

# Theme Overview: The Linkages between Entrepreneurship and Sustainable Regional Food Networks

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*JEL Classifications: Q10, Q13, Q18, Q56, R11, O13*

*Keywords: Food system, Regional food networks, Resilience, Entrepreneurship, Public Policy*

Entrepreneurship has been the key driving force in developing and designing innovative food strategies at local and regional levels. Food strategies include methods and procedures of production, aggregation, distribution, transportation, marketing, and resource management. The three pillars of creating and establishing a successful venture involve entrepreneurial mindsets/attributes, entrepreneurial knowledge/skills, and entrepreneurial opportunities. The links between entrepreneurship and food strategies become more obvious in the recent “local food” movement as local farmers and producers develop and adopt innovative methods to connect with consumers. The local-to-regional food strategies emerging across the country have stimulated discussions around the social, economic, and ecological impacts of food production and consumption.

Proponents of both global and regional/local scales argue about their relative benefits for market development and food security. The fact is that we need to feed a growing population with healthy food. More importantly, the priority of agriculture has evolved beyond the focus of production. Some suggest that local/regional production and marketing can enhance food security and quality of life (Allen, 1999; Campbell, 2004; Martinez, 2010). Others argue that our dependence on the commodity food system may, in fact, undermine food security and the ability of regions to provide for themselves (Pothukuchi and Kauffman, 2000; Chappell, 2011).

In a new era of designing and developing creative solutions, the concept of regional food networks (RFNs) offers a broader interdisciplinary theme relative to food systems. A food system involves resources, decisions, actions, and outcomes from production to management and marketing. A food network, in contrast, emphasizes the various levels, types, and attributes of relationships between actors within and across food systems interacting with one another. It is essential to understand and capitalize on relationship quality in the process of discussing policies to improve, support, and enhance the services and functions of sustainable RFNs.

This collection of articles discusses findings from a project funded by the U.S. Department of Agriculture under National Institute for Food and Agriculture grant 2014-68006. Our primary focus is to explore, identify, and

## Articles in this theme:

- **Can Regional Food Networks and Entrepreneurial Strategies Enhance Food System Resilience?**  
*Sally Duncan, Christy Anderson Brekken, Sue Lurie, Rob Fiegenger, Seth Sherry, and Chyi-Iyi (Kathleen) Liang*
- **Linking Regional Food Networks to Ecological Resilience**  
*Christy Anderson Brekken, Rob Fiegenger, and Sally Duncan*
- **The Support Ecosystem for Regional Food Network Entrepreneurship**  
*Thomas S. Lyons and Michael Lee*
- **Farm Incubators - Creating Entrepreneurial Relationships to Support Prosperous Food Networks**  
*Kathleen Liang*

examine how entrepreneurship influences the process of designing and implementing innovative strategies to support farming and communities. The article by Duncan et al. discusses the potential impacts of the “local food” movement on the economic, social, and environmental benefits gained through integrated RFNs. There are nested scales within the RFNs with respect to social, economic, and ecological connections to foster entrepreneurial opportunities between producers and consumers. The authors hypothesize that policies targeted to support various scales of production and consumption should significantly strengthen both RFNs and long-term food security.

Brekken, Fiegenger, and Duncan provide a framework to further illustrate producer motivations for environmentally sensitive production and how their decisions could improve ecological resilience. Environmental consequences have not been at the forefront of the local food movement. Many existing food policies encourage improvement of farming practices with respect to conservation and resource allocation, but it is not clear how various production and management strategies directly or indirectly relate to sustaining a healthy ecosystem. Through empirical surveys in Oregon, the authors find that farmers who choose ecological farm management practices may be poised to support RFNs. Marketing through RFNs may have strong influences on farm practices, leading to improved regional environmental outcomes by taking advantage of the spatial, temporal, and figurative proximity of food supply chain actors as messages about the environmental impact of food move among producers, consumers, policy makers, and the environment.

A positive and supporting entrepreneurship landscape is one key element to promote and advance successful business ventures. Lyons and Lee examine selected organizations that underpin the support system for entrepreneurship within RFNs. This review of the entrepreneurship landscape offers examples of representative organizations that support agricultural- or food-related entrepreneurial initiatives at various policy levels. The support or services provided to food networks by various organizations might not be explicitly recognizable in communities. Lyons and Lee discuss the types of activities that these supporting organizations undertake, including purposes, objectives, limitations, and policy orientation corresponding to different endeavors.

Finally, Liang shares insights about the importance of creating and sustaining entrepreneurial relationships in RFNs. The ultimate goal of a sustainable RFN is to motivate, support, and enhance collaboration with all participants. Examples of farm incubator programs, in which program participants receive support and guidance to develop and sustain entrepreneurial relationships and co-independent decisions, are offered. Participants in such programs are more likely to be mindful about environmental impacts and conservation practices through training and education programs and to engage in direct marketing through farmers’ markets, community-supported agriculture programs, on-farm markets, and co-operatives.

## For More Information

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# Can Regional Food Networks and Entrepreneurial Strategies Enhance Food System Resilience?

Sally Duncan, Christy Anderson Brekken, Sue Lurie, Rob Fiegener, Seth Sherry, and Chyi-lyi (Kathleen) Liang

*JEL Classifications: Q13, Q18, Q56, R11, O13*

*Keywords: Food system scales, Regional food networks, Resilience, Entrepreneurship, Public Policy*

Viewed in retrospect, one of the more important contributions of the local food movement will arguably be its stimulating effect on new policy dialogue around questions of scale, entrepreneurialism, and resilience—the capacity to withstand and adapt to shocks to the food system such as climate change, geopolitical and economic disruptions, energy and water shortages, and natural disasters (Smith et al., 2016; Puma et al., 2015; Magis, 2010; Wilson, 2010; Ericksen, 2008). The emergence of local food as a player—quirky, questionable, but quite clearly consequential—has driven inquiries and arguments from town squares and university halls to state departments of agriculture and Congress. The scientific and policy dialogue is timely. Food system policy must be examined with an eye to scale and resilience.

We argue that no scale is inherently good or bad. Instead, we hypothesize that with targeted policy support, regional food networks (RFNs) can play a critical role in strengthening food system resilience. We see regions as a useful unit of analysis because agricultural issues tend to be regional issues; “topography, water availability, land and other inputs, farm scale, crop options, and market proximity are operable at the regional level” (Clancy and Ruhf, 2010). RFNs arise through marketing relationships between consumers and producers that are still considered “local” but take on new forms as demand for local food has grown: While direct-to-consumer sales are plateauing, “intermediated” sales to retail, restaurants, institutions, processors, or distributors that are rooted in a region have grown (Low et al., 2015). An “RFN ecology” framework reminds us that food systems are integrated, nested, and networked scales with interactions and responses between and among different levels of food production and their social, economic, institutional, and natural environments. The more scales and interconnections in play, the stronger the underlying system (Meadows, 2008).

We conceive RFNs linking local and national or global scales; from this central role, they can enhance long-term opportunities in ag-related entrepreneurship at diverse production, consumption, and community scales, stimulating new strategies, practices, products, and markets. Diversity is another key attribute of a resilient system (Ericksen, 2008; Meadows, 2008). But rather than focusing only on individual farm entrepreneurship, the New Natural Resource Economy (NNRE) is an economic development framework that recognizes the collective importance of very small, community-focused, multifunctional businesses that create new products and markets with an emphasis on environmental stewardship (Lurie and Brekken, 2017; Hibbard and Lurie, 2013). The NNRE framework integrates economic, social, and environmental impacts with a focus on the small- and midsized-farm sector, which could enhance community development in rural areas.

To date, there has been a lack of systematic research on RFNs, their characteristics, and their scalar linkages and interactions. To fill the gap, we conducted two surveys using convenience sampling, one of Oregon RFN producers ( $N = 193$ ) and another of RFN consumers ( $N = 614$ ), then analyzed results from the rural parts of the state to assess whether RFNs in rural Oregon reflect an NNRE development model (Lurie and Brekken, 2017). Based on our

findings and the literature, we now consider how RFNs contribute to entrepreneurship and innovation, in turn contributing to resilience in the food system across economic, social, and ecological dimensions. We then turn to public policy options for supporting the RFN ecology to enhance food system resilience.

## RFN Ecology: Adaptability, Diversity, and Integrated Nested Scales Foster Entrepreneurship and Food System Resilience

Our overall hypothesis is that more-integrated RFNs will enhance entrepreneurship and innovation through opportunities for adaptation and increased diversity at multiple scales, which will contribute cumulatively to social, ecological, and economic resilience in the food system (Figure 1). RFNs enhance diversity by expanding the range of food marketing options. They present adaptive strategies for small and midsize farm and food businesses as they struggle to compete in the global food system. Small and midsize farms may also be more willing and able than larger operations to adapt their operations to new regional markets (Hibbard and Lurie, 2013; Diamond and Barham, 2011; Lev and Stevenson, 2011; Walker et al., 2004; Lichtenstein and Lyons, 2001).

Figure 1. Connections between RFNs, Entrepreneurship and Innovation, and Resilience

### HYPOTHESIS

*Our overall hypothesis is that more integrated RFNs will improve and enhance long-term opportunities for entrepreneurship and innovation, which will contribute cumulatively to social, ecological, and economic resilience.*



**Integrated Regional Food Network (RFN)** refers to the connectedness of the actors in the RFN; the levels of connection and interaction of people, place, and prosperity with respect to social, economic, and ecological aspects. RFN marketing includes direct to consumer and local/regional intermediated sales to retail, restaurants, institutions, or distributors that maintain regional place of origin.

**Entrepreneurship & Innovation** refers to recognition and creation of new opportunities which stimulate new strategies, new practices, new products, and/or new markets to improve long-term prosperity for individual participants and the entire network. The New Natural Resource Economy (NNRE) economic development strategy focuses on small multifunctional businesses creating new products as a stimulus for entrepreneurship and innovation.

**Resilience** refers to the capacity of a system to absorb disturbance and reorganize while undergoing change so as to retain essentially the same function, structure, identity, and feedbacks. Community resilience that supports broader regional resilience relies on sense of place, access to jobs, affordable food and housing, general health, and ability to rebound after variable economic, social, or ecological shocks.

