



Untangling the role of social relationships for overcoming challenges in local food systems: a case study of farmers in Québec, Canada

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Abstract

Advocates for re-localizing food systems often encourage consumers to support local farmers and strengthen local food economies. Yet, local food systems hinge not only on consumers' willingness to buy local food but also on whether farmers have the social support networks to address diverse challenges during food production and distribution. This study characterizes the challenges and support systems of farmers selling to local markets in Québec, Canada, across multiple growing seasons using a mixed-methods research design. We sent an online questionnaire to 1046 farmers and conducted follow-up interviews with 15 of the 133 respondents. Our findings show that farmers relied on an average of four support actor groups, particularly employees, customers, and other farmers. Actors played distinct roles in terms of the importance, frequency, and formality of interactions, providing immediate and long-term support through formal and informal relationships across multiple spatial scales (farm, local community, and regional/international). Our thematic analysis showed that support actors helped farmers in four key domains: (1) Knowledge sharing and emotional support; (2) Labour and workforce; (3) Material and financial aid; and (4) Consumer education and business promotion. Farmer associations provided resources to tackle various challenges, acting as bridges across multiple support actor groups. Yet, our results suggest that political desires to encourage local food systems are in some cases poorly matched with resources to address specific types of challenges farmers face. Specifically, overlooking the role of diverse social support actors in helping farmers build food production and distribution capacity could undermine efforts to foster localization.

Keywords Foodshed · Short food supply chains · Social relationships · Support network · Food self-sufficiency

Abbreviations

CAPE	Coopérative pour l'Agriculture de Proximité Écologique
CSA	Community supported agriculture
FFN	Family farmers network
MAPAQ	Ministère de l'Agriculture, des Pêcheries et de l'Alimentation du Québec (Ministry of Agriculture and Fisheries)
TFW	Temporary foreign workers

US	United States
UPA	L'Union des producteurs agricoles (Union of Agricultural Producers)

Introduction

Programs by grassroots organisations, agricultural associations, and governmental actors in the Global North aim to (re-)build and support local food supply chains with the goal to increase the demand for food from local sources and the capacity of a region to produce and sell more food within its boundaries rather than depend on distant markets (Selfa and Qazi 2005; Buchan et al. 2021). Within this context, and partly in response to the pandemic, the Government of the province of Québec, Canada, announced plans in late 2020 to bolster local food self-sufficiency (Radio-Canada 2020). While some regions in Québec can, theoretically, be fully supplied from local farms (Des Roberts 2018), the agricultural sector faces multiple, often compounding challenges

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that can limit the amount and quality of food local farmers can produce and market (Abate 2008). For instance, farmers' livelihoods and operations in many regions are increasingly vulnerable to impacts resulting from climate change (Thornton et al. 2017; Kohn and Anderson 2021). Consequently, this may compromise the feasibility of local food systems and further constrain the feasibility of local food self-sufficiency in some regions (Kinnunen et al. 2020).

Farmers must respond to a myriad of challenges to sustain their livelihoods (Ashkenazy et al. 2018; Kangogo et al. 2020; Kohn and Anderson 2021) and supply food to markets. Social relationships and social capital can build farmers' capacity to address obstacles and innovate, grow, and adapt their operation to changes and prepare them for future impacts (van Duinen et al. 2012; Paul et al. 2016; Jones et al. 2022). The local food systems movement in particular considers mutual aid, cooperation, and direct consumer-producer relationships as factors that distinguish territorial food supply chains from globalised, "disconnected" trade networks (Bauermeister 2016; Blay-Palmer et al. 2018).

Local food systems activists and policymakers often encourage consumers to "support local farmers" to strengthen local food economies (Jacques 2021). Yet, the ability to respond to these calls, including in the province of Québec, can be constrained by a lack of understanding of the specific types of challenges that food producers supplying local markets in the Global North face, as well as which types of resources are needed to help address them.

Studies often focus on a single challenge type such as climate change (Harvey et al. 2018), access to funding (Fisher 2013; Tregear and Cooper 2016) and land (Horst and Gwin 2018), or the adoption of new technologies (Castillo et al. 2021). Comparatively, fewer studies investigate a suite of challenges (Bruce and Som Castellano 2016; Iles et al. 2021). Furthermore, previous research has primarily explored how local food systems can build social capital and relationships. Still, few assessed how farmers in local food systems benefit from and rely on those relationships (Glowacki-Dudka et al. 2013; Elton et al. 2021). While McIntyre and Rondeau (2011) analysed consumer-facing limitations to buying local food, producer-facing perspectives on supplying local food are still sparse. Few studies have analysed the needs, challenges, and motivations of farmers involved in direct food marketing. Although social values and community-orientation seemed to drive participation, the authors did not assess whether and how social infrastructure in turn helped farmers to overcome challenges and barriers (see Charatsari et al. 2018; Beingessner and Fletcher 2020). Furthermore, some studies largely focused on specific distribution schemes, such as farm-to-institution programs (see Izumi et al. 2010; Matts et al. 2016; von Germeten and Hartmann 2017).

We address this knowledge gap by using a mixed-methods approach to interrogate the meaning of support actors in overcoming diverse challenges for farmers selling to local markets in the province of Québec across diverse distribution channels. Acknowledging the role of social relationships for local farmers, we identify how different actor groups support local food production and distribution. Below, we briefly introduce the local food systems concept and describe the study's methodology. We then present the results, starting with an overview of our respondent demographics, followed by the results from our quantitative analysis on the actor groups farmers in Québec rely on. We close the results section by elaborating on the meanings of social support for overcoming challenges, combining both qualitative and quantitative data from our survey and interviews. Finally, we discuss our findings around implications for local food research and practice more broadly and propose future research directions.

Local food systems, short food supply chains, and social proximity

Interest in local food systems evolved in response to an erosion of trust in global food supply chains and agro-industrial systems (Ekici 2004) caused by an overall increasing awareness about negative social and environmental impacts of agriculture (Foley et al. 2011) and international food crises (Clapp 2017). Despite the lack of scientific evidence that food from local sources is inherently more sustainable, healthier, and fairer than non-local food (Enthoven and Van den Broeck 2021; Stein and Santini 2021), local food self-sufficiency and local food supply movements have experienced growing enthusiasm, especially among consumers and policymakers.

Local food movements aim towards building a just and sustainable food system through localising social and physical food distribution networks (Morgan 2015). The reduction of social and physical distance is expected to help shift power from centralised multi-national corporations to the community scale (Clapp 2014; Hitchman 2016; Hammon and Currie 2021) and (re)build trust via reciprocal relationships and shared values between all actors involved along the entire food supply chain (Trivette 2017), among other goals.

