

What Makes a Small Farm Successful? A Review of Success Factors, Needs, and Challenges

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Abstract. Small-scale farmers face unique challenges. In this review, we conceptualize small farm success by aggregating and categorizing results from recent (post-2000) literature on small farm success factors and producer needs assessments. Our findings suggest that small farm success is multifaceted and not limited to profitability. We find that small farms have a diverse range of needs, though little has been done to rank their importance. We conclude that future research would benefit from increased methodological transparency and a systematic approach to needs evaluation. We consider the role of Extension professionals regarding the continued success of small farms.

INTRODUCTION

U.S. agricultural production changed markedly throughout the early 20th century, from small, diversified family farms to larger, mechanized farms (Dimitri, Efland, & Conklin, 2005; Hoppe, MacDonald, & Korb, 2010; Sumner, 2014). The number of farms in the United States peaked at 6.8 million in 1935, declined rapidly in the 1940s and 1950s, and continued declining to approximately 2 million farms in 1990, where it has approximately remained (Gardner, 2002; Hoppe & Banker, 2010). As total farm numbers declined over the 20th century, agricultural output increased by nearly seven times and the average size of a U.S. farm increased by 67% (Dimitri et al., 2005; Gardner, 2002). Indeed, farms are now larger, more specialized, and more productive (MacDonald & Hoppe, 2018).

Larger, more specialized farms are generally more viable businesses than smaller farms (Hoppe & Banker, 2010). Large farms may access greater economies of scale or possess increased managerial capacity (Dimitri et al., 2005; Sumner, 2014), while small farm operators are often willing to take economic losses or devalue their labor to achieve goals beyond production, such as maintaining a rural lifestyle and passing the farm onto the next generation (Hoppe et al., 2010). Although small farms vastly outnumber large farms in the United States, their share of total agricultural productivity is meager in comparison (Sumner, 2014). Large farms with gross annual sales of over \$1 million contribute

the bulk of agricultural production in the 21st century (Burns & MacDonald, 2018).

To proponents of industrialization, the decreased number of small farms translates into increased efficiency and output for the agricultural sector with less labor needed to maintain productivity (Dimitri et al., 2005; Sumner, 2014). For instance, the proportion of the U.S. population engaged in agriculture dropped from 41% to just under 2% from 1900 to 2002 (Dimitri et al., 2005).

On the other hand, detractors view U.S. agriculture as increasingly divided between very small and very large commercial farms, signaling trouble for small to mid-sized producers and the rural communities in which they live and operate (Hamilton, 2011; Johnson & Endres, 2011; Kirschenmann, Stevenson, Buttel, Lyson, & Duffy, 2008). The decline of small and mid-sized farms and rural population loss are linked: as farms go out of business, they take complementary businesses with them (Johnson & Endres, 2011). Especially in farming-dependent communities, those losses can spur closures of community facilities such as schools and hospitals (Baker & Baker, 2019; Johnson & Endres, 2011). In this article, we explore the literature on small farm success factors, needs, and challenges. We see this review as a critical first step in unraveling the complex socioeconomic issues facing small-scale agriculture in the United States.

DEFINING SMALL FARMS

The United States Department of Agriculture (USDA) classifies a farm as any place that produces and sells, or would have normally produced and sold, \$1,000 in agricultural products in a year (Hoppe & MacDonald, 2013; Hoppe et al., 2010). The USDA defines *small* farms as those with gross cash farm income (GCFI) under \$350,000 (Hoppe & MacDonald, 2013). GCFI is a measure of gross farm revenue, which includes revenue from crop and livestock sales, farm-related income, government payments, and fees from production contracts (Burns & MacDonald, 2018).

