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## **Change as a Double-edged Sword: Ecological Farmers' Stressors and Responses to Changes In Farming in Grey County, Ontario**

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### **Abstract**

Farming is a well-known stressful occupation, with farmers facing a multitude of stressors and higher rates of mental health problems than the general population. Farming continues to change, with greater use of technology, changing ownership and management of farms, globalization of agricultural inputs and products, and climate change. Although there has been research to document these changes, to the researchers' knowledge there has been no qualitative studies, particularly within Canada, to understand farmers' perceptions of these changes and link them to their stressors and mental health. In this qualitative study, based on 16 in-depth interviews with small-scale farmers in Grey County of Southwestern Ontario, Canada, we explored farmers' perceptions of changing farming practices and their implications for their health as well as ways of responding and adapting to these changes. Thematic analysis using a social ecology framework revealed a number of major themes. Farmers' relationships to change were complex with both benefits and challenges of changing farm practices for health and well-being—a "double-edged sword." Technology changes were important new tools, while weather had become more extreme, rapid and un-predictable. Growing weather uncertainty generated brutal stress for some. Farmers described turning to ecological farming and the resilience that they experience from diversified farming which connects them to the land "essentially being at one with place." Their passion for farming connected to beliefs about protecting the land, even if most markets do not reward a farmer for doing so. Farmers also highlighted the lack of support they experienced from governments—dealing with bureaucracy, community—and experiences of isolation. Implications for policies and systems include increased support for farmers financially and administratively and interventions which build on their work with farm organizations.

**Keywords:** Agriculture, diversified farming, stressors, resilience, qualitative research, Canada

## **1.0 Introduction - Context Literature Review**

### ***1.1 The Changing Nature of Farming***

Farming continues to undergo dramatic changes, both within Canada and internationally (Canadian Agriculture Safety Association, 2005). The globalized food economy and the growth of industrial farming practices have accentuated the distances between food production and consumption with attendant environmental challenges (Zimmerer, 2007). Large agribusinesses now control much of the world's food production, with food on global markets valued as a commodity for profit maximization (Clapp, Desmarais, & Margulis, 2015). Changes in the nature of farming in Canada are occurring in tandem with massive demographic shifts. Over the next 10 years, 70% of farmers in Ontario are expected to retire, and 75% of them do not have a successor to take over the farm (Farmstart, 2010). Throughout Canada and the United States, the population of small towns is also getting older, as young people move to urban areas, and forgo farming because they perceive it as a less desirable career option (Carr & Kefalas, 2009; Costello, 2007; Davies, 2008; Johnson, 2003).

At the same time, family farms are shifting towards an entrepreneurial model with a rise in technological development and a larger focus on efficiency (Moriondo et al., 2010). Others are partially disengaging from mainstream agriculture, choosing diverse approaches to livelihoods and land management (Bessant, 2006; Lobley & Potter, 2004). An important minority have become more multi-dimensional, seeking to balance economic, social and environmental well-being (Rivera et al., 2018), of particular interest to us in this paper.

### ***1.2 Stressors in Farming and Health Impacts***

Farming is recognized as an unpredictable occupation, which often involves forces beyond farmers' control, including weather, farming equipment and animal illness (Gregoire, 2002). To compensate, farmers often work long hours (Kolstrup, et al., 2013; Swisher, Elder, Lorenz, & Conger, 1998), more than 10 hours per day or 70 hours per week (Gregoire, 2002). Another response has been the increasing shift to two or more income earners on a farm, with off-farm income maintaining the farm (Beach & Kulcsár, 2015). The fragile nature of a farm business can be a considerable financial stressor (Marotz-Baden, 1988), in particular due to large amounts of debt often associated with agribusiness growth models (Bryant & Garnham, 2014).

The amount of administration and paperwork required by governmental bodies has been increasing in farming (Kolstrup et al., 2013). Administrative demands are one of farmers' highest ranked stressors, often coinciding with busy farming periods (Gregoire, 2002, Kallioniemi, Simola, Kaseva, & Kymäläinen 2016). Extreme and variable weather, such as droughts and flooding, with attendant crop production and price fluctuations (Moriondo et al., 2010), have also become a stressor (Ellis & Albrecht, 2017; Polain, Berry & Hoskin, 2011; Sartore, Kelly, Stain, Albrecht, & Higginbotham, 2008), causing distress known as *solastalgia* in Australia (Ellis & Albrecht, 2017; Sartore, et al., 2008), something ecological farmers have actively tried to address.

