

Economic sustainability through diversification and self-reliance: The role of farmers on the north shore of Oahu

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ABSTRACT

The economic, social and environmental benefits of supporting local food have been shown through other research to be the driving force behind the increase in consumer demand. This study uncovers the perspectives held by direct-sale farmers, operating at Oahu's north shore farmers' markets, which relate to their ability and willingness to meet the growing consumer demand. Through a voluntary survey, farmers' market organizers, local food supporting organizations and direct-sale farmers operating at the three north shore markets were interviewed and the results were analyzed to uncover the areas that impact the demand/supply dynamic of local food. The results of the study demonstrate that accessing consumers, despite the geographical isolation and market times of the observed farmers' markets, is not a primary concern. The analysis reveals that government land use and agricultural policies are the predominant areas affecting the relationship between consumer demand and the supply of locally produced food. This study indicates that a majority of farmers, who have the desire and ability to produce more food, utilize multiple avenues to reach consumers, have implemented some form of sustainable production methods into their business and offer a diverse variety of products in order to remain competitive. Despite such beneficial attributes, the results of this study conclude that the supply and consumption of local food is limited. In turn, the structural barriers related to land use and agricultural policies are shown to be affecting the economic prosperity of the farm community operating at the north shore farmers' markets.

Keywords: Farmers' Market, Sustainability, Supply, Demand, Hawaii

Hawaii has one of the most open economies in the United States, making the island state vulnerable and hypersensitive to economic, social, and environmental fluctuations around the world. Although currently importing 85% of its food at a cost of over \$3.1 billion annually (Leung & Loke, 2008), the state is in an advantageous position to offer diversified agricultural commodities because of its year-long growing season, numerous soil types, and abundant fertile farmland. Agriculture also offers a suitable solution to the protection of open space, which is a high priority for the majority of state residents.

The *Hawaii 2050 Sustainability Plan* (HSTF; 2007) indicated the path toward economic prosperity is through economic diversification and self-reliance. Farmers and local food systems play vital roles in building this diverse, self-reliant economy. Small to medium-scale farms, which predominantly occupy farmers' markets, are essential in diversifying the island economy through the production of a wide range of agricultural commodities; and farm sales have a multiplier effect on economic prosperity through direct revenues and indirect and induced inputs from farm activity.

The focus of this research study was the role direct-sale farmers on the north shore of Oahu have in developing increased economic prosperity for Hawaii through diversification and self-reliance. These direct-sale farmers produce diverse commodities but currently have limited consumer exposure due to the geographical isolation of the region. The primary aim of this study was to uncover the effect of the spatial-temporal variation of consumers at north shore farmers' markets on direct-sale farmers' ability and desire to produce more agricultural food commodities to meet increasing demand to perpetuate economic prosperity for Hawaii. The secondary aim was to analyze how the farmers surveyed incorporate sustainable production methods into their business operations and to what degree they do so.

BACKGROUND

Problems with the global industrialized food system and the sustainability of local food systems have been repeatedly documented. These difficulties include immense carbon dioxide emissions; land and water pollution; destruction of rural economies; the development of food deserts within urban areas; the homogenization of food commodities; health problems, including diabetes and obesity; inequality; and most important, dependence upon the global food market (Brown, 2008; Connell, Smithers, & Joseph, 2008; Domhoff, 2006; Halwell, 2002; Hinrichs & Lyson, 2007; Macias, 2008; Meadows, Meadows, & Rander, 2004; Nichol, 2003).

Local food systems, on the other hand, lower emissions of carbon dioxide because of closed loop production and consumption cycles and the limited need for transportation. Local food systems enhance open space; strengthen rural economies; link urban and farm communities; protect biodiversity; offer diverse, healthy food options; recharge aquifers; limit the spread of invasive species; and assist in regaining independence from corporate agribusiness and the global food market (Gilg & Battershill, 2000; Grewal & Grewal, 2011; Halwell, 2002; Leung & Loke, 2008; Macias, 2008; Nichol, 2003; Pollan, 2006; Seydel, 2008).

Supply

Supplying sufficient quantities of diverse foods to farmers' markets can be difficult. Local food production is limited by the availability of resources, product outlets, and

infrastructure. Farmers striving to improve their production processes may also reach the point at which pursuing further production opportunities is uneconomical and environmentally threatening.