From the results of our 2016 Oregon RFN consumer survey, we found that consumers define local food at a more regional level: One-third of respondents considered food from within the state to be local, with a majority looking beyond immediate city or county lines (Lurie and Brekken, 2017). RFNs stimulate farm entrepreneurship as farms respond to consumer interest in supporting local farmers and reducing the environmental impact of their food purchases. Oregon RFN consumers indicated a willingness to pay more for Oregon-grown food with environmentally sustainable practices (although environmental attributes were valued more strongly in urban areas), which aligns with the motivations of producers operating in Oregon's RFN who reported personal motivations for using environmentally sustainable production practices while contributing to their local economies and food security. Connecting consumers and producers in RFN markets can create a virtuous cycle that contributes to the economic, social, and environmental resilience of the region (Brekken, Parks, and Lundgren, 2017; Lurie and Brekken, 2017; Liang, 2015).

Looking in particular at rural areas of the state, we found that the RFN has the distinct characteristics of an NNRE strategy for economic development, with highly multifunctional agriculture among farms of multiple scales that seek to strengthen ties with their community and reduce environmental impacts from production. Here, we explore the literature to determine whether this regional NNRE strategy in the food system has the potential to contribute to economic, social, and environmental resilience (Lurie and Brekken, 2017).

### *Economic Resilience in RFNs*

At the farm level, multifunctionality in agriculture generates additional revenue and inherent crop insurance through growing multiple products or offering services for a range of markets, along with expanded market knowledge and improved networking (Liang and Dunn, 2013; Iles and Marsh, 2012; Meter and Rosales, 2001). In our Oregon RFN survey, we found that farmers engaged in economically multifunctional agriculture through RFN participation: Respondents from the rural areas of Oregon on average sold into two RFN marketing channels, but some were highly diversified, selling into four. Furthermore, 40% of RFN survey respondents received over half of their household income from the farm, while the farm was an important source of supplemental income for the other 60%. The RFN also provided opportunities at a variety of scales: Nearly all respondents were very small businesses, but those that employed more than 10 people were also full RFN participants, showing that RFN marketing is not reserved for very small farms (Lurie and Brekken, 2017).

Some economic analysis has found that local food endeavors are economic development drivers, but impacts depend on the structure of local agriculture and the role agriculture currently plays in the economy. Factors such as farm size, farm distribution, commodities produced, types of agriculture, and level of urbanization are key variables (Low et al., 2015; Brown et al., 2013; Martinez et al., 2010). Over time, regionalizing may result in distributed and appropriately scaled infrastructure. The gap between supply and demand for new markets provides an opportunity for entrepreneurs and innovation, bringing new money and skills into the community (Kutzhanova, Lyons, and Lichtenstein, 2009). Diversity generates opportunities for new product development and associated entrepreneurial opportunities in related businesses.

On the downside, change is hard and potentially expensive, especially in the absence of capital backing for innovation (Lichtenstein and Lyons, 2001). Our rural RFN survey respondents ranked costs and time constraints higher than other barriers to RFN marketing (Lurie and Brekken, 2017). Furthermore, larger entities may incorporate “local” purely to increase market share, without regard for community development (Cleveland et al., 2014). Competing with these developments while dealing with the complexity of entering new markets can challenge smaller producers beyond their capacity (Born and Purcell, 2006). Additionally, economic development departments (city, county, etc.) tend to focus on larger scales to provide assistance and resources (Lurie and Brekken, 2017; Hibbard and Lurie, 2013; Walker et al., 2004). Enhancing RFN resilience requires significant leadership coupled with technical and other types of support. Starting at smaller scales and scaling up may be a key to developing appropriate, workable regional governance policies (Candel, 2014).

### *Social Resilience in RFNs*

One outcome of local food is the “gentrification” of the food system, which fails to address the social justice issues of food insecurity. However, recent literature and our 2016 Oregon RFN producer survey found RFN farmers in Oregon’s rural areas were highly motivated to sell into RFN channels to “support local health/food security.” Rural Oregon RFN producers seem to understand that lack of fresh food and food security are problems in rural Oregon. Producer participation in the RFN creates strong social and community connections, enhancing social aspects of community resilience. From the consumers’ perspective, 72% of RFN consumer survey respondents from rural Oregon were motivated to participate in RFNs to “support local farmers,” recognizing the value of farmers in their rural communities (Lurie and Brekken, 2017).

Our survey also found that farmers look to one another for support and advice, although farmers tend to look to others who share their production and marketing views, which can strengthen an RFN if more producers are involved (Brekken, Parks, and Lundgren, 2017; Parks and Brekken, 2018). For producers seeking new entrepreneurial opportunities, regional networks of peer advice and modeling can be important social support mechanisms.

### *Environmental Resilience in RFNs*

Food systems studies commonly collect social and economic data to measure resilience, but only rarely do they measure environmental impacts or ecosystem services. All agricultural systems can use environmental services in unsustainable ways through pesticide and fertilizer pollution, excessive irrigation, soil erosion and loss of organic matter, loss of genetic diversity of crops, loss of habitat, and others. Damage to natural resources is rarely integrated into agricultural product pricing structures (Tillman et al., 2011; Pretty et al., 2006).

RFN marketing, as expressed through an NNRE development strategy, appears to allow producers to mitigate the environmental impacts of agriculture through production practice choices. In our survey of Oregon RFN producers in rural areas, we found strong adoption of environmentally conscious farming practices, with over 53% using organic practices but foregoing certification, 13% organically certified, and conventional growers reporting adoption of other conservation practices (conservation tillage, cover crops, etc.). Nearly 78% were motivated by their environmental values when choosing production practices. RFN marketing, which commands higher prices based on place of origin, can provide operators with the opportunity to cover the costs of environmental practices even when consumers may not be willing to pay more for environmental benefits of alternative production practices or when those benefits are difficult to communicate through marketing.

There is a lack of understanding of environmental impacts for agriculture at all but the coarsest scales and a lack of consensus on the use of integrated metrics. While this understanding is limited, multiple experimental models and frameworks are in construction or testing phases, with the promise that RFNs can support producers who use production practices attuned to restoring land, air, and soils while reducing input costs (Meter and Rosales, 2001; Boody et al., 2005; Sandhu et al., 2008; Iles and Marsh, 2012). The reduction of overall scale is typically helpful to the process of modeling outcomes across the landscape and can help generate policies and associated metrics for assessing local or regional environmental impacts and progress.

### *Enhancing Resilience through Policies Supporting RFNs*

The concept of scale is an obvious foundation for policy dialogue, but it is freighted with many unchallenged assumptions: selected social and economic values, conflation of scale with desired outcomes, efficiency regardless of ecological impacts, political boundaries or distances as the definition of scale. To avert disappearing into the weeds, scale can more usefully be framed as socially produced, both fluid and fixed, and fundamentally relational (see Hinrichs, 2016). Attention to scale is useful in achieving many different goals (Born and Purcell, 2006; Puma et al., 2015). Significantly, recent research has concluded that policy makers need to be sensitive to variation in rural context, as a region's proximity to a variety of other resources has direct and indirect effects on its development potential (Van Berkel and Verburg, 2011). Such findings point to the importance of nested scales across production, consumption, *and* policy making.

### *Federal Food System Policy*

Agricultural policy in the United States supports a narrow range of commodity crops. Coupled with market and technological changes, this policy stance contributes to the decreasing number of agricultural producers, particularly midsize diversified operations, associated regional infrastructure, and rural economies. These trends undermine resilience over time and across space (Boody et al., 2005). Furthermore, agriculture in its current state is a major contributor to environmental damage. Although the federal conservation programs and organic certification are available, they remain voluntary programs and do not systematically address the negative externalities that result from large-scale monoculture-production systems. One effect of such commodity-focused subsidies is policy path dependency, whereby institutions and policies accrue increasing returns for continuing down a certain path and, in so doing, make alternative choices costly, thereby becoming self-reinforcing (Iles and Marsh, 2012).

The value of “smaller and closer” has effectively been brought to the fore by the local food movement and is raising important questions for policy makers. Recent small adjustments in the Farm Bill promise some support for smaller-scale farm operations. Some of the 2014 provisions directed toward farmers markets and marketing support have greatly expanded their previous budgets, but their share of the overall bill remains in the very low single digits (Low et al., 2015). A provision to establish the data infrastructure to evaluate the effects of the

changes on local food systems would be more promising if mandatory funding had been assigned. Farmers markets and direct farm marketers are now eligible to accept Supplemental Nutrition Assistance Program (SNAP) benefits as a form of payment, directly benefiting consumers and local food producers (USDA-FNS, 2017). These sorts of adjustments may chiefly indicate the slow pace and limited scope at which federal policy change can be expected, although advocates continue to work toward systemic long-term changes.

### *Regional, State and Local Food System Policy*

At the state level, policy supports that target cottage food laws, agritourism, small-scale meat processing, the expansion of farmers' markets and farm-to-school programs, and some attention to urban agriculture are emerging across the country (Brekken et al., 2016; Low et al., 2015; Iles and Marsh, 2012). These laws take the form of funding support or deregulating some small and local food system activities.

Recognizing that the food system has significant impacts—such as on the local economy, jobs, transportation, the environment, health, and waste disposal—food system planning saw dramatic growth in the early twenty-first century. Currently, many local food system planning efforts lack balanced coordination to include stakeholders across sectors, organizations, and residents. There is a growing trend for states, cities, and counties to incorporate food systems into comprehensive and environmental planning, using land use and other regulatory tools such as permitting, licensing, and monitoring from production through processing to consumption and disposal (Brekken et al., 2016; Low et al., 2015; Neuner, Kelly, and Raja, 2011). The movement has included the development of a variety of food system assessment tools, which range from assessing the productive capacity of surrounding lands to multidimensional, qualitative, and quantitative evaluation of food systems across social, economic, and ecological dimensions (Thilmany et al., March 2016; Freedgood, Pierce-Quiñonez, and Meter, 2011). The latter approach is expensive and complex; its power as a tool for dialogue about resilience, however, is significant.

### *Economic Development Policy*

Community resilience that supports broader regional resilience relies on sense of place, access to jobs, affordable food and housing, general health, and ability to rebound after economic, climatic, or ecological shocks. The global scale of production has overwhelmed connections between food and regional resources, and it is clear that “ag of the middle” (Lyson, Stevenson and Welsh, 2008)—small and midsize farms that are the classic supporters of RFNs—is in critical decline. Recent multifunctional farm studies (Liang, 2011; Liang and Su, 2013; Liang, 2012) suggest that entrepreneurial farmers are able and willing to create new opportunities by introducing innovative products and markets and adapting new technologies. Further study on the importance of matching production and consumption scales for regional economic development could help us better understand the structural and policy requirements to support such a shift.

