Local Food Systems, Ethnic Entrepreneurs, and Social Networks

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Abstract

African immigrants in the United States (U.S.) experience immense challenges in the form of poverty, unemployment, and underemployment. Limited English language proficiency often restricts African immigrants to low-paying, unskilled positions. Ethnic entrepreneurship in the form of small-scale farming provides some African immigrants with an alternative to mainstream employment. Key to the success of many African immigrants is participation in beginning farmer programs. These programs operate as social networks, connecting immigrant farmers to training, farming resources, and members of the local community who provide access to additional resources and markets. Drawing from social capital theory, this mixed methods study investigates economic outcomes and social capital development within immigrant farmer programs. Immigrant farmer programs are analyzed as social networks that connect immigrants to technical training, farming resources, and community members who can provide access to markets. Data were collected through a survey of 112 agricultural educators working with immigrant farming programs across the United States. Data were also collected through case studies of programs in Ohio and Virginia. Bivariate correlation tests found the following agricultural training topics were significantly associated with economic outcomes, specifically training on farm equipment use, organic certification, and pest management. Ten marketing training topics were associated with economic outcomes, including business management, identifying markets, and introduction to direct markets. Social network ties were also associated with economic outcomes. These relationships were with the following organizations: farmers markets, community-supported organizations, the Extension Service, local farm supply stores, restaurants, and the Farm Bureau. Multiple regression tests found that 24.8% of the variance in economic outcomes could be accounted for by social network development, market training, and agricultural training.

Introduction

In the past decade, more than 850,000 African immigrants have relocated to the United States (U.S. Department of Homeland Security, 2011). These individuals have a lower median income than the native population and are more likely to live in poverty (U.S. Census, 2012). Employment opportunities are often limited for African immigrants because of their lack of English language proficiency which restricts them to working at low-paying, unskilled jobs (Reed, Andrzejewski, & Strumbos, 2010). Self-employment offers immigrants an alternative to mainstream employment (Salaff, Greve, Wong, & Li Ping, 2002). One area of growth in ethnic entrepreneurship is small-scale farming and marketing within a local food system (Brown,

2011). The USDA defines a local food system as an area in which food production, distribution, and consumption occurs less than 400 miles from its origin (Martinez et al., 2010). Farmers markets and other direct markets provide a low-cost point of entry for small farm operators who often have limited start-up capital (Gillespie, Hilchey, Hinrichs, & Feenstra, 2007).

Critical to the success of many immigrant farmers is participation in beginning farmer programs (Ostrom, Cha, & Flores, 2010). These programs operate as social networks, connecting immigrant participants to technical training and local food system stakeholders (Brown, 2011). Social networks can result in the development of social capital which can result in economic outcomes for participants (Lin, 1999). This mixed methods study explores the development of social capital through immigrant farmer programs in the United States.

African Immigrant Farmers in the U.S.

Although African immigrants make up only 9.7 percent of the total number of immigrants living in the United States, they represent one of the fastest growing immigrant groups in the nation (U.S. Department of Homeland Security, 2011). Between 2000 and 2010, the number of African immigrants living in the U.S. increased by 86.8 percent, which represented the highest rate of growth among all immigrant groups (Table 1).

Table 1
Immigrants in the United States by Country of Origin between 2001 and 2010

Country of Origin	Number of Immigrants in 2001	Number of Immigrants in 2010	Percent change
Africa	53,731	101,355	+ 88.6%
Asia	357,160	422,063	+ 18.2%
Europe	165,507	88,743	- 46.3%
North America	405,638	336,602	+ 17.0%
Oceania	6,071	5,345	- 12.0%

South America	68,484	87,187	+27.3%
Unknown	2,311	1,330	- 42.4%

Note. Adapted from the "2010 Yearbook of Immigration Statistics," by the U.S. Department of Homeland Security, Office of Immigration Statistics, 2011.

Approximately one and half million African immigrants live in the U.S., with an average of 50,000 African immigrants coming to the U.S. each year (Roberts, 2005; Terrazas, 2009). African immigrants coming to the U.S. in the 21st century face a number of challenges such as poverty, underemployment, and health-related issues. About 19 percent of African immigrants in the U.S. live at or below the poverty line, compared to 16 percent of other foreign-born populations and 13 percent of the native-born population (Reed, Andrzejewski, & Strumbos, 2010; U.S. Census Bureau, 2010). Approximately 49 percent of African immigrant families with a single mother and children under five live at or below the poverty line (U.S. Census Bureau, 2010).

