

An Analysis of Levels of Optimism, Self-Efficacy, and Types of  
Motivations of Farmers in Alternative Agriculture:  
Understanding Small and Medium-Scale Organic and Local Farmers at  
the Rural-Urban Interface

by

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## **Introduction**

The purpose of this research is to develop a more comprehensive understanding of the attitudes and internal factors affecting operators of small and medium-scale farms at the rural-urban interface. The rural-urban interface (RUI) is the landscape of relatively rural area surrounding metropolitan areas (Audirac, 1999). Farmers at the RUI face unique pressures and opportunities compared to rural farmers. Farming at the RUI is particularly vulnerable to pressures such as population growth and farmland conversion, but opportunities abound in agriculture at the RUI. Alternative agricultural practices and markets are increasingly important at the RUI as land scarcity and price per acre continue to rise. Organic agriculture, specialty crop agriculture, high-intensity production, and direct-to-consumer marketing such as community supported agriculture (CSA) are a number of different strategies that are continuing to grow at the RUI to keep farming in these areas economically viable (Inwood and Clark, 2013). According to the Department of Labor “Small-scale, local farming, particularly horticulture and organic farming, offer the best opportunities for entering the occupation” (page 51, 2010).

Local sales and organic production are expected to continue to rise in the next few years, following trends from the early 1990s. According to a 2013 industry report on organic agriculture, the organic food market is expected to continue growing rapidly, at a compound annual growth rate of 16% through 2020 (TechSci, 2013). The USDA reported a three times increase in direct local sales from 1992-2007 and report farmers’ markets and CSAs as growing exponentially within the past ten years (Tropp, 2014). These trends are expected to continue for the local food market, with consumers citing a myriad of reasons why they are drawn to local agriculture, such as support for local economies, availability of healthier options, and reductions in environmental impacts (Kearney, 2013). As growth of these industries continues and new farmers enter alternative agriculture occupations, it is important to understand who these people are, what factors motivate them, and how they view their communities and futures.

This research focuses on comparing RUI farmers involved in various types of alternative agriculture, such as organic crop production, and various types of marketing such as local-direct sales, and local-intermediated sales. Local-direct sales involve direct marketing from producers to consumers (such as CSAs and farmers’ markets) and local-intermediated sales are defined as involving at least one intermediary between producer and consumer (such as distributors or brokers) (King, et al., 2010). The internal factors that will be analyzed are farmer levels of

optimism in regards to their farms, self-efficacy related to making positive changes in their communities, feelings of belongingness in their communities, and motivations or goals. The research looks first at differences and similarities across alternative types: organic, local, both organic and local (dual-motivated), and neither. The second analysis looks at comparisons across farmers in local sales channels: local-direct, local-intermediated, and no local sales. The data that was used for this study comes from the USDA grant funded research project, *Small and Medium Scale Farm Growth, Reproduction and Persistence at the Rural-Urban Interface: Balancing Family, Goals, Opportunities and Risk*.

### **Rationale and significance**

Agriculture at the rural-urban interface is critically important for United States agricultural production. In 2002, counties at the rural-urban interface accounted for 55 percent of all US farm sales, although only 40 percent of US farmland is located within rural-urban interface counties. (Jackson-Smith and Sharp, 2008). Small and medium-scale farms operating at the RUI continue to face a number of unique pressures, including social, financial, and land-use pressures. However, the RUI also presents opportunities for growth in agriculture. The RUI has a variety of characteristics that support alternative agricultural practices and networks. Producers at the RUI are close enough to urban areas to market their products as local through either direct or intermediated channels. RUI farms face increasing economic pressure because these farms often cannot expand land use (as easily as other farms in rural agricultural production zones) because RUI farms are situated in areas that face intense land pressure. Land pressure at the RUI can be attributed to low land availability, urban sprawl development pressure, high tax rates, and land preservation policies.

Farmers at the RUI are increasingly turning to higher value agricultural products and markets such as organic and local because alternative agriculture can increase economic viability for farmers without requiring them to scale-up in size. Interest in alternative agriculture, particularly in local food systems and organic foods has increased substantially in recent years (Hinrichs et al, 2008; Greene, 2000; Tropp, 2014). According to the USDA, there was a 108 percent growth rate over the past twenty years in local food production, as compared to a 45 percent growth rate in agricultural production for that same period (USDA, 2014). In the period 2004 to 2011, US organic food sales more than doubled (\$11 billion to \$25 billion) (USDA-ERS,

2012). The global organic food market is expected to have a 16% compound annual growth rate during the period 2015-2020 (TechSci, 2013). Farmers' markets, CSAs, and local-intermediated sales are expected to continue growing as interest in local foods continues to gain momentum. Local sales and organic agriculture have become increasingly mainstream since the early 2000s. There is little research on the farmers operating in these newly energized markets and especially on farmer attitudes towards their futures considering the very recent successes of the organic and local food movements. This research will investigate the levels of optimism of farmers in regards to the future of their farm businesses, which is useful in predicting and preparing for the future of agriculture.

Previous research on factors affecting local and organic agricultural producers has largely focused on the external factors that motivate production rather than the internal (Chouinard, 2008). Much of the literature on internal motivations of local and organic farmers was published prior to the rapid growth seen in local food systems and the establishment of the official USDA organic certification program, and there is a need for more current research that seeks to understand and support those working in alternative agriculture (Duram, 1999; Lamine, 2008).

In terms of comparing organic to conventional, or local to conventional, current literature is outdated perhaps because the realm of alternative agriculture is so quickly changing and growing. Few studies exist that analyze a relatively new group of producers; the dual-motivated. In the realm of sustainability and food systems, research on dual-motivation (showing interest in both local and organic attributes of food) has centered on the consumer side. Research on alternative food system supporters (specifically supporters of organic and local food systems) shows that these supporters are more environmentally conscious and health conscious than the average consumer (Bean, 2011). There is less information available related to dual-motivated producers, as researchers have focused primarily on producers that identify as either local or organic, not on dual-motivated producers. This research examines the internal motivations of this growing sector of agriculture at the RUI and analyzes the differences between local, organic, and dual-motivated producers.

In 1999, Leslie Duram (a leading researcher in social and behavioral conceptions of organic agriculture) did a study on how organic Illinois farmers view political, economic, social, and ecological factors using interviews and qualitative methods. Her study includes direct quotes from farmers as related to these different factors. The results of her study included an analysis

and comparison of organic farmers and conventional farmers in their broader social contexts. Duram found that human health issues and environmental/ecological responsibility factors motivated nearly all of the organic farmers that she interviewed. Duram noted that, “economic, political, social, and ecological structures play an increasingly important role in organic agriculture” (page 12, 1999), and that given this, research is necessary to understand how these various factors and structures influence organic farmers. Duram also found that in some cases multi-generation farms were less likely to convert to organic farming because of pressure from relatives who had owned the farm and used conventional practices. However, in other cases, earlier generation farmers were the initiators of organic practices on the farms (Duram, 2000).

In a separate study, Duram researched the characteristics of certified organic farmers in Colorado. In the study she analyzed eight key factors, which were: diversity, challenge, change, businesslike approach, no formal agricultural education, love of the land, anti-“radical environmentalist”, and obstacles. Using these eight factors, Duram found three main obstacles to the adoption of organic agricultural practices. These were lack of information sources, confronting conventional traditions, and stabilization of organic markets. Since the publication of this study, many organic markets have either stabilized or grown considerably, and there is a need for more relevant research on motivations of organic farmers.