The business development concept of “clusters,” or geographic concentrations of interconnected companies, may offer value to food system and resilience planning (Beckie et al., 2012; Rodriguez-Clare, 2007; Born and Purcell, 2006). Farmers' inability to move their “factories” to more advantageous locations provides a strong motivator for cluster development, but historical trends away from regional infrastructure—from grain milling to slaughter facilities—are widespread (EcoTrust, 2015). Business development loans or other strategic support identified through planning and market analysis could promote strategic clustering to alleviate the infrastructure gap, particularly for “ag of the middle” producers with significant product volume or products that require further processing. Cluster development has been connected to upscaling of alternative food networks and stronger roles for regional networks in international business (McAdam et al., 2016; Gellynck, Vermeire, and Viaene, 2007).

Food hub development—and other forms of values-based supply chains—also appears to support the resilience potential of RFNs. A food hub is generally defined as “a business or organization that actively manages the aggregation, distribution, and marketing of source-identified food products primarily from local and regional producers to strengthen their ability to satisfy wholesale, retail, and institutional demand” (Barham et al., 2012). Well-organized, knowledgeable, and adaptable technical help; adequate financing; and a strong umbrella organization are important to but not always available in communities; supplying these needs is deserving of the attention of regional and community planners and economic development offices (Cleveland et al., 2014; Pirog et al., 2014).

Significant untapped market opportunities at the regional level provide potential to expand and diversify RFNs, particularly in wholesale markets that maintain the place-of-origin identity of the food. A classic example is the trend in institutional buying (among schools, hospitals, prisons, universities, etc.) toward sourcing locally or regionally. However, smaller enterprises, particularly in rural areas, face multiple barriers to market entry (Hibbard and Lurie, 2013), including the ability to supply adequate and consistent volume across seasons. However, this challenge suggests that both suppliers and buyers may need to update expectations, procurement, and marketing strategies to accommodate new and seasonal products (Cleveland et al., 2014). Our Oregon RFN survey results from rural areas showed that these market channels are already in use but are not as developed as direct marketing: A majority of respondents use local retail and restaurants as a marketing channel, but this accounts for only 23% of farm income on average; only 29% of respondents sold to local or regional distributors, and 11% sold to institutions (Lurie and Brekken, 2017). Regional planning and policy adaptations could provide support in these areas.

If resilience across many variables and geographies is to become a serious goal, policy discussions must address the strengths to be found in the links between scales, away from the half-century focus on economies of scale that have historically eliminated many productive choices in the “smaller and closer” arena. RFNs can provide strong support to such links between nested scales.

## Summary

Thinking in terms of “RFN ecology” may be a helpful framework for creating food system resilience: integrating nested and networked scales with interactions between and among levels of food production and their social, economic, institutional, and natural environments. RFNs occupy the fertile middle ground between purely local production, distribution, and demand and prevailing national and international markets. Creating and sustaining robust, resilient RFNs and communities is complicated due to interconnecting scales and the immense variability across regions, including climate, soils, land use policies, sociopolitical culture, and organizational, leadership, and marketing proficiencies. State and local policies can be attuned to regional conditions, which is where we see more policy support at present.

Just as the elements in a healthy, diverse ecosystem support one another, RFNs need to exhibit mutually supportive structures and interactions to provide optimum diversity and concomitant resilience. The complexities of integrating networked scales across many community attributes suggests the importance of adaptability and begs for further public policy support. The path dependency phenomenon noted above has a proven history of helping larger producers; no data suggest it would fail to do so at the regional level. A policy commitment to RFNs at multiple scales can provide the institutional support necessary to increase returns to RFNs and creating self-reinforcing food security.

The local food concept continues to carry significant influence in the marketplace, defying its tiny share of the total food market. In this emerging discussion, “local” can still be defined as anything from next door to state boundaries, and “local” by any definition clearly cannot address food needs on a national basis. But far from dismissing the local food movement, these facts simply suggest that its ideas, practices, and consequences—intended and unintended—remain in the nascent stages of development. Vigorous debates will continue.

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# Linking Regional Food Networks to Ecological Resilience

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*JEL Classifications: Q13, Q15, Q56, R11, O13*

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While the agricultural practices used to create the food we eat depend on natural systems, they are also key drivers of many pressing environmental threats (Foley et al., 2011). Consumers and policy makers attempt to influence the environmental impacts of food production through food labeling programs, local food sales, or payments for conservation practices, but each of these options has limited ability to provide systematic improvements to production agriculture's ecological impacts (e.g., Tuck et al., 2014; Batáry et al., 2011; King et al., 2010; Weber and Matthews, 2008; Born and Purcell, 2006; Bengtsson, Ahnström, and Weibull, 2005; Pirog et al., 2001). A fuller understanding of producers' motivations for environmentally sensitive production practices and the structural dynamics of the food system suggest other policy approaches for improving agriculture's environmental impact. Ensuring global food security will require a reimagined food system that is more sustainable and resilient.

Recognizing that scale is a key structural aspect of the food system, we focus on regional food production and consumption to consider both ecological and food security concerns (Clancy and Ruhf, 2010). Regional food networks (RFNs) comprise local and mid-size food systems that encompass a larger land base, broader natural resources, more diverse production capacity, and larger markets than local food systems. RFNs are defined by fixed, region-specific characteristics such as soil types, climate conditions, and water availability. Primary food products typically flow through processing facilities that operate at a regional scale with a fixed location and capital expenditure and that interact with global and national markets through imports and exports (Clancy and Ruhf, 2010). While consumer interest in "local" food has grown in recent decades, direct sales to consumers have recently plateaued in the United States and more "local" food moves through retail outlets, distributed through intermediated regional marketing channels (Low et al., 2015). For both producers and consumers, volume, variety, supply chains, and markets may make "regional" an advantageous scale for enhancing food security and mitigating the environmental impacts of agriculture.

To understand the connection between producers' participation in RFNs and environmental outcomes, we construct a framework based on marketing theory to identify five characteristics that influence the environmental impact of production agriculture: ownership and control, personal values and social embeddedness, entrepreneurship and multifunctionality, scale, and spatial and temporal distribution. We use this framework to analyze results from our 2016 Oregon RFN producer survey ( $N = 193$ ) and consumer survey ( $N = 614$ ), which probed RFN participants' environmental motivations and practices (Brekken, Parks, and Lundgren, 2017). We conducted both surveys using convenience samples due to practical limitations in reaching RFN participants. In addition, interviews with producers along Oregon's Willamette Valley, a survey and interviews of multifunctional Vermont farmers, and the established literature inform our analysis (Parks and Brekken, 2018; Brown, 2016). Although the results cannot be generalized to the entire population of Oregon or U.S. producers and consumers, the surveys and interviews provide a window into the RFN and multifunctional farm sector. We conclude that marketing through RFNs has an influence on ecological farm practices, while farmers who choose ecological farm practices may be uniquely situated to participate in RFNs. Policy that supports RFN development and the farms that participate in RFNs can support ecological resilience in the food system.

## Regional Food Networks and Environmental Outcomes

Food system outcomes arise from the relationships between food supply chain actors. Producers, processors, wholesalers, retailers, marketers, and consumers communicate through supply and demand signals regarding food quality, quantity, and other attributes. Other actors—government regulators, input providers, investors, advocacy groups, universities, and transportation services—interact with the supply chain through the market and public policy. The natural environment—including soil, water, and weather—is an active member of the system, responding to farming practices via natural processes and reflecting impacts through feedback loops. The signals run in all directions and are influenced by the forces acting on each system actor through their relationships in the supply chain.

Agricultural producers are directly connected to environmental outcomes through their choice of production practices, which are influenced by policy and market conditions. Our empirical work suggests that the farmers who participate in Oregon’s RFN also use environmentally sensitive farm practices. Nearly all producer respondents participated in at least one RFN marketing channel (agritourism, direct to consumer, local retail or restaurant, local/regional institutions, local/regional distributors). Most also reported environmentally sensitive production methods: 59% used organic practices but were not certified, 13% reported certified organic production, and 28% used conventional methods. Over half of producers, including many who indicated conventional methods, also reported other conservation practices such as conservation tillage, cover crops, or integrated pest management (Brekken, Parks, and Lundgren, 2017). We hypothesize that farm characteristics link production practices and RFN participation (Figure 1).

Figure 1. Connections between Producers, RFN, and Ecological Resilience

### HYPOTHESIS

*We hypothesize that RFNs are connected to ecological resilience through the market mechanisms connecting regional consumers with entrepreneurial small and mid-scale producers. Marketing through RFNs may have a strong influence on farm practices; conversely, farmers who choose ecological farm management practices are uniquely poised to participate in RFNs.*



**Producer Characteristics** such as ownership and control of land and scale of production influence whether a farmer chooses ecologically sensitive production practices and markets through integrated RFNs.

**Integrated RFN** refers to the connectedness of the actors in the regional food network (RFN); the levels of connection and interaction of people, place, and prosperity. Social embeddedness of the actors and entrepreneurship opportunities arising from integrated RFNs facilitates market signals that reward producers for ecologically sensitive production practices attuned to local and regional impacts.

**Ecological Resilience** refers to the capacity of a system to absorb disturbance and reorganize while undergoing change so as to still retain essentially the same function, structure, identity, and feedbacks. Scale of production itself impacts ecological outcomes and matches to market scale within the RFN. Spatial and temporal distribution of on-farm activities and production resources across the regional landscape impact ecological resilience.

Production and marketing choices are intertwined; both are informed by producers’ functional, emotional, social, conditional, and epistemic values (Brown, 2016; Sheth, Newman, and Gross, 1991). We operationalize these values by identifying five key characteristics that connect environmentally sensitive production practices and RFN marketing: ownership and control (functional and emotional values), personal values and social embeddedness (social and emotional values), entrepreneurship and multifunctionality (functional and epistemic values), scale (conditional value), and spatial and temporal distribution (conditional value) (Table 1). Although many of these characteristics are intertwined, we attempt to separate their independent relationships to production and

marketing practices that influence the environmental impacts of farming, which may then give rise to improved ecological resilience for regional food production.