Many African immigrants are employed in low-paying, unskilled jobs (Reed, Andrzejewski, & Strumbos, 2010). African immigrants are more likely to work in unskilled service occupations compared to other foreign-born populations (Reed, Andrzejewski, & Strumbos, 2010; Terrazas, 2009). "In the case of African immigrants, entry to labor markets, earnings, and mobility has been influenced largely by education, language proficiency, and entrepreneurial initiative." (Arthur, 2000, p. 3). African immigrants that come to the U.S. with limited education may "find themselves restricted to menial and low-paying jobs where they are subjected to exploitation" (Arthur, 2000, p. 3).

Many African immigrants also experience high rates of illness and poor nutrition (Biro, 2011; Patil, McGown, Nahayo, & Hadley, 2010; Reed, Andrzejewski, & Strumbos, 2010). Some African immigrants have pre-existing medical conditions that have developed through years of living in harsh environments with constant political oppression, famine, and torture

(Orieny, 2008). Immigrants also tend to have higher rates of infectious diseases compared to U.S. natives. “Tuberculosis rates (are) estimated to be four times higher among these (African) immigrants, and rates of hepatitis B virus, HIV, and parasitic infection also (are) significantly higher” (Orieny, 2008, p. 103). Children of immigrants also often have development delays in the forms of “general functioning delays, speech delays, gross motor delays, and disability from birth” (Orieny, 2008, p. 105).

In addition, many African immigrants struggle with high levels of depression, anxiety, and stress (Orieny, 2008; Venters & Gany, 2011). New immigrants often struggle trying to integrate into unfamiliar social, work, and educational venues which can lead to emotional strain (Venters & Gany, 2011). Struggling to assimilate into a new culture can be especially acute for men who often experience a loss of social status and identity in their host countries (Venters & Gany, 2011). African refugees tend to have heightened levels of anxiety which originate from the dangerous travels they experienced trying to flee from their homelands (Venters & Gany, 2011). “The unique stressors of such a journey have been associated with atypical presentation of depressive symptoms and dissociative or somatoform symptoms that escalate during a dangerous voyage and continue to worsen as an immigrant encounters new difficulties upon arrival” (Venters & Gany, 2011, p. 338).

Employment opportunities are often limited for immigrants because of their lack of English language proficiency which restricts them to working at low-paying, unskilled jobs (Reed, Andrzejewski, & Strumbos, 2010). Self-employment offers immigrants an alternative to mainstream employment (Salaff, Greve, Wong, & Li Ping, 2002). One area of growth in ethnic entrepreneurship is small-scale farming and marketing within a local food system (Brown, 2011). Immigrants that become farmers in the U.S. can often generate supplemental income.

Farming has provided immigrants with increases in annual income from $5,000 to more than $50,000 (Brown, 2011). Much of the success of immigrant farmers has been attributed to niche marketing of ethnic crops which are often expensive to purchase in supermarkets (Brown, 2011; Patil, McGowan, & Nahayo, 2010). When immigrant farmers make these specialty crops available through farmers markets and other local venues, they also provide immigrant communities in the surrounding area with additional sources of healthy, culturally-relevant food (Darcé, 2010).

Critical to the success of many immigrant farmers is participation in beginning farmer programs (Ostrom, Cha, & Flores, 2010). The programs often target beginning farmers and ranchers, or individuals who have "operated a farm or ranch for 10 years or less" (Ahearn & Newton, 2009, p.iii). These programs provide immigrants with essential resources to help them transition from community gardens and incubator farms to owning their own farms (Brown, 2011). These farming programs offer educational training in a range of topics including growing practices, pest control, irrigation techniques, soil science, growing seasons, and business development (Hill, 2011; Macy, 2011; Nickel-Kailing, 2011; Pereira, 2007; Tufts University, 2011). They also provide resources in the form of farmland, farming equipment, and utilities (Hill, 2010; Macy, 2011; Nickel-Kailing, 2011; Pereira, 2007; Tufts University, 2011). In addition, these programs provide access to local markets such as farmers markets, community-supported agriculture programs (CSAs), farm stands, and locally-owned restaurants (Brown, 2011; Snook, 2010).