Stressors faced by farmers were long ago linked longitudinally to personal problems, depression, marital discord and alcoholism (Ortega, Johnson, Beeson, & Craft, 1994), with increasing links to other chronic diseases (Brumby, Chandrasekara, McCoombe, Kremer, & Lewandowski, 2011). A national Canadian survey of over

1,000 farmers found 45% of farmers experienced high stress, 58% experienced anxiety and 35% experienced depression, a higher proportion than among the general population and two to four times higher than farmers in Norway and the United Kingdom (Jones-Bitton, Best, MacTavish, Fleming, & Hoy, 2019). Farmers experiencing a substantial burden of stressors suffer mental illness, with a concomitant lesser willingness to seek help, and may commit suicide (Fraser et al., 2005; Gregoire, 2002; Hounsome, Edwards, Hounsome, & Edwards-Jones, 2012; Kennedy, Maple, McKay, & Brumby, 2014; Milner, Spittal, Pirkis, & LaMontagne, 2013). Effects may also vary by gender (Carruth & Logan, 2002). Much of this research is quantitative and reflects different kinds of agriculture, particularly in Australia and the United Kingdom. Despite the calls for more research on stressors and health in rural populations (Brannen, Emberly, & McGrath, 2009), only a few qualitative studies have been conducted. Two papers explicitly explored social and environmental factors associated with suicide (Perceval, Ross, Kølves, Reddy, & De Leo, 2018a, 2018b). One examined how Canadian farmers perceive the effects of the changes in agriculture on their stress and health (Raine, 1999) while another explored factors associated with thinking about suicide among Manitoban farmers (Sturgeon & Morrissette, 2010).

### ***1.3 Resilience and Social Ecological Framing***

Despite changes in farming and ongoing stressors, farmers have also shown themselves to be resilient (Darnhofer, Lamine, Strauss, & Navarrete, 2016). Resilience for farmers has been understood as an ability to adapt and maintain stability through change (McManus et al., 2012). At a farm level, resilience may vary by production approaches, such as among organic farmers (Herman, Lähdesmäki, & Siltaoja, 2018). A number of social elements of farming can promote resilience, including increased self-efficacy, social networks, community trust and shared identity (Larson & Dearmont, 2002; Stain et al., 2008). Connections to family and rural community are some of the components of resilience set out by Buikstra et al. (2010) in Australia and Kulig, Edge, and Joyce (2008) in rural Canada using multi-method approaches.

The multiple levels of relationships among changing *macro*-contexts, landscape and community *meso*-contexts, and farm household and individual *micro*-contexts are perhaps best understood in social-ecological frameworks (Stokols, Lejano, & Hipp, 2013). Wilson, Wilson, and Usher (2015) drew on multiple literatures to develop a rural social ecology framework which brings these together for rural mental health. As Darnhofer et al. (2016) described farming as “a situation-specific web of ecological, technical and social relations” (p.114) such a framework helped orient us in this paper.

### ***1.4 Research Question***

Hence, we asked, “how do ecological farmers in Southwestern Ontario interpret and respond to the changing nature and contexts of farming and their potential impact on farmers’ stress and health?”

## **2.0 Methods**

### ***2.1 Study Location***

Grey County, Ontario ([https://en.wikipedia.org/wiki/Grey\\_County](https://en.wikipedia.org/wiki/Grey_County)) is a predominantly rural county with about 2,300 farms. Strengths are in cattle and sheep

raising, hay, and apple production. The majority are under 130 acres though larger farms (>2240 acres) are increasing (Grey County Agricultural Services, 2018). Choice of county was primarily due to existing second author's relationships with farm and county organizations.