Small family farms dominate the national landscape, accounting for approximately 89% of total farms, using 51.9% of agricultural land, and contributing 25.8% of agricultural production in 2017 (Burns & MacDonald, 2018). A further distinction can be made between small non-commercial and small commercial farms. In 2010, 60% of small farms had GCFI of less than \$10,000 and 22% had GCFI of less than \$1,000 (Hoppe et al., 2010). Hoppe et al. (2010) defined small noncommercial and small commercial farms as follows:

- Small non-commercial farms as those with GCFI less than \$10,000.
- Small commercial farms as those with GCFI from \$10,000 to the upper limit of the small farm category (\$249,999 at time of this publication).

Hoppe et al. (2010, p. iv) further suggested that small non-commercial farms exist “independently of the farm economy,” largely due to their reliance on off-farm income. Contrastingly, small commercial farms had a total economic contribution of \$65 billion in 2007, greater than all farms in the Corn Belt states of Iowa, Illinois, Indiana, Missouri, and Ohio combined (Hoppe et al., 2010). Small commercial farms made up 40% of small farms and contributed all but 1% of total agricultural productivity associated with small farms in 2007 (Hoppe et al., 2010). In other words, about 800,000 out of two million small farms produced nearly all agricultural output attributed to small farms in 2007 (Hoppe et al., 2010). This trend has persisted, with small non-commercial farms contributing 0.8% of agricultural production compared to 23.9% for small commercial farms in 2017 (MacDonald & Hoppe, 2018). Small commercial farms are the type of farm disappearing at the fastest rate (while retirement or “hobby” farms are generally increasing) and will likely continue to dwindle due to economies of scale generated by larger operations (Burns & MacDonald, 2018; Hoppe et al., 2010).

It may be worth noting that several publications, including those by Ahearn and Newton (2009), Hoppe et al. (2010), Hoppe and MacDonald (2013), and Burns and MacDonald (2018) suggest that USDA farm typologies, for example the definitions of “small,” “beginning,” and “family” farms, are overly broad and can mask true differences among categories. Nonetheless, we consider discussions of typology

useful in presenting the structural characteristics of U.S. agriculture and small farms.

VALUE OF SMALL FARMS

Researchers and small farm advocates regularly cite concerns around small farm profitability (Harper & Eastman, 1980; Hoppe et al., 2010; Pool, 2014). Between 52.6% and 76.3% of small family farms have operating profit margins of less than 10%, an economic indicator of future financial problems (Burns & MacDonald, 2018). Measurement of operating profit is especially important for small farms where labor is often provided by operators, family members, and household members for low to no cost (Hoppe et al., 2010).

Most small family farms are reliant on off-farm income to meet their financial needs (Burns & MacDonald, 2018; Hoppe et al., 2010). Although this trend raises the median household income (i.e., GCFI and off-farm income combined) of farmer households, reliance on off-farm income also indicates a lack of profit from farming. Farming does not usually contribute positively to household income until GCFI reaches \$50,000, and farms with GCFI of \$100,000–\$249,999 still often rely on off-farm income for half their total household earnings (Hoppe et al., 2010). In 2019, average farm income remained below the cost of production with more than half of farming households losing money from farming (Baker & Baker, 2019).

Small farms have public value (USDA National Commission on Small Farms, 1998). Although several federal programs have been created or expanded to benefit small-scale producers, programmatic favoritism toward large agribusinesses remain common grievances among small farm and local food advocates (Johnson & Endres, 2011; Vogt & Kaiser, 2008).

SMALL FARM SUCCESS FACTORS, NEEDS, AND CHALLENGES

SUCCESS FACTORS ON SMALL FARMS

Farm success has traditionally been defined by financial measurements such as positive net income and profitability. More recently, researchers have addressed small farm success in terms of utility maximization, an economic concept which incorporates non-financial elements of success like quality of life and level of satisfaction (Ajwa, 1991; Nanhou, 2001). A wealth of literature on farm success factors exists prior to 1990; Fox, Bergen, and Dickson (1993) conducted a review of the literature on farm success factors, summarizing 20 different studies ranging from 1900 to the late 1980’s. Economic factors such as farm size and assets, net income, and returns on equity or investment defined their evaluated success factors (Fox et al., 1993). We decided not to incorporate these studies in our review due to major structural shifts in U.S. agriculture and the underrepresentation of small farms or small producers as

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the specific population of focus in the literature. We reviewed recent (post-2000) studies on small farm success factors to illuminate the meaning of success to small-scale agricultural producers as defined in the 21st century.