Table 1. Endogenous Values Measured

	<b>Definition (Sheth, Newman, and Gross, 1991)</b>	<b>Brown (2016)</b>	<b>RFN Framework</b>
Functional	The perceived utility acquired from an alternative's capacity for functional, utilitarian, or physical performance.	Using pro-environmental practices improves the overall quality of my food/product; increases my income	Ownership and control, entrepreneurship and multifunctionality
Social	The perceived utility acquired from an alternative's association with one or more specific social group.	Using pro-environmental practices on my farm helps the way I'm perceived in the community	Personal values and social embeddedness
Emotional	The perceived utility acquired from an alternative's capacity to arouse feelings or affective states.	Farming using pro-environmental practices does feel like making a personal contribution to something better	Ownership and control, personal values and social embeddedness
Epistemic	The perceived utility acquired from an alternative's capacity to arouse curiosity, provide novelty, and/or satisfy a desire for knowledge.	I farm to connect with the community	Entrepreneurship and multifunctionality
Conditional	The perceived utility acquired by an alternative as the result of the specific situation or set of circumstances facing the choice maker.	We can gain more watershed benefits if we can restrict pollution from farm production; Farm-level indicators of run-off	Scale, spatial and temporal distribution

### *Ownership and Control*

Farm owner–operators and multigenerational family farms have present and future connections to their land, prompting both emotional and functional values that influence responsible natural resource management. They may be willing to take short-term losses that contribute to long-term economic and environmental sustainability and recognize that the market often fails to reflect the long-run costs of natural resource use (Lyson, Stevenson, and Welsh, 2008; USDA National Commission on Small Farms, 1998; Hamilton, 1994; Strange, 1988).

For this reason, absentee ownership of U.S. agricultural lands has caused growing concern as the farming population ages. Absentee landowners are more likely to live in urban areas and lack personal knowledge of the land or production; many have purchased rather than inherited the land, severing a family history of stewardship (Petrzelka, 2012; Mendham and Curtis, 2010). Absentee landowners may be unwilling to make investments in environmental practices that are costly up front but may pay off in long-term productivity or contribute positive environmental benefits to the region. On the other hand, farms owned by absentee owners or investment firms

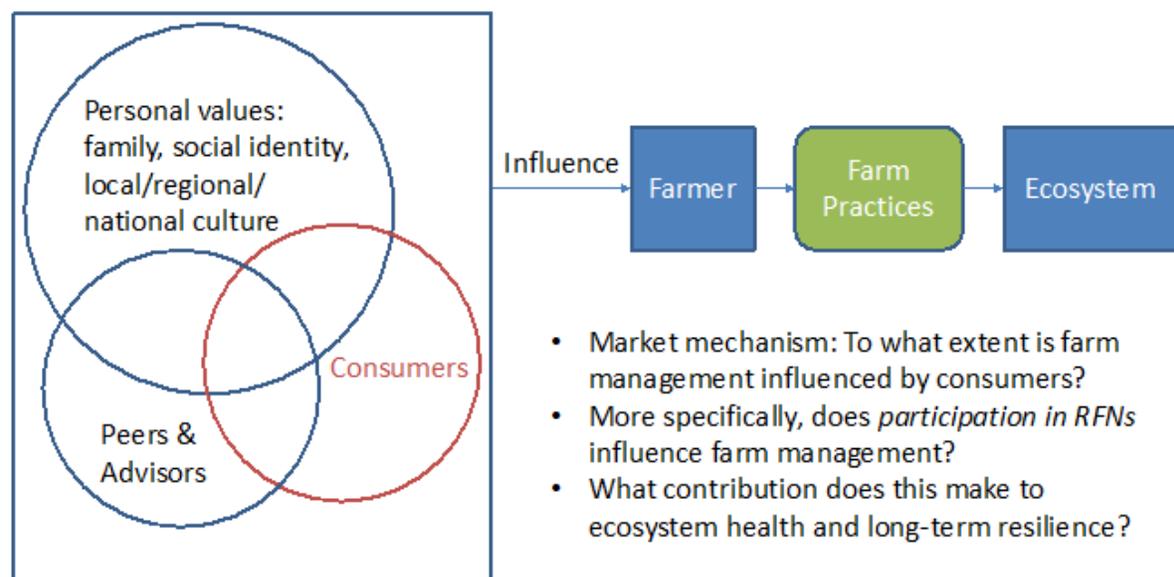
may make the decision to become USDA-certified organic for marketing purposes but have no motivation for choosing practices attuned to regional environmental conditions (Parks and Brekken, 2018).

In Oregon, almost 80% of principal farm operators currently own their land, compared to 61% nationwide. However, farm and ranch operators over the age of 55 control 64% of agricultural land, 10.45 million acres, which could change hands in the next 20 years. With growing interest from investment companies and absentee landowners, states can use public policy to support owner-operated agricultural enterprises to facilitate environmental stewardship of agricultural land (Brekken et al., 2016).

### *Personal Values and Social Embeddedness*

Personal values arise from farmers' experience and worldview (Parks and Brekken, 2018); at least three communities influence producer values and practices: the community of peers and other advisors, the community of consumers, and the family and society in which the farmer lives. Farmers are embedded in their communities, with smaller farms creating a greater diversity of ownership and social capital, while participation in local and regional markets leads to familiarity, transparency, and accountability (USDA National Commission on Small Farms, 1998).

Figure 2. Personal Influences on Farmer Production Practices



The personal values that lead agricultural landowners and operators to choose environmentally sensitive farming practices start with the owner/operator (Parks and Brekken, 2018). A previous focus group of mid-size regional producers in Oregon found that all chose production practices based on personal values; they also used a variety of local and regional marketing options (McAdams, 2015). In our 2016 Oregon RFN survey, 80% of producers chose "aligns with my environmental values" as the top motivator for production practices, highly correlated with environmentally sensitive practices, regional marketing channels, and status as beginning farmers (under 10 years of experience; no correlation with age). Respondents could choose multiple motivations: 32% chose "more profitable," 29% chose "local or regional support and infrastructure," and 25% chose "access to established markets," far behind values but demonstrating that respondents' choice of production practices is also intertwined with their choice of RFN marketing channels, fulfilling emotional and functional values (Brekken, Parks, and Lundgren, 2017). While we cannot generalize our results due to our convenience sampling methods, the strong correlation between personal motivations, production practices, and marketing channels in our RFN survey respondents is consistent with other studies of similarly situated farmers and indicates that the personal values and farm characteristics of RFN participants, small to mid-size farmers, and beginning farmers differ from the farm population at large.

The community of peers and local advisors has a large influence on whether producers translate stated environmental values into actual production practices on their land. Neighboring landowners with similar landscape, soil, and climate watch the success and struggles of those who adopt new farm or marketing practices and learn from one another (Iles and Marsh, 2012). Peers and local advisors share many social, economic, and environmental conditions and have strong influences on farm practices. Our RFN producer survey showed that nearly all farmers, regardless of production practices, most often rely on other farmers for advice, training, education, and technical support, while interviews in Oregon’s Willamette Valley showed that farmers tend to associate with farm organizations and other farmers who share similar production practices and worldviews (Brekken, Parks, and Lundgren, 2017; Parks and Brekken, 2018).

The community of consumers influences producers in RFNs through market mechanisms. Within the confines of a region, producers and consumers in RFNs are “closer” to the environmental impacts of food production, not just physically but also figuratively closer to social norms and values, market conditions such as wages and prices, and environmental conditions such as landscape and weather. Consumer demand signals concern for the environmental impact of food production through a higher willingness to pay for food produced using environmentally sensitive production practices (Pullman and Wu, 2012). In our RFN consumer survey, 45% of respondents stated that environmental concerns motivated them to buy local foods, with some consumer segments expressing significantly higher environmental motivation. Importantly, those who were willing to pay more for local foods were much more likely to be motivated by environmental concerns, rewarding producers who used and communicated their environmentally sensitive production practices (Brekken, Parks, and Lundgren, 2017).

Producers in RFNs also communicate with consumers by telling the story of their food through labeling or face-to-face interactions with consumers: They are engaging in environmental farming practices *here*, to improve a river that the consumer may visit, landscapes that they enjoy, wildlife that they encounter. The connection through regional identification imputes transparency and accountability that contributes to environmental stewardship. Policy that supports RFN marketing channel development, such as appropriate infrastructure and investment, can create market structures that support ecologically minded RFN farm operations.

### *Entrepreneurship and Multifunctionality*

Entrepreneurship and multifunctionality describe the ways that farmers try new things and diversify their operations to enhance profitability. Multifunctional agriculture encompasses a mix of market and non-market uses, such as conservation and provision of ecosystem services (Hibbard and Lurie, 2013). Economically multifunctional activities such as agritourism, value-added, and organic certification can include environmental management practices that differentiate the product in the marketplace and command a higher price (Brown, 2016; Liang, 2012; Liang and Su, 2013; Liang et al., 2012). Entrepreneurship and innovation reflect functional values related to price and quality of products but can also be expressed in epistemic values such as a willingness to try new products, markets, or practices.

The characteristics of farms that choose ecological farm practices and RFN marketing may be the same characteristics that make them entrepreneurial: They may be more risk tolerant and adaptable to environmental and market conditions. Characteristics of entrepreneurship also overlap with characteristics of resilience: Flexibility and intentional adaptation allow a producer to take advantage of new information and opportunities as they arise, while adapting in the face of adversity (Ecotrust, 2012; Clancy and Ruhf, 2010). Entrepreneurial, multifunctional farms manage diverse goals—such as biodiversity and food production—while maintaining economic profitability.

The respondents to our Oregon RFN survey scored high on entrepreneurial attitudes and showed signs of multifunctional operations, averaging 3.2 broadly defined product categories at each farm (for example, “vegetables,” “grains,” “poultry products,” etc., rather than individual crops or varieties) and two marketing channels per farm. Nearly all farms participated in at least one RFN channel, which are often in development stages, along with their environmentally conscious production practices. Beginning farmers in their first 10 years of operation (regardless of age) were significantly more likely to use direct marketing and environmentally sensitive production practices, offering further insights into the entrepreneurial period of new farm operations. Combined with the data on personal values and social embeddedness, it appears that people entering agriculture choose

their practices and marketing to fulfill their personal vision for the operation, mediated by the physical characteristics of their farm, connecting to the markets that will provide the economic returns necessary to support the operation. RFN channels are useful because they allow these values-driven entrepreneurial farms to capture price premiums for their products that are differentiated in the marketplace by their connection to place and environmental practices.