To date, there is no universally agreed-upon definition of the local food. Generally speaking, local food is sourced from within a certain geographical boundary or a "local foodshed" which can encompass a sub-national area (e.g., state, county) or span across a certain radius around a place of interest (e.g., a city) (Feldmann and Hamm 2015; Schreiber et al. 2021). Food systems scholars and practitioners often draw the geographical boundaries of local food

Table 1 Categories of actor groups in our study

Support actor group	Examples of specific types of actors within each category
Employees and Volunteers	Temporary and permanent workers (full-time and part-time); volunteers
Customers	Private customers; business/institutional customers (i.e., restaurant chefs, hotels, schools, and hospitals; supermarkets; independent grocery stores)
Associations	Coopérative pour l'Agriculture de Proximité Écologique; Equiterre; Les Bio Locaux; L'Union des producteurs agricoles; Québec Farmers Association; Associations des producteurs maraîchers du Québec; Union Paysanne; Family Farmers Network
Other farmers	Farmer acquaintances; neighbours
Family & Friends	Relatives; acquaintances; friends
Government	provincial Ministry of Agriculture and Fisheries (MAPAQ); Agriculture and Agri-Food Canada

Table 2 Characterization of relationships with support actor groups in terms of their importance (reliance on the actor), frequency of interaction (relevance in their daily operation), and degree of formality (commitment and trust)

Indicator	Rationale	Questions in our questionnaire	Response options
Importance	Degree of reliance on support actor group; relevance for farmer	“How crucial are these contacts for you to address challenges?”	<ul style="list-style-type: none"> • Less important • Important • Very important
Frequency (Sharp and Smith 2003)	Frequency of interactions between farmer and support actor group; relevance for daily operations and long-term development	“With regard to the [relationships with the selected actors], approximately how often do you interact with these contacts?”	<ul style="list-style-type: none"> • At least once per week • Once per month • Not more than once per season
Formality (Fletcher et al. 2020)	Trust; accountability; commitment	“Are these relationships more informal (e.g., conversations, sharing information with customers), more formal (e.g., contracts, grants), or both.”	<ul style="list-style-type: none"> • Informal • Formal • Both formal and informal

systems based on the context and purpose of action, program, project, or study.

Methodology

Our sequential mixed-methods approach involved a semi-standardized online questionnaire sent to farmers selling to local markets in Québec (‘local farmers’) and semi-structured follow-up interviews with respondents (Supplementary Information SI 1). Data collection and analysis were guided by three main questions: (1) Which challenges do local farmers encounter, and how do they affect their operations? (2) Which actor groups do local farmers consider important to address those challenges, what is their relationship with them? (3) How do these actor groups contribute to overcoming challenges? This study is part of a larger research project on local farmers’ challenges and coping strategies in Québec (Schreiber et al. 2022). The data collection took place from February to April 2021 after the study was approved by the Research Ethics Board of our University.

The semi-standardized survey included fixed-response questions, open-ended questions, as well as open-ended

response boxes for most fixed-response questions to allow for elaboration. The respondents selected the relevant challenges from a list of seven challenge types that they had encountered before the onset of the pandemic (2017–2019) and at the onset of the pandemic. For this analysis, we focused on the pre-pandemic challenges. The challenge types were collaboratively defined by the authors during the design of the questionnaire and covered four production-related and three distribution-related challenges (SI Table 1). We then asked farmers to indicate the actors and actor groups that they drew on for support (Table 1) as well as to rate each actor group in terms of their importance (reliance on the actor), frequency of interaction (relevance in their daily operation), and degree of formality (commitment and trust) (Table 2). We sent the questionnaire in French and English via e-mail to 1046 business e-mail addresses that we collected using the platforms of four local initiatives and organizations that connect consumers with local farmers: Coopérative pour l'Agriculture de Proximité Écologique (CAPÉ), Le Réseau des Fermierslères de famille, Mangez Québec, and Mangeons Local. We received 133 full questionnaire submissions (12% response rate), which included a total of

343 clarifying comments as a source of qualitative data for the pre-pandemic period.

The purpose of the follow-up interviews was to provide additional depth to the quantitative and qualitative data from the survey, and to better understand the meanings of support actor groups for farmers selling to local markets in Québec. The sampling strategy for our interviews was based on purposive criterion sampling of a voluntary roster to which 49 survey respondents signed-up by entering their e-mail address. We purposively sampled interviewees according to different characteristics (i.e., food diversity, food types, gender, age, marketing, farm location, support actor groups, challenges) to ensure that the interview sample represented our survey population and to find common themes in terms of perspectives on support actors and challenges. We contacted 31 of the volunteer respondents, starting with the most information-rich cases based on their survey responses. A total of 16 respondents subsequently withdrew from the interview process after follow-up e-mails. We therefore conducted 15 interviews with local farmers in English and French after which, in combination with qualitative data from the survey, we reached thematic saturation and little or no new aspects arose and existing ones began to repeat.

The interviews lasted between 25 and 75 min and were recorded with the interviewees' consent. The interview recordings were fully transcribed by the first and third author and coded with the data management software MAXQDA. The first author conducted thematic analysis on the coded interview transcriptions and the open-ended responses from the questionnaire. Our coding strategy was deductive and inductive, following the principles for qualitative data analysis (Kuckartz 2014) and hybrid thematic analysis (Fereday & Muir-Cochrane 2006). This hybrid approach allowed for theory-driven and data-driven codes and more flexibility while maintaining scientific rigour.

Results

We begin with a brief overview of the respondent demographics. We then summarize our primarily quantitative findings on the meanings of support actors for local farmers in Québec and their various roles. Following this, we give more in-depth insights into these meanings and associated challenges, drawing from both the qualitative and quantitative data from our survey and interviews. Our thematic analysis resulted in four main categories of support networks: (1) Knowledge sharing and emotional support; (2) Labour and workforce; (3) Material and financial aid; and (4) Consumer education and business promotion. Finally, we elaborate on the specific role associations play for local farmers in Québec.

Respondent demographics

Most survey respondents (48%) were between the age of 45 and 64. Among the survey respondents, 42% identified as female and 57% as male. Farm operations in our sample were heterogeneous in terms of diversity of produced food, production methods, and distribution models. More than half of the survey respondents (57%) produced five or more types of food while the rest (42%) specialised in four or less, such as squash, meat, eggs, and fruit (cranberries, blueberries, strawberries, raspberries, haskap berries, ground cherries). While all survey respondents sold food in Québec, 16% also marketed their products in other Canadian provinces. A total of 8% of our survey respondents sent food to the US and 2% internationally. Most survey respondents used farm stores (62%) to sell their food, followed by independent grocery stores (44%), restaurants (42%), and public and farmers markets (41%) (Schreiber et al. 2022). Overall, close to 60% sold their products directly to consumers and through intermediaries, whereas a quarter of respondents sold only to end consumers, and 9% only to intermediaries (SI Fig. 1). Subscription systems (e.g., vegetable baskets) and restaurants were used more by farms with higher food diversity than those with fewer food types. In contrast, supermarkets and U-pick were more frequently chosen as outlets for farms that produced more food types (SI Fig. 2).

