organic). However, the general consensus that farms should remain productive was held by both organic farmers: *'We don't only have to look after the landscape. We also have to produce'* (organic), and IP farmers: *'we want to keep the arable land and produce food cleverly'* (IP). In general, the IP farmers and the organic farmers had many more similarities than differences, in that they all face common problems, they see themselves as sustainable producers of quality produce, and they all care about soil conservation.

Climate for conversion

There was general agreement among the farmers that the necessary requirements for conversion to organic are in place. They have a high degree of trust in the advice and support they receive from agricultural consultants and they consider the Swiss agricultural policy, the market and the existing infrastructure to be favorable to conversion. Different and changing external conditions, such as the requirements for being eligible for direct payments and new solutions to problems, such as new treatments against pathogens, influence the decision of whether, when and how to convert to organic, and the professional consultants are perceived to have the most complete overview. One farmer put it simply: *'we only get good advice'* (organic). Farmers who had converted to organic farming often reported that the conversion was less difficult than they had imagined, which supports the findings of Schneider (2001) who found that risks were generally overestimated by farmers before they start with the conversion. However, farmers expressed reluctance to seek external 'official' advice about conversion before they had made the mental decision to convert. In other words, the advice was usually sought to learn how to convert rather than whether to convert.

The direction given by the current agricultural policy was often nominated as being favorable for conversion to organic farming, with the explicit requirements for biodiversity conservation being in alignment with Swiss subsidies for ecological compensation on farms. However, in agreement with the findings of Khaledi *et al.* (2010), a barrier to conversion is the fear of a change from a favorable policy that is necessary for individual economic survival, to an unfavorable policy that might cause economic hardship. New developments in the agricultural policy are awaited with tension and closely observed as farmers evaluate the developments in relation to the direct effects they have on their own situation: *'I'm thinking at the moment that we can live with the AP 2014-17 (the most recent major change in agricultural policy)'* (IP). Fear of policy change as a barrier to conversion is an example of O'Donoghue and Rabin's (1999) time-inconsistent preferences, since the situation does not meet the requirement that farmers believe that maximized present utility will also maximize utility in the future.

A possible reason for trusting the agricultural policy for IP more than organic is because of the entry costs. There are sometimes significant entry costs for conversion to organic. For example, one (IP) farmer would either have to rebuild their pigsties, at a cost of several hundred thousand francs, to meet organic standards, or give up keeping pigs; a step they were not willing to

make. Furthermore, there are costs associated with the transition period in which yields are often lower, but the withheld certification means that the increased subsidies and prices have not yet materialized. The entry costs and transition costs mean that conversion to organic comes with a higher risk. For many farmers, their trust in the stability of agricultural policy is insufficient for them to take the risk of converting.

In contrast to farmers' mistrust of the consistency of policy, they have overall trust in the market. The majority of farmers predict a positive development of the organic market: *'It will grow. Not hugely but it will grow compared to the others'* (IP). The explanation for the continued growth is the demand for organic products that is not yet perceived to be satisfied: *'the numbers are still gradually increasing, and the local production, there are a lot of branches that are far from their full capacity if someone wants to go organic, they will surely find something'* (organic). A possible exception for this prognosis is organic milk, which is already close to fulfilling its capacity potential. Production should be demand driven and farmers should *'produce the products that we need'* (organic). The major retailers lend stability to the market with intensive advertising: *'It's amazing what's invested there, in a much greater proportion than what's on the shelves'* (organic). The major retailers are seen as necessary, but their power makes the farmers nervous: *'As long as they (the major retailers) stay moderate and sensible, with the prices, then I see a great future'* (organic). One farmer, in the second year of conversion, expressed being surprised by the unexpected market demand for the produce: *'what I produced this year was practically torn out of my hands'* (organic). Farmers saw two main dangers for the stability of the market: the import of cheaper organic produce that applies downward pressure on price: *'The foreigners produce cheaper and deliver cheaper'* (IP); and scandals that damage the image of organic: *'my biggest worry would be the same nonsense that you see in other sectors'* (IP).