Identifying and understanding common characteristics of organic and local farmers is necessary for tailoring programs to support these individuals, and also necessary to engage underrepresented groups with sustainable agriculture. Farmers at the RUI are becoming increasingly diverse. According to a recent study on farm adaptation at the rural-urban interface, RUI agriculture has upwards trends of women, minority, and beginning farmers (Inwood and Clark, 2013). Studies concerning organic farmer personal characteristics have lacked analyses of specific characteristics such as gender (Lamine, 2008). However, some studies on alternative agriculture have found significant gender differences across farm operators involved in local marketing channels. One study conducted in Massachusetts found CSA farmers were three times as likely to be female as compared to the national average of farm operators (Paul, 2015). Demographic data on alternative farmers at the RUI is needed to give insight to how programs can be tailored to support vulnerable or underrepresented groups in agriculture.

There is extensive research on motivations of organic producers, as compared to conventional producers. A number of researchers have discussed motivations for organic

agricultural production in the context of the social theory of reflexivity. For example, Lyson and Gupstill (2004) theorize that direct sales farmers are more likely to see themselves as playing a role in community improvement. Other researchers have described the ways in which organic farmers have an understanding of their roles as producers and the effects of their roles on themselves as consumers (Stock, 2007). In an in-depth analysis of organic farmers, Stock found that the primary motivation for organic farming as a livelihood in the US was reflexive consumerism, which was associated with attitudes towards health. He identified a number of similar basic characteristics of the farmers that he interviewed which included educational attainment and family history of organic farming. Stock identified religion, philosophy, and stewardship as secondary motivations and characteristics. From his research he concluded that organic farmers need continuous support from social networks, but most critically, they need to be motivated by endogenous factors. Using this information, he proposed the idea that successful conversion of conventional to organic agriculture requires a combination of exogenous and endogenous factors<sup>\*</sup>. This research seeks to expand our understanding of endogenous factors through an analysis of survey responses related to personal motivations, perceptions, and outlooks.

Many studies on organic versus conventional farmer motivations have identified organic farmers as more motivated by environmental and community factors than conventional farmers (Sullivan, 1996; Egri, 2008). Currently there is a lack of research comparing motivations of different types of alternative producers. Studies have primarily focused on organic versus conventional or local versus conventional, but I was unable to find any published study that compares across alternative types of farmers.

Literature on motivations of local producers has generally focused on understanding producers as proponents of “civic agriculture”, which promotes socioeconomic and environmentally conscious food systems that addresses the concerns of community members, including both producers and consumers (Lyson, 2004). Farmers involved in local marketing are generally considered to be interested in working towards the creation of alternative food systems that provide healthy food to their communities while protecting environmental resources (Selfa, 2004). Organic and local farmers generally have similar motivations according to the current

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<sup>\*</sup> Endogenous factors are those that are personally motivated, whereas exogenous motivations are external factors such as policy or market changes.

body of literature. Motivations of dual-motivated producers have not been extensively studied, and there is a gap in our understanding of alternative producers, as research has largely ignored this group.

Research comparing levels of self-efficacy across farmer types in the United States is nearly non-existent. The closest body of research to addressing self-efficacy of alternative farmers is that on civic agriculture. There is obvious high self-efficacy in groups of individuals involved in civic agriculture, as these groups are spearheading movements and programs to support community food security, local economy growth, sustainable agricultural practices, and equality in access to healthy food for all (Feenstra, 2002). Producers involved in civic agriculture tend to use alternative practices and sales channels such as organic certification and local direct sales. People involved in civic agriculture have been shown to have higher levels of community voluntarism and engagement, two factors that are associated with personal efficacy towards positive community impact (Obach, 2013). Though there have not been studies specifically looking at how different types of farmers view their abilities to positively impact their communities, civic agriculture theory suggests that local, organic, and dual-motivated producers would believe in their abilities to positively impact their local food systems and communities.

There is a clear lack of research comparing farmer types within alternative agriculture, and especially a lack of understanding of dual-motivated producers, who are a growing population in this era of interest in sustainable food systems. Additionally, there are gaps in the current base of research on farmers who market their products as local. In general, the research has ignored the comparison between farmers involved in direct local sales and farmers involved in intermediated local sales.

This specific project is important for better understanding the internal factors that affect farmers involved in RUI alternative agricultural production and markets. Identification of characteristics and factors that contribute to the growing fields of organic food production and local food marketing is necessary to promote and support these activities. The research could be practically applied by government agencies for technical assistance and grant programs specifically for households involved in organic and local food production. Additionally, policymakers could use the research to develop policies that are more efficient and effective for the continuous development of a more sustainable food system.



## Research questions

There are three core questions that I addressed. These questions were first analyzed across alternative farmer types, which included farmers involved in organic production, local sales, both organic production and local sales (dual-motivated), and farmers involved in neither of those practices. The questions were then analyzed across local sales channel types, which were local-direct, local-intermediated, and non-local. The questions are:

1. How do motivations and goals compare between types of farmers?
2. How do levels of optimism compare across farmer types?
3. How do levels of self-efficacy and feelings of belongingness related to community differ between farmers?

I hypothesized that the three types of alternative farmers (organic, local and dual-motivated) would be more motivated by environmental motivations and personal desires to farm than by income when compared to conventional farmers. I expected alternative farmers to be more optimistic than conventional farmers given the recent growth and future projections of local and organic food markets. I also expected alternative farmers to be optimistic because of their presence at the RUI. Farmers at the RUI face high land prices and development pressures, but alternative practices present them the opportunity to maintain farms that are more economically viable than conventional farms. Value-added agriculture such as organic production allows for higher profits per acre, and being located at the RUI gives farmers the opportunity to engage in local direct-to-consumer sales such as community-supported agriculture. In terms of levels of self-efficacy as related to ability to improve community I based my hypothesis off civic agriculture literature. I hypothesized that dual-motivated producers and farmers involved in local-direct sales would be more likely to feel self-efficacious as compared to the other types of farmers.

Additionally, I expected dual-motivated producers to be most motivated by the desire to promote a sustainable food system as compared to the three other groups of farmers. Finally, I expected farmers in alternative agriculture and especially local-direct sales to be more likely to feel at home in their communities as compared to conventional farmers.

## Data

### *Collection*

This research project is part of a larger research initiative at The Ohio State University. The data that was used for this project comes from a USDA grant funded research project, titled *Small and Medium Scale Farm Growth, Reproduction and Persistence at the Rural-Urban Interface: Balancing Family, Goals, Opportunities and Risk*. The USDA grant that supports this project is #2011-67023-30139. The principal investigators of the project are Dr. Jeff Sharp (Ohio State University), Dr. Jill Clark (Ohio State University), and Dr. Shoshanah Inwood (University of Vermont). The central aim of the project is to “identify and assess the relationship of household dynamics (demographics, employment strategies and, goals and values) to the growth, development and persistence of small and medium scale farm enterprises at the RUI” (Sharp et. al, 2011).

Data was collected in five case study locations in the United States. These locations consisted of counties within the Core Based Statistical Areas (CBSA) of: Burlington, Vermont; Columbus, Ohio; Honolulu, Hawaii; Miami-Fort Lauderdale-Pompano Beach, Florida; and Portland-Lewiston-South Portland, Maine. These study locations were chosen for a number of reasons, including; county classification as rural-urban interface (RUI), strong agricultural production (top 25% of counties in 2007 US agricultural sales), representation of various commodities, representation of each of the four USDA regions, higher than regional average percentages of small and medium size farms, and higher than regional average percentages of women, minority, and beginning farmers.