Similar to the survey, 43% of interview participants were between the age of 45 and 64. The gender-distribution among our interviewees was considerably less balanced than among the survey respondents. Only four of the 15 interviewees identified as female and eleven as male. In terms of food diversity, nine interviewees produced more than five types of food and six interviewees focused on five crops or less. All interviewees sold food in Québec. Additionally, one interviewee marketed their products in other Canadian provinces, but none sold food in the US or internationally. Most interview participants sold their food directly to consumers and intermediaries (60%), 33% only directly to consumers, and 7% only to intermediaries.

Actor groups local farmers in Québec rely on to address challenges

Eight out of ten respondents considered the group 'Employees & Volunteers' as an essential source of support (77%), followed by customers (75%) and other farmers (68%). Close to 2/3 of our respondents relied on governmental support (65%) and associations (60%). Half of the farmers (48%) selected 'Family and Friends' as important (Fig. 1, Table 3). Most respondents used e-mail and social media, whereas less communicated via phone calls and in-person and virtual meetings (SI Fig. 3). Overall, most farmers relied on

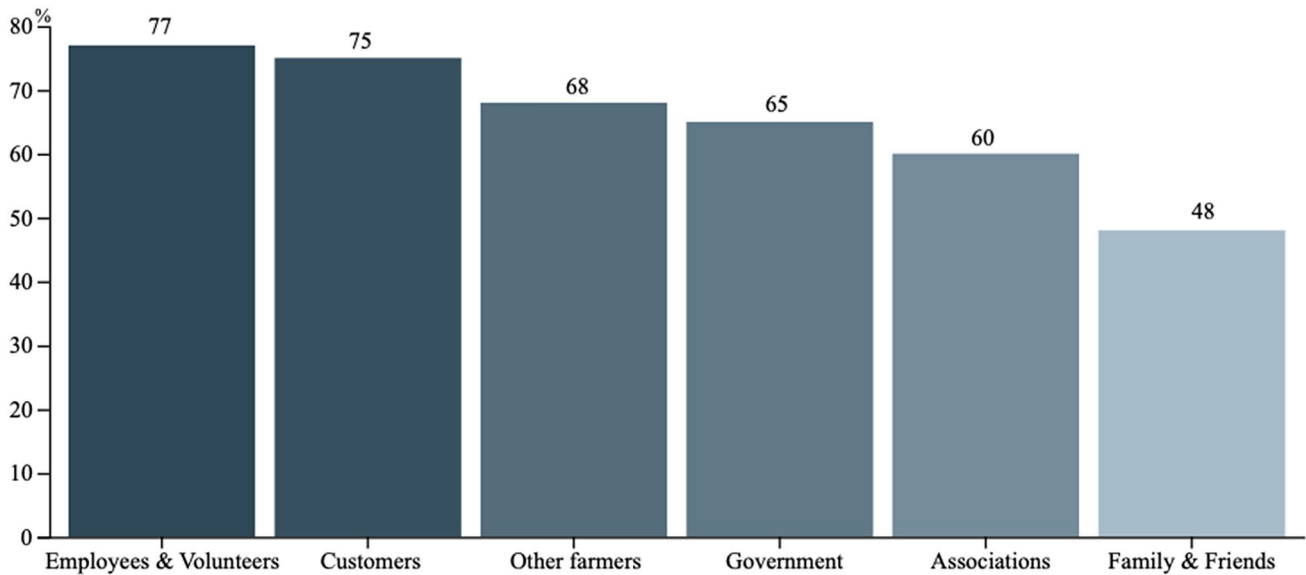


Fig. 1 Overview of support actor groups that local farmers rely on for resources. The y-axis shows the results standardised as % of respondents in the questionnaire and the numbers on the bars show

the absolute number of respondents. Local farmers found employees and volunteers to be the most important support actors, followed by customers and other farmers

Table 3 Summary of actor groups

Actor group	Examples of specific actors	Share	Sample types of support provided	Interaction	Barriers
Employees & Volunteers	Paid employees Volunteers Temporary foreign workers	77%	Volunteers can reduce financial pressure Harvest & care Services & marketing	Harvest & fieldwork Customer interaction	Hiring and retention of workers Locals often underqualified or unmotivated
Customers	Restaurants Individuals Institutions Market organizers	75%	Cash flow Customer recommendations Spreading awareness	Direct contact Storytelling Social media Labels	Lack of understanding Internet access Expectations
Other farmers	Neighbors Mentors	68%	Sharing of resources Mentoring	Social media Neighbourhood Meetings	Competition
Government	MAPAQ Agriculture & Agri-Food Canada	65%	Financial aid Help with recruitment of TFW Mentorship	Grants Programs Mentors	Lack of representation Access to grants
Associations	CAPE Family farmers network UPA Québec Farmers Association	60%	Representation of interests Collective action Knowledge sharing Workforce	Marketing & promotion Meetings Workshops	Membership fees Some sectors lack formal organization
Family & Friends	Close and extended family Friends	48%	Emergency help Free services Sharing equipment	Everyday interactions	Work-life balance

multiple support actor groups. On average, respondents selected four (3.9) out of six support actor groups (Fig. 2).

Our detailed quantitative analysis of the meanings of support actors showed apparent differences in terms of importance, frequency of interaction, and formality of interaction

among support actor groups. We found that employees and volunteers (72%), as well as family and friends (67%), were considered very important to the surveyed farmers (Fig. 3a). Hence, family and friends were selected by the fewest respondents as support actors (48%) but were of