## **2.2 Participant Recruitment**

After approval from The University of Toronto Health Sciences Research Ethics Board study (#34969), participants were recruited via emails through farming organizations such as the Ontario Federation of Agriculture and National Farmers' Union chapters. Snowball sampling complemented this recruitment strategy (as per Rawolle, Sadauskas, van Kessel, & Dollman, 2016). We particularly sought representation of younger farmers between the ages of 25–39—given their crucial role in the future of (Davies, 2008) and their recent increase in the proportion of Canadian farm operators (Statscan, 2017)—and women farmers given their complex roles (Kubik & Moore, 2001) and increasing proportion among farm operators (Statscan, 2017).

## **2.3 Data Generation**

As we sought to elicit farmer perceptions and understand their meanings (Crouch & McKenzie, 2006), we asked them to draw a mind map of the ways farming practices impact their health. These visual representations were used to shape discussion (Wheeldon & Faubert, 2009) during one-on-one, semi-structured interviews. The interview guide was grounded in the literature and underwent iterative adaptation based on farmer interviews.

Farmers were given the option of completing the interview alone or with their partner or a family member—two couples chose this option—as co-narration has been shown to be more effective in having a descriptive dialogue in farming communities (Morgan, Ataie, Carder, & Hoffman, 2013; Riley, 2014). Responding to participant preference, the interviews were conducted face-to-face, by telephone or on Skype. Interviews lasted 50 minutes to 1 hour and 45 minutes. With participants' permission, the researchers took hand-written notes and audio recorded the interviews.

## **2.4 Data Analysis**

An initial subset of transcripts was descriptively coded independently by each co-author, followed by agreement and application in N-Vivo (Braun & Clarke, 2006). Inductive analysis followed (Green & Thorogood, 2014) with themes developed by considering context, assumptions, interactional strategies, and conditions that gave rise to the theme (Braun & Clarke, 2006). As both members of the research team have family members who are farmers, the research team reflected on the impact of these positionalities on results interpretation (Green & Thorogood, 2014).

## **3.0 Findings**

Interviewees (n=16) came from diverse socio-demographic backgrounds (see Table 1) Over 50% (n=9) of the farmers interviewed were under the age of 39, approximately two thirds (n=10) were female, most were farming full-time (n=13), and almost all had farmed for seven or more years (n=15). Just over half (n=9) of respondents had personally experienced a mental health challenge. About half of the farms raised cattle (n=8), with hay, poultry, and vegetables (all n=4) also common (see Table 2). All farms were diversified with an ecological or organic component,

and most were small-scale for Canadian farms (all under 400 acres, 11 were 80–100, and 3 < 80 acres).

Table 1. *Interviewee Characteristics, Grey County, ON (N = 16)*

<b>Farmer Characteristic</b>	<b>Number</b>	<b>Percent</b>
<b>Gender</b>		
Male	6	38 %
Female	10	62 %
<b>Age</b>		
30–39	9	56 %
40–54	2	13 %
55–65	4	25 %
65+	1	6 %
<b>Employment Status</b>		
Farm manager	13	81 %
Farm spouse (not primary manager)	3	19 %
<b>Children</b>		
Yes	13	81 %
No	3	19 %
<b>Marital Status</b>		
Married, no children	2	12 %
Married, children at home	9	57 %
Married, children not at home	3	19 %
Divorced	1	6 %
Widow/widower	1	6 %
<b>Number of Years Farming</b>		
3 - <7	1	6 %
7+	15	94 %

Table 1 *Continued*

<b>Farmer Characteristic</b>	<b>Number</b>	<b>Percent</b>
<b>Career Change to Farming (due to job shift or marriage)</b>		
Yes	5	31 %
No	11	69 %
<b>Mental Health Challenge</b>		
Yes	9	56 %
No	7	44 %
<b>Working status</b>		
Full time	13	81%
Part-time (off farm work)	3	19 %
<b>Ethnicity</b>		
White	14	88 %
Other	2	12 %