Researchers developed a survey titled *Farm Growth & Change: Balancing Family, Goals, and Opportunities* and mailed 2044 total surveys to farmers in the five study areas. In total, 658 farmers returned completed surveys. The survey questions were adapted from a survey previously conducted by the PIs. The survey included 51 multi-part questions in a 10-page packet. The questions were primarily close-ended with categorical or number scale responses. The questions covered: farm size and ownership details, farming and marketing practices, farm growth and future, farmer optimism levels, personal motivations for farming, decision-making, healthcare, childcare, community and civic engagement, attitudes towards farm services, and general demographics.

### *Overview of data*

The average age for the data set was 54.7 years, ranging from a minimum of 18 years to a maximum of 90 years (Table 1). The average age from USDA national data was 58.3 years. The average number of acres farmed in the data set was 189.8 acres, ranging from a quarter of an acre to 10,000 acres.

The average number of years spent farming as an adult ranged from 1 to 70 years, with an average of 23.2 years. The farmers in this study were highly educated, with 56.7% of farmers holding a bachelor’s degree or above. About half of the farmers are multi-generation, and half derive 25% or less of their total household income from farming activities. Across national USDA data, a much larger percentage (70.3%) of farmers derive less 25% or less of their total household income from farming activities. Compared to national data, the dataset includes farmers that are more likely to be female, younger, and farm smaller areas of land. These demographics were to be expected, as we selected study sites with higher rates of these specific attributes.

**Table 1: Demographics of full data set**

|                                                  | Survey data<br><i>n</i> = 658 | USDA data, 2012<br><i>n</i> = 2,109,303             |
|--------------------------------------------------|-------------------------------|-----------------------------------------------------|
| Age<br>mean (standard deviation)                 | 54.7 (13.1)                   | 58.3                                                |
| Gender<br>% male                                 | 59%                           | 86%                                                 |
| Education level at bachelor’s<br>degree or above | 56.7%                         | USDA does not collect<br>data specific to education |
| Acres<br>mean (standard deviation)               | 189.8 (573.8)                 | 434                                                 |
| Derive < 25% of total income from<br>farming     | 46.6%                         | 70.3%                                               |

## **Methods and results**

### *Respondent typology*

Types of farmers were created and analyzed using survey responses to yes/no, multiple-choice, and numerically based questions. One of my original research goals was to not only compare organic farmer responses to local responses, but to break down the types of local farmers into more specific types: local-direct and local-intermediated.

To answer the three research questions, the first section of data analysis focused on responses from four types of alternative producers and the second section of data analysis focused on responses from farmers involved in three types of local sales channels. For each section of analysis, the types are mutually exclusive. For the first section, four types were produced from the dataset to compare farmers that self-identified as engaging in strictly organic practices, strictly local marketing, both organic practices and local marketing, or neither (Table 2). Strictly organic farmers produce and sell their products under USDA organic certification standards. They do not use local channels to sell their products. Strictly local farmers do not use USDA organic certification standards but sell their products through either local-direct or local-intermediated channels. Dual-motivated producers are USDA organic certified and sell their products through local channels. Farmers classified as neither do not use USDA certification standards nor do they sell any of their products labeled as local. This study will refer to farmers in the 'neither' group as 'conventional' from here forward. For any farmer to be classified as involved in local sales, the cutoff point was 80% of 2013 farm sales were farmer-defined as local. In a distribution of the responses to "what percent of your farm sales came from local sales?" there were a high number of responses at or below 20%, and at or above 80%. I selected 80% as the cutoff point for farmers to be typed as local, as this would create a type of farmers that primarily produced for local sales.

**Table 2: Categorization requirements for alternative practices**

| Types                        | Strictly organic                      | Strictly local                             | Organic and local                       | Neither organic or local                 |
|------------------------------|---------------------------------------|--------------------------------------------|-----------------------------------------|------------------------------------------|
| Responses for categorization | organic certification, no local sales | 80%+ local sales, no organic certification | organic certification, 80%+ local sales | no organic certification, no local sales |

The second part of this research answers the three research questions focused on differences across farmers involved in local sales. Farmers that responded positively to selling 80% or more of their products as local were then categorized into either a local-direct or local-intermediated group. Local-direct farmers sell their products exclusively directly to consumers through channels such as farmers’ markets, U-picks, CSAs, farm stands, etc. Local-intermediated farmers sell their goods exclusively to either an institution or business (such as schools, hospitals, grocery stores, or restaurants), or to distributors or brokers who then market their products as “local”. In a USDA report to congress, intermediated sales are defined as “all marketing opportunities in the local supply chain that are not farmer-to-consumer transactions” (page 5, USDA ERS, 2015). The requirements for typing of local-direct or local-intermediated are listed in Table 3.

**Table 3: Categorization requirements for local sales channel**

| Types                        | Local-direct                                                                                      | Local-intermediated                                                                                                                                                                                                     |
|------------------------------|---------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Responses for categorization | 80%+ local sales, exclusively direct-to-consumer sales (farmers’ market, U-pick, CSA, farm stand) | 80%+ local sales, exclusively intermediated sales (sales to an institution or business such as schools, hospitals, grocery stores, or restaurants or to a distributor or broker who then sells your product as “local”) |

*Demographics by farmer type*

The household survey packet included a series of questions related to demographics and farm structure. The variables that I chose to compare across farmer types are listed below in Table 4. These variables were selected due to their high levels of significance across types, and the use of these same variables in other studies to which I could compare my results.

**Table 4: Demographics by alternative farmer type**

|                                                                           | Strictly organic<br><i>n</i> = 37 | Strictly local<br><i>n</i> = 281 | Both<br><i>n</i> = 80 | Neither<br><i>n</i> = 82 |
|---------------------------------------------------------------------------|-----------------------------------|----------------------------------|-----------------------|--------------------------|
| Age* (mean with standard deviation)                                       | 50.8 (11.7)                       | 55.2 (13.6)                      | 48.1 (12.0)           | 57.7 (11.0)              |
| Gender (% male)                                                           | 75.7                              | 56.2                             | 50.0                  | 61.0                     |
| Education level at bachelor's degree or above* (%)                        | 35.1                              | 58.8                             | 73.8                  | 52.4                     |
| Multi-generation farmer* (% yes)                                          | 73.0                              | 44.1                             | 28.7                  | 54.9                     |
| Acres* (median)                                                           | 326                               | 20                               | 25                    | 57.5                     |
| Proportion of total household income that comes from farm business* (%)   | 76-100                            | 0-10                             | 76-100                | 76-100                   |
| (mode)                                                                    | 26-50                             | 11-25                            | 26-50                 | 26-50                    |
| (median)                                                                  |                                   |                                  |                       |                          |
| Number of years spent farming as an adult* (mean with standard deviation) | 24.6 (14.3)                       | 21.3 (14.9)                      | 15.3 (10.4)           | 28.6 (13.0)              |

\*Differences across farmer types are statistically significant. Tests for significance were either analyses of variance (ANOVA) or chi-square tests depending on the structure of the question and responses, with  $p < .05$  as significant.

There are significant differences between the ages of farmer types. Dual-motivated producers tend to be the youngest, with an average age of 48.1 years, whereas conventional farmers are on average 9.6 years older than the dual-motivated producers, at an average of 57.7 years. Organic farmers are on the younger side, with an average of 50.8 years, and local producers average on the higher side at 55.2 years.