Among small farm success studies, we discovered a clear distinction between financial measurements of success (i.e., profitability) and self-perceived success. Only one researcher conducted an in-depth quantitative analysis, using a sample of 73 Iowa farms sorted by size and profitability (Nanhou, 2001). The researcher found several statistically significant differences between small, highly profitable farms and small, unprofitable farms (Nanhou, 2001). For example, small, highly profitable farms were operated by younger, more highly educated farmers who had more experience working on other farms and kept their cost-to-gross-profit ratio low in comparison to small, unprofitable farms (Nanhou, 2001). Other researchers ran inferential statistics on a sample of 74 small farms in Tennessee, finding that use of neighbors and use of radio as sources of information, use of forward cash contracts, minimum use of hired labor, record keeping, and other factors were statistically significant compared to less successful farms (Muhammad, Tegegne, & Ekanem, 2004). However, success in Muhammad et al. (2004) was measured via producer self-assessment using an 8-point Likert-type scale from 1 (*not successful*) to 8 (*very successful*), rather than in terms of profitability. Most of the small farm success factor researchers concluded that profitability was not the sole indicator of success for small-scale producers (Cuykendall, LaDue, & Smith, 2002; Pool, 2014; Shepherd, 2014; Yeboah, Owens, & Bynum, 2009).

Most of the data collected and analyzed in reviewed studies relied on producers' self-assessment of success. Nanhou (2001) and Muhammad et al. (2004) both had small-scale farmers identify attention to detail and timing as top contributing factors to their self-perceived success. When New York producers were asked the two most important factors to their success, they specified family support and love of farming (Cuykendall et al., 2002). In North Carolina, small-scale producers unanimously agreed that intrinsic satisfaction, rather than profitability, was a superior measurement of success (Yeboah et al., 2009). In Pool's (2014) qualitative study on small farm success in Oregon's Willamette Valley, each farmers' perception of success was unique and incorporated multiple dimensions. Finally, a study of small, direct market farms in the Mountain West found that profitability, low debt load, use of outside services (farm manager, bookkeeper, etc.), more years of experience, and less perceived competition had positive effects on self-perceived success. Table 1 provides a summary of the six studies with aggregated results of producers' self-perceived success factors.

Apart from Pool (2014, p. 69), who used qualitative methods to define "multiple dimensions of success" rather than specific factors, the other five studies yielded 28 success factors. As Table 1 demonstrates, no single model exists for conducting a study of small farm success factors; survey instruments, methods, and analyses varied considerably. Given the multi-faceted nature of small farm success, the four dimensions from Pool (2014)—operational, financial, quality of life, and social—created a conceptual framework in which we could further categorize and interpret the 28 small farm success factors gleaned from the literature (Table 2). The four dimensions of success can be defined using selected indicators from Pool (2014, p. 70):

- Operational: Product quality, production efficiency, and marketplace satisfaction.
- Financial: Solvency (i.e., making a living, growth in net farm income and/or production).
- Quality of life: Achieving work-life balance, feelings of satisfaction and accomplishment.
- Social: Farming for a belief or cause, for example environmentalism, or feeding one's community.

