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Institutional erosion and new strategies: Changing contexts for learning in agriculture in Northern Sweden

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Abstract

This article describes the erosion of institutions that support farmers' learning and the construction of knowledge in agriculture in an area of agricultural decline. It is based on a qualitative study in northern Sweden, exploring farmers' learning to farm, their peer networks, contacts with advisory services and their sales relationships. As farming is increasingly differentiated, with an intensification of production in some areas and increasing farmland abandonment in others, so are the institutions that support farmers' learning. Farmers handle this in different ways, and the article indicates that resourceful farmers, dependent on farm income, seek out and create contexts for learning. Others seem increasingly decoupled from advisory institutions and upstream industries, selling their produce in local networks. The article illustrates that the widening gap in agrarian production is related to a differentiation of social and institutional preconditions for the construction of knowledge in farming.

KEYWORDS
agricultural extension, farmers' learning, regions of agrarian decline, rural and agricultural sustainability

INTRODUCTION

Issues of sustainability are increasingly gaining ground within EU agricultural policies. Recent examples are the EU Commission Farm to Fork initiative, the EU Biodiversity Strategy and the regulation for the EU Common Agricultural Policy (CAP) programme period 2023–2027 (EU, 2021; EU Commission 2020a, 2020b). In these initiatives, knowledge and innovation are seen as central in order to strengthen agricultural sustainability. Moreover, systems perspectives embracing multiple actors are increasingly applied in understanding knowledge in agriculture (EU SCAR AKIS, 2019).

However, agrarian change is characterised by agricultural production becoming more intensive in some areas and more extensive in others. These are interrelated processes. Intensification, higher labour productivity and an increase in scale in one area lead to decreasing profitability and production in other areas (Hanna & Bakker, 2011). Moreover, agricultural land is decreasing, as land is used for other purposes or is simply abandoned. This leads both to a loss of arable land and of techniques and knowledge required for the conservation of traditional landscapes (Lasanta et al., 2017). With the looming lack of both agricultural land and biodiversity worldwide, this is a problematic development. It can also be detrimental to local rural development (Milestad et al., 2011).

This article expands on the observation of a loss of knowledge in regions characterised by agricultural depletion. It builds on a qualitative study on agrarian change in Sweden. The data indicated a lack of institutional support for farmers' learning and for the construction of knowledge in agriculture in a region of agricultural decline, in which both advisory organisations and upstream industries were retreating. This brought about the present analysis, which builds on an abductive logic, reasoning from an observation to explore what renders it likely (Fann, 1970) and to explore its qualities. Research on farmers' learning, on knowledge production in agriculture and the commercialisation of advisory services, is used for this purpose. The aims of the article are (1) to describe different processes contributing to the erosion of the preconditions for farmers' learning and the construction of knowledge in agriculture in an area of agricultural depletion and (2) to illuminate how the farmers handle this erosion.

The article is structured as follows. It begins with a section on research on farmers' learning and the construction of knowledge in agriculture and on the consequences of the commercialisation of advisory services in Western Europe. The study is then presented. The last parts of the article present the results of the interviews and discuss how farmers handled the erosion of preconditions for learning and knowledge, the lack of political interest in farming in the North and what the rebuilding of an available and relevant advisory function may demand, all in relation to agricultural and rural sustainability.

RESEARCH ON LEARNING AND KNOWLEDGE IN AGRICULTURE

Aiming to capture the complex processes of changing practices in agriculture, rural research on knowledge in agriculture, somewhat eclectically, draws on a range of different theories and concepts. However, since the 1980s, the social and contextual character of knowledge in agriculture has been a prevalent theme. Studies drawing the sociology of knowledge then explored differences between knowledge grounded in different life-worlds, highlighting contradictions and power relations. The book *Battlefields of Knowledge* by Long and Long (1992) is such an example.

Another example is the discussion on dichotomies of knowledge, on the one hand, as based on scientific knowledge, formal education and formal rationality, and on the other hand, as lay or local knowledge, experiential learning and adaptive rationality (e.g. Apffel Marglin & Marglin, 1990). Although the social character of farmers' learning has since been a central theme in research, the focus has shifted from the early more critical studies of different forms of knowledge to the need for the co-production of knowledge and innovation. The individual farmer's on-farm learning is also increasingly understood as embedded in contextual preconditions, yet cognitive questions of farmers' integration of formal information with their own experiential knowledge remain.

This section presents three approaches in recent rural research to learning and knowledge in agriculture, relevant to explore the issues brought up in the interviews: (1) farmers' learning on farm and in local/collegial networks, (2) the significance of other relevant actors and (3) the co-production of knowledge drawing on system perspectives. This is followed by research on the commercialisation of advisory services. Research focusing on the spatial aspects of the decrease of institutions supporting learning and knowledge in regions characterised by agricultural decline has not been found. The section ends by formulating the analytical framework used to analyse the data.

Learning on farm and in collegial networks

A study by Šūmane et al. (2018), analysing 11 European cases of farmers' learning practices and informal knowledge concerning sustainable agriculture, offers an example of a study in which a broad range of personal and societal factors underlying farmers' learning are explored. In their analysis, the farmer's individual on-farm experiential knowledge is the primary source for learning. Second comes other trusted farmers. The authors contrast this learning with the use of standardised formal information and point to the risk of farmers not being able to contextualise this to their own particular conditions. In order to support farmers' learning and integration of formal knowledge, they suggest both structural support for networking among farmers and for knowledge exchange between formal and informal sources of knowledge (see also Lyon et al., 2011). Noy and Jabbour (2019) emphasise the value of advisors and experts with local experience, preferably embedded in the local community.