### *Scale*

Scale is related to conditional values because changing practices for the sake of environmental impacts is conditioned on the ease of changing the operation. The characteristics that link entrepreneurship to environmentally sensitive farm practices are often found in small-to-mid-size operations, which have the diversity, adaptability, and self-reliance required to respond to environmental and market conditions. The size of smaller farms may simply make it easier to manage natural resources (USDA National Commission on Small Farms, 1998). For example, self-reliant farms may use soil building and nutrient cycling, relying on farm-generated inputs (Kremen, Iles, and Bacon, 2012; Pearson, 2007; Shennan, 2008), which is both ecologically sensitive and provides some insulation from external economic shocks. Self-reliance, flexibility, and adaptability may result from lower financial and information barriers. Small and mid-size farms may also have lower sunk costs in equipment and training than large farms, allowing them to adopt new practices as cash flow allows rather than taking on large debts and becoming “locked in” to specialized equipment (McAdams, 2015).

Economic viability for small and mid-size farms requires matching production and market scales. Local food systems have emerged in recent years to support small-scale local production, but RFNs provide a mid-size market to match the volume and cost structure for mid-size farms, also known as the “Agriculture of the Middle” (Lyson, Stevenson, and Welsh, 2008; McAdams, 2015). Research on the Agriculture of the Middle has focused on “short” supply chains for differentiated products to connect to consumers who are willing to pay for food imbued with producer and consumer values (Lyson, Stevenson, and Welsh, 2008). Supply chain partners bolster the resilience of the RFN by adding capital and marketing expertise that producers themselves may not be able to provide and are crucial to supporting mid-size farms (Lyson, Stevenson, and Welsh, 2008).

In our RFN survey results, small operations tended to use direct marketing channels, with strong correlations between direct sales and organic practices (but not certified), grazing/free range, and antibiotic- and hormone-free animal husbandry. Large operations used wholesale channels, with certified organic products correlated with RFN retail and wholesale channels, while sales to national or international distributors are correlated with conventional practices. For mid-size farms, barriers to local/regional retail, restaurant, and distribution channels indicated difficulty in matching motivations and price premiums with supply chain partners. This is an area of entrepreneurial opportunity that could bolster Oregon’s mid-size farms and may warrant some public or private policy support (Brekken, Parks, and Lundgren, 2017).

### *Spatial and Temporal Distribution*

The final step in linking RFNs to ecological resilience is recognizing the spatial and temporal distribution of landscape characteristics and farm practices. The agricultural landscape facing the producer is a conditional value used to make decisions about which management practices could be used to improve environmental outcomes. These are physical conditions that can be measured empirically and can be used by producers and policy makers to target policies linked to farm practices (Brown, 2016).

Ecologically multifunctional farms are diverse with regard to field size, field-to-edge ratio, and amount of uncultivated land (verges, hedgerows, etc.). Temporal diversity—crop rotations, timing of management activities—may also increase the overall heterogeneity of the farm ecosystem and ultimately have a positive impact on biodiversity and, by extension, overall ecological resilience (Kremen, Iles, and Bacon, 2012; Pearson, 2007; Shennan, 2008).

The ultimate goal is to translate farming practices to actual environmental impacts (Millennium Ecosystem Assessment, 2005; Jones-Walters, 2008). Water quality (riparian buffering, habitat connectivity, and groundwater infiltration), pollination, nutrient cycling, soil conservation, carbon sequestration, and biodiversity conservation are important ecosystem services that operate at multiple landscape scales (Dale and Polansky, 2007; Swinton et al.,

2007, Zhang et al., 2007). However, ecosystem services generated by farm practices are widely inferred from farm practices in organic certification, eco-labeling, and government regulatory programs rather than by direct measurement.

While measuring environmental outcomes or indicators is ideal, it may be cost or measurement prohibitive (van der Werf and Petit, 2002). Rapid advances are occurring in “precision agriculture,” using new technology to measure on-the-ground environmental indicators. New self-assessment tools also allow farms and their supply chain partners to assess the environmental impacts of the food supply chain. It is becoming increasingly possible for farms to use the latest technology to manage their farm to reduce their environmental impacts, understand the impact on the bottom line, and communicate their progress up the supply chain and to consumers. “Small brands” that aggregate product from regional producers for regional markets in RFNs often differentiate their products based on environmental attributes as well, spurring innovation and the adoption of new technologies among participating producers.

We can also apply the economic concept of “clustering” to ecological impacts of agriculture. Clustering happens when farm businesses participate in their RFNs, strengthening the market and opportunities for individual farms and amplifying economic and ecological impacts (McAdam et al., 2016; Iles and Marsh, 2012; Gellynk et al., 2007). For example, habitat fragmentation can be more effectively alleviated if neighboring landowners participate in habitat restoration plans. Reducing irrigation needs across multiple farms in a watershed could provide more water for other agricultural uses and migrating fish species. Another take on clustering would protect agricultural landscapes from development to enhance regional food security. Multifunctional landscapes can be intentionally maintained and interacted with the RFN’s social, economic, and ecological characteristics to create greater benefits.

While we do not have specific geographical data to analyze the spatial proximity of the farms in our Oregon RFN survey, future research on ecological impacts should account for the aggregated impacts of clustered farm practices.

## Summary

The ecological impacts of agriculture are most directly a product of farm practices. Fundamental farm management decisions—such as what to produce, fertilization, irrigation, pesticides, tillage, harvesting, and processing equipment—have direct consequences for ecological health. These decisions are informed as much by factors in the social and economic environment as much as by those in the physical environment.

We analyzed the results from our Oregon RFN producer and consumer survey using a framework of five characteristics that connect producers who participate in RFNs to improved ecological resilience: ownership and control, personal values and social embeddedness, entrepreneurship and multifunctionality, scale, and spatial and temporal distribution of RFN producers and markets. We conclude that farmers who choose ecological farm management practices may be good candidates for RFNs, while marketing through RFNs may have a strong influence on farm practices: taking advantage of the spatial, temporal, and figurative proximity of food supply chain actors can lead to improved environmental outcomes in the region as messages about food’s environmental impact move among producers, consumers, policy makers, and natural feedback mechanisms are reflected in ecosystem functions. Developing stronger RFNs opens new market opportunities for innovative, entrepreneurial farmers with strong ecological values, which may improve ecological outcomes for soils, water, and climate while building farms’ productive capacity to ensure long-term food security.

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# The Support Ecosystem for Regional Food Network Entrepreneurship

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Arguably, regional food networks (RFNs) represent multiple kinds and levels of entrepreneurship. There is the network coordinator, acting as a social entrepreneur by maintaining the mission and values of the RFN while providing leadership, mediating disputes, and innovating (Lyons and Wyckoff, 2014). There are the producers, who must think and act entrepreneurially as they manage the land and production. Those who add value must recognize and act upon the needs of prospective customers through innovation. Distributors and retailers must understand the entrepreneurship of identifying and capturing markets. Every player in a modern RFN must be entrepreneurial if the network is to be competitive. As a result, a host of support organizations have popped up across the landscape to reinforce the entrepreneurial activities of RFNs, creating a support ecosystem. These support organizations assist entrepreneurs in the RFN by providing access to equipment and infrastructure; business development; debt and equity capital; entrepreneur coaching, counseling, and mentoring; network building; and policy advocacy. They include entities such as kitchen incubators, microenterprise development programs, gap financing programs, small business development centers, SCORE chapters, food innovation labs, programs to connect food processors and retailers, business pitch competitions, and cooperative development programs, among others. However, this ecosystem is not necessarily transparent to RFN entrepreneurs, nor is the purpose and efficacy of the ecosystem's component parts well understood.

In order to make RFN support ecosystems understandable to the entrepreneurs they serve, we use two variables that describe the organizations within an ecosystem—policy level (local, state, sub-state regional, multi-state regional and national) and function—as coordinates for mapping the support ecosystem in matrix form. We then examine selected organizations that make up these ecosystems. This review is not meant to be comprehensive; rather, it attempts to provide a few concrete examples of representative organizations that are supporting agriculture- or food-related entrepreneurial initiatives at various policy levels and to examine the types of activities that they undertake in doing so. We offer an overall assessment of the strengths and limitations of these entrepreneurship support activities, and we make recommendations for ways that RFN entrepreneurs can use them more effectively.

## Mapping the Activities of RFN Organizations

Support organizations for RFNs vary in terms of size and scope. They run the gamut, from broadly connecting policy thinkers across the country to focusing on developing farming talent in local minority groups. The approach here is to classify these organizations along the two dimensions noted above: the geographic scope of the organization's focus and the types of activities for which the organization provides support. We identified these patterns by reviewing over 40 specific organizations and programs, including U.S. Department of Agriculture (USDA) programs, state government initiatives, university extension programs, and nonprofit organizations. These are of course only a selection of the myriad groups and activities extant nationwide; however, these organizations were chosen to reflect both common activities as well as those noteworthy in some way.

### Geographic Breakdown

Support organizations can be categorized into five geographic designations based on target audience: whom the organizations' programs are meant to serve and where they are accessible.

<i>National</i>	Covers organizations that have a national focus, or are in service to actors that can be from any part of the US
<i>Multi-state Regional</i>	Organizations that focus on a region that encompasses multiple states
<i>State</i>	Organizations that serve actors within the boundaries of a given state
<i>Sub-state regional</i>	Efforts that encompass parts of different states or smaller areas within a state
<i>Local</i>	Organizations that operate at the city/county level and below

### Types of Activities

For all of the organizations reviewed, we categorized the types of work they do in support of agriculture- or food-related entrepreneurship using five general categories:

<i>Government</i>	National policy delivery or programs in support of such policies
<i>Policy</i>	Policy lobbying and advocacy
<i>Networking</i>	Creating and fostering connections between actors
<i>Financing</i>	Loan programs, direct financing
<i>Incubation</i>	Development programs, education, business training, technical assistance, equipment and infrastructure access

The work of RFN entrepreneurship support organizations is not exclusive to any one of the above categories; for some of these organizations, the lines we draw are purely artificial. This is to be expected, given the very nature of the businesses that these organizations seek to assist. For organizations that support burgeoning entrepreneurial activities, this means that they will naturally support the whole business across its different facets. Though most of the organizations we review have a core competency, it is not uncommon for them to be active in other areas. The delineations we make also do not preclude some functional overlap between them; for example, a mentorship program to develop young farmers could possibly fit into the networking, financing, and incubation categories. Nevertheless, we believe the general groupings to be reliable and instructive. To further elaborate:

- **Government activities:** This category covers the work of the USDA, namely programs and services available through its Rural Development (RD) arm. USDA-RD offers several grant and loan programs that are relevant for agriculture and food entrepreneurs.
- **Policy activities:** These include political action committees, policy creation and advocacy, lobbying, and creating/participating in case studies. These activities do not center around one particular actor but are undertaken to influence local, state, and national policies.
- **Networking activities:** Communication to, for, and about agriculture and food entrepreneurship is observed in many ways across organizations. Some methods are meant to spread best practices or strengthen knowledge about a cause (for example, conferences, newsletters, webinars), while other activities are about building business relationships and markets (for example, farm-to-school programs, market-matching programs).
- **Financing activities:** Organizations that have access to capital and are involved in direct lending to entrepreneurial businesses, from revolving loan funds to term loans. Financing activities could be sponsored with other institutions, such as government lenders or private banks, but at least some capital comes from the organizations themselves.
- **Incubation activities:** This category covers the widest range of support activities, encompassing business development assistance in various forms (in other words, knowledge as well as physical capital and infrastructure). Examples include new farmer programs, community food processing centers, land assistance, technical advice, and business planning.