Relationships with neighbors and family

As Lamine and Bellon (2009) suggest, farmers appear to be involved in complex social and professional networks, and although independent in decision-making, should not be considered to be isolated rational actors. In some cases, the decision not to apply synthetic-chemical sprays was the trigger for conflicts with neighbors: *'Then came the organic farmer and planted potatoes, and they had leaf blight (...) I had to wash ours with 50% more fungicide so that I could get by'* (IP). Furthermore, IP farmers challenged the idea that organic farms are more environmentally friendly, given that organic farms apply copper, which is perceived to be more damaging than chemical synthetic sprays: *'They spray with copper (...) It's not biodegradable, and we're no longer allowed to use it. For me copper is far far worse than sprays that I can use that break down in 20 days'* (IP). Organic farmers are sensitive to these criticisms and aim to have fields that look like conventionally farmed fields: *'Our potatoes have been great, as good as those that are sprayed. (...) It's like saying, "Hey, we can do it as well"'* (organic).

This perceived negative attitude toward organic agriculture by other farmers acts as a barrier to conversion. The organic farmers reported that they felt closely observed by neighboring farmers immediately following conversion, but that the level of observation returned to the 'normal' level after a certain time during which they demonstrated their competence as farmers. Several farmers pointed out that there was a need for mutual respect

among farmers, regardless of the form of production. Organic farmers expect respect and tolerance from non-organic colleagues, as well as understanding if things go wrong: *'I had a good relationship with my neighbours and colleagues, and they knew me when I was an IP farmer, and I'm still valued now that I'm an organic farmer. That's a big honour'* (organic). Many of the interviewed farmers continued with collaborative arrangements with neighboring non-organic farmers after conversion, which they interpreted as a sign of acceptance: *'We still share machinery and still have a good relationship. There's mutual respect'* (organic). Neighboring farmers show a certain tolerance to errors of farmers who have recently converted. Mistakes and failures are considered an opportunity for learning, and every farmer, including IP farmers, had a story of an expensive mistake from their early farming days. On the other hand, successes are also noted and can contribute to more positive attitudes toward organic cultivation: *'I've been complimented by other farmers who've said "hey, you can do so much, and make good products, also without chemicals"'* (organic). An IP farmer commented: *'I take my hat off to him. He does it well'* (IP).

However, IP farmers sometimes have the impression that they are not respected by the organic farmers. One IP farmer described the relationship in the village between organic and non-organic farmers as strained because organic farmers see themselves as better: *'They say "we are organic farmers and we are the best". But it's not true. They aren't better than us, or more ecological'* (IP). This attitude was confirmed by an organic farmer who commented: *'I've never personally spoken badly of non-organic farmers, or brought them down, but I know others do'* (organic). This position is counterproductive, since it can lead to feelings of disrespect and alienation from both sides. Some IP farmers feel cheated, and expressed the criticism that organic farmers do not always follow the rules and spray more copper than is allowed: *'They also mess around in organic (...) they can buy feed from non-organic farms, and let that run through a cow, and organic milk comes out (...) those organic farmers, who take it to the limit. They make it difficult for everybody'* (IP).

A further criticism was the use of machines that are not perceived to be protective of the soil: *'The organic farmers have bigger machines than us, and ploughing twice a year is no good for the soil. On our farm, we get a subsidy for not ploughing, but in organic it's the opposite'* (IP). This decision basis is an example of framing (Tversky and Kahneman, 1974), in which the farmer attaches their opinion to a particular practice: in this case, soil protection. One organic farmer reported knowing of such accusations by hearsay, but was reluctant to comment on these criticisms: *'What should I say? Nobody has said things like this directly to me'* (organic). Another organic farmer claimed that the criticisms probably have some background in village politics that have nothing to do with production form: *'I don't know how seriously you can take that. There is always some background'* (organic). The general feeling among organic farmers is that they are part of a supportive community, while the non-organic farmers are competitive, which may explain the tendency to criticize: *'There's a lot of solidarity among the organic farmers. We help one another. We're not afraid to talk about our mistakes. The conventional guys are afraid people will laugh at them'* (organic).