Agricultural educators working in farming programs often make accommodations to meet the needs of immigrant farmers. Some programs include translators who relay information to participants in their native languages (Macy, 2011; Ostrom, Cha, & Flores, 2010). In some

cases, agricultural educators have translated curricula into alternative languages or reformatted the curricula to include simple language and visual aids (Hightower & Griffin, 2012).

Researchers explain that immigrant farming programs operate as social networks, connecting participants to a wide range of influential individuals who provide them with access to new resources such as farmland, as well as access to markets such as farmers markets and community-supported agriculture programs (International Rescue Committee, 2012; Lewis, 2010; Macy, 2011). Social networks developed through immigrant farmer programs have led to a number of benefits for program participants, including supplemental income, access to culturally-relevant food, and integration into American society (Laverentz & Krotz, 2012). Farming also provides immigrants a way to return to the agrarian lifestyle that many of them experienced in their homelands (Lutheran Social Services, 2011). Farming provides immigrants with employment that helps them meet their economic needs while preserving their cultural heritage (Biro, 2011; Lutheran Social Services, 2011).

Local Food Systems

Farmers market, community-supported agriculture programs or CSAs, and other direct markets have become prolific throughout the U.S. due to the alternative agriculture movement which promotes local food production, distribution, and consumption (Allen, 2004). Markets that sell locally-grown agricultural products often put a premium on specialty products that have been grown using low-input farming methods (Lyson, 2004). Immigrant farming programs have been successful in teaching farming practices for specialty crops such as ethnic crops, and production with limited use of fertilizers and pesticides (Brown, 2011). These programs also connect immigrant participants to influential individuals working in the local

food system, including farmers market managers, local farmers, and local farm supply managers (International Rescue Committee, 2012; Lewis, 2010; Macy, 2011).

Social Networks and Social Capital

Communities are constructed through human interaction (Flora & Flora, 2003). Social networks are formed as individuals within communities interact with each other (Mitchell & Trickett, 1980). Social networks are the "total set of linkages among all of the members of a particular population (e.g., the social network characteristics of a village community, or of a bounded work group)" (Mitchell & Trickett, 1980, p. 28). The relationships that are developed between members in social networks are called social ties (Mitchell & Trickett, 1980). These ties can be categorized by their level of multidimensionality or the type of exchanges that occur between members, the strength of the ties, and the frequency of interaction that occurs (Granovetter, 1973; Mitchell & Trickett, 1980).

Social capital is a type of capital which is accrued through building relationships in social networks (Bourdieu, 1986). Developing relationships in social networks requires an investment of time and energy by the members, with the expectation that members will have access to the resources held by other members within the network (Green & Haines, 2012). Increasing social capital in communities reduces transaction costs which in turn promotes collective action (Newman & Dale, 2005).

Emery and Flora (2006) describe two types of relationships that occur within social networks and the social capital that is generated from each type of social tie. The first type of network relationship is the relationship that is developed among peers within the network, also known as horizontal networks (Emery & Flora, 2006). Horizontal networks involve close knit

relationships among peers within the network. These ties tend to involve high frequency of interaction between the members and often increase community solidarity. These relationships result in strong ties and bonding social capital (Emery & Flora, 2006; Granovetter, 1973).

The second type of network relationship involves the development of horizontal networks (Emery & Flora, 2006). Vertical networks involve loose ties with individuals from different social networks (Flora & Flora, 1993). Granovetter (1973) refers to these kinds of relationships as weak ties. These relationships have much lower levels of frequency of interaction between the members compared to horizontal networks, and often include members with varying levels of influence. Vertical networks result in bridging social capital (Emery & Flora, 2006). Bridging social capital offers members access to resources that would otherwise be unavailable such as new information channels (Coleman, 1988). Burt (1998) explained that these relationships provide individuals with key resources such as access to new markets and information about potential employment opportunities.

Ethnic Entrepreneurship and Social Networks

African immigrants often develop horizontal networks with peers in their ethnic group (Arthur, 2000). These relationships can be enhanced through African mutual aid associations. Mutual aid associations are organizations that are formed by individuals to "represent their ethnic, clan, religious, village, alumni, and national affiliations" (Arthur, 2000, p. 70). These associations provide "economic, psychological, cultural, and political support" (p. 70). African mutual aid associations provide new immigrants with social ties ties which are "crucial for social, cultural, and economic survival" (Arthur, 2000, p. 71). These social networks help immigrants preserve their African culture while successfully integrating them into the host

country (Association of Africans Living in Vermont, 2012; Somali Bantu Youth Association of Maine, n.d.). “The interpersonal bonds that the immigrants foster among themselves within these associations are crucial to how they define and express their cultural distinctiveness and identity as Africans.” (Arthur, 2000, p. 71).