Table 2. *Characteristics of Interviewees' Farms, Grey County, ON (N=16)*

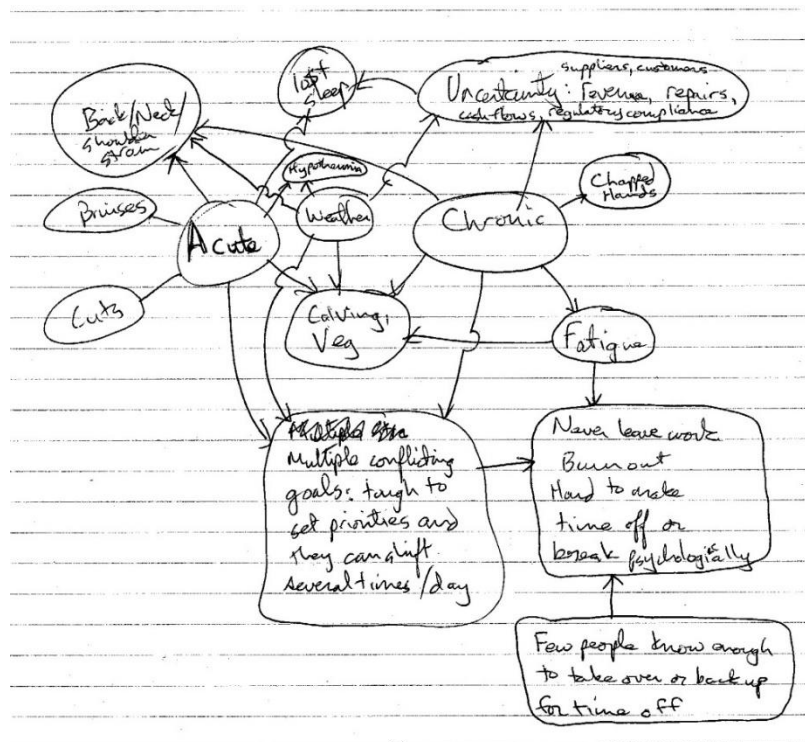
<b>Farm characteristic</b>	<b>Number</b>	<b>Percent</b>
<b>Type of farm (&gt;N as some multiple categories)</b>		
Mixed (organic and conventional)	1	6 %
Ecological (organic but not certified)	11	61 %
Certified organic	2	11 %
Ecological - Organic community supported agriculture	2	11 %
Cash cropping (both conventional & organic)	2	11 %
<b>Products (&gt;N as most multiple products)</b>		
Cattle	8	25 %
Hay	4	13 %
Chickens/poultry	4	13 %

Table 2 Continued

Farm Characteristic	Number	Percent
Vegetables	4	13 %
Dairy cows	2	6 %
Lamb	2	6 %
Pork	2	6 %
Other animal (eggs, sheep, wool)	3	9 %
Other horticultural (cut flowers, fruit, hops)	3	9 %
<b>Number of Acres</b>		
<80	3	19 %
80 - <100	11	69 %
100-400	2	12 %

Only a small group of farmers did the mind-maps, but they were revealing about diverse sources of their stress and the connections between them and their reactions over time (see Figure 1).

Figure 1: One participant’s hand drawn mind-map of stress and health.





Review of transcripts identified three main themes—with component sub-themes—centred around farmers’ experiences and interpretations of changes to farming practices: (a) changes experienced as both challenging and rewarding; (b) ecological-organic, small-scale farming as intentional and value-based work; and (c) variable availability of supports for farmers.

### ***3.1 Change as a Double-edged Sword***

The majority of participants reported the many changes to farming as both rewarding and challenging. The fact that farming is always evolving is part of what attracts people to farming in the first place. As Sophie (30–39) states, “when I say the challenges are also the rewards, it is kind of the same thing.” Farmers discussed the need to be adaptable, flexible, inventive, creative, and ready to deal with change. As Mary (65+) commented, “things are always changing. If you are a very rigid person, then you cannot survive as a farmer. [As] you do not have a lot of control, [you] have to be able to adapt when things change.”