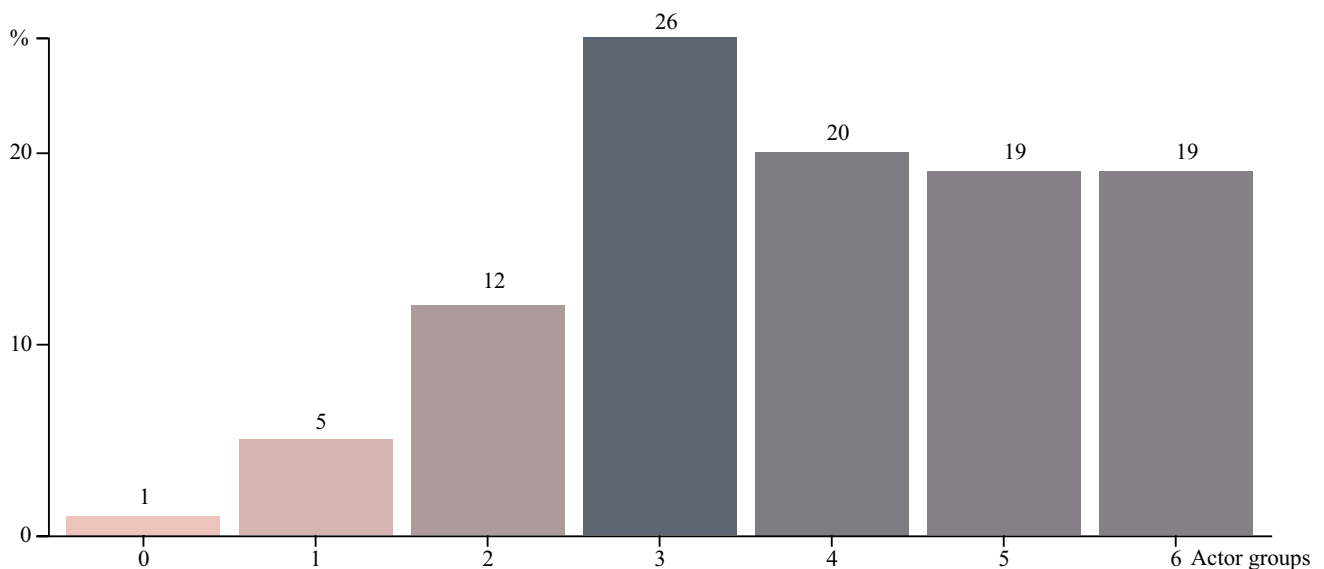


Fig. 2 Histogram showing the distribution of support actor groups selected by local farmers as being important. The x-axis shows the number of support actor groups selected by respondents as either ‘important’ or ‘very important’ in the questionnaire (see Table 2).

The y-axis shows the results standardised as % of respondents in the questionnaire and the numbers on the bars show the corresponding absolute number of respondents. On average, the farmers we surveyed were supported by four support actor groups

high importance for those who relied on them for help and contacted the most frequently. Farmers interacted least frequently with associations and the government (Fig. 3b). In terms of the formality of the relationships, farmers had the most informal support relationships with family and friends, as well as with other farmers. The most formal interactions took place with governmental actors, most likely due to grants farmers applied to and programs they participated in (Fig. 3c).

Meaning of support actors for local farmers

In this section, we present the meaning of support actors for local farmers drawing from the qualitative data and thematic analysis. Our thematic analysis showed that support actors helped farmers in four key domains: (1) Knowledge sharing and emotional support; (2) Labour and workforce; (3) Material and financial aid; and (4) Consumer education and business promotion. Farmer associations provided resources to tackle various challenges and acted as a bridge across multiple support actor groups. Under “Roles of Associations,” we elaborate on the unique position of associations as a bridging actor between several support actor groups. Further results concerning the specific types of challenges and their repercussions are summarised in Table 4.

Knowledge sharing and emotional support

Trustful exchanges with other farmers, selected by 68% as an important support group, were crucial for new and

small-scale farmers as they benefited from information and knowledge sharing. Specifically, several beginning farmers were mentored by more experienced peers but also within their group. For example, one interviewee explained knowledge sharing in response to the Covid-19 pandemic:

“People had to build online stores really quickly and we already had one because of the sales we’re doing. Just getting on the phone with a friend who is also a farmer to ask those technical questions was, for sure, happening a lot. It’s just, in general, a big part of our farming life to be able to just find out from other’s experiences [I-14].

Interaction between farmers with shared values, as well as family and friends (48% of the farmers chose this group), provided mutual emotional support and encouragement. One interviewee, for example, shared their experiences as a beginning farmer and the value of family support:

“For me, it’s free labour to have a supportive family. Especially, because it’s a career change for me, so I experienced a bit of imposter syndrome at the beginning. Knowing that my family is behind me and that I am capable” [I-2].

However, family responsibilities sometimes also conflicted with the farming business. Several farmers, predominantly female, pointed out the difficulty of maintaining a work-life balance and finding childcare.

Although most farmers depended on the “arm’s-length” support and knowledge exchange, many respondents could

Fig. 3 Variations in importance, frequency, and formality of different support actors **a** Importance of interactions with support actor groups. The actor groups of the highest importance (“Important” and “Very important”) were family and friends, employees and volunteers, customers, and the government. Associations and other farmers were more often rated as ‘less important’ (13% and 17% of respondents selecting these actors, respectively). **b** Frequency of interactions with support actor groups. Farmers interacted most frequently with employees and volunteers, family and friends, and customers. In relative terms, respondents interacted least frequently with government and associations—generally once per month, year or season. **c** Formality of interactions with support actor groups. The most informal interactions occurred with family and friends, and other farmers. Half of the farmers relying on customers interacted with this group both formally and informally. Overall, interactions with the government were far more likely to be formal as compared to other support actors