There are differences between groups for % of farmers that are male in each, but the significance level should be noted at  $p = .06$ . Only half of the dual-motivated producers are male, as compared to 75.7% of the organic farmers. The conventional and local farmer gender rates fall

between these two extremes, with 56.2% of local farmers being male, and 61% of conventional farmers being male.

There are also significant differences for level of education across farmer types. This question was recorded as highest level of education, and reported as % of farmers with at least a bachelor's degree. Dual-motivated producers tend to be extremely well educated with 73.8% of them having a bachelor's degree or higher. Organic producers tend to have the lowest levels of education attainment, with 35.1% reporting attainment of a bachelor's degree or higher. Again, local and conventional farmers fall in the middle of the spectrum, with 58.8% of local farmers attaining a bachelor's or higher, and 52.4% of conventional farmers.

There are significant differences between farmer types for percent of farmers that are multi-generation. Organic farmers have the highest rates of multi-generation farmers, with 73.0% of organic farmers reporting as such. Dual-motivated producers had the lowest amount of multi-generation farmers, with only 28.7%. Local farmers were also below half, with only 44.1%. Conventional farmers fall near the middle again with 54.9% of them reporting to be multi-generation farmers.

Organic farmers in this study tend to have the largest farms (both owned and rented acres). The median farm size for organic farmers is 326 acres. Local farmers have the smallest farms in the study, with a median of only 20 acres. Dual-motivated and conventional farmers have medians of 25 acres and 57.5 acres, respectively.

Organic, dual-motivated, and conventional producers all most frequently reported as generating 76-100% of their total household income from their farms. Local producers score much lower for proportion of income from farm sales, most frequently reporting 0-10% of income from farm activities.

Dual-motivated producers have spent the least amount of time farming as adults, with an average of 15.3 years spent farming. Conventional farmers reported the most number of years spent farming, at 28.6 years of experience. Organic farmers were second highest for years of experience at 24.6 years. Local farmers tend to have spent less years farming than conventional and organic, but still significantly more than the dual-motivated producers. Local farmers reported a mean 21.3 years of experience farming.

Of the four types, dual-motivated producers are the youngest, most educated, most female, and least likely to be multi-generation farmers. This niche of dual-motivated producers

stands out from the other three types in nearly all of the demographics tested. Even compared to the national average for education, dual-motivated producers are extremely well educated. Almost three-quarters of dual-motivated producers reported holding a bachelor’s degree or higher, as compared to national data for all US citizens, for which 29.3% of people over 25 had their bachelor’s degrees or higher (US census, 2010-2014). These farmers are also the most likely to be female, with 50% reporting as such. Dual-motivated producers tend to be new to farming life, with less than one third of them reporting to be multi-generation farmers.

The second demographic data analysis is across types of local sales channels, including local-direct, local-intermediated, and no local sales. The data is presented in Table 5.

**Table 5: Demographics by local sales channel**

|                                                                           | Local-direct<br><i>n</i> = 103 | Local-intermediated<br><i>n</i> = 18 | No local<br><i>n</i> = 119 |
|---------------------------------------------------------------------------|--------------------------------|--------------------------------------|----------------------------|
| Age (mean with standard deviation)                                        | 55.8 (13.5)                    | 59.4 (12.4)                          | 55.5 (11.6)                |
| Gender (% male)                                                           | 54.7                           | 66.7                                 | 65.5                       |
| Education level at bachelor’s degree or above (%)                         | 61.0                           | 55.5                                 | 47.1                       |
| Multi-generation farmer* (% yes)                                          | 40.6                           | 33.3                                 | 60.5                       |
| Acres* (median)                                                           | 20                             | 40                                   | 226                        |
| Proportion of total household income that comes from farm business* (%)   | 0-10                           | 76-100                               | 76-100                     |
| (mode)                                                                    | 11-25                          | 76-100                               | 26-50                      |
| (median)                                                                  |                                |                                      |                            |
| Number of years spent farming as an adult* (mean with standard deviation) | 20.2 (14.2)                    | 32.5 (15.7)                          | 27.3 (13.5)                |

\*Differences across farmer types are statistically significant. Tests for significance were either analyses of variance (ANOVA) or chi-square tests depending on the structure of the question and responses, with  $p < .05$  as significant.



Farmers involved in local-intermediated sales tend to be the oldest of the three types. As was expected, farmers involved in local-direct sales are more likely to be female as compared to farmers involved in local-intermediated sales channels and farmers not involved in local sales. Farmers not involved in local sales channels tend to be the least educated of the three types, although still significantly more educated than the national average. Sixty-one percent of farmers involved in direct sales have their bachelor's degree or higher, and 55.5% of farmers in local-intermediated sales have their bachelor's degree or higher.

On average, farmers not involved in any local sales were significantly more likely to be multi-generation farmers than farmers involved in local sales, with 60.5% reporting to be so. Only 33.3% of the local intermediated farmers are multi-generation and 40.6% of the local direct farmers. Farmers not involved in local sales were more likely to either own or rent more acres than the other two types with a median of 226 acres. Local farmers were more likely to farm less acres, with local-direct farmers reporting a median of 20 acres and local-intermediated at 40 acres.

Local-direct farmers were most likely to select 0-10% for the proportion of total household income that they produce from their farming activities, as compared to local-intermediated and non-local farmers that produce 76-100% of their income from farming. Local-direct farmers also tend to have the least amount of years of experience farming, with an average of 20.2 years. Local-intermediated farmers had the most experience at 32.5 years, and non-local farmers were in the middle at 27.3 years experience.

Similar to the statistical tests of alternative farmer demographics, one group of farmers in the local sales channel analysis sticks out. The local-direct farmers are the youngest, most educated, most female, and least likely to be multi-generational. They also have spent the least amount of time farming as compared to the other two groups. Local-direct farmers in this study tend to farm less acres, and are most likely to report that only 0-10% of their total income comes from farming. In fact, 54% of local-direct farmers reported that less than a quarter of their total household income comes from their farm business. This group of local-direct farmers likely includes a high number of hobby farmers, or farmers that farm for reasons other than financial.

### Survey Questions

Four survey questions were selected for analysis as indicators of farmer motivations, levels of optimism, and community perspectives/self-efficacy towards community. These questions are shown below. Of the four questions analyzed, three were single scale questions, with farmers responding with one number. For these questions, I used ordinal regression analysis. The fourth question was more elaborate and asked farmers to score 11 various factors as related to motivations on a scale of 1 to 5. This question was analyzed using factor analysis to initially group the 11 factors into four different groups and later univariate analysis of variance to determine which factors each farmer type was more or less likely to rank as important to them.