*3.1.1 Challenges and rewards of technology.* Farmers viewed technological change as helpful in terms of efficiency and time management but at the same time, it often involved substantial expense and repairs:

...we are talking about 1.5 million...I think the debt loads are higher...[buying more technology] doubled our debt and my father in-law said, ‘I don’t want to lose the farm,’ that is a huge weight to take as a couple...(Sophie, 30–39)

Uhh...Well this technology, she is a double-edged sword, I will tell you that. I often wonder if it’s the worst thing that has happened to agriculture in the history of mankind. That being said, I sure don’t want to go back to pruning a fork or whatnot. It is a double-edged sword for my health. (Bill, 55–65)

One farmer described how a robotic barn, requiring more than two years of research and an investment of over \$250,000, is now saving time:

It has freed up a lot of time. We used to just do milking and feeding morning and night. Now we are down to 4 or 3 hours a day....[however] if something goes wrong, I am actually tied more to my phone than I was before because I am checking in with the robot and that is not necessarily the best for my health. (Jim, 30–39)

*3.1.2 Changing weather is challenging, yet interesting.* The unpredictability of the weather was described as a challenge:

I have been farming for 15 years. Usually if you are in a career for that long you have a good handle on it, but I feel like every year we are starting from scratch...it makes me laugh when people say farming is so relaxing, because the stress is brutal. (Charlotte, 30–39)

In terms of stress, it doesn't help when you can't rely on consistent weather. At the same time, the kind of farming I do is meant to have the resilience to deal with those issues which improves my wellness....It increases complexity, which is less efficient but also more interesting. So, weather that is more of a challenge actually makes it more interesting....Part of the reward is figuring how to deal with weather-related issues. (Julia, 30–39)

**3.1.3 *Healthy and unpleasant views of farming.*** Changing social norms about farming and farming practices were described as both harmful and helpful:

...certainly consumers are becoming more engaged in farming and having an opinion....Farmers are being accessed by the public more and some of that [causes] unpleasant stress. I think it happens a lot online via social media...[yet] I am hopeful and optimistic. I see kind of the beginnings of a shift of people [to] becoming more caring. That is the shift we need, to be able to keep more family farms going. That would be the healthiest view of farming and it makes me feel healthier too. (Emily, 30–39)

**3.2 *Small Scale Diversified Ecological–Organic Farming as Intentional, Regenerative, and Value-based***

Many participants chose to intentionally establish an ecological farm. Several interviewees had grown up on a conventional farm or had moved from another career and decided to farm organically in order to address some of the larger system issues in a more intentional, values-based way. As Julia (30–39) states, “global food culture is all about monoculture, lots of machinery and lots of debt and food that is way too cheap, and so [is] robbing the environment. The kind of farming that I do is regenerative in nature.” Sally (30–39) said, “I just hope that we don't lose our agriculture to offshore and mechanization and urbanization. I just hope that there is some thought given to the future generations. I think the rural landscape is pretty important.” Steven (60+) remarked that, “I enjoy working with biology and the diversity of what I am dealing with. Although I grew up on a conventional farm, I have chosen to farm ecologically as a response to changes I saw in farming.”

These intentions helped our participants face the financial sacrifice compared to conventional farming. Charlotte (30–39) observed that “it is hard for organic cash croppers. Organic cash croppers have to have a crop rotation that includes over five different crops like rye or spelt or oats, and those things don't always bring returns, which is stressful.” According to Mark:

Even through working a second job during the entire growing season which I will have to do and work full time on the farm, it still won't meet my financial requirements which are necessary to operate. That is going to be really difficult and stressful. (Mark, 40–45)

*3.2.1 Passion for farming and the way that small-scale farmers farm.* All of the farmers demonstrated a real love for farming, a love which helps many farmers to cope with stress:

We are so lucky to wake up every day and have our dream come true. That is one of the reasons that we can handle the stress because we love it. I think it is cheesy, and a lot of farmers probably say it, but not only do we have our dream jobs, but also our dream life. (Sophie, 30–39)

Participants described their experience of farming in terms of adapting and trying things out:

I can't speak for industrialized agriculture, but in diversified agriculture, resilience is built into the way that we farm. Lots of different ways of doing things. The ability to change the way of doing things if it is not working. That is high on our list of priorities and it helps to reduce our stress. (Julia, 30–39)

Paul (30–30) commented that, “it is because farming is essentially basic research. I am looking at my land and look at what my land can support, see what my animal is doing, and see what my pasture is doing....” Jim (30–39) noted, “the more we do, the better we do...we will try and grow our crops in the best way possible and just keep researching and trying things out. It makes me hopeful.”