These horizontal networks can provide key support for ethnic entrepreneurs. Tight-knit immigrant communities develop human and social capitals which are vital to small business development (Sanders & Nee, 1996). Membership in ethnic communities provides a number of benefits, including intra-family loans, a ready pool of labor, shared interests among members, close personal ties, informal subleasing agreements (Sanders & Nee, 1996).

Unfortunately, immigrants that have established horizontal networks through membership in ethnic communities often fail to have established vertical networks. When immigrants rely on connections they have within their ethnic communities, they reduce their interaction with individuals outside of their ethnic communities (Li, 2004). This in turn can limit their ability to access mainstream markets and alternative sources of capital (Li, 2004).

Participation in beginning farmer programs can provide immigrant farmers with access to a range of individuals outside of their ethnic community (Brown, 2011; Hill, 2010; Macy, 2011; Nickel-Kailing, 2011; Pereira, 2007; Snook, 2010). These programs help immigrant farmers to establish vertical networks. Through these programs, immigrant farmers can gain access to mainstream markets such as farmers markets and CSA (Hill, 2010; Macy, 2011; Nickel-Kailing, 2011; Pereira, 2007). These programs can also connect immigrant farmers to individuals who can provide access to farming resources such as farmland and credit (Ostrom, Cha, & Flores, 2010).

Research Methods

This mixed methods study explores the development of social capital through immigrant farming programs in the United States. The study investigates the association between technical training, social network development, and economic outcomes in immigrant farmer programs. The researchers conducted a national survey with 112 immigrant farmer program directors across the U.S. In addition, the researchers interviewed and conducted focus groups with 29 individuals from immigrant farming programs in Cleveland, Ohio and Fredericksburg, Virginia. These individuals included immigrant farmers, agricultural educators, and community partners.

Unit of analysis. Immigrant farmer programs in the United States serve as the unit of analysis in this study. The experiences, attitudes, and perceptions of the diverse individuals associated with immigrant farmer programs will be explored to determine how organizations administering immigrant farmer programs affect the development of social capital for immigrant participants within their programs. The individuals include program participants, agricultural educators, and community partners. Focusing on this unit of analysis is fitting for this study because social capital development is being investigated at the program level rather than the program participant level.

Population. The population for the survey included agricultural educators working with immigrant farmer programs across the United States. No exhaustive list existed of immigrant farming programs in the U.S. Therefore, the researcher developed a list of these programs by compiling partial lists of immigrant farming programs from the websites of granting agencies and organizations that focus on immigrant farming initiatives. Immigrant farmer programs were identified through searches of the following organizations' websites: the USDA's National

Institute of Food and Agriculture, the USDA's Start2Farm initiative, the National Immigrant Farming Initiative, and the Office of Refugee Resettlement's Refugee Agriculture Partnership Program. The researcher then created a Google Alert search which provided weekly updates on local, regional, and national news stories that featured the search terms "immigrant farmer" or "refugee farmer." Through this process, the researcher identified 125 immigrant farming programs. The survey population included 274 agricultural educators associated with these immigrant farmer programs.

Survey instrument development. The researcher could not identify an existing survey instrument which measured social capital development within immigrant farmer programs. Therefore, the researcher developed a survey instrument to collect data on social capital development within immigrant farmer programs. The researcher reviewed a number of existing surveys to guide the development of the survey instrument. The researcher reviewed surveys on beginning farmer programs, including the Massachusetts New Entry Beginning Farmer survey and the Virginia Beginning Farmer and Rancher Coalition Project survey. The researcher also reviewed surveys on social capital development such as the Australian Institute of Family Studies' Families, Social Capital and Citizenship survey.

From these surveys, the researcher created an online survey which assessed the attitudes, perceptions, and experiences of agricultural educators who worked with immigrant farming programs. The researcher was guided in the survey design by the Tailored Design Method (Dillman, Smyth, & Christian, 2009). The survey included Likert-scale questions which measured variables associated with economic outcomes, agricultural production technical training, marketing technical training, and social network development. The researcher chose to distribute the survey online in order to reach the greatest number of survey recipients across the

country. Data collection for the online survey occurred over an eight-week period of time, from June 11th – August 1st, 2012. A further description is provided for the four variables.