**C4. Thinking about the next 5 years, how do you feel about the future of your farm business?**  
(Circle your answer)

|                       |   |   |                |   |                        |   |
|-----------------------|---|---|----------------|---|------------------------|---|
| 1                     | 2 | 3 | 4              | 5 | 6                      | 7 |
| <i>Not optimistic</i> |   |   | <i>Neutral</i> |   | <i>Very Optimistic</i> |   |

**E1. In general, would you say you feel “at home” in your community?** (Circle your answer)

|            |   |         |   |   |                |   |
|------------|---|---------|---|---|----------------|---|
| 1          | 2 | 3       | 4 | 5 | 6              | 7 |
| Not at all |   | Neutral |   |   | Yes Definitely |   |

**E3. Overall, how much impact do you think people like you can have in making your community a better place to live?** (Circle one)

|           |   |         |   |   |            |   |
|-----------|---|---------|---|---|------------|---|
| 1         | 2 | 3       | 4 | 5 | 6          | 7 |
| No impact |   | Neutral |   |   | Big impact |   |

**C6. People farm for a variety of different reasons and these motivations affect how they manage their land. On a scale of 1 to 5, please tell us how important each of the following goals are for you when making decisions about your farm. (1=Not Important to 5=Extremely Important)**

| <i>Motivation and Goals</i>                | Not Important |   | Somewhat Important |   | Extremely Important |
|--------------------------------------------|---------------|---|--------------------|---|---------------------|
| a. Maximize net farm income                | 1             | 2 | 3                  | 4 | 5                   |
| b. Ensure household income is adequate     | 1             | 2 | 3                  | 4 | 5                   |
| c. Desire to keep living on the farm       | 1             | 2 | 3                  | 4 | 5                   |
| d. Fulfill my desire to be a farmer        | 1             | 2 | 3                  | 4 | 5                   |
| e. Desire to keep this farm in the family  | 1             | 2 | 3                  | 4 | 5                   |
| f. Fill spiritual needs                    | 1             | 2 | 3                  | 4 | 5                   |
| g. Spend more time with family             | 1             | 2 | 3                  | 4 | 5                   |
| h. Being a good steward of the land        | 1             | 2 | 3                  | 4 | 5                   |
| i. Increase self-reliance                  | 1             | 2 | 3                  | 4 | 5                   |
| j. Contribute to a sustainable food system | 1             | 2 | 3                  | 4 | 5                   |
| k. Provide good food to my community       | 1             | 2 | 3                  | 4 | 5                   |

*Methods: Questions E1, E3, and C4: PLUM*

I used question C4 to draw conclusions for the research question “how do levels of optimism compare across farmer types?” Question C4 is an indicator for optimism for future farm success and was scaled 1 to 7 from not optimistic to very optimistic.

To answer the research question “How do levels of self-efficacy and feelings of belongingness related to community differ between farmers?” I used farmer responses to questions E1 and E7. Question E1 had farmers rank how “at home” they feel in their community, with 1 being not at all and 7 being definitely yes. Question E7 asked farmers to rank their potential impact on making their communities better places to live, with 1 being no impact at all and 7 being a big impact. In order to analyze questions C4, E1, and E3, responses on the sliding scale of 1-7 were simplified down to coded responses of low (1-2 on the scale), medium (3-5), and high (6-7).

Once the farmers were typed by alternative type and local sales channel type, their responses to the three questions above were compared using ordinal regression models in SPSS statistics. The ordinal regression model used was a polytomous universal model (PLUM)

because this model allows for direct comparison across categorical data. PLUM requires that variables are not overlapping, which is why I created the strict mutually exclusive types for which farmers could only belong to one of for the alternative typology and local sales channel typology. In order to run an omnibus test for statistical significance, SPSS PLUM requires orthogonal contrasts, which essentially allows for comparisons between pairs of farmer types. These orthogonal contrasts were written into the syntax so that I could look at differences between individual types, and have significance values reported. I ran PLUM four times for each question because orthogonal contrasts require that for each test the dependent variables are compared to a base variable. For example, running a PLUM on question C4 (optimism) produces four sets of results. The first set would compare the three types of alternative farmers to the base type of conventional (neither) farmers. The second set would compare conventional, local, and organic to the base type of both. This process continued until each type had been coded as the base once and I had results for a total of 6 pair-wise comparisons.

The final number produced through PLUM is an odds ratio. For a pair of types this ratio tells us what the odds are that a specific type of farmers selects a higher number on the scale than the base type. For example, in table 7: E3 the first comparison is organic to neither with an odds ratio of 3.66. This number tells us that organic farmers are 3.66 times more likely than conventional farmers to select a higher number on the low-medium-high scale for question E3. With a p-value of .002, this result is significant and I can say with certainty that the organic farmers in this study are 3.66 more likely to see themselves as able to positively impact their communities as compared to conventional farmers.

#### *Results: Questions E1, E3, and C4: PLUM*

Ordinal regressions were run on each of the three questions for both alternative farmer types and local sales channel types. Of the six tests, three had significant results that are reported in the tables below.

**Table 6: Question E3: How much impact do you think people like you can have on making your community a better place to live? (alternative farmer types)**

| <b>Pair</b>        | <b>Significance</b> | <b>Probability Ratio</b> |
|--------------------|---------------------|--------------------------|
| Organic to neither | .002                | 3.66                     |
| Local to neither   | .000                | 2.45                     |
| Both to neither    | .000                | 4.60                     |
| Both to local      | .024                | 1.88                     |
| Both to organic    | .597                | 1.26                     |
| Organic to local   | .280                | 1.50                     |

The responses to question E3 were significant for four of the six pair-wise comparisons. Organic certified farmers were 3.66 times more likely to select a higher value than conventional farmers, local farmers 2.45 times more likely, and dual-motivated farmers were 4.60 times more likely than conventional farmers to select a higher value. The other significant pair-wise comparison is between dual and local producers. The dual-motivated producers are 1.88 times more likely to select a higher value on the scale than the strictly local producers.

The results show that organic, local, and dual-motivated producers are more likely to believe that people like them can impact their communities in positive ways. Dual-motivated producers had the highest probability ratio when compared to conventional farmers. This indicates that dual-motivated producers have higher self-efficacy than any of the other types of farmers, and especially when compared to conventional farmers. Farmers that are both certified organic and sell their products locally are almost five times as likely as conventional farmers to believe that they can make positive impacts on their communities. The mean value for this question across all farmer types was 5.6, indicating that on average farmers in this study had high self-efficacy.

**Table 7: Question C4: Thinking about the next five years, how do you feel about the future of your farm business? (Alternative farmer types)**

| <b>Pair</b>        | <b>Significance</b> | <b>Probability Ratio</b> |
|--------------------|---------------------|--------------------------|
| Organic to neither | .628                | 1.21                     |
| Local to neither   | .044                | 1.65                     |
| Both to neither    | .000                | 4.74                     |
| Both to local      | .000                | 2.88                     |
| Both to organic    | .001                | 3.92                     |
| Organic to local   | .367                | .73                      |

PLUM analysis on question C4 resulted in 4 significant pair-wise comparisons. Local producers were moderately more optimistic than conventional producers. Dual-motivated producers were nearly five times more likely to be optimistic about their farms in the next five years than conventional farmers. Dual motivated producers were also more likely to be optimistic than local producers (2.88 times more likely) and organic producers (3.92 times more likely). The mean response for this question across all farmers types was 5, indicating that on average the farmers surveyed had relatively high optimism.

Question E1 for alternative farmer types did not produce significant results, indicating that there are not significant differences between how “at home” the four types of farmers feel in their communities. However, there were significant results for this question when analyzed in terms of local sales channel types.

**Table 8: Question E1: In general, would you say you fell “at home” in your community?  
(Local sales channel types)**

| <b>Pair</b>                         | <b>Significance</b> | <b>Probability Ratio</b> |
|-------------------------------------|---------------------|--------------------------|
| No local to local-intermediated     | .004                | 4.30                     |
| Local-direct to local-intermediated | .025                | 3.08                     |
| No local to local-direct            | .253                | 1.40                     |

Question E1 resulted in two significant pair-wise comparisons. Surprisingly, farmers not involved in local sales were 4.30 times more likely to feel more at home in their communities than farmers involved in local-intermediated sales. Farmers involved in local direct sales were 3.08 times as likely to feel more at home in their communities than farmers involved in local intermediated sales. We expected local direct farmers to feel the most at home in their communities, but were surprised by the high scores for conventional farmers. The average score for this question across all farmer types was 5.89, indicating that on average, famers in this study felt very “at home” in their communities”.