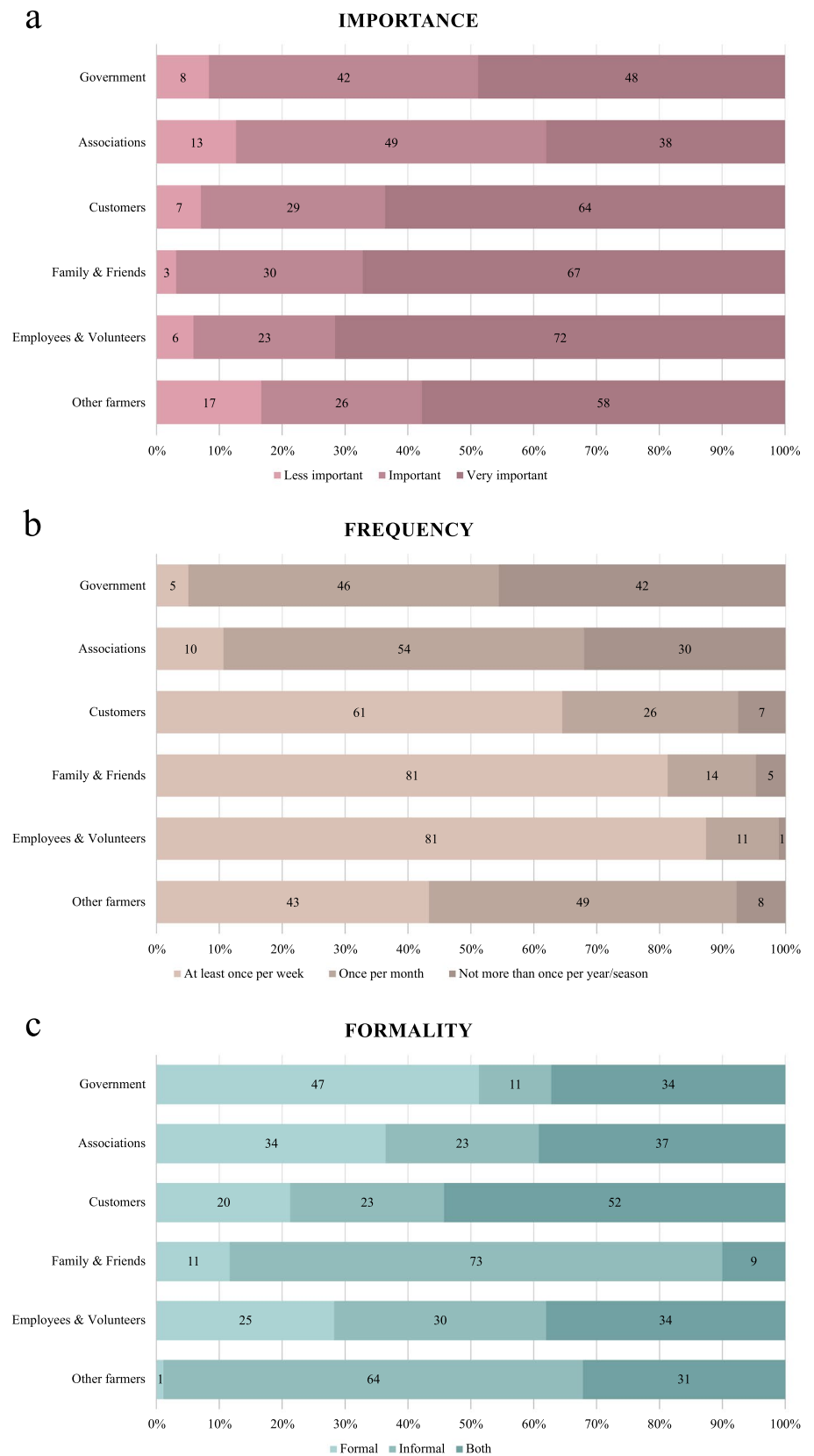


Table 4 Summary of local farmers' challenges and their implications for the farming operation

Challenge Type	Share	Examples of specific challenges	Implications of challenges
Environmental	68%	- Precipitation patterns (e.g., droughts, extensive rainfall, and humidity) - Extreme temperatures (e.g., heatwaves, late frost), strong wind, crop diseases, and pests	- Limiting food production capacity - Crop loss - Burden or even health threat for farm workers
Financial	46%	- Labour costs - Low margins and liquidity - High insurance costs	- Starting, running, and expanding business - Investments (building and equipment, insurance) - Limited bulk purchases
Workforce	43%	- Finding workforce (quantity and quality) - Retaining workforce	- Workforce shortages and fluctuations - Limiting productivity
Sales & Marketing	38%	- Domestic and international competition - Building and maintaining a customer base	- Limited growth potential - Limited market access
Technical	30%	- Lack of storage - Access to specialized equipment - Processors not adaptable to small producers	- Higher production cost - Limited market access
Customer relationships	25%	- Mismatch in expectations and requirements - Costly labelling	- Responsibility to educate consumer and retailers - Limited market access
Logistics	18%	- Logistics firms not adapted to small producers - Limited access to vehicles and rental trailers	- Additional costs - Limited market access

not or did not want to rely solely on resources from the province. Many farmers valued relationships abroad or in other provinces to learn about novel methods and tools from farmers with similar values and goals. Social media helped to overcome logistical barriers to enable this exchange. Likewise, one farmer also emphasized that engaging in exchange with other farmers in Québec, especially with farmers that focus on similar products, was perceived as a risk factor due to local competition. Instead, the farmer primarily interacted with farmers abroad about technical concerns and innovation, which allowed them to access knowledge about novel production methods:

“We talk to each other, we’re friends [farmers in Québec], but we keep the language superficial. The big advantage I have is my relationship with a group of producers in France. We openly tell each other everything because we are not competitors, we are just colleagues. This group also has contacts in Peru, Mexico, Italy, Belgium, and Spain. Often, we advance, and our new findings sometimes start from mistakes. [...] Sometimes one person’s mistake has resulted in a new technology. By having a wider network, we can manage to advance [and innovate] much faster. Everything—machinery, classification, harvesting, [...] all this experience comes from France and Europe. Here in Québec, in Canada, we are too few to have companies interested in producing and developing things for us. We are not a big enough market for them, so it’s

good to have eyes on the other side, in Europe, to allow us to move forward faster” [I-3].

Labour and workforce

We found that 77%¹ of farmers perceived support by their employees and volunteers as crucial, yet 43% encountered challenges, for instance, to find and retain the right quantity and quality of workers. Predominantly, this applied to the seasonal workforce, although personnel with special skills and knowledge for greenhouses were difficult to recruit, too.

High costs and slim margins were perceived as one of the most crucial factors that limited workforce stability. Multiple farmers mentioned in the survey that low wages, long work hours during the peak season, and the seasonal character of the work were often discouraging local people from jobs in agriculture. Farmers interested in hiring locals said that few were willing to work under such conditions. For instance, one farmer explained that people in Québec, due to shorter summers and extreme weather, prefer to go on vacation rather than work on farms. To overcome this concern, two interviewees mentioned that they paid higher wages and fostered a sense of belonging among their employees and volunteers, resulting in a more stable workforce. However, paying higher wages seemed to depend on the farmer’s values, financial support systems, and whether the farm was considered a hobby or primary source of income. One

¹ There was also a small share of farmers without employees. Those producers often ran the farm as a hobby or retirement project or did not have the financial means to hire employees.

respondent shared their frustration in terms of compensation for a physically-taxing job while working in a low-profit-margin sector:

“It’s hard to provide a competitive wage to our employees because we function with tight margins. Once folks come and see how hard the work actually is, they wonder why they do it for so little money” [Q-95].

To compensate for local workforce shortages, some local farmers in our survey hired temporary foreign workers (TFW), acknowledging the help of the provincial Ministry of Agriculture and Fisheries (MAPAQ) in the recruitment process. Several interviewed farmers pointed out that family and friends offered free labour, especially during peak harvest time. Friends and other helpers were often compensated for their time with products from the farm through which farmers could save money and time that they invested into other projects. In emergency situations, family members also recruited volunteers in their own social networks. Individual farmers mentioned that employees and volunteers helped to promote the farm among their social contacts. Two small-scale farmers pointed out in the interviews that their employees told family and friends about the farm and helped to get new customers and volunteers.