Figure 1 provides a matrix that demonstrates the interaction of these factors and affords the ability to map all RFN entrepreneurship support organizations in a region or nationally.

Figure 1. Entrepreneurship Support Organization Matrix

	Government (National policy delivery/support)	Policy (policy lobbying, advocacy)	Networking (creating and fostering connections)	Financing (loan programs, direct financing)	Incubation (development programs, training, technical assistance, equipment and infrastructure access)
<b>National</b>					
<b>Non-profit</b>					
National					
Business Alliance for Local Living Economies		█	█		
<b>University</b>					
National					
Agricultural Marketing Resource Center			█		
New Entry Sustainable Farming Project			█		█
<b>USDA</b>					
National					
Beginning Farmer and Rancher Development Program	█			█	█
Business & Industry Loan Guarantees	█			█	
Community Food Projects Competitive Grant Program	█			█	
Farm Service Agency - Farm Loan Analysis	█			█	
Food and Nutrition Service - Farm to School Grant Program	█			█	
Rural Business Development Grants	█			█	
Rural Business Investment Program	█			█	
Rural Cooperative Development Grant Program	█			█	
Rural Economic Development Loan and Grant Program	█			█	
Rural Microentrepreneur Assistance Program	█			█	█
Value Added Producer Grants	█			█	
<b>Multistate Regional</b>					
<b>Non-profit</b>					
Northeast					
Natural Capital Investment Fund				█	
Plains					
Rocky Mountain Farmers Union		█	█	█	█
Southeast					
Federation of Southern Cooperatives/Land Assistance Fund		█	█	█	█
<b>State</b>					
<b>Non-profit</b>					
Midwest					
Indiana Cooperative Development Center			█		█
Kentucky Center for Agriculture and Rural Development			█	█	█
Latino Economic Development Center			█		█
Northeast					
The Center for an Agricultural Economy			█	█	█
Virginia Foundation for Agriculture, Innovation and Rural Sustainability			█		█
Plains					
Value Added Agriculture Development Center					█
<b>State Government</b>					
Midwest					
Kentucky Proud			█	█	
<b>University</b>					
Southeast					
Center for Environmental Farming Systems			█		█
LSU AgCenter Food Incubator					█
<b>Substate Regional</b>					
<b>Non-profit</b>					
Midwest					
Appalachian Center for Economic Networks		█	█	█	█
Great Lakes Ag-Tech Business Incubator					█
Pacific West					
Enterprise for Equity (Agri-preneur Business Planning Program)			█		
Northwest Agriculture Business Center					█
Plains					
La Semilla Food Center		█	█		█
Lake County Community Development Corporation					█
<b>Local</b>					
<b>Non-profit</b>					
Midwest					
The Kinsman Farm			█		█
Northeast					
Groundswell Center			█		█
Intervale Center			█		█
Pacific West					
Agriculture and Land-Based Training Association (ALBA)			█		█
Plains					
Cultivate Kansas City		█	█		█
South Valley Economic Development Center's Mixing Bowl			█		█

## Examples of RFN Entrepreneurship Support Organizations across the Matrix

The five organizations reviewed here were chosen because they are representative of the diversity of service providers within our geographic scope and activity framework. The diversity of these organizations is not limited to those factors but also lies in the regions in which they are based and in the population density of the areas they serve.

Geographically, these five organizations are located in the Southwest, Midwest, Northeast, and Southeast regions of the United States, covering operations in an area as small as a single neighborhood to as large as a multi-state region. Organizations that operate in urban, suburban, and rural environments are all included. The types of activities that they undertake are similarly varied, including new farmer training programs, business development initiatives, community outreach, and funding supports.

### *Kinsman Farm, Cleveland, Ohio*

*Geographic level: Local*

*Types of activities: Incubation*

Kinsman Farm likely has the most focused scope in terms of geography and purpose. Located in Cleveland's Kinsman neighborhood, their mission is to develop and support agricultural enterprise in an urban environment (Kinsman Farm, 2014a). The Farm has been active since 2010 and was developed as a joint effort between the Ohio State University Extension, the City of Cleveland, a local conservation nonprofit (West Creek Conservancy), and a local nonprofit development organization (Burten, Bell, and Carr Development).

As an incubator farm focused on developing new farming businesses, Kinsman Farm offers a "safety net" by providing land and support to small, beginning urban farmers who may not be ready or able to jump into larger-area or larger-scale commercial farming. Prospective tenants are required to take a training program and to provide a business plan. If approved, tenants are granted a lease for approximately 0.25-acre plots of land to develop their new business, with continuing technical advice provided by on-site demonstration areas run by Ohio State Extension. In addition to the lease, all tenant farmers have a responsibility to help with overall farm maintenance (Kinsman Farm, n.d.).

Kinsman Farm has about 6 acres, with roughly 17 plots available to farmer partners. At present, the farm hosts a dozen operations, with a mix of nonprofits, partnerships, and sole proprietorships. Most farms grow mixed fruits and vegetables, but an egg producer and an apiary are among the tenants (Kinsman Farm, 2014b).

### *Groundswell Center for Local Food and Farming, Ithaca, NY*

*Geographic level: Local*

*Types of activities: Incubation, networking*

The Groundswell Center is a project of the Center for Transformative Action, an Ithaca-based nonprofit that seeks to develop communities in Ithaca and Tompkins County that are "socially just, ecologically sound, and work for everyone" (Groundswell Center, n.d.-a). In that vein, Groundswell's mission is to promote accessible, healthy, and ecologically sound food and agriculture systems to and for the community. Groundswell's programs revolve around education, with an emphasis on experiential education. The center offers a wide variety of courses and seminars, covering everything from Farming 101 to more advanced and specific technical training for farmers, including basic community outreach learning programs and events.

Incubation and development are related parts of Groundswell's ultimate mission in bringing new members into the local food system. The incubator farm at Groundswell is comprehensive, offering farmland, access to equipment, continuing education, mentorship, and training as part of a three-year program for aspiring farmers. The cost to a program participant is nominal, but prospective participants must have some sort of demonstrated farming experience as well as a commercially oriented business plan (Groundswell Center, n.d.-b). A notable aspect of this program is its socially conscious orientation: Though open to all applicants, priority is given to potential farmers

that belong to socially or economically disadvantaged groups (e.g., people of color, veterans) (Groundswell Center, 2015).

For farm business development, Groundswell offers a business-planning course meant for beginning and experienced farmers that have farming experience but need guidance on business aspects (Groundswell Center, n.d.-c). Participation in the development program is not limited to those already with or able to afford land; connections are made to lenders and investors through connections established by the program.

### *La Semilla Food Center, Anthony, New Mexico*

*Geographic level: Sub-state regional*

*Types of activities: Incubation, networking, policy*

La Semilla Food Center's focus on building local food systems concentrates on increasing the involvement of different parts of the community across the system, with an emphasis on youth and young adults. Based in the Mesilla Valley, La Semilla's programs are active in the area between and within the cities of Las Cruces, New Mexico, and El Paso, Texas (La Semilla Food Center, n.d.-a). La Semilla seeks to engage and promote local food and agriculture efforts by developing farmers' markets, coordinating farm-to-school programs, running a demonstration farm, and engaging in policy advocacy.

La Semilla's focus on youth is reflected in much of their programming. Their on-site demonstration farm hosts a summer day camp program for younger children. For youth at the high school level, La Semilla runs a semester-long course, called Raices (Spanish for "roots"), that acts as a hands-on "food systems primer," offering experiences in all areas of the Center's interests: food production, nutrition education, policy advocacy, and leadership development. Youth and young adults with aspirations beyond Raices can apply to be a part of La Semilla's Food and Farm Apprenticeships, which combine actual employment and a stipend with further education, mentorship, and skills development (La Semilla Food Center, n.d.-b).

Connection to younger members of the community is also promoted through public institutions. The Center runs several initiatives with educational partners for students, their families, and teachers/educators, including family cooking nights, school gardens, and edible education programs. As an intermediary, La Semilla also provides expert assistance to schools in setting up farm-to-school programs with local providers (La Semilla Food Center, n.d.-c).

The Center's Farm Fresh program works to improve connections within the food system by developing potential markets for local farmers, where they fulfill the roles of analysts and marketers in the value chain between producers and potential clients (markets, restaurants, stores).

La Semilla Food Center is a charter member of the Mesilla Valley Food Policy Council, engaging in policy advocacy and engagement with local communities and their elected officials.

### *Kentucky Center for Agriculture and Rural Development, Elizabethtown, KY*

*Geographic level: State*

*Types of activities: Incubation, networking*

The Kentucky Center for Agriculture and Rural Development, or KCARD, is a nonprofit organization that concentrates on improving agricultural and rural businesses through addressing their business development-related needs. Consulting and support are given for new and existing Kentucky businesses at various stages of maturity (Kentucky Center for Agriculture and Rural Development, n.d.-a).

KCARD is a source of knowledge and partnership for producers and businesses that can benefit from their expertise in planning and analysis. They maintain an online "toolkit" of documents and resources on business development topics specifically for Kentucky-based businesses (Kentucky Center for Agriculture and Rural Development, n.d.-b), but the organization is very proactive in its direct work with its clients. Businesses in the early stages of development can take advantage of KCARD's involved "hands-on approach" in creating feasibility studies (marketing, management, and technical), management and operations analyses, legal documents, and

personnel management. For more-established businesses, several services are available, including general consulting, record keeping, cost analysis, marketing plans, and board training. General business skill training geared toward individuals, like training in QuickBooks or Excel, is offered as well (Kentucky Center for Agriculture and Rural Development, n.d.-c). Though KCARD does provide direct funding, their Agribusiness Grant Facilitation program helps agribusinesses connect to and apply for previously untapped grants and funds.