*Methods: Question C6: Factor analysis scaling and Univariate ANOVA*

In order to answer the question “How do motivations and goals compare between types of farmers?” I analyzed farmer responses to a question in which farmers ranked eleven different motivations or goals. Since this question is formatted differently, it required a more complex method of analysis. I used factor analysis scaling to initially group the various motivations and later, post-hoc results from univariate analysis of variance (ANOVA) tests to understand the likelihood of farmers for ranking those groups as more important to them. Question C6 asked farmers to rank the importance of a number of different factors from not important to extremely important. For simplicity of comparisons of responses by farmer type, the 11 different factors were scaled using factor analysis. Factor analysis essentially allows for data reduction by uncovering unobservable variables. In conducting the factor analysis, I used varimax rotation, which is used when each variable has few large loadings (matches up very well with few factors,

or only one factor) and many small loadings (does not match up well with most factors). I used a scree plot to visually determine that the 11 factors could best be reduced to 4 categories.

The determined categories and their associated factors are shown below in Table 9. These categories are motivations related to: income, farm, personal responsibility and stewardship, and promotion of a healthy and sustainable local food system. The category of income has to do with farmers being motivated by profit maximization and economic viability. The category of farm is associated with farmer interests in farming as a way of life for themselves and their families. The third category contains factors associated with personal responsibility and stewardship. The final category is motivations related to promoting a sustainable food system.

I ran a reliability analysis that produced Cronbach's alpha values to investigate the internal consistency of each category. Cronbach's alpha is a measure used to understand how closely variables in a group scale together. A value of 0.7 or higher generally indicates that the category is considered to have high internal consistency. The four Cronbach's alpha values for the motivation categories are at .65 or above. Grouping the motivation factors into four categories (as opposed to 3 or 5) yielded the highest Cronbach's alpha scores for each category. The category personal responsibility and stewardship had the lowest internal consistency as compared to the other groups, likely because it included four factors instead of two that covered a variety of internal motivations. I gave farmers scores for each of the four categories by summing their values for the factors belonging to each category. This resulted in each farmer having one score for each of the four motivation categories.

Once the categories of motivations had been created and the farmers had scores for each motivation category, I were able to compare farmer responses using post-hoc results from univariate analysis of variance (ANOVA) tests. I ran ANOVAs on each of the four motivation categories. ANOVA allowed for direct comparison between the farmer types. The extracted values used for analysis were the mean differences in scores for pair-wise comparisons. For example, in comparing farmer type A to B for income as a motivation, if the difference in means is 1.5, this indicates that on average farmers in group A scored the factors related to income as 1.5 points higher total as compared to group B.



*Results: Question C6: Factor Analysis and ANOVA*

**Table 9: Categorization of motivation factors**

| Category         | Income                                                                | Farm                                                                                                                     | Personal responsibility and stewardship                                                                                       | Sustainable food system                                                            |
|------------------|-----------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| Cronbach's alpha | 0.74                                                                  | 0.69                                                                                                                     | 0.65                                                                                                                          | 0.91                                                                               |
| Factors          | A: maximize net farm income<br>B: ensure household income is adequate | C: desire to keep living on the farm<br>D: fulfill my desire to be a farmer<br>E: desire to keep this farm in the family | F: fill spiritual needs<br>G: spend more time with family<br>H: being a good steward of the land<br>I: increase self-reliance | J: contribute to a sustainable food system<br>K: provide good food to my community |

There were not significant differences between how important the four types of farmers ranked financial factors, indicating that they are all motivated to a similar extent by income.

**Table 10: Question C6: Motivated by farm factors (alternative farmer types)**

| Pair    |         | Significance | Mean Difference in score (A-B) |
|---------|---------|--------------|--------------------------------|
| A       | B       |              |                                |
| organic | neither | .033         | 1.24                           |
| local   | neither | .857         | -.07                           |
| both    | neither | .222         | .57                            |
| both    | local   | .087         | .64                            |
| both    | organic | .246         | -.67                           |
| organic | local   | .010         | 1.31                           |

In the farm motivation category, on average, organic farmers scored this category as a little over 1 point higher than both conventional (1.24) and local (1.31) farmers. There were not

significant differences between any other pairs. This value indicates that on average, organic farmers rank farming as a lifestyle as well as a livelihood as more important to them than local or conventional farmers.

**Table 11: Question C6: Motivated by personal responsibility and stewardship factors (alternative farmer types)**

| Pair    |         | Significance | Mean Difference in score (A-B) |
|---------|---------|--------------|--------------------------------|
| A       | B       |              |                                |
| organic | neither | .003         | 1.90                           |
| local   | neither | .020         | .95                            |
| both    | neither | .004         | 1.44                           |
| both    | local   | .212         | .49                            |
| both    | organic | .460         | -.47                           |
| organic | local   | .088         | .96                            |

For the personal category, organic, local, and dual-motivated producers all scored these motivations as more important to them than conventional farmers. On average, organic farmers gave these factors a total of 1.90 points higher than conventional farmers, indicating that they are more motivated by factors such as spirituality and stewardship than conventional farmers. Local farmers scored this sum about one point higher than conventional farmers, and the dual-motivated producers scored the personal category as 1.44 points higher than conventional farmers.

**Table 12: Question C6: Motivated to promote a sustainable food system (alternative farmer types)**

| Pair    |         | Significance | Mean Difference in score (A-B) |
|---------|---------|--------------|--------------------------------|
| A       | B       |              |                                |
| organic | neither | .007         | 1.26                           |
| local   | neither | .000         | 1.35                           |
| both    | neither | .000         | 2.17                           |
| both    | local   | .006         | .83                            |
| both    | organic | .050         | .91                            |
| organic | local   | .838         | -.08                           |

As was expected, organic, local, and dual-motivated producers ranked this category as more important to them than the conventional farmers did. As compared to conventional farmers, organic farmers scored the sustainable food system promotion category as 1.26 points higher on average, and local farmers scored it as 1.35 points higher. The dual-motivated producers scored this category the highest compared to the other three groups, scoring it an average of 2.17 points higher than conventional farmers. There were also significant results for pair-wise comparisons between the dual-motivated producers and the local or organic producers. Dual-motivated producers rated this category as .83 points higher than local producers and .91 points higher than organic producers. Between local and organic producers there were not significant differences.

**Table 13: Question C6: Motivated by income factors (local sales channel types)**

| Pair                |                     | Significance | Mean Difference in score (A-B) |
|---------------------|---------------------|--------------|--------------------------------|
| A                   | B                   |              |                                |
| local direct        | neither             | .000         | -1.22                          |
| local direct        | local intermediated | .141         | -.70                           |
| local intermediated | neither             | .274         | -.52                           |

There were significant differences between how the local-direct and conventional farmers ranked the factors related to finances/profit maximization. Local-direct farmers scored an average of 1.22 points less than conventional farmers, indicating that they are significantly less motivated by financial factors than farmers that are not involved in local sales.

**Table 14: Question C6: Motivated by farm factors (local sales channel types)**

| Pair                |                     | Significance | Mean Difference in score (A-B) |
|---------------------|---------------------|--------------|--------------------------------|
| A                   | B                   |              |                                |
| local direct        | neither             | .133         | -.62                           |
| local direct        | local intermediated | .176         | 1.04                           |
| local intermediated | neither             | .030         | -1.67                          |

The only significant result for the farm motivation category was surprising: local-intermediated farmers scored this category as 1.67 points less important than conventional farmers, indicating that they are less motivated by their personal desire to farm and keep farming as a lifestyle than conventional farmers are.