Material and financial aid

Almost half of farmers (46%) faced financial challenges whereas 30% of the survey respondents reported technical problems and one-fifth of local farmers (18%) encountered logistical barriers (Table 4). Most technical, financial, and logistical challenges arose due to the lack of machinery and vehicles, especially among farmers with non-mainstream farming methods and smaller production volumes. For instance, two livestock producers we interviewed shared that processing and transportation infrastructure was often not adapted or adaptable to small enterprises and production volumes. Furthermore, some farmers were concerned about the lack of access to suitable delivery vehicles. Those obstacles limited the farmers’ access to markets or increased their operation costs.

Farmers often found ways to address specific challenges within their community thanks to social ties. For instance, family and friends helped to overcome financial barriers to investments. This support was particularly crucial for farmers during the start-up phase of their enterprise when working capital was limited. Farmers with relatives in the farming business also shared equipment or experiences with novel techniques to reduce expenses. Likewise, some farmers saved money by lending machinery from neighbours or having neighbours work on the farmers’ land for a little compensation, products, or services. One interviewed farmer

explained the benefits of collaborating with a neighbouring farm:

“We’re a small farm, we got a smaller tractor, we’ve got small equipment. He’s a good neighbour, so he doesn’t charge us a lot to do all that work. He’s already got the equipment. His fields are kind of surrounding us. So, for him, it doesn’t make [a difference]. All he does is to do our field like the other one. The difference is that we’re organic. So, he has to do us first or last, depending on what he’s doing. The first thing that comes to my mind is cost. We don’t have a bailer and the machinery to seed the ground. We only own the tractor with a bucket for small stuff. He helps us with hay and hay bales, straw bales. All those things that are really expensive to buy when they’re all done. We pay for the seeds and the labour cost is so cheap compared to us owning all those big machinery for the amount of field we have” [I-12].

A total of 75% of farmers relied on their customers for support. Customers primarily contributed to the cash flow of the farm, which was necessary to cover expenses (e.g., salaries, feed, seeds) and make investments. For example, one mid-size livestock farmer explained that they needed a constant cash flow as they couldn’t afford to buy feed in bulk. Hence, building stable relationships with private customers and retailers was perceived as essential. Nevertheless, some farmers struggled with low margins, rentability, and low liquidity.

A considerable share of surveyed farmers (68%) indicated that they were impaired by environmental challenges that required material and financial aid (Table 4). Extreme precipitation patterns (e.g., droughts, extensive rainfall, and humidity), extreme temperatures (e.g., heatwaves, late frost), strong wind, diseases, and pests forced farmers to invest in irrigation systems, crop protection, and other equipment. In the interviews and survey, farmers explained that the unstable and extreme weather was limiting their food production capacity, destroying crops, and becoming a burden or even health threat for farmworkers. In fact, environmental challenges exceeded the new challenges posed to farmers by the disruptions of the first year of the Covid-19 pandemic (Schreiber et al. 2022).

The majority of farmers had relationships with the MAPAQ (65%) and benefited from subsidy programs, for instance, for capital-intensive investments such as greenhouses and nets, as well as risky investments in new technologies to foster mechanisation and development, among others. MAPAQ also supported farmers by providing agronomists and pest experts that visited farms to prevent, address, and mitigate the spread of pests. Although programs were in place that could support farmers financially, one

farmer criticized that documentation and application formalities made aid inaccessible to some farmers that were new to agriculture, “functionally illiterate,” or could not pay professional assistance with grant proposal writing:

“It is not easy to apply for assistance even if the project presents practically no risk. The government is cautious, and it is very laborious to make additional requests to improve the business” [Q-12].

Furthermore, the Ministry’s requirements seemed to limit some farmers’ access to resources. For example, one farmer whose production methods differed from standard practises could not find suitable equipment in Québec. Buying the equipment abroad was not feasible as provincial subsidies only applied to purchases with suppliers in Québec. The farmer bought the pieces individually and built the equipment according to the instructions of farmer acquaintances. Some small-scale operations reported that bulk purchases were sometimes not feasible due to limited storage space and disposable monetary resources, leading to higher per-unit costs.

Multiple farmers reported that insurance costs skyrocketed after several insurance companies stopped their operations in 2020. Access to insurance was limited, as farmers explained, due to the declining number of companies and competition between companies, resulting in higher insurance prices. This limitation led one farmer to pause an important construction project on the farm and others to adapt their cropping plans.

Consumer education and business promotion

A total of 38% of respondents mentioned marketing challenges and 25% of farmers pointed out that they encountered challenges with customer relationships (Table 4). Among those, many farmers had issues with publicity and making themselves known to potential customers. This particularly applied to farmers with niche products that were not widely known, farms with non-mainstream production methods, or young enterprises without a stable customer base. Some farmers supported each other formally by collaborating with other local enterprises, creating an ecosystem of food and food products to attract local consumers and tourists. Farmers also supported each other informally. For instance, a farmer we interviewed explained that other farmers in his network lost crops due to drought, and in response, they referred their customers to his farm.

Furthermore, challenges arose in response to diverging expectations and requirements when interacting with private and business customers. Farmers often struggled to convey the difference in price and quality between local and imported products as well as products of higher quality.

Since labels were often costly and difficult to obtain, farmers mitigated this challenge by increasing customers’ knowledge through direct interaction as highlighted by a farmer participating in Community Supported Agriculture (CSA):

“We still had to do a fair bit of education around the CSA model and justify the slightly higher cost of our produce compared to non-organic produce or produce that comes from far away. [...] also quite a bit of education about eating in season and the fact that we cannot grow things like watermelons all summer in our climate” [I-14].

Some farmers without direct consumer interaction highlighted relationships with business customers, such as butchers and chefs, since they could convey the special characteristics of the product which was not possible in a supermarket. Those direct relationships were also preferred since strict packaging and labelling standards, enlisting expenses, and competing with other producers and brands for restricted (visible) space on store shelves limited the integration of local food products into the retail sector and supermarkets. Restaurants also played an important role in creating awareness for niche and local products in Québec. One farmer explained how they supported their business:

“I’ve been making [crop] for about seven years and initially I had just a small area to try. I sold a little bit of it at the kiosk on my farm, but the Québécois who bought it said that it was not so good. I concentrated on the production. I did not know the kitchen at all. While doing my little tests in the Association of Market Gardeners, I had entered in my client file that I was producing [crop]. A great restaurant in Montréal was looking for [the crop] and called me. This is where I set foot in the restaurants. All chefs know each other. It wasn’t long before my friend, who knew a chef, took them to the farm. When he came to visit, we were in production. We gave a tour and he was really excited. He had big eyes and wanted to have this [crop]. The next day at noon, he called me and told me he loved it. He put 2-3 photos on his Facebook and lots of chef friends asked him for my number to buy [crop] too. He told me he didn’t have a problem to share but asked me to be served first before his friends if he ran out” [I-3].