### *Federation of Southern Cooperatives/Land Assistance Fund, Epes, Alabama*

*Geographic level: Multi-state regional*

*Types of activities: Incubation, networking, policy*

The nonprofit Federation of Southern Cooperatives/Land Assistance Fund represents the interests of member cooperative institutions in their mission of developing low-income and rural communities through cooperatives. Though its programs are accessible to all low-income and family farmers, the Federation's membership draws from and focuses on the historically underserved black community (Northeast Sustainable Agriculture Working Group, 2016). The Federation represents cooperatives from nine states in the Southern and Southeastern United States: Alabama, Arkansas, Georgia, Kentucky, Louisiana, Missouri, Mississippi, South Carolina, and Texas. Funding comes from a mix of private, nonprofit, and government sources (Federation of Southern Cooperatives Land Assistance Fund, 2015).

The work of the Federation focuses on three areas: cooperative economic development, land retention, and advocacy (Federation of Southern Cooperatives Land Assistance Fund, n.d.-a). The cooperative economic development effort of the Federation involves work in all three of those categories. The Federation conducts active outreach through its field/state offices to identify socially and economically disadvantaged farmers that could benefit from its agricultural expertise and business assistance, encouraging the formation of cooperatives when appropriate. Federation specialists provide one-on-one counseling to help produce business plans, complete loan applications, and take advantage of available resources. The Federation also coordinates technical workshops and networking conferences on specific topics and themes relevant to its membership (Federation of Southern Cooperatives Land Assistance Fund, n.d.-b).

Most cooperative development effort flows through the Federation's own Rural and Training Research Center, a property in Alabama that houses farm, forestry, and agroforestry demonstration sites as well as meeting space. The Federation uses the Center to run workshops and programs that train members on technical, financial, and business issues related to cooperatives and small farm management, including advice on sustainable agriculture, land assistance, credit union formation, cooperative formation, marketing, and advocacy. These programs contribute to the development and growth of new and existing rural food communities.

## Observable Trends within These RFN Players

Certain common themes can be observed among the organizations that make up the RFN support ecosystem, and these can be instructive in furthering thinking about the driving forces behind RFN organizations in general.

### *Activist or Mission-Based Action*

RFNs can be thought of as value chains that exist as alternatives to the status quo, namely the global industrial food model. As such, organizations that choose to be a part of an RFN chain likely have objectives beyond a standard bottom line: policy concerns such as food sovereignty, environmental sustainability, and community economic development are all examples of issues that align closely to their missions. Commitment to a local food system is not a secondary concern for these organizations, and this is reflected in the activities in which the organizations take part. In light of this, RFN entrepreneurship support organizations and the players in the value chain they serve are acting as social entrepreneurs—mission-based enterprises that use markets to address social issues (Lyons and Wyckoff, 2014; Kickul and Lyons, 2016).

### *Entrepreneurial Innovation*

These organizations fill gaps that they may see in the system or pursue new, mission-oriented activities. That impetus to provide an alternative to the conventional system leads to innovative thinking throughout the value

chain. In addition, the local focus allows these organizations to take advantage of unique local opportunities. By drawing on these strengths, organizations are finding new ideas that expand the RFN. For example, Kinsman Farm created its own combination of urban farming, new farmer incubation, agricultural education, and local orientation to transform what had been just another rundown and neglected city lot in the middle of Cleveland into a promising symbol of urban agriculture.

### *Underserved Populations and Accessibility*

RFN entrepreneurship support organizations are open to working with all classes of people and, importantly, groups of people that may have been previously unaware of or excluded from existing, dominant systems. Tailoring services toward the less-advantaged or less-served populations can be explicitly part of an organization's mission, as it is for the Federation of Southern Cooperatives in supporting African-American farmers and for the Groundswell Center in creating opportunities for economically disadvantaged groups. Regardless of the groups being served, it is important to note that acknowledging and working for these groups can have an effect on expanding the reach and value of RFNs. These organizations impart values, skills, and resources to groups that can help build a stronger and more participatory food system. Whether the new contributors being brought into the circle are urban farmers, youth, or people of color, proactively being open and inclusive can lead to sustainable outcomes for RFNs.

### *Expanding Knowledge In and Of Food Systems*

The concept of scaling knowledge can be seen across the activities of these organizations. Their goal is to promote and grow local food systems that bring benefits to participants and consumers; rather than simply teaching a skill, they make sure that the skill enters, becomes part of, and grows the network. For example, when the La Semilla Food Center runs education courses at schools, they also work to supply local food to that school's cafeteria and give students who excel in the course a route to becoming local farmers. Another example of this is the Groundswell Center, which not only has a wide range of courses to help existing producers but also brings new farmers into the community through training in their incubation program.

### *Networking*

A big part of effectively expanding the food system is making and maintaining connections among different actors and institutions; given that need, it makes sense that organizations share a networking mindset (Groundswell Center, n.d.-a; La Semilla Food Center, n.d.-c; Kentucky Center for Agriculture and Rural Development, n.d.-a; Federation of Southern Cooperatives Land Assistance Fund, n.d.-b). Each actor has different core competencies, but within the breadth of services they provide, most feel comfortable promoting networking activities beyond those outlined in their mission statements. An organization could be acting as an intermediary between producers and consumers (as La Semilla does in promoting its farm-to-school programs), facilitating introductions between existing actors (as KCARD does in helping businesses find financing), or sharing best practices (as the Federation of Southern Cooperatives does in running conferences for its members).

### *Institutional Backing and Visibility*

In addition to the networking functions undertaken as part of operations, it is important to note that the organizations that make up regional food systems do not operate independent of other institutions. Such links can provide significant advantages. There are larger scale resources available to and active in supporting RFN actors at all levels, whether they are land-grant academic institutions, nonprofit foundations, or local/state/federal governments. For example, the USDA provides funding support to each of the organizations highlighted here in some way, and each organization had at least two partners providing additional financial support.

## Opportunities

Numerous food and/or agricultural actors support entrepreneurship in RFNs, providing value at all levels and in many ways. Each actor chooses an area of the value chain to which they can contribute. Each individual organization has a valuable role to play, but none is, or can be, sufficient to meet all the needs of RFN players. Local food systems will exhibit degrees of fragmentation and siloization of existing organizations simply because of the unavoidable differences in the organizations' size and scope. However, the more these organizations are treated as a system, the more opportunities are revealed: opportunities for networking, improved referral, cross-

community information sharing, and a more transparent apparatus for service delivery. Choosing a holistic approach to evaluating the efficacy of the value chain will lead to a more successful food network.

The biggest opportunity to improve the power of the regional food value chain might simply lie in proper identification (that is, clearly identifying and classifying extant organizations and their capabilities). Proper identification of where an organization fits, conveyed to others in the network, will increase efficiency in the value chain. Role identification alone will not be sufficient to maximize the capability of the whole system, but it could increase performance and reveal where assistance gaps exist in the chain.

Two characteristics of RFN organizations may hinder clear identification from naturally occurring within the network: mission drift and a lesser amount of cross-level/cross-functional networking. “Mission drift” describes a situation in which an organization is active in areas beyond their core competencies and mission because they feel there are no other viable suppliers within their network, or they are unaware of another player that would be a better fit. Many of these groups have ambitious missions and/or an underdeveloped value chain, so they may be active in areas that could or should be out of scope. Therefore, it may be unclear in a network what needs are truly being met versus which could be improved upon. Clearly identifying the participants and their competencies within the network will improve all parties’ understanding of what organizations are truly capable of and what opportunities exist within the value chain.

Again, RFN organizations are proactive in networking efforts overall, as they all share the goal of establishing a robust and sustainable alternative to the global model. Consequently, the opportunity for identification will not be to bring organizations into a network from isolation but to help better understand where the organization fits within functional or operational bounds.

This is where a matrix of organizational supports will be useful. Using this method to clarify the roles of RFN organizations makes it much easier to think about a multitude of service providers and how they can fit into a cohesive system. The benefits of a RFN can be realized, as opportunities within the value chain can be coordinated and matched to specific players.

## Recommendations

It is clear that there are creative, dedicated, and dynamic players at work in the RFNs today; those highlighted in this review are evidence of the actors providing key contributions at the intersections of many different levels of geography, size, and scope. However, these actors are not always visible to the RFN entrepreneurs they seek to assist, nor are they networked as effectively as they could be. By mapping them by geographic area served and type of assistance provided, RFN coordinators can make this group of assistance providers more transparent and lay the groundwork for a seamless system of service provision, adding value to the entire RFN. The examples presented here should be useful in thinking about points of connection for building such a system. The matrix offered in this article may be used as a template for facilitating the process. In light of this, we recommend that RFN coordinators take the following steps:

1. Identify the support organizations that serve entrepreneurs in their value chains by geography and types of service(s) offered;
2. Map these organizations using the matrix presented;
3. Look for service gaps and service overlap;
4. Look for existing connections among organizations as well as opportunities to build new connections; and
5. Facilitate interaction among support organizations that foster efficiency and effectiveness, while allowing these organizations to participate actively in building their own social capital.