Instead of focusing on the individual capacity to reflect on formal information, practice theory draws attention to the cultural grounding of practices (Lave & Wenger, 1991). Proficient ways to act are appropriated by participating in a practice and in communities of others engaged in the same practice. Rural research drawing on practice theory is, for instance, Morgan (2011) on organic farming and Ingram et al. (2014) on permaculture cultivation as practices. Yet, in a broader way, practice theory draws attention to the cultural context in which farming is embedded. For instance, in a study of women entrepreneurs in farm businesses, Shortall et al. (2022) discuss the 'cultural constraints' for changing farming practices women are faced with as they engage in farming. They find it hard to break with the model for farming handed down intergenerationally and are under peer pressure not to do so. A study of family farming in Sweden in the 20th century similarly points intergenerational models of farming learnt through farming. Here, the actual work on the farm constituted the fundamental part of the lifeworld socialising children, delimiting gender and generational relationships, and justifying ownership (Flygare, 1999).

Importance of other actors relevant for production

Farmers' learning is not only embedded in collegial networks but also in relations with other actors relevant for production. Rose et al (2018a, 2018b) suggest, for instance, that farmers' decision-making should be understood by a distributed approach rather than as an individual endeavour. This includes actors such as landowners, advisors, food manufacturers and retailers. The authors claim that academia, industry and technological companies need to develop participatory, practice-relevant ways of working in which key decision-makers in the farmers' ring of confidence are actively included.

Yet, farmers' relations with industry, banks and other external actors include power relations that affect farmers' practices curtailing both decision-making and learning. Partly building on Braverman (1998), and in a more critical stance, van der Ploeg discusses agro-ecology as a response to how capital has affected the labour processes in modernised agriculture. As on-farm tasks increasingly have been taken over by outside agencies, farmers are increasingly required to align with the artefacts and protocols that these actors demand (van der Ploeg, 2020). This then has effects for the construction of knowledge in agriculture as well as for farmers' learning, as this externalisation involves 'the monopoly over knowledge to control each step of the labour process and its mode of execution' (Braverman, 1998, p. 82).

Systems perspectives of knowledge and learning

Today, research drawing on Systems perspectives often focuses on the co-evolution of activities and innovations rather than on power relations. Earlier, such approaches concerned the links among research, extension and utilisers of research. Later approaches, such as the Agricultural Knowledge and Information Systems (AKIS) and the more recent Agricultural Innovations Systems (AIS), include a broader set of actors. Originally, AIS had a greater focus on innovation, institutions and infrastructures for learning, yet they increasingly resemble each other (Klerkx et al., 2012). In the EU, AKIS, now redefined as Agricultural Knowledge and Innovation Systems, is seen as means to enhance innovation in agriculture and to promote the adoption of more sustainable practices among farmers (EU SCAR AKIS, 2019). The aim to contribute to sustainable practices is also central in the notion of mission-oriented innovation systems proposed by Klerkx and Begemann (2020) aiming to serve transformative purposes and public goods such as a clean environment, biodiversity, animal welfare and social justice.

However, research proves that the co-evolution of innovations requires particular preconditions to be successful. Studies on actor-initiated innovation processes (Gava et al., 2017; Klerkx et al., 2010), as well as research-initiated multi-actor innovation processes aiming for sustainability (Knierim et al., 2019; Tisenkopfs et al., 2014), come to similar conclusions. The complexities of multi-actor settings demand dedicated facilitation and leadership in order to bridge actors' diverse interests and enhance the joint learning needed for co-ordinated action (Dolinska & d'Aquino, 2016; Klerkx et al., 2010, 2012; Tisenkopfs et al., 2014). The more heterogeneous the members are, the more the need for facilitation to make use of the heterogeneity and not lose relevant actors. The backgrounds of members need to be carefully considered, depending on the desired outcome and stage in network evolution (Klerkx & Begemann, 2020; Tisenkopfs et al., 2015). Another common conclusion is that the mutual accommodations required of network members take time. Again, not least does the integration of expert knowledge with the farmers' knowledge take time (Tisenkopfs et al., 2014).

Research on structural conditions that enhance or hinder the development of national or regional agricultural innovation systems reveals further problems (Hermans et al., 2015; Minh, 2019). Exploring such conditions for innovation networks for sustainable agriculture in eight European countries, Hermans et al. (2015) analyse the knowledge infrastructures, regulations, norms and values, market preconditions and interactions conducive for innovation. They found large variations within and between countries and overall more hindering than facilitating conditions. Lack of funding for research, lack of interest in education in agriculture, fragmented perspectives on sustainable agriculture and rural development, institutional logics not conducive for collaboration and vertical and horizontal fragmentation of the AIS were among the hindering preconditions for social learning and collaborative projects identified. Competition among knowledge providers for funding and contracts, especially in countries where advisory services are privatised, hampered the formation of innovation networks.

Relevance and availability of advisory services

In Sweden, as in many other European countries, the dismantling of the national extension organisation in the 1990s led to advisory services characterised by both diversity and organisational pluralism (Knierim et al., 2017) and to them being increasingly charged for.

In an overview article analysing research articles on advisory services from 1998 to 2008, Faure et al. (2012) point out that this can be seen as transferring of costs from the state to the final beneficiaries and that it is generally acknowledged that the majority of farmers cannot assume the total cost of advisory services. This leads to state bodies having contradictory roles in defining priorities and to their funding advisory activities through several mechanisms. Yet, the authors claim that a large majority of studies question the implementation of mechanisms capable of responding to the diversity of contemporary challenges. Furthermore, they found surprisingly few articles that addressed power relationships between actors with different and/or contradictory motivations in advisory services.

Later research on the commercialisation of advisory services in Europe points that it affects the relations between the farmers and the advisors, as well as the advisors' connection to agricultural R&D. Central in this research is the distinction between 'front-office' and 'back-office' activities (Knierim et al., 2017; Labarthe & Laurent, 2013a, 2013b; Prager et al., 2016). Front-office activities stand for advisors' contacts with farmers, while back-office for their contacts with research, monitoring scientific progress and trials, further education, and so forth. Another focus in this research is the number of one-to-one farmer contacts that advisers have. A common conclusion is that commercialisation tends to lead to more one-to-one front-office activities and contacts, at the expense of the back-office activities. Advisors then become a weak link in the overall AKIS, something also discussed in EU SCAR AKIS (2019) and by Knierim et al. (2019).