Variable 1: Economic outcomes. The dependent variable in this study is economic outcomes. The survey included 15 items measuring economic outcomes of the programs which were rated on a four-point Likert scale of how likely these outcomes were occurring, from 1, strong disagree to 4, strongly agree. Table 2 provides a description of the items. A reliability test determined that the 15 items were similar (Cronbach alpha = 0.898). Therefore, a composite variable was developed that aggregated the values of the 15 items into a single score. This composite variable was used in the analyses.

Table 2
Economic Outcomes of Immigrant Farmer Programs

Program Outcomes	**Mean**[1]	**Std. Deviation**	**N**
1. Participants are saving money on food.	3.33	0.59	84
2. Family members are saving money on food.	3.29	0.64	82
3. Participants are farming part-time.	3.20	0.71	81
4. Farming is providing supplemental income.	3.04	0.80	78
5. Participants are selling more of their agricultural products.	3.01	0.93	81
6. Participants have sold their products at a farmers market.	2.87	0.96	78
7. Farming is providing family members with supplemental income.	2.83	0.82	77
8. Participants have developed a farm plan.	2.74	0.77	81
9. Participants have developed a marketing plan.	2.70	0.79	79
10. Participants have sold their products through a CSA program.	2.61	1.04	79
11. Participants have hired family members to help them farm.	2.48	0.87	77
12. Participants are farming full-time.	2.46	1.00	79
13. Participants have acquired a business license.	2.35	0.86	79
14. Farming is providing participants with a sustainable source of income.	2.30	0.80	76
15. Farming is providing family members with a sustainable source of income.	2.17	0.76	78

[1] Mean based on a four-point scale from '1' strongly disagree to '4' strongly agree.

Variable 2: Agricultural production technical training. One of the independent variables in the study was agricultural production technical training. The survey included seven items measuring the frequency that agricultural production technical training topics were taught. The topics were listed as statements and participants ranked how often the topic was taught on a

five-point scale ranging from 1, never taught to 5, six or more sessions taught. Table 3 provides a description of the agricultural production technical training items.

Table 3
Technical Training Topics Taught in Immigrant Farmer Programs

Technical Training Topics	Type of Training	Mean[1]	Std. Deviation	N
1. Pest, disease, and weed management	Production	3.04	1.36	89
2. Harvest and post-harvest handling	Production	2.87	1.24	90
3. Soils, nutrients, and irrigation	Production	2.84	1.23	90
4. Crop planning	Production	2.74	1.16	91
5. Introduction to direct marketing	Marketing	2.64	1.35	88
6. Identifying markets	Marketing	2.53	1.22	89
7. Developing a business plan	Marketing	2.52	1.27	92
8. Developing a marketing plan	Marketing	2.48	1.21	89
9. Record keeping	Marketing	2.47	1.19	93
10. English language skills	Marketing	2.45	1.70	84
11. Business management	Marketing	2.39	1.20	92
12. Farm equipment use and maintenance	Production	2.37	1.07	90
13. Financial literacy	Marketing	2.31	1.23	90
14. Interacting with individuals in markets	Marketing	2.30	1.19	84
15. Introduction to wholesale marketing	Marketing	2.11	1.20	88
16. Legal issues	Marketing	2.07	1.06	89
17. Leadership skills	Marketing	1.90	1.10	88
18. Organic certification	Production	1.87	0.98	84
19. GAP (Good Agricultural Practices)	Production	1.84	0.94	81

[1] The mean comes from a five-point scale ranging from '1' as never taught to '5' as six or more sessions taught.

Variable 3: Market technical training. Another independent variable in this study was market technical training. The survey included 12 items that measured how frequently market training was offered to the participants. The items were ranked on a five-point Likert scale from 1, never taught to 5, six or more sessions taught. Table 3 provides a description of the market technical training items.

Variable 4: Social network development. The fourth independent variable in the study was social network development. These items measured the level of vertical social network development occurring within the programs. The survey included 10 items that measured the interaction the participants had with individuals from organizations outside of the program. The respondents rated the level of interaction on a five-point scale ranging 1, never interact to 5,

interact a few times a week. Table 4 describes the level of interaction participants had with organizations outside of the program.