Examples in the region have a strong influence on farmers' decisions and are often used to confirm prejudices: *'I used to have a different opinion of organic, but it was because of a bad example here in the village'* (organic). This is an example of bounded rationality (Gigerenzer and Todd, 1999), in which

farmers seek to simplify the information processing needed for the decision, which is especially the case when subjective norms are not met. Organic farmers are often seen as representatives of their form of production, so poor examples by organic farmers are perceived to carry a larger weight than negative examples by conventional farmers: *'I think organic farms have to have even a bit better order than conventional farms'* (organic). As the number of organic farms increases, the continual critical observation by the neighbors appears to fall: *'I think these times have passed. Some farmers are dissatisfied with their own situation, a bit pre-occupied, and look at what others do'* (organic). Despite the clearly expressed wish for acceptance by their peers, farmers still deny that it is important to them: *'If you always listen to what the others want, you might not be on the right path'* (IP).

In addition to acceptance by other farmers, acceptance by family was also found to be important, which supports the findings of Goy and Waibel (2005). A positive attitude and generous support from the farmer's life partner were highlighted as particularly important when deciding whether or not to make a large change, such as conversion to organic. In some cases, the involvement was one of consultation: *'We discussed it, but in the end I made the decision myself. Because my wife doesn't come from agriculture in that sense.'*(IP). There were cases in which the support of the partner was more central: *'Then it was up to my wife to decide whether she was up for it, and she also bore the decision'* (Bio), and there were other cases in which the farmer's wife provided the drive for change as they were concerned about the use of pesticides in the vicinity of their children.

Several of the farmers commented that their parents, or even their grandparents, had trouble with the conversion to organic: *'My parents would say we were crazy if we were to convert. My brother also wouldn't want it'* (IP). The opinion of the farmer's father, who is often the predecessor and still lives on the farm, appears to be an important factor in the decision: *'At the beginning, my father bred cattle, and I did the fields. I talked with him about conversion. But that's the old generation'* (IP). An organic farmer reported that she *'was lucky that her father no longer worked on the farm, so I could make my own decisions'*, but she knew of other farmers who *'wouldn't dare to convert to organic as long as their father was still around'* (organic).

Self-determination

All informants value their independence and freedom to make decisions, but they also have some restrictions on what they can do if they are to receive subsidies. One barrier to conversion is created by some farmers bounding their rationality (Gigerenzer and Todd, 1999) with a perception that they would lose independence. They fear being limited by a wide range of complex rules and regulations and, as Koesling et al. (2012) pointed out, perceive that regulations related to organic farming are strengthening over time. However, organic production was seen to give an overall gain of self-determination by those who had converted, and independence from major players in the agricultural market, such as suppliers or distributors of synthetic inputs, was named as a positively experienced change after conversion: *'Before we became organic, a company used to come and do all our spraying. We didn't have much to do with it. They just sent us a bill and we paid it'* (organic). After conversion, this farmer makes the decisions himself and expressed that this stronger power of decision-making gives him a stronger connection to the land. An IP farmer made a similar observation about organic farmers and

commented: ‘*Today they know the soil and the techniques. They have to think and not just follow a treatment plan. That causes an improvement in quality*’ (IP).

Lamine and Bellon (2009) proposed that conversion decisions are multidimensional and complex, and called for more research into the factors that enable or hinder conversion. The results presented in this contribution address the question of why the early majority, which the diffusion of innovations model (Valente and Rogers, 1995) suggests should have followed Padel’s (2001) early adopters, have failed to appear. Furthermore, by identifying and describing a complex range of influencing factors as they are perceived by farmers, these results provide empirical support to Lamine and Bellon’s (2009) assertion.

Differences between French and German language regions

The case study of Switzerland features two language regions that, although existing within the same framework of incentives and regulations, have experienced different degrees of uptake of organic farming practices (Willer and Lernoud, 2017). Some examination of the reasons for this difference is therefore worthwhile. Among the differences between the language regions were some that could be attributed to local politics, such as dominance of German language speakers in farmer associations, which are therefore not easily transferable to other contexts. However, other differences are related to existing structures and critical mass, which are conceivably relevant in other contexts. For example, Schmidtner *et al.* (2011) found that the density of organic farmers in surrounding areas is an important factor and proposed that the influence may be due to social networks and the ability to receive peer advice and support. Läßle and Cullinan (2012) similarly found that regional support and the presence of pioneering organic farmers might influence spatial clustering of organic farming.