According to our respondents, customers also contributed indirectly to a farm’s business by increasing the farm’s visibility on social media and among their friends and family. Storytelling on social media, as another farmer highlighted, helped to communicate crop or product qualities, and share information about the farm’s processes and philosophies to attract potential new customers, build trust relationships, justify relatively higher prices, and create an understanding of food production and processing. However, the requirement

for using social media was also considered a challenge in itself as farmers wanted to share the farm life but not their personal life, which was sometimes difficult to separate. Furthermore, while many farmers valued social media as an overall affordable and easy way to stay connected with customers, and promote and manage sales, others emphasised the difficulty of learning to use online tools. The time and monetary investment as well as poor and expensive internet connection in the countryside seemed to be particularly challenging (Schreiber et al. 2022). Finally, private and business customers were also crucial sources of non-monetary benefits including recognition, trust, dialogue, fun, encouragement, and understanding which helped farmers to adapt or overcome challenges.

Roles of associations

Associations enabled farmers to get together, exchange ideas and experiences, and build capacity to strengthen their marketing and public relations. Associations also built linkages beyond the farming community by connecting farmers with other industries and customers as well as representing their interests and needs in front of the government.

As the largest farmers organisation in Québec, the Union of Agricultural Producers (UPA, “L’Union des producteurs agricoles”) was described by some interviewees as an entity that invests heavily in advertisement to increase demand for local food and go up against the domestic and foreign competition. The UPA supported farmers with tax refunds, temporary foreign worker recruitment, and applications for wage subsidies, and advised farmers at any stage of development, with a particular focus on beginning farmers. Politically, the association was perceived as an intermediary between farmers and the government that provided the space for negotiation and represented collective interests with regard to taxes, pesticide use, land access, and other topics of concern. Finally, the UPA assisted farmers in implementing new laws and regulations. Several smaller farmers, however, complained about the high membership fees and the perceived low relative benefit they drew from their membership while being poorly represented.

While major farmer associations, such as the UPA, played an important role for most farmers, they failed to sufficiently account for alternative types of farming covered by some participants in our study. Smaller organisations such as the CAPÉ and the Family Farmers Network (FFN) appeared to fill this gap by representing interests that farmers in our study felt were left out in UPA debates and by engaging in political work. As FFN members pointed out, the association helped in building networks of shared identity, exchange, and mutual aid among small-scale organic farmers. More concretely, the FFN offered training opportunities (programs, workshops, and conferences), information distribution

(listserv), mentoring between more established and new farmers, and help with constructing of equipment. The FFN further organised collective buying to take advantage of discounts for bulk purchases and supported farmers with marketing. Organisations like the CAPÉ therefore worked across the province and helped farmers to identify product demand and potential drop-off points for food baskets.

Sector-specific groups and organisations helped farmers to merge forces for marketing and political representation. For instance, an association mobilised resources for social media campaigns and video material to promote asparagus from Québec. Producers also organised clubs to build and expand formal and informal networks within and beyond their community to exchange knowledge and share issues or support each other’s marketing (e.g., selling products from other members). Clubs served as substitutes for formal organisations or as bridging institutions between actors from different sectors. Those clubs included farmers, craftspeople, food processors, and shops from a subregion to foster agritourism. However, one respondent highlighted that not all sectors were sufficiently formally organised. Due to a lack of formality, it was difficult to bring problems to the attention of the government, especially with regards to foreign and domestic competition.

Discussion

Our study examined local food systems through a social relationships lens from the food producer’s perspective. Social infrastructure is an important factor in farming communities, particularly among those participating in local food systems and among small-scale farmers (Iles et al. 2021; Scott and Richardson 2021), offering both emotional and physical benefits (Scott and Richardson 2021). In analysing the challenges local farmers encounter, the actors that can support them in overcoming challenges, and the meaning of those relationships, we demonstrated that social bonds between local farmers and a diverse set of support actors can contribute to local food systems in realising and mobilising local food production potentials. These bonds range from formal to informal, frequent to infrequent, and span across geographic scales from the farm to international level. Stepping away from an idealised notion of consumer-producer relationship that hinges solely on the willingness of customers to purchase local foods, our results indicate that the capacity to localise food systems requires a broad network of support actors with different relationships and meanings across various temporal and spatial scales.

We showed that local farmers overall relied on a diverse network of support actors, with each farmer being supported by an average of four out of six actor groups that helped farmers across various challenge domains. This suggests

that, although consumers may play an important role in promoting local food systems, farmers need a range of support and draw on a variety of networks. While we do not know whether farmers with more connections “perform” better, support actor diversity could have implications on resilience. Resilience theory suggests that redundancy, diversity, and modularity in a social-ecological system can enhance its capacity to bounce back after impacts (Kharrazi et al. 2020). Future research could investigate possible relationships between resilience characteristics and identify whether certain relationships help farmers more than others.

Our results indicate that actor groups often supported farmers across different challenge domains by providing specific types of resources and assistance (i.e., “Knowledge sharing and emotional support,” “Labour and workforce,” “Material and financial aid,” and “Consumer education and business promotion”). Akin to previous studies, we found that our respondents benefited heavily from the immediate, frequent, informal, and direct support from peers, family members and technical advisors when dealing with these challenges (Gielen et al. 2003; Oreszczyn et al. 2010; Glowacki-Dudka et al. 2013). Although informal relationships built on trust and frequent interactions helped to deal primarily with urgent issues and short-term challenges, we find that many high-stakes challenges such as environmental issues or workforce gaps should be tackled with long-term solutions in mind.

In concert with our previous study on the same farmer population, which indicated that farmers perceived environmental challenges as more severe than those arising from the Covid-19 pandemic-related impacts (Schreiber et al. 2022), we suggest that farmers would benefit from more systemic and formal support at various levels, especially moderated and facilitated by associations. Associations played a particularly important role for the local farming community as they served many needs and helped to access different types of resources to address farmers’ challenges. Local associations further functioned as intermediaries, connecting homogenous and heterogeneous food producer groups with each other, with other stakeholders, and representing their interests on the political stage. In their study of 25 small-scale farmers in Québec, Allaby et al. (2021) found that the CAPÉ and other grassroots organisations supported small farmers in overcoming financial, knowledge, and time barriers related to the direct marketing of their produce online. This capacity that associations exhibit in Québec could prove valuable for tackling large-scale, long-term issues that need more formal and collective action such as climate change adaptation, thereby facilitating social innovation and grassroots actions (Cattivelli and Rusciano 2020; Vercher et al. 2022).