Another common conclusion is that commercialisation tends to favour more affluent farmers (Prager et al., 2016) and that some groups may be neglected such as farm employees, women, young farmers and part-time farmers (Knierim et al., 2017). Moreover, some studies indicate that commercialisation enhances a focus on production issues at the expense of other issues, such as agri-environmental advice. This is seen as an effect both of advisors' adaptation to farmers' priorities on production and of a lack of back-office activities (Krafft et al., 2022; Sutherland et al., 2013). A diverse privatised advisory and extension service may also lead to problems in co-ordinating innovations for long-term environmental issues (Hermans et al., 2015).

Moreover, privatisation of advisory services may be detrimental to small-scale farmers. Labarthe and Laurent (2013a) point out that the relevance of advice emerges in the co-production of knowledge between farmers and advisors. This is how advice can be contextualised to the farmers' on-farm situation, production and values. Privatisation of advisory services not only risks leading to a vicious circle in which advice becomes less available, relevant and reliable for small-scale farmers. It also leads to the construction of knowledge that would be relevant for them being unheeded.

Analytical framework

Drawing on these different studies, and in order to capture both individual and social aspects of learning, the coming analysis focusses on how farmers talked about:

- learning to farm,
- education and use of advisory services,
- local/collegial networks and collaboration,
- extended networks,
- sales relationships,
- the future of farming.

THE EMPIRICAL STUDY

The study was set up as a follow-up of a survey of farming households made in the early 1990s. The survey included 350 farms in two municipalities on the Southern plains, on the mid-Swedish plains and in the coastal areas of Northern Sweden. These sites were chosen purposively as representative of the three different Swedish agricultural production regions, and the municipalities as not being atypical for these regions. The survey led to a suggestion for a typology of Swedish farmers based on household labour and sources of income, an analysis of gender relations and mobility patterns in farming (Djurfeldt & Waldenström, 1996, 1998, 1999).

The follow-up was qualitative and aimed to explore themes related to changes in strategies for livelihoods and production (Hajdu et al., 2020), gender relations (Eriksson & Hajdu, 2021) and prospects for the future. Using the register of Swedish farms and farmland, we drew a sample of farmers tilling the land that had been part of the survey, aiming to capture a variation in production, age, size and gender. The interviews were made on-farm, taped and partially transcribed, and took 1–4 h. Some of the interviewees remembered the previous interview, but on most farms, a new generation, or new owners, had taken over. In several cases, the original farm had been split up and was now part of other farms, a consequence of the structural changes in agriculture.

The findings presented here are based on the interviews made in the Northern study area, in the municipalities, Kramfors and Sollefteå in Västernorrland County (see Figure 1) in 2017 and 2018. Here, the erosion of institutions supporting learning in agriculture was salient.

We made 14 interviews in this area and covered a broad variety, meeting young farmers venturing into full-time farming and part-time farmers as well as various ways of keeping the farm going through diversified agriculture or other off- or on-farm ventures. An overview is