There are structural differences between the French-speaking and the German-speaking regions, which could form elimination heuristics (Wilson and Dowlatabadi, 2007) and influence the decision of whether or not to convert: ‘*Farms in the French-speaking region are very dependent on sugar beet but it’s almost impossible to grow it organically because of the weeds*’ (IP). This is precisely the crop identified by Schramek and Schnaut (2004) as being sufficiently problematic to represent a barrier to conversion to organic in 2004 and which is still nominated as being a barrier although technical solutions have since been found. A further structural difference, and a further knowledge gap of IP farmers about organic practices, is in the lack of animal manure: ‘*On an organic farm, you have to have animals. In the French-speaking region there are a lot of farms without animals. We don’t produce any manure on the farm, but import it instead; mineral fertiliser*’ (IP). A direct effect of the lower number of organic farms in the French-speaking region is a lower number of supply and delivery points for organic produce. This means that organic farmers in the French-speaking region have to travel further to buy inputs and sell their produce, and it was repeatedly mentioned that delivery stations should not be too far from the farm: ‘*I deliver everything to Cornaux. If I would produce organically, I’d have to travel much further to bring my grain, to Murten I believe. If I could bring it somewhere closer, it’d be simpler*’ (IP). In contrast to the findings of Läßle and Cullinan (2012), who reported that the availability of organic market outlets has no clear effect on the density of organic farmers, it appears that insufficient density of delivery points does indeed present a barrier to conversion. The other benefit of local delivery stations in

the French-speaking region is the platform they provide as a contact point for farmers that enables networking and exchange. An organization with the goal of promoting organic farming would be well advised to invest in delivery stations that would remove this barrier: even if such stations were unprofitable until a sufficient number of delivering farms had converted to organic production.

The inaccessibility of delivery stations has a particularly large impact given the lack of networking and information events for organic farmers in the French-speaking region. Some organic farmers mentioned that there are more events for organic farmers in the German-speaking region than in the French, whether these are small local events such as farm visits or national organic days that are often held in the German-speaking region. The respondents point out that the distance provides an additional (to the language barrier) hurdle that French-speaking farmers must overcome to travel to such events: ‘*We don’t like to travel too far. But when there would be such events nearby, we would certainly come along*’ (organic).

The unique geographic situation of Switzerland having multiple language regions allowed us to gain insight in areas with higher and lower degrees of conversion: despite identical systems of policy, regulation and incentives. When combined with the identified and described range of influencing factors as they are perceived by farmers, these differences provide further confirmation of Lamine and Bellon’s (2009) assertion that the factors that enable or hinder conversion are multidimensional and complex. Perhaps more importantly, the finding that there were differences between the language regions suggests that, although the study was conducted in Switzerland and not with a representative sample, the results might well be generalizable to other national contexts.

Conclusions

The study presented in this paper builds on the study by Lamine and Bellon (2009) and examines how Swiss farmers’ decision of whether to convert to organic farming reflects the interaction of perceptions, relationships, policies and economic factors. In particular, we follow Lamine and Bellon’s (2009) suggestion to consider farmers as complex social and professional networks rather than as isolated rational actors. Many of the studies in the past decade into the factors that influence conversion have addressed the issue of reconversion from organic production back to conventional production (e.g., Ferjani *et al.*, 2010a,b; Läßle, 2013). This contribution rather attempts to propose an explanation for the stagnation in the number of farmers converting to organic by enabling the farmers to explain their decisions in their own words. Furthermore, the unique geographic situation of Switzerland, with multiple language regions, allowed us to gain insight in areas with higher and lower degrees of conversion: despite identical systems of policy, regulation and incentives.