Table 4
Level of Interaction with Organizations Outside of the Program

Organizations	**Mean** [a]	**Std. Deviation**	**N**
Churches	2.47	1.39	81
Resettlement organizations	2.41	1.57	80
Farmers markets	2.28	1.26	83
Community-supported agriculture programs	2.16	1.43	82
Universities or colleges	2.14	0.96	83
Extension Service	2.04	1.06	85
Local farm supply	1.96	0.94	82
Restaurants	1.90	1.03	83
Americorps	1.69	1.27	80
USDA Farm Service	1.54	0.67	85
Small business administration	1.45	0.77	84
Farm Bureau	1.32	0.62	84

[a] The mean comes from a five-point scale ranging from '1' as never interact to '5' as interact a few times a week.

Case study selection. The researcher reviewed the respondents who had completed the survey. The researcher conducted phone interviews with five of the respondents to identify programs that could be used for the cases, as well as determine the selection criteria. Through the interview process and a review of the literature, the researcher identified three criteria which would be used to select the cases, including the 1) world region of origin of the participants, 2) classification of the county in which the program was located, and 3) gender of the participants. Table 5 offers a detailed description of the criteria and the two programs which were selected.

Table 5
Criteria for Case Study Selection in the Qualitative Research Strand

Selection Criteria	**Ohio Program**	**Virginia Program**
World region of origin of participants [a]	Africa	Africa
Classification of county [b]	Metropolitan area	Metropolitan area
Gender of participants	Majority are male	Majority are female

[a] World region of origin given by the U.S. Department of Homeland Security (2011).
[b] Classification of county given by U.S. Census Bureau (2012).

The researcher chose two selection criteria that operated as control variables: world region of origin of the participants and classification of the county in which the programs were located. The researcher used world region of origin of the participants as a criterion in order to control for cultural differences that could exist among immigrant farmers from different regions of the world. The researcher chose to focus on African immigrant program participants rather than participants from other regions of the world in order to fill a void in the literature with respect to African immigrant farming programs. In addition, the researcher chose to use the classification of the county in which the programs were located as a control variable. Research has shown that individuals within urban areas tend to develop vertical networks and individuals within rural areas tend to develop horizontal networks (Hofferth & Iceland, 1998). The researcher wanted to ensure that the county in which the programs were located did not influence the development of social capital within the programs.

Qualitative protocol development. The researcher developed a series of interview guides to further study issues involved in technical training and social network development. The researcher developed three interview guides for the main groups of individuals associated with the programs: 1) program participants, 2) agricultural educators working with the program, and 3) community partners. When necessary, the researcher utilized translators as part of the data collection. The researcher developed a translator confidentiality agreement form to ensure that

the information the translator was privy to during the interviews remained. The researcher received approval for the protocol from the Institutional Review Board.

Qualitative data collection methods. The data collection for the case studies included site visits to Ohio and Virginia. During the site visits, the researcher conducted interviews and focus groups with individuals associated with the programs (e.g., program participant, agricultural educator, and community partner). When the researcher conducted focus groups, the interview guides for the appropriate individuals were used. The site visits occurred from August - September 2012.

Results

The researcher analyzed the data collected through the online survey using IBM SPSS Statistics. The researcher emailed an initial pre-notice letter to the survey population of 274 individuals. After the initial mailing, 17 individuals were removed from the survey population. These individuals were removed from the population because the email address was invalid or the individual emailed the researcher to report they no longer worked with the program or the program did not include immigrant participants. A link to the online survey was then sent to the remaining 257 individuals in the population. Of those individuals, 126 responded to the survey.

The first item on the survey asked respondents if they worked with a farming program that included immigrant participants. Of the 126 individuals that responded to the survey, 14 individuals stated that their program did not include immigrant participants. Those 14 individuals were disqualified and did not complete the rest of the survey. Out of a total of 243 qualified respondents (i.e., individuals who worked with farming programs that included immigrant participants), 112 individuals completed the survey. The response rate for the survey is 46.1%.

Bivariate correlation tests found the following agricultural production training topics were significantly associated with economic outcomes. Economic outcomes were positively associated with the following topics 1) pest, disease, and weed management, 2) farm equipment use and maintenance, and 3) organic certification training. Table 6 provides an overview of the correlations. Market training topics were also significantly associated with economic outcomes. Eleven out of 12 market training topics were associated with economic outcomes. The only topic not associated was leadership skills. All of the associations were positive, except for one market training topic. Training in English language fundamentals was negatively associated with economic outcomes. Table 7 provides a detailed description of the correlations among the market training topics.