There were no significant results between local sales channel types for motivations related to income or promotion of a sustainable food system.

## **Discussion**

### *Demographics*

Demographic data results were not always consistent with USDA 2012 census data. According to the USDA census, 16% of conventional US farmers are female whereas 18% of organic farmers are female, indicating that organic farms are more likely to be operated by women than conventional farms are. Our demographics show the opposite result, with approximately 24% of the organic farmers being female and 39% of the conventional farmers being female. In the study mentioned earlier on organic farmer demographics and motivations, Leslie Duram found that organic farmers tended to be more educated than conventional farmers. They also tended to have significantly less on-farm experience and were more likely to be female

than conventional farmers (2005). My results are not consistent with those of Duram. In my analysis, I found conventional farmers to be more educated (52% bachelor's degree or above) as compared to organic farmers (35%), and less likely to be female. Organic farmers in the dataset did however have less total years of experience as compared to conventional.

USDA census data shows that organic farmers tend to be younger at an average of 53 years old as compared to the national average of 58 (USDA, 2012). This was consistent with the dataset, with organic farmers being on average 7 years younger than conventional farmers. There were differences between organic and local farmers, but the most significant differences between the types were between the dual-motivated producers and the other three types.

Dual-motivated producers tend to be younger compared to the other types, and their average for the dataset is nearly ten years younger than conventional farmers (48% compared to 58%). Dual-motivated producers also have the highest representation of women, with 50% of the farm operators identifying as female. Nearly three-quarters (73.8%) of the dual-motivated producers hold at least a bachelor's degree. Dual-motivated producers tend to be the most educated in terms of formal university education. The next highest group was local producers, at 58.8% with a bachelor's degree or above.

Dual-motivated producers also tend to not be multi-generation farmers as compared to conventional or organic farmers. In our dataset, 74% of the organic farmers are multi-generation farmers, as compared to only 29% of dual-motivated producers. We cannot draw any correlations between multi-generation and likelihood to use organic practices or local sales channels.

The most frequent response to "proportion of total household income that comes from farm business" for dual-motivated producers was 76-100%, which was also the most frequent response for both organic and conventional producers. Farmers involved in local sales most frequently selected 0-10% of their total income as generated through farming. These farmers can be considered hobby farmers, and tend to be well-educated individuals or families that farm for secondary income, or for recreation. Farms involved in local sales tend to be smaller and are more likely to be headed by female operators as compared to farms that do not sell their products locally. This finding is consistent with our understanding of who seeks out local sales opportunities and markets such as CSAs and farmers' markets: younger, more female, and more

educated farmers that are not farming specifically for income, but instead for some other motivation, often related to civic agriculture or personal desire to become a farmer.

Dual-motivated producers have spent the least amount of time farming, indicating that they are relatively new to the profession when compared to conventional farmers, who have spent on average almost twice as long in the profession (15.3 years as compared to 28.6 years). However, the dual-motivated producers are not considered, on average, beginning farmers, as the USDA classifies a beginning farmer as 10 years experience or less. Newer farmers are more likely to take up organic certification practices and local sales as compared to farmers who have been farming for longer periods of time, and this is consistent with the relatively new existence of programs that support beginning farmers in alternative agriculture.

Demographics related to local channels had less significant results, but some are still worth mentioning. Local farms (both direct and indirect) tended to be significantly smaller than farms not involved in local sales (20 acres, 40 acres, 226 acres respectively). Local-direct farmers are much more likely to be female than either local-intermediated or non-local farmers. Local-direct farmers also tend to be the highest educated in terms of university degrees. These demographics are consistent with other studies on local-direct farmers. Local-direct farmers most frequently recorded 0-10% as the proportion of total household income that comes from their farm business. This type also had the highest rate of women as farm operators. It is likely that the local-direct farmers farm either as a secondary source of income for their families, or as a hobby. Local-intermediated farmers and non-local farmers most frequently recorded 76-100% of their income to come from their farm business and were also more likely to be male than local-direct farmers. Again, these results match with the current research on those involved in local-direct sales: producers who sell direct to consumers are more likely to be involved in agriculture as a secondary method of producing household income.

Farmers not involved in local sales are much more likely to be multi-generation farmers. This result could potentially be related to the location of the multi-generational farms prohibiting the use of local sales channels, but because these farms are all located in the RUI, this is unlikely. It is more likely that newer farmers (with smaller farms) are more likely to seek out direct-to-consumer sales opportunities than multi-generational farmers with larger farms.

### *Question responses*

For comparisons across alternative farmer types, two of the three questions produced significant results using PLUM. Question E3: Overall, how much impact do you think people like you can have in making your community a better place to live? and question C4: Thinking about the next 5 years, how do you feel about the future of your farm business? My hypotheses for both questions proved correct, as alternative producers (and especially dual-motivated producers) scored consistently higher for levels of self-efficacy and levels of optimism.

For question E3, organic, local, and dual-motivated producers all had significantly higher responses than those of conventional farmers. The most significant difference was between dual-motivated and conventional producers, with dual-motivated producers being nearly five times as likely to select a higher value than conventional farmers, meaning that dual-motivated producers have much higher self-efficacy towards their communities. Dual-motivated producers were also more likely than local producers to rank their self-efficacy as higher. Dual-motivated producers are both certified organic and involved in selling their products locally, and these two practices are more likely to be taken up by people interested in promoting the health and well-being of their communities and their landscapes. The responses of dual-motivated producers to this question are important in creating programs for farmers that allow them to interact with and improve their communities. Self-efficacy is a critical component to success in community development, and it seems that dual-motivated producers are not lacking in it. Dual-motivated producers have this belief that they can create positive changes in their communities and by providing them the tools necessary to actually initiate those changes, results could be monumental towards creating healthier and more sustainable communities.

The second question that produced significant results was question C4: thinking about the next five years, how do you feel about the future of your farm business? Again, dual-motivated producers scored much higher for this question than the three other types. Dual-motivated producers were almost five times more likely to feel optimistic than conventional farmers, four times more likely than local farmers, and three times more likely than organic farmers. Dual-motivated producers were newer to the profession as compared to other types, and less likely to be multi-generation farmers, both of which could impact levels of optimism.

As described in the beginning of this paper, there are extremely high growth projections for both local and organic agricultural markets. With such positive projections for both local and

organic markets, it is no wonder that dual-motivated producers are optimistic about their farms in the next five years.

My hypothesis regarding feelings of belongingness to community was not proven correct. I hypothesized that alternative producers would respond as feeling more at home in their communities as compared to conventional farmers, and this was not the case. Question E1 (how “at home” do you feel in your community?) did not produce significant results, indicating that type of alternative farmer does not necessarily dictate how at home they feel in their communities. All four types of farmers had an average of at least 15 years of farming experience. Feelings of “at home” in a community may be more related to number of years spent in that community farming, and with all of the farmer types indicating a long period of time spent farming, it is likely that perspectives of community are indeed more related to time spent farming in a community as opposed to type of agricultural production or sales channel.

Questions E1 and C4 were not significant for local sales channel types. However, question E1 did produce significant results. It should be noted that the local-intermediated type only had 18 samples, which could impact the significance of my results. It was surprising to me to find that farmers not involved in local sales were more than four times as likely to feel at home in their communities as compared to local-intermediated farmers. I attribute this result to the conventional farmers having a rate of multi-generational farmers of nearly twice that of the local-intermediated farmers. Having a family-owned farm that has been passed down to the current farmer would likely make that current farmer feel “at home” in their community, as opposed to farmers who are not multi-generational. The pair-wise comparison of local-direct to local-intermediated farmers also produced significant results, with local-direct farmers being three times more likely to feel “at home” in their communities. This result was consistent with my hypothesis, as I expected farmers that sell directly to consumers through channels such as CSAs or farmers’ markets to feel more involved and thus at home in their communities as compared to farmers that sell their products to distributors or institutions.