Our results also indicate spatial and temporal variability among the support networks. Although access to local resources was deemed crucial (e.g., sharing of machinery and locally specific knowledge), the support relationships often go beyond the provincial boundaries to acquire new knowledge, fill technological gaps, introduce novel methods, and retain market advantages. Although, in the latter case, the trust relationships with locals may be lower, the province’s food supply might, overall, still benefit from more open innovation networks in the long run by overcoming inertia (Cofre-Bravo et al. 2019). From a temporal point of view, social networks served as a source of support for immediate and on-going concerns. As mentioned previously, we found that some support actors helped with responding to short-term or suddenly arising challenges (e.g., harvest, field preparation, childcare), while others were needed for long-term support and transitional change (i.e., climate change adaptation, infrastructure). Future research could explore in more detail to what degree this spatial and temporal variability affects farmers and local food systems quantitatively.

This study has shown that formal and informal social relationships between farmers and support actors can help farmers access various resources to address their challenges. Yet, we did not account for the network processes and social norms that could affect the entire community’s success. Social interactions within and beyond a community, regardless of their formality, require agreed-upon norms and rules that govern those relationships, which is the foundation for building and sustaining social capital (Putnam 2000). Social capital among farmers has been shown to facilitate a range of processes that benefit farmers and farming communities, such as knowledge sharing and acquisition (Pratiwi and Suzuki 2017; Thomas et al. 2020), diffusion of innovation (Oreszczyn et al. 2010; Cofre-Bravo et al. 2019, Cofré-Bravo et al. 2019), increasing access to funding (Fisher 2013; Tregear and Cooper 2016), fostering the adoption of new technologies (Lanza Castillo et al. 2021) and adaptation to new agricultural policies (Arnott et al. 2021). Furthermore, social capital can improve an entire community’s capacity to deal with challenges by facilitating formal and informal collective action and community building (Glowacki-Dudka et al. 2013; Hulke and Diez 2020). Despite its benefits, social capital can also function as a barrier. For instance, strong bonding capital in tight-knit communities limits exposure to innovation, prevents actors from seeking new opportunities or challenging their own perceptions, goals, and tools (Cofre-Bravo et al. 2019; Arnott et al. 2021). Overreliance on social capital may cause inertia and reduce the members’ willingness to engage in change and compromise (Gargiulo and Benassi 1999). In the context of local food systems, our understanding of social capital could help us determine to what degree the benefits

and drawbacks of social norms, trust, and reciprocity can reduce or increase local food production and distribution capacity. Future research could investigate the social support systems of local farmers in Québec from the vantage point of social capital, trust, and reciprocity within and beyond the farming community, and how those factors affect the access to resources (Putnam 2000).

Farmers are experts at their craft and evolve in multivariate systems every day. But the problems that they face are equally complex, and the institutional support they receive should acknowledge their diversity. For example, most of our respondents struggled with environmental impacts, a threat to farmer livelihoods, worker health, and food crops alike. Similarly, a considerable share of farmers faced challenges recruiting a suitable and reliable workforce and paying fair wages. Especially small-scale farmers and producers in niche markets often found it difficult to access the right transportation, processing, and storage infrastructure. Policymakers should put more emphasis on addressing or mitigating those and related challenges by sustaining farmer representation across different sectors, production systems, and distribution channels, embracing international knowledge exchange, and building new or improving existing infrastructure and technology. Furthermore, governments should acknowledge the role of informal and often unpaid, yet crucial labour in farming provided by families and friends, and cater their needs in an appropriate, equity-oriented, and inclusive fashion.

Limitations

We used a mixed-methods approach to collect quantitative and qualitative data and assess the challenges and support actors through the lens of food producers. Our case study's scope was limited to farmers in Québec who already distribute food through local food supply chains (e.g., farmers and public markets, CSA, farm stores) and identify themselves as such to potential customers through online platforms. Hence, we may not have reached all possible respondents and our sample could be biased towards farms that are using online platforms for marketing purposes. Future research should employ methods to reach farmers without access to or interest in such marketing tools. Furthermore, our interview participant sample was predominantly male and, unlike other characteristics, did not match the gender distribution of the survey. This imbalance may have introduced gender bias to our interview data and our findings and conclusions.

Instead of focusing on farmers of a specific size, food type, or sales venue, we allowed for a diversity of producers, making our results less generalizable. However, according to the values of the local food system movement, food systems ought to move away from large-scale standardised operations towards a more diverse agricultural landscape

with more complexity. Hence, our study aimed to represent the various challenges and support actor groups and meanings that will result from the localization of food supply chains in Québec. Furthermore, investigating a broad variety of challenges and support actor types enabled us to identify overlaps across and between different challenge domains and actor groups. While a reductionist approach that focuses on individual challenges or actors is helpful in providing more detailed insights, it doesn't lend itself to understanding the broader context in which local food systems take place (see McIntyre and Rondeau 2011).

Even though our study covered a broad variety of challenges, we did not identify some widely known challenges such as land access (Horst and Gwin 2018), farm succession (Bruce and Som Castellano 2016), and language constraints (Scott and Richardson 2021). The latter challenge may play an important role among farmers with limited ability to communicate in French in Québec. Thus, suggesting various predefined challenge types to our respondents may have affected our results and conclusions. Although farmers could add open-ended responses to the questionnaire, some farmers may not have taken advantage of this option due to time constraints or privacy concerns.

Conclusions

Strengthening and (re-)building local food systems by supporting local farmers is a common objective among food systems advocates, planners, and policymakers. As Québec and other regions are trying to augment local food self-sufficiency, knowledge of support systems is crucial in understanding and planning for realistic targets of local food system provisioning. In the long run, if such aspirations are not backed up by the necessary social support system that helps in accessing physical and mental resources may be barriers to the development of fair and just local food systems. Our findings suggest that local governments must allow for diverse support systems to thrive while making sure that large-scale issues are matched with the necessary resources that cannot be retrieved from existing community ties. This may be particularly true with the new challenges created by the Covid-19 pandemic and other disturbances that compounded pre-existing issues, such as workforce shortages and extreme weather. Efforts to encourage local food self-sufficiency need to be matched with resources that address the broad types of challenges farmers face at different times. Without better acknowledgement of the role of social networks and relationships for local food production across temporal and spatial scales, physical local food production capacity may not be harnessed, undermining efforts to foster localization.

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