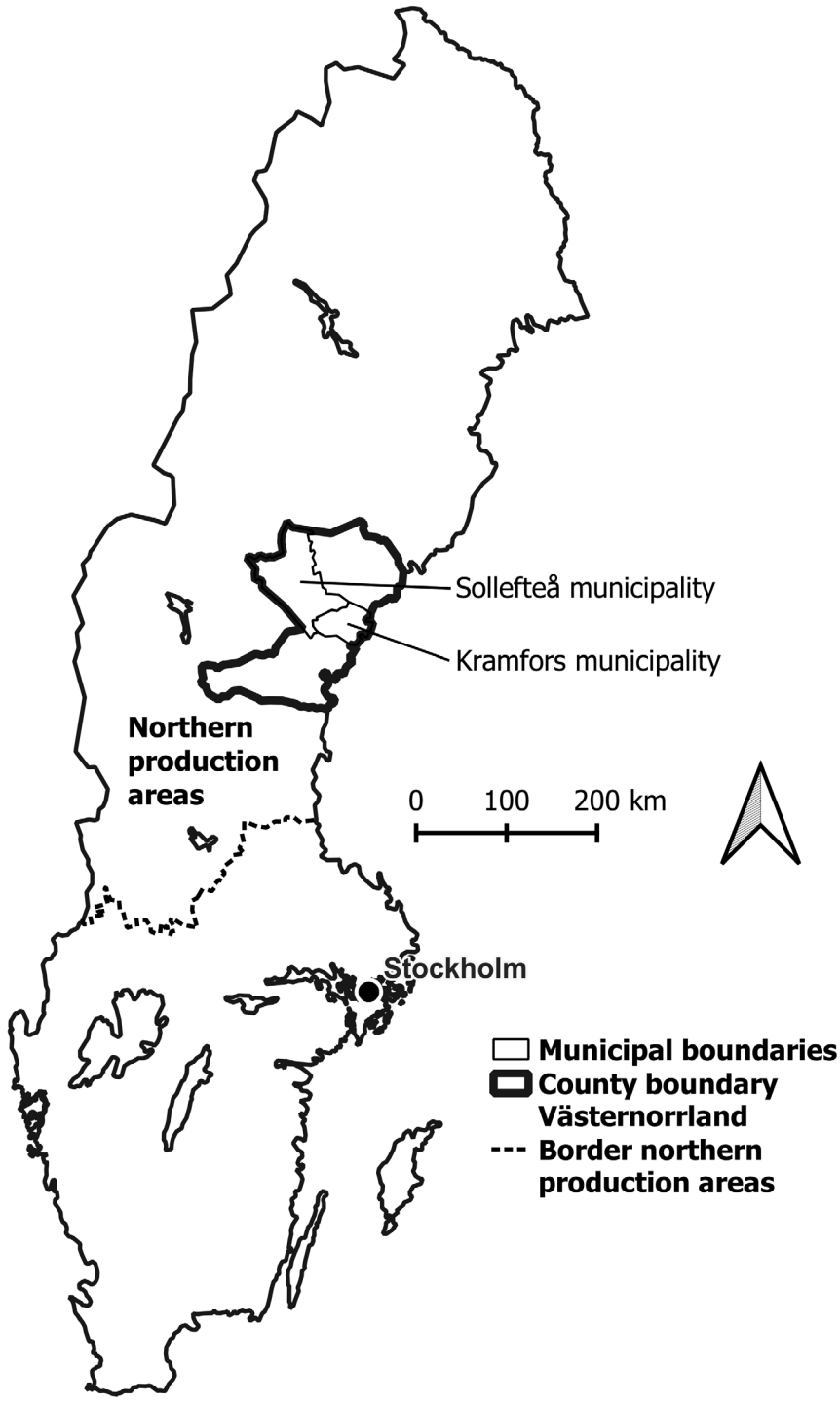

FIGURE 1 The location of the study area

presented in the Results section. In 2022, two interviews were made with officials at the County Administrative Board (CAB) in Västernorrland and Norrbotten and one with a representative from Hushållningssällskapet (HS) in Västernorrland. The CABs manage the EU support for agriculture. HS is one of the main Swedish advisory organisations. All names have been changed.

The study site

Västernorrland has had a problematic demographic and economic development since the previous study. This is mainly due to industrial, but also to agricultural, decline. As in many other Western European countries, Swedish agriculture was transformed in the mid-20th century. Since the 1950s, the percentage of the total labour working in agriculture in Sweden has decreased from 20% to 1,2%. In Västernorrland, 50% of arable land was taken out of production, most often afforested. From 1992 until today, the number of farm holdings in the two municipalities in the study decreased from 940 to 550.[1]

The harsh climate and mosaic agricultural landscape have historically implied a focus on dairy production in the county. However, since the survey in the early 1990s, there has been a shift from dairy to meat production. While the number of dairy cows has decreased by 40% since 1992 in Västernorrland, the number of suckler cows has increased from 1000 to 4000. Today only 3% of the Swedish farms are in Västernorrland, and the average farm size is 24 hectares. The national average is 41 hectares, but this hides a very skewed distribution. Farms in regions with better preconditions for cultivation are considerably larger. Except for farms up to 2 hectares, all farm size groups in Sweden are shrinking, apart from farms larger than 200 hectares, which increase.

Availability of advisory services in the study site

In Sweden, four actors dominate the advisory services to farmers: HS focussing on crop production; Växa Sverige focussing on dairy; Gård och Djurhälsan focussing on meat, and Ludvig & Co focussing on financial services. All have backgrounds in farm-based organisations, yet all are on a commercialisation gradient (Prager et al., 2016) as most of their advisory activities are charged for. There are also approximately 50 smaller private advisory businesses (Krafft et al., 2022).

In the sparsely populated Swedish North, with long distances and little production, the presence of these organisations have decreased. Today, there is no HS advisor on crop production in Västernorrland. None of the main offices of Växa Sverige or Gård och Djurhälsan are in Northern Sweden. According to interviews, Växa is almost absent from Västernorrland. Ludvig & Co is present all over Sweden, offering business advice in general. Three private advisors living and working in the county were mentioned in interviews.

Free of charge public advisory services are connected to agri-environmental issues and organic agriculture. These are administrated by the CABs, but mostly procured and managed by advisors from other organisations. The *Focus on Nutrients programme*, aiming to reduce losses of nutrients from production and to support development of production, is such a programme. When established in 2001, it was only available in the southern parts of Sweden. However, since 2015 farmers in Västernorrland may take part of nutrient loss advice, but not the production development part. Moreover, the Swedish Board of agriculture employs 10 national experts in crop protection, weeds

TABLE 1 Overview of the farms in the study

Type	Interviewees (co-farmers)	Production	Employment
1. Large farms or full-time farm with farm income only	1. Martin	Dairy	Six full-time, three part time
	2. Gavin	Dairy	Son 30%, one 50%
	3. Tor and Astrid	Crops, hunting, game, meat, forest	Four in forest company
	4. Ulf (sister, brother-in-law)	Saplings, potatoes, meat	Nephew 100%, one 50%
	5. Erik and Tina	Goats and cheese	International volunteers
2. Off-farm income important. Spouses work off-farm	6. Klara and Katarina	Meat	
	7. Robert and Elinor	Sheep (mutton breed)	
	8. Lars and Meg	Dairy	
	9. Mattis	Dairy	
3. Part-time farms	10. Folke	Sheep (tapestry wool breed)	
	11. Knut	Meat	
4. Co-operative	12. Paul and Klas	Meat	
5. Only Basic Payment Scheme	13. Rick and Ann	Exit, planning to move	
	14. Nils	Forbidden to keep animals	

and machinery, all placed further south. That the crop protection advisor comes to Västernorrland once a year holding two meetings for farmers was mentioned as important.

Upstream or downstream industries also offer advisory services. Yet, as the agricultural production is concentrated in the mid-Swedish and the Southern regions, so are these industries (Albihn et al., 2021). In Västernorrland, there is a moderately large private abattoir, some small local abattoirs and one dairy left. Dairy farmers with robots are offered advice on dairy production from the company supplying the robot. Lantmännen Agriculture and Lantmännen Machinery (henceforth Lantmännen) is the largest Swedish co-operative in grain, milling and selling agricultural machinery. Their advisors are also mainly found in the southern parts of Sweden, yet they are active in the region and have a plant-breeding station in Västernorrland.