Question C6 (motivations) produced both expected and unexpected results. The results related to the income category disproved our hypothesis of conventional farmers being significantly more motivated by income/profit as compared to alternative farmers. There were no significant differences between how farmers ranked financial factors. I speculate that there were not significant differences because all farmers are profit-maximizers. Whether or not they



produce using organic practices or local sales channels, in order to sustain viable farms, all farmers in the dataset have to be motivated in some part by financial factors.

There were however significant results for the category containing farm factors such as desire to keep living on the farm, desire to be a farmer, and desire to keep this farm in the family. Organic farmers scored these factors as more important to them as compared to both conventional and local farmers. I speculate that organic farmers rank this category as particularly high because they enjoy farming as a lifestyle, and have a sense of purpose in their organic farming. Many studies have found that conventional farmers who convert to organic practices do so for reasons related to farmworker/family health, and protection of their land. It would make sense that farmers who are dedicated to sustaining farms that are healthy and safe for them and their families would have stronger desires to continue farming, and to pass their farms down to their children.

The responses to motivations related to promotion of a sustainable food system were as to be expected; organic, local, and dual-motivated producers all ranked these factors to be significantly more important to them than conventional farmers. Dual-motivated producers scored this category as the most important as compared to the other farmer types. This was expected, as research has shown that farmers involved in either organic production or local sales are more concerned with developing local food systems that provide healthy food to their communities than conventional farmers, thus it would make sense for dual-motivated producers to be the most concerned with their contributions to a sustainable food system.

Two motivation categories were significant between local sales channels. Local-direct farmers were significantly less likely to be motivated by financial factors than farmers not involved in local sales. Various demographic categories provide support for this finding; local-direct producers farm much smaller areas of land, have spent fewer years farming, and rely significantly less on their farming activities for income as compared to farmers that do not sell their products as local. These factors all contribute to the local-direct farmers being less motivated by profit or finances. I speculate that the farmers in this study involved in local-direct sales are likely to be hobby farmers, as only 0-10% of their income comes from farming, and thus they are motivated to farm and sell locally for reasons other than financial.

For motivations related to farm factors, non-local farmers were more likely to be motivated by factors such as a desire to farm or desire to keep their farms in their families as

compared to local-intermediated farmers. This result should not be analyzed extensively, as the sample size for local-intermediated farmers was quite small (n=18), but I assume that this result is related to the non-local farmer type having comparatively very high rates of multi-generation farms and much larger farms.

### **Potential issues**

There are a few caveats to this dataset and methods of analysis that should be noted. The dataset represents a specific set of farmers and is heavily weighted toward those involved in alternative agriculture practices, as well as female, minority, beginning, and younger farmers. This dataset should not be assumed as representative of national data for alternative farmers. Farmers self-identified as involved in organic sales, and we did not record data for what percent of their products are certified organic, or for how long their farms had been certified as such. Farmers also self-identified as local, and were not given a definition for “local”. They were given specific examples for involvement in local-direct sales as compared to local-intermediated sales, but without any standard definition or certification for farmers to follow, their definitions of selling products as local may vary widely.

### **Conclusion**

Alternative practices and markets will continue to provide opportunities for agriculture to remain economically viable at the RUI. As interest grows in organic and local food consumption, we need to understand the motivations and characteristics of the farmers operating in these spaces in order to provide specialized and effective support programs for them. This research gives us some insight to how alternative farmers are motivated, how much change they believe they can affect in their communities, and how optimistic they are. The results of my research question asking how motivations and goals compare across farmer types are not surprising, although my hypothesis that alternative producers are less motivated by finances than conventional farmers proved to be idealistic. All farmer types ranked financial factors as relatively equally important. However, dual-motivated producers and local-direct producers ranked factors related to the promotion of a sustainable food system as exceptionally high. While it is important to continue supporting these dual-motivated and local-direct farmers in their efforts towards creating local and healthy sustainable food systems, it is also critical that there

are programs that support the farmers that did not rank these factors as high. Creative policies might influence all farmers to pursue practices that support a sustainable food system, regardless of farmer attitudes towards creating that system.

The results for my second question related to levels of optimism were also not surprising. Dual-motivated producers responded as extremely optimistic compared to the other farmer types, and I attribute this high optimism to 1) recent growth in alternative agriculture and growth projections for both organic markets and direct-to-consumer sales, and 2) qualities of the RUI that make alternative agriculture particularly attractive as compared to conventional agriculture, such as high land costs and access to urban markets.

Finally, my question related to levels of self-efficacy and feelings of belongingness was not fully answered. I found that alternative agricultural practices did not have a significant effect on feelings of community belongingness, and suspect that this question is more related to whether or not farmers are multi-generational, and how many years they have spent in their communities. Dual-motivated producers showed extremely high self-efficacy, showing that they believe that they can have large positive impacts on their communities. In developing programs and policies towards the creation of alternative food systems that provide healthy food to communities, it is important that policy-makers leverage this self-efficacy, as making positive changes in our communities starts with believing that we can do so.

Currently there are some policies and programs enacted at federal, state, and county levels to support alternative agriculture. Programs such as the Beginning Farmer and Rancher Development program help new farmers by providing grants, education, and technical assistance. The Know Your Farmer, Know Your Food program helps support the development of local food systems by linking local farmers to consumers and increasing education about and access to local foods. However, the majority of programs still primarily focus on conventional agricultural practices and markets.

Our farming population is aging, and many of our current farmers are expected to retire in the next decade. Ten years from now, US agriculture will be dependent on many of the farmers that have either just entered the occupation, or are currently starting. To support civic agriculture, community food security, and an environmentally and economically sustainable food system, policy-makers should couple programs for beginning farmers with technical assistance tailored specifically for alternative practices and sales channels.

At the RUI, where farmers face unique and significant pressures such as high cost of land, increased regulations, and urban sprawl, alternative agricultural practices and sales make sense. Organic production is a form of value-added agriculture, which helps farmers to stay in business even with extremely high land prices. Positioning at the RUI allows farmers to engage in local-direct sales, such as CSAs and farmers markets, that help make farming economically viable for small farmers. As the face of agriculture continues to shift towards more organic production and local marketing, it is critical that policies are created to protect vulnerable alternative farmers operating at the RUI. Protecting farmers at the RUI is protecting our nation's future of agriculture.

Potential ways to support farmers involved in alternative agriculture at the RUI include; tax incentives for sustainable agriculture practices, tax breaks for agricultural operations at the RUI, loan forgiveness for farmers (especially since alternative farmers tend to be very highly educated, and thus likely to have debt), technical assistance from agricultural extension workers that specialize in and promote alternative practices, increased accessibility to farm and farmworker insurance, and farm conservation programs. These are just a few policies that could be used to protect alternative farmers at the RUI, and thus lead us towards a more sustainable food system. While many of these programs and policies are focused on the external factors that affect farmers at the RUI, there are few that address the internal factors of farmers. This research demonstrates that internal factors play a critical role in farmer motivations, decision-making, and perspectives. Future research may look at the ways in which individuals, communities, and governments can support and leverage the high levels of self-efficacy of dual-motivated producers at the RUI.

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