The current system of agricultural planning in Hawaii also limits local food production (Nichol, 2003). Challenges include an extensive development approval process, the reliance on litigation to solve planning disputes, confusion over the purpose of the state agricultural district, lack of resources used in effective planning, and limited public participation. Land planning has also had more to do with preventing urban sprawl than with developing effective agricultural systems (Suryanata, 2002).

The different interpretations of *sustainable development* also affect supply. Planning authorities view sustainable development as strictly economically viable, while local farmers view sustainable development as the cohesion of human needs and environmental stewardship (Nichol, 2003). Hawaiian environmental stewardship is based on five principals that emphasize resource management, the interdependencies that abound in nature, the value of fresh water, ancestral knowledge, and the practice of *aloha aina* (“love of the land”).

In terms of increasing the local food supply, the current planning system only considers the distance travelled by consumers to direct-sale markets. The distance travelled between production and point of sale is not addressed. Nor is the need for more labor. The system does not support increased housing for farm workers on agricultural lands, which limits the availability of the labor needed to increase supply.

Another problem is the scarcity of available land in Hawaii, which increases its value and intensifies competition for its use. Much of the land classified as important agricultural land (more than 400,000 acres) lies idle due to the downturn in the sugar and pineapple industries at the end of the last century (HSTF, 2007). Two thirds of private land (approximately 1.6 million acres) is owned by the 40 largest landowners (Suryanata, 2002). Many of these owners hope to have their land reclassified from agricultural to urban, with the intention of selling the land for the development of resorts or suburban communities.

Lack of awareness among consumers about the benefits of buying locally produced agricultural commodities, competition from inexpensive imports, and the overwhelming power and inflexibility of supermarket chains affect the willingness and abilities of farmers to increase the supply of local foods as well. Thus, marginalized farmers must incorporate survival strategies at both the macro (structural economic processes) and micro (individual) levels to increase their economic standing to increase their supply of local foods (Meert, Huylenbroeck, Vernimmen, Bourgeois & Hecke, 2005). Directly linked to achieving success in doing so are three options for diversification: (a) innovative approaches to the current market for agricultural commodities, (b) redistribution of resources through government policies to prioritize local agriculture, and (c) reciprocity or cooperation with other farmers. Entrepreneurial behaviors such as innovative marketing activities and the development of new organizational channels may also result in economic success for farmers operating through farmers’ markets.

Demand

Consumers have become very aware of the destructive nature of the globalized food system and have begun purchasing food produced locally by a less intensive manner. However, several issues limit the demand for local food (Seyfang, 2006). First, the current economic system does not account for the environmental and social externalities related to the globalized food system.

Second, in policies concerning sustainability and local food, factors of consumption such as availability, convenience, affordability, and identity are often ignored. Third, rather than working together to solve environmental problems, consumers often find themselves working as individuals against global corporations and political entities. Fourth, policy endeavours are focused strictly upon consumer goods rather than on obstacles in the government and infrastructure that result in limiting consumer demand. Last, in policies concerning sustainability and local consumption, alternative channels for the availability and demand for local food are not included; thus, current patterns of consumption are not addressed.

Spatial-temporal variations in farmers' markets also affect consumer demand. Venue locations and the times the markets are open are often not conducive to consumers. These must be addressed to increase access to direct market sales. Consumer demand has also been limited to predominantly middle and upper class, educated individuals (Macias, 2008). By turning their attention to low-income neighborhoods and participating in coupon programs for the urban poor, direct-sale farmers may increase product demand substantially.

METHODOLOGY

The method of inquiry for this study was both qualitative and quantitative. The qualitative approach was used to uncover trends and the perceptions of farmers and market organizers in their roles in delivering economic prosperity and social and environmental sustainability. The quantitative approach was used to gather information concerning farm size, agricultural productivity, and labor and to comprehend perceptions, trends, and statistics in an organized fashion.

Participants and Setting

The subjects for this study consisted of farmers participating in the farmers' markets on the north shore of Oahu, the organizers of those markets, and members of local food support groups. Twenty-five of the 32 farmers (78%) who conducted business at the farmers' markets volunteered to participate. Organizers from two of the three farmers' markets analyzed in this study participated. Although members from many influential support organizations and certifying organizations were contacted, only one certifying member and one support organization member chose to participate in the study. All participants were volunteers.

The three farmers' markets operating on the north shore of Oahu were chosen as the sites for the study: Hale'iwa Farmers' Market, North Shore Country Market, and Waialua Farmers Market. North shore farmers' markets were selected for two reasons. First, they encompassed a larger percentage of vendors who actually produced agricultural food commodities. Many of the other farmers' markets on Oahu were overrun with food wagons and specialty crafts not produced locally. Second, direct-sale farms on the north shore of Oahu offered diverse locally produced commodities but currently experienced limited consumer exposure due to the geographical isolation of the region.