RESULTS

The overview of the farms in Table 1 builds on an adapted version of the typology of farms developed in the original survey (Djurfeldt & Waldenström, 1996). It distinguishes between:

1. Large farms with several employees and farms where the household works on-farm and get their income from farming;
2. farms where the household also depends on off-farm incomes, as spouses work off-farm and, at times, also the farmer;
3. part-time farms, where both spouses work full-time off-farm and have main incomes off-farm;

4. farming co-operatives;
5. farms with CAP Basic Payment Scheme (BPS) as only farm income. This implies no other gainful activity on-farm apart from getting support for keeping the land open.

In Sweden, about 50% of agricultural land is leased and most farmers both owned and leased land. Several farmers also owned forests. Forestry and agriculture are usually seen as a totality in forested regions.

In the analysis, the farmers in the first row in Table 1 proved to be more active when it came to issues of knowledge, learning and networking; therefore, these farms are described in more detail. They represent different ways of getting profitability from the farm, it being the sole income. Martin had the largest farm with 140 dairy cows and 340 hectares. Gavin, also a dairy farmer, had 42 cows and 100 ha. Both came from mid-Sweden and had bought farms in the region as land prices are lower and subsidies higher. Both were considering moving again. Martin wished to expand substantially, to 1000 cows, maybe abroad. Gavin wanted to expand to be able to increase the part-time labour he employed seasonably, to all-year full-time. He was not only considering moving mainly because the location of the farm made expansion difficult, but also because he wanted to be in an area with more of a farming community.

Tor and Astrid, a young couple, tilled 150 hectares and had 109 deer and 14 suckler cows. Tor also had a successful forest company. Their aim was to combine organic rapeseed production with hunting tourism and selling game. They wanted to expand to 300 hectares and were building a small game abattoir and a dryer.

Ulf had a 40-hectare farm together with his sister and her husband, in which his nephew was fully employed. Their main production was pine and fir saplings and potatoes, keeping some sheep and cattle for grazing pastures and working their own forest. They were on track to add more value by buying equipment in order to sell peeled and pre-cut potatoes to large local kitchens. Erik and Tina were smallholders. They owned 3 hectares, but with leased land, they had 25 hectares of pasture and arable land. Keeping goats, they added value by making cheese.

Learning to farm

Martin and Gavin were the only farmers interviewed with an education in agriculture. Both had been to agricultural school in Mid-Sweden. Gavin, one of the few who had not grown up on a farm, had gone the traditional way after school, working on farms for 10 years, gaining experience until he managed to buy a farm, which he sold to move north to expand and get better results. Martin had been expected to manage his grandparent's farm in Mid-Sweden, but it was more profitable to buy the one he has now. After agricultural school, he had a machine station tilling for others.

Neither Tor nor Astrid had any education in agriculture. Tor said that he had learnt to farm growing up on the farm and especially from having had a machine station for 6 years, working over a large part of the region. Learning to farm by growing up on a farm was almost a taken-for-granted way of learning. It was especially mentioned by Ulf, who said that his father had taught him and his sister to work and farm. Their father had toiled so terribly on farms in Canada at a young age and had continued so at the farm they grew up on. He had started both the profitable sapling niche and the potato production.

However, growing up on a farm is no guarantee for learning to farm. Klara and Katarina, two sisters, managed their family farm. Being girls, they had not been included in farm work. Later, their father had helped them a bit, but he was not very good at teaching, they said, and now he

lived elsewhere. It was, they said, a bit chaotic in the beginning, but they had learnt mainly it seemed from experience, reading and from the Internet.

Tina had another kind of learning career. Without any farming background, but a university degree in biochemistry, she had married Erik, who had inherited the smallholding they managed. No one in the neighbourhood could teach her to make cheese or set up a dairy. She had taken courses at the national centre for local food in the neighbouring county.

The co-operative represents yet another way of learning to farm. Coming back after a long career abroad, the engineer Paul, was disheartened by seeing the shores of the river, which used to be grazed, turned to bushes. He initiated a project to graze them, but no farmers were interested. He then got project funding to set up an 'academy' arranging seminars about production built on grazing from 2006 to 2013. Invited lecturers talked about raising grass-fed cattle, meat quality, cultural landscape and much more. In this process, the idea of buying cattle and leasing land emerged. A co-operative was established by eight people with no background in farming. At the time of the interview, they jointly owned 70 cattle, grazed and tilled leased land.

The topic of learning to farm was not elaborated on in the other interviews. When it came to general education, Paul, who was crucial for the establishment of the co-operative, and Tina, who learnt to make goat cheese, and the two couples having part-time farms, were the interviewees with higher education.

Using advisory services—or not

Gavin was the only interviewed farmer who had frequent in-person contacts with an advisor. For him, the Växa services available in the region included too few on-farm visits. Instead, a regional private advisor came once a month. Gavin emphasised the value of an advisor he could talk with on the farm and in the cow house. He had also consulted a Finnish cow house architect about his plans for expanding and discussed breeding with a company in southern Sweden where he bought sperm. Long-distance advice was also used by Ulf. He corresponded over mail with an advisor in Finland who had been recommended by other potato farmers in Northern Sweden. 'It is a small world, potato farming', he said. Tor and Astrid turned to Växa to calculate and to discuss their plans for expansion and talked about using advisors as the natural thing to do.

Otherwise, the general impression from the interviews was that farmers did not find that advice on production was needed. Occasional use of advisors to get help filling in EU applications, tax return forms or consulting Ludvig & Co about financial and business issues was mentioned. The veterinary had been helpful to someone, the organic production controller to Klara and Katarina and the animal health controller to Erik and Tina. But, as Matti said:

> There is not much advice available here, so we have to learn to think and take care of ourselves ….we don't need that much advice.… We are maybe not best, but good enough, and we know what it is for real, nothing is really as it says in the papers.