Table 6

Correlations Between Economic Outcomes and Agricultural Production Technical Training

Agricultural Production Training Topics	Pearson correlation (r)
1. Pest, disease, and weed management	0.228*
2. Harvest and post-harvest handling	0.111
3. Soils, nutrients, and irrigation	0.162
4. Crop planning	0.172
5. Farm equipment use and maintenance	0.293†
6. Organic certification	0.288†
7. GAP (Good Agricultural Practices)	0.131

Notes: * Significant at $p \leq 0.05$, † Significant at $p \leq 0.01$, ‡ Significant at $p \leq 0.001$.

Table 7

Correlations Between Economic Outcomes and Market Technical Training

Market Training Topics	Pearson correlation (r)
1. Introduction to direct marketing	0.440‡
2. Identifying markets	0.451‡
3. Developing a business plan	0.413‡
4. Developing a marketing plan	0.412‡
5. Record keeping	0.339‡
6. English language skills	-0.240*
7. Business management	0.443‡
8. Financial literacy	0.355‡

9. Interacting with individuals in markets	0.244*
10. Introduction to wholesale marketing	0.438‡
11. Legal issues	0.414 ‡
12. Leadership skills	0.173

Notes: * Significant at $p \leq 0.05$, † Significant at $p \leq 0.01$, ‡ Significant at $p \leq 0.001$.

Correlation tests were also conducted among the social capital development items and the variable of economic outcomes. Economic outcomes were positively associated with interaction with the following organizations: farmers markets, community-supported agriculture programs, the Extension Service, local farm supply stores, restaurants, and the Farm Bureau. Economic outcomes were negatively associated with interaction with resettlement organizations.

Table 8
Correlations Between Economic Outcomes and Interaction with Organizations Outside Program

Organizations	**Pearson correlation (r)**
Churches	0.183
Resettlement organizations	-0.196‡
Farmers markets	0.390‡
Community-supported agriculture programs	0.245*
Universities or colleges	0.118(0.295)
Extension Service	0.217*
Local farm supply stores	0.283*
Restaurants	0.260*
Americorps	0.083
USDA Farm Service	0.208
Small business administration	-0.019
Farm Bureau	0.390‡

Notes: * Significant at $p \leq 0.05$, † Significant at $p \leq 0.01$, ‡ Significant at $p \leq 0.001$.

Multiple regression tests were conducted with the following variable: economic outcomes, agricultural technical training, marketing technical training, and social network development. The regression tests found that 24.8% ($r^2 = 0.248$) of the variance in economic

outcomes could be accounted for by social network development, market training, and agricultural training ($F = 6.908$, $p = 0.000$).

Qualitative analysis found that the technical training most critical to farmer success was training on farmers markets. This training included interacting with customers, making change, and weighing agricultural products. Through this training, participants also acquired English language skills. Key social ties developed with individuals outside of the programs were with individuals from the following organizations: farmers markets, churches, and the Extension Service.

Conclusions and Discussion

This study explored the association between social capital development in immigrant farmer programs and the economic outcomes generated through those programs. The social capital factors of technical training and social network development were investigated. Results from a national survey and case studies found that the key technical training topics associated with positive economic outcomes were predominately focused on market training. These included identifying markets, introduction to farmers markets and other direct markets, and business management. While many programs taught agricultural production topics they seemed to have less of an association with economic outcomes.

In addition, interaction with individuals from organizations outside of the program was positively associated with economic outcomes. A wide range of relationships were associated with positive economic outcomes, including individuals from farmers markets, community-supported agriculture, and Extension Service. These findings support the results of the studies

by Burt (1998) and Granovetter (1973) which state that vertical networks, or social networks involving individuals outside of the person's peer group, enhance business development.

We recommend that individuals working with immigrant farmer programs encourage their participants to interact with organizations outside of the programs. This interaction can occur through field trips to local farmers markets or farms. Interaction between participants and outside organizations can also be encouraged through mentor programs that link participants to individuals working with local markets or community-supported agriculture programs. These types of interaction can provide participants with key market training and connections to individuals who can facilitate entry into new markets.

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