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# Farm Incubators - Creating Entrepreneurial Relationships to Support Prosperous Food Networks

Kathleen Liang

*JEL Classifications: Q10, Q13, Q18*

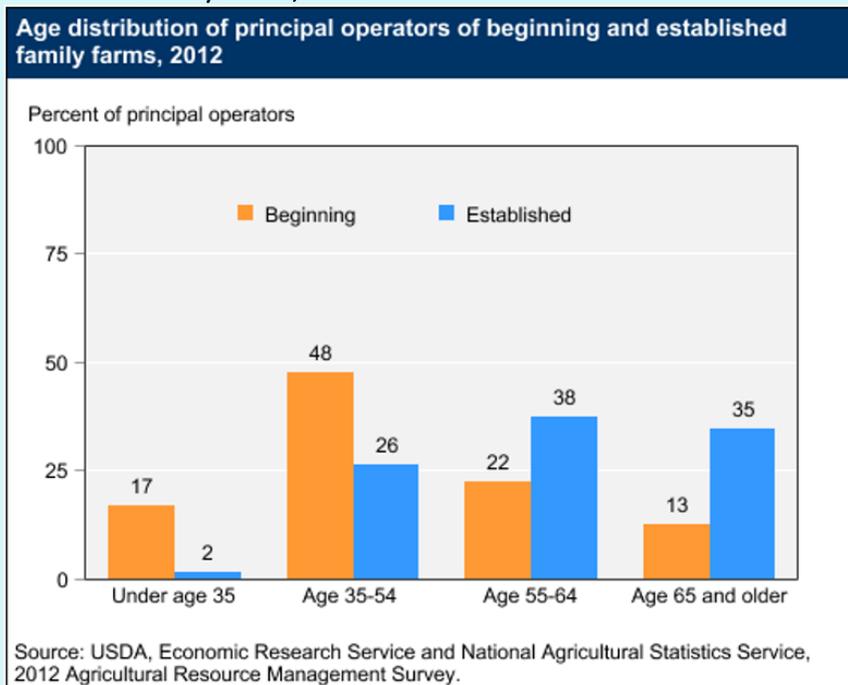
*Keywords: Food networks, Entrepreneurship, Incubator farms, Public policy, Relationship*

The Breeze Farm in Orange County, North Carolina, represents a growing trend in the United States of those without a farming or ranching background entering a career in farming (North Carolina Cooperative Extension, 2018). Started in 2008, Breeze Farm is an incubator program, supported by North Carolina Cooperative Extension and public-private collaborative funding, Breeze Farm provides a place for farm enthusiasts to test out skills and markets. Land, tools, infrastructure, and services are available as a part of the lease, which significantly reduces the start-up burden for many beginning, small-scale farmers. Participants of the Breeze Farm program complete a business-planning course, then take their knowledge to the field through the incubator lease agreement. Breeze Farm tenants stay 3–4 years on average, then transition out of the program. The majority of the participants use organic and other conservation practices. The program participants also have the option to bring their own tools and equipment such as a small tractor. Beyond receiving technical support, participants have opportunities to introduce new crops to diversify the local food scene or provide for ethnic demand, as well as to exchange information and experiences to support each other. The Breeze Farm incubator is a place where food networking begins!

## Beginning Farms and Farm Incubators in the United States

The U.S. Department of Agriculture (USDA) defines a beginning farmer as a farmer or rancher with less than 10 years of experience operating a farm or ranch (USDA, 2017). In the 2012 Census of Agriculture, approximately 17.2% of family farms were categorized as beginning farms, and these beginning farms were more likely to operate at a small scale than

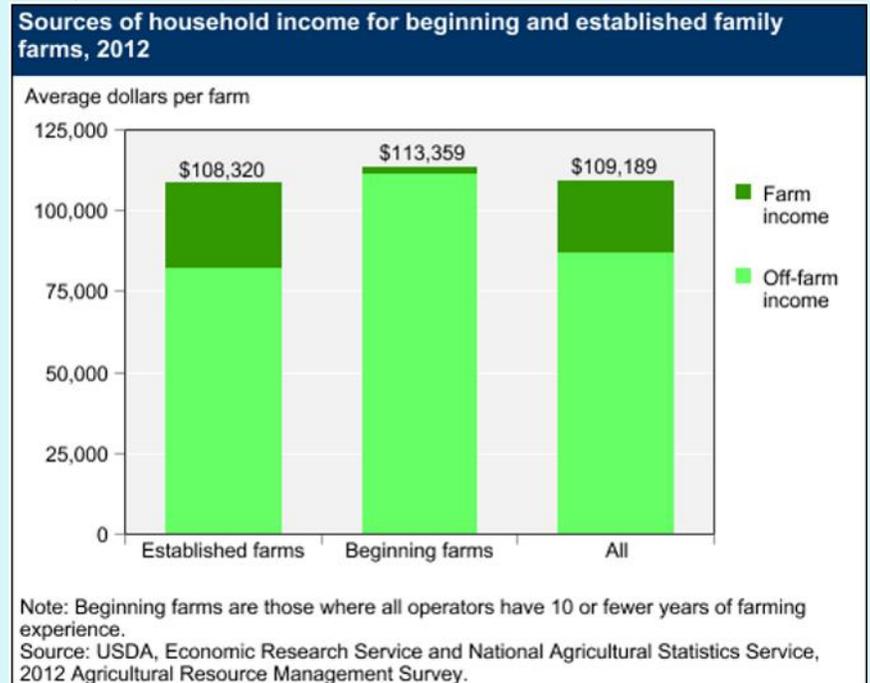
**Figure 1. Age Distribution of Principal Operators of Beginning and Established Family Farms, 2012**



Source: Source: USDA Economic Research Service, 2017.

established farms. The majority of beginning farm operators were younger and had acquired more education than established farm operators, and they relied more on off-farm income than established farm families (USDA, 2012; USDA, 2017). Beginning farmers could be found across all categories of age, gender, race, and ethnicity (see Figure 1). Research had also shown that beginning farmers were more likely to adopt best management practices or innovative technologies while considering environmental impacts (Inwood, Clark, and Bean, 2013; Caswell et al. 2001; Nickerson and Hand, 2009). With strong encouragement from the USDA Beginning Farmer and Rancher Development Program and the local food movement, it is likely that more retirees, veterans, and other citizens will seek farming opportunities. Some common challenges for beginning farmers and ranchers include lack of support in career transition and lack of access to resources such as land, labor, capital, government programs, and networks (see Figure 2) (Ahearn, 2011; Ruhf, 2001).

Figure 2. Sources of Household Income for Beginning and Established Family Farms, 2012



Source: Source: USDA Economic Research Service, 2017.

Many community organizations have established farm incubator programs to respond to the growing interest among beginning farmers. Similar to a business incubator, a farm incubator offers exclusive use of affordable shared space, well-organized and intensive training, and shared infrastructure such as tools and equipment. Program participants pay a fee to lease land, access technical assistance, and acquire tools/equipment. Some farm incubator programs charge additional fees to cover custom work, pesticide application, or greenhouse rental, depending on the complexity of the program participant’s goals. Most of the incubator farm programs require participants to complete a series of business-planning workshops prior to enrolling in farming activities.

Only a few farm incubator programs in the United States have operated for more than 10 years (Overton, 2014). The National Incubator Farm Training Initiative (NIFTI) was established in 2012 through a collaboration between New Entry, the Intervale Center, the Minnesota Food Association, the Agriculture and Land-Based Training Association, Cultivating Community, and the International Rescue Committee (NIFTI, 2016). NIFTI offers toolkits to support farm incubators and conducts annual surveys to gathers information across the country to establish and maintain a database for all farm incubators. NIFTI also operates a farm incubator training program to include farm business-planning courses, access to farmland and infrastructure, one-on-one technical assistance, on-farm field trainings and workshops, and other technical assistance such as identifying markets and transition off the incubator farm site (NIFTI, 2016).

According to recent survey information provided by NIFTI, there are approximately 220 farm incubator programs in the United States—up from 62 in 2013—representing almost 20,000 acres of agricultural land (Overton, 2014; NIFTI, 2016). The majority of funding for these farm incubators comes from federal or foundation grants. About 70% of land was leased to operate the incubator programs. Most farm incubator programs have no more than 2

full-time and part-time staff members. Almost 60% of former program participants are still farming or working as primary farm operators (NFITI, 2016). The farmable acres and size of plots vary significantly among farm incubator programs depending on location and availability. Only a few are certified organic, while others practice organically or are undergoing the process of becoming certified based on program participants' preferences.

The majority of program participants use the food they grow for their own consumption, donate produce to charity organizations, or share with others. Most program participants have some prior farming experience, but this is not a required component when enrolling in many farm incubator programs. Program participants have very diverse demographics and operating categories, similar to the profile of beginning farmers in the United States as reported by the USDA. Interestingly, many program participants are non-English speakers, but only a few programs offer multilingual programming and support. Marketing channels for farm incubator participants include Community Supported Agriculture (CSA), farmer markets, food hubs, schools, and food co-ops (Overton, 2013; NIFTI, 2016). Some of the most popular training topics include business planning, marketing, farm management, crop production, and sustainable practices. Most farm incubator programs face challenges in funding, infrastructure, and staffing. (NFITI, 2016)

## Challenges and Implications

Farm incubator programs introduce a new way to engage farmers in food networks to enhance relationships between farms and communities. Some program participants have limited prior farming experience, so becoming a farm operator represents a new career choice for them. It could also be a daunting task for beginning farmers to learn everything from production to field management, marketing, and financial analysis in 3–5 years, the average length of time supported by farm incubator programs. While beginning farmers receive benefits to obtain affordable experiential learning opportunities from the farm incubator programs, they are also encouraged to test innovative ideas and explore new opportunities to serve their communities. Program participants often develop a sense of community and appreciation to support each other by sharing information and stories (Overton, 2014). With guided support, participants would be more likely to sustain a collaborative interest to help others by being actively engaged in local food movements. Farm incubator programs seem to serve an important role in motivating entrepreneurial relationships to support a new paradigm of co-independent decision-making processes within a food network (Liang, 2018).

Beginning farmers have become a focal point of several agricultural policies, and many policy makers believe that beginning farmers are critical to rural development and food security (Ahearn, 2011). Farm incubator programs support the interests of beginning farmers across age, gender, education, experience, race, and ethnicity. However, there are many challenges and policy implications to consider:

- The top challenges faced by most farm incubators are lack of funding, lack of access to infrastructure, and lack of staff. Since most programs receive funding from government agencies or foundations, there is a need to assist farm incubators to seek private–public, collaborative-funding opportunities. Private enterprises could also contribute to 1) technology and staff development by offering training and education, 2) volunteer and mentoring services, and 3) fundraising support to host events.
- Many farm incubator participants are non-English speakers. Dealing with language barriers will be critical to support both program staff and participants.
- The locations of farm incubator programs may or may not fulfill the need to stimulate rural development or to balance the rural–urban divide.
- Small-scale beginning farmers are more likely to produce more than 20 types of crops at the same time. Promoting and supporting niche products through incubator programs to accommodate diversification may be a way to improve profitability.
- There is a need to support farm incubators in designing, developing, and delivering scale-relevant technology. New technology like hydroponic production, aquaponics production, and GIS-guided smart farming systems will be essential for a new generation of farmers.
- There are discussions about the growing interests in ethnic markets, food as natural medicine, and other types of use of food in the health service industry. Farm incubator programs could offer training and support for beginning farmers to explore and access information to create new opportunities.

- Farm incubators need to include educational materials for customers to identify and properly use specialty crops and niche products. Developing apps or web-based information platforms are good examples.

## Summary

Farm incubator programs offer shared resources and opportunities to support beginning farmers. These programs also support participants to develop entrepreneurial relationships which strengthen the capacity and functions of regional food networks. This article discusses the challenges faced as well as the opportunities provided by incubator farms, including suggestions as to future changes these programs might take to improve the success of their beginning farmer participants.

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