Other comments pointed out that advisors, when mainly focusing on profitability, were not engaging in the farmers' other, for them perhaps more vital interests and aims. These farmers had other sources of income, from necessity or because they also pursued other careers and interests. Turning to more extensive production, lowering costs and selling their produce locally were common strategies. Klara and Katarina had been disappointed when the advisor who had come to their farm, advising them to have many more cattle than they wished to have, had not been

able to give them advice they found relevant to their situation. Another had recommended Folke, breeding sheep with high-quality wool, something he gladly spent his money on, not to keep any animals at all. The interviewees from the co-operative were outright dismissive of all established organisations and services. 'They have nothing useful to offer', Paul said, having built their own academy and network.

However, some of the older interviewees remembered old times, when the national extension system and HS were active in the area. They talked about the study circles on production, the field trips and study tours they went on with fellow farmers and all the meetings one could go to. Then, it was natural to know what went on in the farming co-operatives and associations. Now nothing of that was left. 'No one brings us farmers together anymore' said Elinor, continuing 'We were not even invited to the municipality's meeting for local businesses'.

The use of social media for communication with others on production was not mentioned much. Robert said: 'Now we use the Internet instead, that is', he corrects himself, 'our son helps us, he is good at that'. However, the study as a whole indicated that using social media seemed more common in the southernmost study area, which has the best preconditions for farming in Sweden, is densely populated, where advisory services are abundant, and several farmers had higher education in agriculture. Växa and Gård & Djurhälsan offer portfolio services with varying degrees of face-to-face, telephone and web-based services. None of those we interviewed took part in these programmes. For Gavin, the Växa programme included too few on-farm visits.

Local community, collaboration and peer networks

Some of the interviewees were active members of the local associations of the Federation of Swedish Farmers (LRF). This afforded local contacts, but when it came to the local community, several, again mainly the older farmers, talked about the changes. Lars and Meg said that they not only socialised less with farmers but socialised less on the whole. People had moved away. Rick and Ann commented not only that people had moved away, but they were also selling off their cattle and planned to move themselves. They had tried so many things to stay on. Like some others, they also commented on the general decrease in local services, shops and post offices. Neither of the two newcomers was rooted in the community. Martin was hoping to move somewhere to expand and had a partner in another part of Sweden. Gavin was longing for a locality with more farmers.

Moreover, many said that earlier, they used to collaborate more with other farmers. Some said that today it is too far to the next farm or that the farms they used to collaborate with had closed down. Gavin said that farmers in his neighbourhood did not collaborate about the things that easily can be shared. The two main exceptions were the co-operative, being a collaboration in itself, and the goat farmers who collaborated with several neighbours. To a lesser degree Ulf, with the saplings and potatoes, collaborated with a neighbour and Martin with a farmer who had been very helpful towards him when he was new in the region.

More distant peer networks were only mentioned by four farmers in the top part of Table 1 and by the interviewees from the co-operative. Gavin had been part of establishing a national association for dairy farmers building a community among dairy farmers. Erik and Tina had contacts with other goat cheese dairies in the neighbouring counties and participated in national goat cheese competitions. Moreover, they depended on volunteers from Europe and the US. Ulf's network with potato farmers was becoming increasingly long-distance, as there were no others of any size within three municipalities. Tor's brother headed a large game abattoir in mid-Sweden,

and his cousin was in fine dining in Stockholm. Moreover, Tor was a member of the regional Lantmännen board, and he had contacts with farmers both regionally and further away. Finally, the co-operative collaborated with 10 small-scale farms in the region, which sold organic grass-fed meat through their own co-operative.

Sales relationships

The sales relationships for milk and meat differed. All dairy producers sold their milk to the regional dairy and slaughtered through the large abattoir that bought the meat. All those with meat production only either slaughtered at home or used smaller local abattoirs getting their own meat back and selling directly to local consumers. Klara and Katarina also sold to local restaurants and to the people in Stockholm, more than 500 km away, through a sister in Stockholm and by social media. At the co-operative, they had realised that to get the quality and the prices they wished, they had to cover the whole chain. They thus established their own abattoir, together with the 10 farmers mentioned above. To get better prices, they sold in Stockholm only, marketing through visits to restaurants and friends. As the delivery firms did not keep the promised temperatures, they did that as well.

The only exception from selling meat themselves was Robert and Elinor. Having 100 ewes, their production was too large for smaller abattoirs. Since the only large abattoir in the region did not take organic production, they could not go organic, which they wanted. This was the second time an upstream industry affected their production. They used to have dairy cows but enlarged their cow house just as a milk quota system was introduced and got their quota calculated on their previous production. Then, Elinor began to work part-time off-farm, and they started egg production with 1200 hens. However, the company that bought the eggs demanded that they enlarged it to 2000 hens. Elinor then went full-time off-farm, and they turned to sheep, being easier to combine with her employment.

On the contrary, for Tor and Astrid, the decision by Lantmännen to open a grain purchasing fodder central in Holmsund, 270 km away, had been crucial for their decision to go for rape seed. Getting hunters from, and partly selling game to, Stockholm was facilitated by their networks. Yet, they mainly aimed to sell game locally. Ulf sold potatoes to local shops, and the goat cheese was also sold locally or at regional markets. So most meat, the potatoes and the cheese, produced by the interviewees was sold locally, apart from that sold to Stockholm.

Another issue raised in the interviews was funding. Banks generally did not lend for agriculture in the region. Farming was not considered profitable enough, especially not in the inland parts of the study area. So expanding in this area could be difficult. Yet, both Tor and Gavin, if he stayed in the region, expected to be able to get bank loans anyway. Tor said 'Well, that depends on how you are doing, doesn't it?' His forest business did well. Gavin's dairy farm was also doing well. 'It's important see to that you have good bank relationships and get credits', Gavin said, commenting on a neighbour in trouble who did not.