This study was qualitative in nature and the sample size, while within the normal range for qualitative study, means that we are reporting the opinions of a small proportion of the Swiss farmers, so care should be taken with overgeneralisation of results. Further quantitative research, with a representative sample, would be needed to confirm the presented results. Despite these limitations, the output of this project is a deeper understanding of the technical, economic and social issues as perceived by farmers. In particular, the results contribute to understanding the complex inter-relationships between these issues and how they influence the decision of whether or not to convert.

A barrier to conversion that was related to technical issues was the lack of awareness among IP farmers of organic solutions to

production-related problems. Solutions that are found in organic agriculture should therefore be publicized more widely to IP Suisse farmers, and probably also to conventional farmers, thereby removing an elimination heuristic (Wilson and Dowlatabadi, 2007). Farmers do not use expensive synthetic inputs because they like to spend money, but because they do not see viable alternatives. If they are made aware of such alternatives, and implement them, the degree of change to meet requirements for conversion becomes smaller. This result is in agreement with the findings of Heinze and Vogel (2017) who suggest the value of extended advisory services both before and during conversion. A further result of publishing solutions could be that organic farming will also be perceived to be production oriented and face many of the same problems as non-organic farming. The process of publicizing practical solutions will also encourage contact between organic and non-organic farmers, which may enable farmers to feel part of the same network, enhance mutual respect between the farmers and reduce an 'us vs them' dynamic.

The finding that there is no recipe as such, and that each farmer must find their own solutions that work for their own farm, means that the conversion to organic is perceived to be uncertain. This uncertainty persists despite the extensive and highly regarded advice that is readily available to farmers. Baron (2004) points out a tendency for people to favor the status quo in cases when uncertainty exceeds the perceived need to change. Strategies to encourage conversion to organic should therefore include components to reduce the uncertainty that is perceived by farmers considering conversion. Better networking opportunities for organic farmers, and also between organic and non-organic farmers would enable exchanges and reduce the uncertainty of conversion. However, farmers may be unlikely to attend events simply to network, but rather when they are brought together by mutual interest, so professional events around production themes, such as open days or demonstrations of new techniques, could contribute to encouraging exchange between organic and non-organic colleagues. Such events could have the effect of strengthening the reputation of organic farmers as producers and provide a platform for receiving informal peer advice, which Läßle and Kelley (2015) found as an influence on adoption decisions.

The organic sector in the French-speaking region enables comparison of two regions with the same system of incentives and regulations but which have different densities of organic farms (Willer and Lernoud, 2017). The French-speaking region, with a lower density of organic farms, has fewer delivery points, which ironically hinders the development of the sector in reaching a critical mass that enables the establishment of infrastructure, such as nearby delivery points. A reasonable recommendation then, to an agency with an interest in encouraging conversion to organic agriculture, would be to look for possibilities to make the network of delivery points denser, prior to this critical mass being reached, so that farmers who are interested in conversion would be reassured that there will be somewhere for them to bring their produce. The dual purpose of delivery points to also function as meeting places for networking and exchange is especially relevant for the French-speaking region, with a lower density of organic farmers. In this way, the delivery points would address the importance of belonging and would enable a supportive network, as suggested by Heinze and Vogel (2017), to help overcome the real and imagined difficulties of conversion.

As a final conclusion, this study found that a complex variety of external, technical production, social and personal factors

influence the decision of whether or not to convert to organic production. In addition to policy, regulation and incentives, social factors should also be taken into consideration if widespread conversion to organic farming is adopted as a goal. However, this study also found that the differences between conventional or IP and organic production tend to be overestimated by non-organic farmers, with organic farmers reporting that conversion to organic had turned out to be less difficult than it was foreseen to be. These new insights in the Swiss context, which were gained from the perspective of farmers and expressed in farmers' own words, have the potential to provide a basis for strategies to address these complex issues and enable conversion to organic by the early majority (Valente and Rogers, 1995) that, until now, has failed to appear. The common theme throughout the recommendations is to facilitate communication between organic and non-organic farmers so that their similarities, rather than their differences, are in the foreground. In addition to providing a social reference group, the perceived degree of change, from the perspective an IP farmer, to fulfil the requirements for organic certification would then be closer to the actual required change, the decision would appear to be less complex, and conversion to organic agriculture would be facilitated.

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