*3.2.2 Being at one with place.* Small-scale diversified farmers also described their strong symbiotic connections to their land and animals with spiritual rewards. Sophie (30–39) remarked, “I think that if you are healthy, your cows are healthy and your land is healthy. I feel that it is very symbiotic....I could cry talking to you about it now.” Another said:

I want to feel happy and confident when I walk the land and support my environment, and that my actions are enhancing the quality of place, and that it is both instructional and that I am part of the system....That I am a mentor and a student all in one....What I find most rewarding about farming is, essentially being at one with place. This is very beautiful and rewarding. The ability to be on the land, witness the change, smell the soil, see and feel the sun, and see the shifting actions through the course of a day, is really incredibly powerful....It is almost a spiritual journey where you realize each day is the expression of the land to you. (Mark, 40–54)

Many participants had to learn with a living system, facing challenges. According to Paul (30–39), “when you get interrupted by circumstances beyond your control, you are...picking up behind where you left off...the...difficulty of getting things

done when you are working with real living systems as opposed to working at a job.” But also finding solace:

If you immerse yourselves in nature, you can find healing for your woes in life. ... What is my role? Not to exploit the resources but to be a steward. Once I get my stewardship hat on, my role in the environment completely changes. It makes me easier to live with, less judgemental and much less demanding of my own self-interest. (Steven, 60+)

### **3.3 Community and Government Support**

Farmers discussed the diverse ways that they were supported—or not—to cope with changes in farming practices, both by their community and governments.

*3.3.1 Community support.* In general, farmers reported isolation, and weakening of community ties. Paul (30–39) observed, “I have seen it too...there is...a lot of isolation on a farm. I get off the farm ½ a day a week. That is the only time I see anyone other than my wife.” Population decline and an influx of urban people who lack an understanding of rural life exacerbated these. According to Richard (55–65), “if you come and live on a farm, then you should be able to accept the farming practices...I am not saying every farmer does it right, don’t get me wrong but uhhh...it is disappointing.” Some younger, ecological farmers have built their own - Charlotte (30–39) commented that, “when you are a young organic farmer, you don’t always fit in with the mainstream rural community, but we have been really lucky because we have built our own [community] and it is very lovely.” Jim (30–39) felt that, “one advantage of being in this newer farmer, small diversified [context] is that there is much more of a sense of community.”

*3.3.2 Lack of government support and political bureaucracy.* Farmers discussed a lack of government support and understanding, with government policies and systems designed for larger, conventional farms. Charlotte (30–39) stated that “it makes it harder for small producers when the regulations are not [appropriate for their farm’s] size. These requirements were designed with large scale operations in mind.” According to Mark (40–45), “in conventional farming you will have a very different situation, and it is not a level playing field. We [ecological farmers] have an enormous disadvantage. There is no real substantive financial support...It is stressful.”

Respondents also identified a lack of support for young farmers, particularly the barriers posed by increasing land prices for those who want to start farming. Mary (65+) says, “there has been a lot of changes in this area...land is really expensive...it must be really difficult [for] young people [who are] trying to buy land.” Ella (40–54) notes:

The government has to be grateful for young farmers and they should support them financially. There should be loans for young farmers where they don’t have to meet all of the requirements...Government should invest hard cash in making it attractive to become a farmer. If [they] don’t do it, farmers will disappear.

Government bureaucracy, the amount of paperwork, and staff lack of knowledge can all be stressful. As Ela (40–54) said, “you take a government application and you look at it and think, ‘I don’t have time for this.’ I am an educated person who is used to having inspections and whatever. Bureaucracy and farming don’t really meet.” Another farmer bemoaned:

When there is a new program, the people in the government don’t really understand it. You can have cases where you have to tell them what is about. Things keep getting changed and people are not on top of the changes.  
(Sally, 55–65)

Because government bodies at all levels lack understanding, farmers need to speak up on their own behalf, despite their small numbers and many competing demands. Jim (30–39) remarked that “it is such a small percentage of people who are working in agriculture and we are always fighting to get our voice heard. Changes are made, but we are such a small minority and I find that stressful”. Sophie (30–39) felt that, “it is a big responsibility...If we want to be represented, we have to talk to politicians.”