The future of farming

Most of the interviewees pointed to the difficulties of farming in the region. The impossibility of competing with other regions or countries was taken for granted and in the more inland part of our study area, so was the general decline of services. Some farmers mentioned the loss of

agricultural land and pastures, as unkempt land was gradually afforested, as a sad but inevitable process. Interestingly, agricultural policies were not focal in the comments on the difficulties for agriculture in the area. There was some general critique about globalization and that 'today we don't pay the real prices for what we buy'. A few commented on the BPS saying it would be better to have higher milk prices or that you should not be paid for just mowing the fields.

Instead, critique on regulations on small-scale food production recurred. Rules 'suitable for large-scale production' quenched small-scale initiatives. Several interviewees said that new initiatives were needed, pointing to ongoing promising examples: farms with some kind of niche, co-operative farms, ranch raising of cattle, small-scale initiatives with less costly investment and local food. There was hope in consumers becoming interested in where the food comes from.

A positive long-term future was envisioned by a few, connected to climate change and Swedish food security. Ulf believed in a long-term future:

> Now, agriculture is in decline…… But where will we be in 10 years' time? I think that the trend will be reversed. But there will be so much to catch up with before it can be really good again. Profitability must up much if it is to be good again.

That there will be much to catch up with was a theme especially in the four interviews, all of them with a focus on the need for better profitability in farming and a general lack of knowledge in farming in the region. This was central in the interview with the representatives from the co-operative. Inviting lecturers had been their way of contributing to renewing farming practices and knowledge in the area. They also pointed out that other farmers sold meat far too cheap, not expecting to make money. On a similar theme, Knut, coming from the mid-Swedish plains originally, said that farmers up here do not know how to manage large effective farms. Gavin said that 'the young up here lack the knowledge about how to farm'. He saw when they sowed and harvested, or went for holidays during haymaking times. For him, this showed a lack of knowledge. He needed to employ someone in the summers, but it was difficult to get competent local labour. Last year, he had a man from Ukraine, whom he hoped to get the coming summer.

However, it was Tor and his father Magnus, who were most explicit on a decline of knowledge in farming in the inland area where they lived. They had seen the changes over time. Magnus explained:

> Thirty years ago all farmers here produced cereal and peas to feed our dairy cows. Then the new trend came, to only grow ley and buy full fodder from the Lantmännen. Lots of farmers did that. So they stopped growing cereals and sold their harvesters.

Tor added that 30 years ago, the oat harvests in their neighbourhood had been 6 tonnes per hectare, now it was 3–3.5. He thought that this mainly depended on people not having 'the drive', or knowledge, to get good harvests. However, his main concern was the combination of land fragmentation, lack of knowledge in farming and a coming lack of possibilities for smallholders to contract someone with farm machinery. When he had started his machine station, he worked for 10 farmers. Six years later, he made 100 invoices for the same land. The larger farms were disappearing, and leased land went back to their owners, becoming smallholdings keeping sheep or horses, but not expecting to make a living from it. He could not make ends meet driving so little, for so many. He pointed out that even if the number of smallholders increased, larger productive farms are also needed. Not only for regional and national food security but also for affording services for smallholders and keeping up the knowledge about farming in the region.

The interviews with the CAB official and the HS representative in Västernorrland pointed out that fragmentation was mainly a problem in the inner parts of the study area. Closer to the coast, the lack of land was more concerning. However, largely all three interviews corroborated the problematic situation concerning advisory services, the lack of competence in agriculture in the regions and the lack of upstream industries. Problems for small-scale farmers to get timely and affordable tilling were also mentioned. Examples of farmers with very extensive networks were given, one farmer getting advice as far away as The Netherlands, and another delivering grain to Linköping, some 650 km away.

They also corroborated that farmers who do not seek out contacts themselves are not offered much. In collaboration with Maskinring Västernorrland, a regional co-operative for farmers with machine stations, the local LRF association and HS Västernorrland had arranged meetings for farmers aiming to improve harvests, over a few years. They had also arranged days for those employed by the machine stations, as these often lacked competence in soil preparation. These meetings had built on project funding and afforded no structure over time. Nor did the regional collaboration that had contributed to the Regional Food Strategy. How that would be followed up was uncertain. According to the CAB official in Västernorrland, the possibility to offer the *Focus on nutrients programme* was very important, although sadly the development part was not included. Yet, now 70 farmers have recurrent contacts with an advisor on crop production. However, he was pessimistic about the future of farming in the region, although the interest in local food and concern for regional food security was growing. In the present programme period of the Swedish Rural Development Programme (RDP), the support for full-time farmers in this part of Sweden will be decreased, and the only eco scheme available for them will be organic agriculture. Yet, the upstream industries in the region already have more of organic produce than they can sell.

CONCLUDING DISCUSSION

Agricultural decline is a common phenomenon in Europe (Schuh et al., 2020) and so is the commercialisation of advisory services. The limited study here may therefore be relevant also for other regions. It shows that the social context for learning and the construction of knowledge in agriculture is becoming worryingly thin on several levels. Local social relations for learning such as local peer groups and collaboration decreased. Advisory organisations retreated from the region and many of the interviewed found their services irrelevant to their own farming. Upstream and downstream industries afforded little choice and their advisory functions are limited in the region. Few of the interviewees had any formal education in agriculture. Learning to farm was mainly talked about as resulting from growing up on a farm and from farming itself.

How then, did the farmers handle the lack of local institutions for learning and construction of knowledge? Two main, overlapping, approaches were discernible. Those who managed farms profitable enough to depend on farm income actively sought support and knowledge. In terms of education, networks or capital, they were a resourceful group. Farmers without incentives to seek support were offered very little. They continued farming, combined with other incomes, by necessity or from preferring to pursue other interests and careers. Lowering costs, selling directly to consumers and turning to more extensive production are examples of their main strategies. Apart from on-farm learning, getting advice from officials from control organisations or the veterinary and seeking knowledge over the Internet seemed their main venues to get knowledge on production.