In Table 2, we categorized all but three success factors into one dimension. We interpreted accurate information, use of outside services, and less perceived competition to span two dimensions, and we added an additional(external) dimension. Arguably, financial and operational dimensions overlap. For example, low debt load is certainly a financial concern, but operational decisions directly affect the amount of debt a farm operator takes on. In this regard, we gave the financial dimension priority when categorizing success factors, and we considered operation analogous to management attributes and production decisions. Table 2 illustrates the importance of operational/management decisions to small farm success, which we think is indicative of farmers' entrepreneurial tendencies. Table 2 also highlights the importance of access to external resources, information, and governmental support, and reflects moderate concern for financial solvency as a factor of success. Although quality of life and social dimensions appear relatively unimportant, it might be noted that qualitative assessments placed more weight on their influence (Pool, 2014). Indeed, New York small-scale farmers reported that a desirable lifestyle and good family life were two of the most important reasons they consider themselves successful, though they cited different factors for measuring success (Cuykendall et al., 2002). Lack of small farm success factors in the social dimension suggests that intrinsic motivations (e.g., environmental or community concerns that sometimes prompt farming endeavors) are not typically considered indicators of success. We think this

Table 1. Summary of Small Farm Success Factor Studies

Authors	Location	Methods (analysis)	# Producers (n)	Types of success considered	Self-perceived success factors identified
Cuykendall et al. (2002)	New York	Survey (descriptive data only)	76	Self-assessment only	Cash flow; net worth (equity); contentment or satisfaction; net income; good rates of production; other factors with <10% response
Muhammad et al. (2004)	Tennessee	Survey (chi-square analysis)	74	Self-assessment only	Attention to detail; timing; government policies
Nanhou (2001)	Iowa	Survey (t-tests; regression models)	73	Profitability only	Timing; hard work; attention to detail; accurate information; effective decision-making ^a ; luck; government policies; formal education and training; off-farm employment
Pool (2014)	Oregon	Semi-structured interviews; focus groups	53	Self-assessment only	Multiple dimensions of success: social; operational; quality of life; financial
Shepherd (2014)	Utah, Idaho, Nevada, Colorado, and Wyoming	Survey (logit models)	86	Profitability and self-assessment	Profitability; low debt load; CSA ^b marketing; planning; more years of experience; use of outside services; perceived competition; personality type; other factors that differed between short and long models
Yeboah et al. (2009)	North Carolina	Survey (descriptive data only)	28	Mentioned profitability, but mainly used self-assessment	Love of farming; manageable debt; workshop participation

^a“Effective decision-making” is our rephrasing.

^bCSA stands for community-supported agriculture.

Table 2. Producers’ Self-Perceived Success Factors Based on Dimensions of Success

Study	Success factors by dimension				
	Operational	Financial	Quality of life	Social	Other (external)
Cuykendall et al. (2002)	Good rates of production	Cash flow; net worth (equity); net income	Contentment or satisfaction	—	—
Muhammad et al. (2004)	Attention to detail; timing	—	—	—	Government policies
Nanhou (2001)	Timing; hard work; attention to detail; accurate information; effective decision-making; luck	—	—	—	Accurate information; luck; government policies; formal education and training; off-farm employment
Shepherd (2014)	CSA marketing; planning; use of outside services; less perceived competition	Profitability; Low debt load	—	—	More years of experience; use of outside services; personality type
Yeboah et al. (2009) ^a	—	Manageable debt	Love of farming	—	Workshop participation
Factor Count	12	6	2	0	10

^aWe only used the primary self-perceived success factors identified by Yeboah et al. (2009).

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could be due to the complexity of measuring social objectives at farm-scale and/or indicative that farm success factors are conceptually independent of farming motivators. Overall, Table 2 demonstrates that profitability is often an integral component of small farm success but fails to entirely define success from the perspective of small-scale producers.

NEEDS AND CHALLENGES ON SMALL FARMS

A needs assessment is a systematic procedure to identify and describe the gaps between an existing state (what is) and a more desirable state (what should be) in a specific context and to establish priorities and criteria for solutions (Witkin & Altschuld, 1995). Producer needs assessments have been conducted in several parts of the country, though approaches

to and findings from these assessments vary considerably. Table 3 summarizes seven producer needs assessments. Producer needs assessments are often a form of agricultural extension; five of seven needs assessments were performed by Extension professionals, government employees, or agricultural service providers.