#### **4.0 Discussion**

We learned a good deal about how ecological farmers in Southwestern Ontario interpret and respond to the changing nature and contexts of farming and their potential impact on farmers’ stress and health, at multiple social ecological levels (Wilson et al., 2015). Starting with macro social-ecological levels, climate variability (Ellis & Albrecht, 2017) is causing our participants major concerns for the future, particularly since governments are not supporting natural resource management approaches which might promote farm resilience, farmer livelihoods and their health (Schirmer, Berry, & O’Brien, 2013). The ongoing changes in agribusiness also loomed large (Bryant & Garnham, 2014) along with the government focus on larger farms. The lack of understanding by governments of farmers’ situation, echoes others’ findings on stressors facing farmers (Kallioniemi et al., 2016; Kolstrup et al., 2013). In fact, a recent federal report (Standing Committee on Agriculture and Agri-Food, 2019) specifically highlighted government policies and requirements as important stressors for farmers, prompting the need for activism which some farmers expressed.

A meso socio-ecological level response to broader agribusiness trends (Lobley & Potter, 2004) is the active choice of smaller scale, diversified farming. Farmers spoke about choosing to farm organically due to their beliefs about ecological health and valuing of resilience (Kaltoft, 1999; Reimer, Thompson, & Prokopy, 2012). Young farmers in particular are choosing this path, with the specific focus on small-diversified farming as an intentional, regenerative and values-based practice (Herman et al., 2018), complementing changing social norms around organic food among consumers. Nonetheless, the pressure on ecological farmers to adapt and develop resilience may be a downloading from macro agribusiness and climate changes, with resources continuing to go to the most powerful, as political ecologists have critiqued (Watts, 2015).

Another meso socio-ecological level factor was the weakening of community rural supports due to changing rural demographics, with both out migration of farm

family members and in-migration of urbanites (Gregoire, 2002; Kallioniemi et al., 2016; Sturgeon & Morissette, 2010). Newcomer young farmers must find their own place in rural areas (Ngo & Brklacich, 2014) while building their own ecological farming oriented, supportive communities with shared practices, as described in this study. Several spoke of other rewards (Rivera et al., 2018) including enjoying nature, feeling at one with place and strong connections to animals and to the land (Saugeres, 2002; Worster & Abrams, 2005). These were noted as important meso socio-ecological level factors for mental health in Wilson et al.'s (2015) framework.

At the individual socio-ecological level, farmers saw the personal growth opportunities to take on challenges, learn about new technology, experiment with different practices, and hence reap the rewards of farming for themselves and their farm. Such social and ecological learning in iterative cycles was also identified by Darnhofer et al. (2016) and is promoted by the Ecological Farmers Association of Ontario through its' Farmer-led Research Program (<https://efao.ca/farmer-led-research/>). In this sense, ongoing changes stimulate farmers' interest, promote their building problem solving capabilities and contributes to their joy in farming and ongoing commitment to it (Lobley & Potter, 2004). Such ongoing learning from experience, including diversity, was identified as both a community and individual resilience concept among Queensland, Australia community partners (Buikstra et al., 2010).

#### ***4.1 Study Limitations and Strengths***

Our sample was not representative of Ontario farmers. It was limited: (a) geographically, due to our capacity, (b) by type of farmer, due to our interests, (c) the farm organizations that chose to assist with recruitment, (d) the snowball recruitment process, and (e) the farmers that chose to participate. Given the relatively small sample, provision of a financial honorarium compensating participants for their time may have broadened participation. Limited funding for the research restricted the range of methods for data triangulation, though our knowledge exchange work with stakeholders, including members of family farms, has corroborated our findings.

#### ***4.2 Implications and Directions***

Our study supports further application of social ecological theoretical frameworks for understanding the complex context and responses of ecological farmers in rural communities. The positive assets among the farmers in this study provide a basis for further consideration of program and policy supports. Research could include agricultural workers and farmers in different farming practice, community, and socio-ecological contexts. To complement county government supports, improvements to provincial and federal government support to smaller-scale, diversified farmers could include a wider range of support programs better tailored to resilience and positive incentives for farmers' existing contributions to addressing climate change.

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