However, on-farm learning may be limited, not least if the local practices are characterised, as some of the interviewed claimed as not being conducive to successful farming. Experiences are interpreted, and experiential learning is affected by expectations (Kayes, 2002). Most of the interviewees were rather despondent about the future of farming in the region and seemed not to expect much profitability from it. Shortall et al. (2022) describe such expectations as cultural constraints against changes in production, pointing out that to begin to seek profitability such constraints need to be questioned. Contacts with advisors may spur such questioning. Both education and advisory services affect attention and may support the contextualisation of formal knowledge (Knierim et al., 2019; Noy & Jabbour, 2019; Seuneke et al., 2013; Šūmane et al., 2018). Yet, advisory support conducive to questioning practices or contextualising knowledge need to build on familiarity and trust, developed over time and available services farmers find relevant (Labarthe & Laurent, 2013a). For many farmers, this was not the case. This may contribute to a lack of productivity and ambition and reinforce both the despondent view of the future for farming and low expectations of profitability. The study indicates that digital media cannot compensate for interpersonal contacts with advisors to build relationships with those now finding advisory services irrelevant.

Moreover, the thinning out of up-stream industries and the reluctance of banks to lend for farming can be seen as 'structural holes'. van der Ploeg cites Burt (1992) on such holes referring to 'lack in the adequate connections, in the dominant system' (van der Ploeg, 2020, p. 9), pointing out that such holes are connected with the emergence of nested markets, self-organised and embedded in mutual agreements between consumers and producers. van der Ploeg discusses agro-ecology as a taking back the initiative over relations that have been dominated by external actors, finding new ways to combine resources in productive, profitable and more sustainable ways. In a Swedish context, Dubois (2018) develops the notion of proximities in a study of Alternative Food Networks in a neighbouring county. In these networks, geographical proximity is one part, but social and cognitive proximity is also central. The study reported here amply exemplifies nested markets and self-organising beyond the conventional agro-food system. So did the examples the interviewees gave of promising initiatives for the future, pointing to locally sustainable alternatives that re-embed agriculture in the local context. That small farms in Swedish regions without the very best preconditions for farming may contribute to local society and sustainability in various ways, not least socially and economically, has for instance been shown by Milestad et al. (2011).

Yet, albeit an increased will to support smallholders in the present CAP and the increasing attention to regional food security, the result for farmers in the Swedish North in terms of policy support seems meagre. Not offering the development part of the *Focus on Nutrients Programme* and the limited choices for farmers in the ongoing RDP indicate this. Neither a report that predicts a 50% decrease in natural pastures in Northern Sweden (SOU, 2014) nor the Long-term Food Strategy for Sweden (Government Bill, 2016) offer a separate analysis of the agriculture in Northern Sweden. Moreover, as both the main advisory organisations and agro-food industries are scarce in this part of Sweden, the construction of knowledge produced by national AKIS constellations reasonably cannot take the agricultural issues of these areas well into account. On a regional level, multi-actor collaborations did exist, such as that aiming to increase harvests or to develop the county Food Strategy. However, most of the preconditions enhancing AKIS constellations as suggested by Hermans et al. (2015) were not in place.

Whereas the EU SCAR AKIS report (2019) discusses exclusion from advisory services as problematic, Schuh et al. (2020) suggest other measures to counter land abandonment. Knowledge then seems a taken-for-granted result of measures to increase profitability. This focus on the economic sustainability of farm businesses undermines a broadening of the understanding of

agriculture's contributions to sustainability. It neglects the needs of farmers that do not perceive today's advisory services as relevant or available. Their potential to contribute to sustainable farming and rural development, and even to farm in more profitable ways, are unheeded. The value of keeping agricultural land in the region in good condition is also neglected, although a growing apprehension that land in these regions may be needed, as other regions worldwide are predicted to be more adversely affected by climate change.

If farmers' learning and knowledge relevant to farming in these areas are to be supported, a first step is to recognise the structural aspect of the present decline. To approach the broader societal development in regions characterised by land abandonment, Dolton-Thornton suggests a move beyond the CAP agriculture-oriented schemes to holistic RDPs (Dolton-Thornton, 2021). In this study, the decline of advisory functions, the retreat of upstream and downstream industries and the reluctance of banks to fund farming, can be seen as interrelated with such broader developments of decline. Further research on knowledge and learning in agriculture in these regions is needed to explore farmers' strategies, adaptations and perceptions of opportunities as issues of learning and knowledge. What is the role of external actors in this?

Rural research aiming to contribute to developing the advisory function in these regions cannot take for granted what local social relations, what local or long-distance networks or what the potential for local or regional innovations systems there are or how digital media are best used. A good start would be to explore the practices and values of farmers, returning to the life-world of farmers. The ongoing re-embedding of farmers into the local context suggests a new landscape of actors and social constellations to include (c.f. Rose et al., 2018b) and the kinds of relationships they entail. Such research would also afford suggestions on the content farmers find relevant. Research on production that takes small-scale farming, fragmented landscapes and other characteristics of these regions into account is needed (e.g., see Kumm & Hessle, 2020; Schermer, 2017). Facilitating local and regional multi-actor settings to support joint learning, co-ordinated activities and innovations relevant to the region is another possibility. As research shows, this would be demanding and need to be long term and carefully facilitated. It could however enhance a bridging of the gap between research, farmers and other actors, and enhance peer networks amongst farmers.

An advisory function, which is available, reliable and relevant for farmers, that contributes to both production and networking functions would require funding beyond what farmers can pay. It requires a political recognition that knowledge applicable to farming in these regions contributes to sustainable rural development and food security. Strengthening knowledge in farming in these regions can be seen as a long-term investment in sustainability.

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CONFLICT OF INTEREST

The author declares no conflict of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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ENDNOTE

[1]All statistics are calculated from Jordbruksstatistisk sammanställning (2021).

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