Like studies on small farm success factors, producer needs assessments did not have a standard model; questionnaire language, methodology, and analysis varied along with results. Three of seven producer needs assessments featured quantitative methods (survey only) and four of seven featured qualitative methods such as focus groups and interviews. Inconsistency makes our interpretation of results challenging. Should differences in top five needs be attributed

Table 3. Summary of Producer Needs Assessments

Authors	Location	Methods	# Producers (n)	Producer scope	Top five producer-identified needs
Bramwell et al. (2016)	South Puget Sound, Washington	Nominal group technique; key informant interviews	92	All producer types and sizes	Removal of physical barriers to high value markets; removal of social barriers to high value market; access to land; access to water; regulatory support and education on existing regulations
Goodwin & Gouldthorpe (2016) ^a	Florida	Focus groups with short demographic survey	59	Small-scale farmers <\$250,000	Information and resources; improved and accessible training; educated consumers; Extension involvement and knowledge
King (2016)	Delmarva peninsula (Delaware, Maryland, and Virginia)	Key informant interviews	~11	Small-scale African American farmers	Access to affordable and/or debt-free capital, infrastructure, and labor; increased market access; transportation/distribution assistance; municipal and government allies
Sullivan (2011) ^b	Cheshire County, New Hampshire	Focus groups and one-on-one interviews	62	All producer types and sizes	Ability to pay health insurance, worker's compensation insurance, and salaries to laborers; more equipment rental; more storage capacity; transportation/distribution assistance
Suvedi et al. (2010)	Michigan	Survey	~928	All producer types and sizes	Education in business, bookkeeping, and marketing; sustainable farming; management and care of livestock and animals; chemicals and fertilizer use; pests and disease management
University of Maryland Extension (2015)	Eastern Maryland	Survey	295	All producer types and sizes	Education in crop production; profit maximization and financial management; computer/financial software; farm business management; farm succession planning and communication
University of Maryland Extension (2017)	Northern and western Maryland	Survey	172	All producer types and sizes	Education in crop production; farm succession planning and communication; food safety regulations; record keeping and financial management; livestock production

^aGoodwin & Gouldthorpe (2016) assessed programming needs.

^bSullivan (2011) assessed labor and equipment needs.

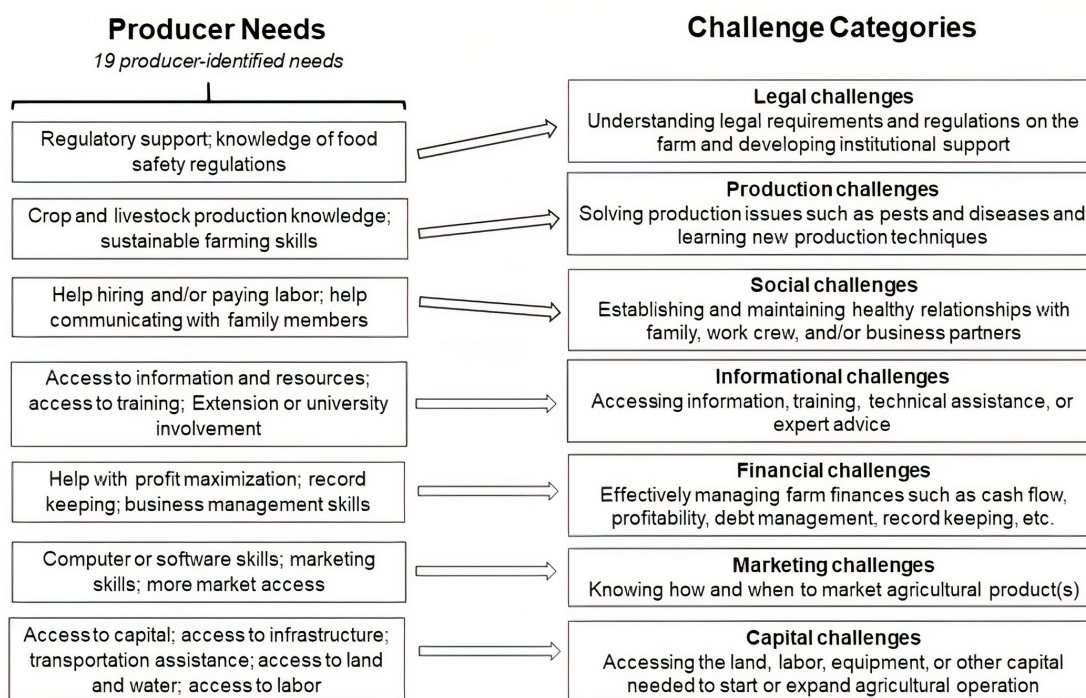


Figure 1. Categorizing producer-identified needs into thematic challenges.

to producer characteristics and geographic differences or in the way questions were written and presented by researchers?

Two studies examined specific types of needs. Goodwin and Gouldthorpe (2016) assessed educational needs of small-scale farmers in Florida from the perspective of Extension programming, which skewed results toward training and informational resources over other needs identified in focus groups, including access to funding, time management, pest control, and advertising assistance. Sullivan (2011) specifically assessed labor and equipment needs in Cheshire County, New Hampshire, creating targeted yet narrower results for our comparison purposes. Some overlap appears among producer identified needs. For example, removal of physical barriers to high value markets from Bramwell et al. (2016) and access to affordable and/or debt-free capital, infrastructure, and labor from King (2016) both address the issue of market barriers.

We categorized producer identified needs from Table 3 to familiarize ourselves with the *types* of needs small-scale producers face (Figure 1). To categorize producer-identified needs into challenges, we used a thematic analysis similar to Goodwin and Gouldthorpe (2016). Goodwin and Gouldthorpe (2016) grouped qualitative data from their focus groups and identified several themes for different types of challenges: personal challenges, economic challenges, natural challenges, marketing challenges, and agricultural knowledge challenges. By presenting this categorization, we attempt to create a framework that future researchers and Extension professionals can use when designing their quantitative and/

or qualitative analysis of small-scale producers. Further, given the variance of small-scale producer needs, we hope our categorization inspires future ranking exercises where researchers report on not only the variety of small-scale producer needs, but also their importance.

DISCUSSION

Recent literature on small farm success factors and the needs and challenges of small-scale producers is surprisingly limited. Studies varied considerably in their methods, analysis, and results. The number of studies we reviewed and the breadth of their results points to the need for a more comprehensive model(s) and/or more descriptive explanations of researchers' methodology. We found that many of the studies lacked explanation of how researchers developed their survey instruments and/or question guides. Some questions that remain are:

- Can our aggregated findings lead to a higher-level understanding of small-scale producer needs, one that actively influences agricultural service providers or policy makers?
- What solutions are available to address the needs and challenges faced by small-scale producers in the United States?
- What role does Extension play in better understanding and addressing the needs and challenges of small-scale producers?

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Our findings clarify that small-scale producers perceive success in multiple dimensions and face diverse challenges influenced by their experience, education, age, market opportunities, and other factors. Due to the diversity of small farm operators and their individual perceptions, it is likely impossible to include every factor that affects small farm success in future studies. However, we think that with increased methodological transparency as well as use (and improvement) of our initial thematic framework, researchers and Extension professionals have a great deal of knowledge to gain about a largely overlooked population.

Success of small farms has important implications for the trajectory of U.S. agriculture. As the average age of U.S. farmers continues to rise, the need to nurture the next generation is evident. Small-scale production tends to be the entry point for beginning and historically underserved producers. Therefore, understanding and addressing the success factors, needs, and challenges of small-scale producers is important to encourage the next generation of farmers. We think that Extension professionals are well poised to identify bottom-up solutions to small farm issues by conducting their own systematic studies on small farm success factors, needs, and challenges. We believe that by doing so, researchers and Extension professionals can help advance new farmers, revitalize rural communities, strengthen the agricultural economy, and solidify long-term investments in agricultural extension activities, which are ultimately predicated on the continuation of small, diversified, family farms.

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