Instrumentation

Separate questionnaires were specifically designed to survey direct-sale farmers, members of certifying organizations, market organizers, and members of influential groups

working towards sustainable agriculture in Hawaii (e.g., the Hawaii Farm Bureau). These questionnaires were developed to assess the existing opportunities and limitations in increasing local food production and distribution from north shore farms. The questions were designed to extrapolate both qualitative and quantitative answers to understand the specific supply/demand dynamic currently at play in these north shore farmers' markets. The surveys for market organizers, members of certifying organizations, and members of support groups each contained a combination of 11 yes/no and open-ended questions. The survey for the farmers contained a combination of 17 yes/no, open-ended, fill-in-the-blank, and multiple-choice questions. The questions concerned participants' business aspirations and their perceptions of (a) local food production and consumption related to the economic prosperity of Hawaii and sustainability, (b) the limitations affecting their abilities to contribute to such prosperity, and (c) opportunities to link consumer demand and the supply of locally produced food.

The questionnaires were pretested by colleagues to enhance face validity and to ensure question clarity, particularly in regard to any language barriers resulting from a large immigrant farm population. The pretest was also used to shorten the length of the questionnaire to minimize the time demands on the survey participants.

Procedure

Participants were first contacted in person at each of the three selected farmers' markets. The subjects were informed of the purpose and significance of the study. Questionnaires were given to those individuals agreeing to participate in the study. Participants chose whether to complete the questionnaires in person, over the telephone, or through e-mail and were given ample time to reflect on the questions and to formulate comprehensive answers. The surveys were completed between January and March 2012.

DATA ANALYSIS

Responses were analyzed both qualitatively and quantitatively. Qualitative analysis was performed to ascertain trends and perceptions concerning the role that these farms play in the economic prosperity and sustainability of Hawaii through the dynamic of demand and supply. Qualitative data were analyzed to assess the use of organic and or natural farming methods to highlight the sustainable production capacity of farms from the study group. Quantitative analysis was performed to identify current limitations and opportunities affecting the farms.

Results

Data collected through the surveys were analyzed to answer the five research questions upon which the study was based. Specific results for each question have been presented in the next sections.

Research Question 1

The first research question concerned how the diversification and self-reliance of farms conducting business through direct-sale at north shore farmer's markets contribute to Hawaii's economic prosperity. Diversification was quite apparent in the various avenues where products

were sold as well as in the wide variety of commodities produced. Figure 1 (Appendix), which shows the percentage of total products farmers sold at farmers' markets throughout Oahu, indicates how farmers diversified the avenues where they sold their products.

Figure 2 (Appendix) shows other avenues farmers pursued to sell their goods to be self-reliant in their business operations. Seventeen (68%) of the farmers utilized at least one other avenue to sell their products. Eleven (44%) operated at more than one farmers' market on a weekly basis.

Diversification was also evident in the wide variety of products the farmers produced and sold to remain competitive within the economic setting of a farmers' market (Figure 3, Appendix). Such diversification was necessary according to the farmers' market organizers who participated in the study. These organizers emphasized that because of competition among vendors and with traditional supermarkets, farmers have been forced to increase the variety of what they produce.

The numerous products offered for sale were grouped into the following categories: root vegetables, eggs/meat/dairy, fruits, common commodities (i.e., bananas, avocados, pineapple, papayas, eggplant, cucumbers, and tomatoes), vegetables, peppers, herbs, and specialty commodities (i.e., coffee, cacao, macadamia nuts, and honey). Figure 3 (Appendix) shows the number of farmers who grew products in each of these categories. Unfortunately, the U.S. Department of Agriculture discontinued tracking diversified agriculture statistics for Hawaii as of 2008. Therefore, the movement toward diversification within the agriculture arena will remain undocumented.

Ten of the farmers (40%) said that they were reliant on off-farm employment and income to stay afloat. Two other farmers indicated that they did not rely on off-farm income but were not profitable. Therefore, 12 farmers (48%) were not making adequate income from their farm businesses. Three of the farmers indicated farming and their operations at the farmers' market were simply a hobby. One farmer owned a retail outlet store to sell products. Nine farmers (36%) said that their farming businesses supplied adequate incomes for their families and that they did not rely on off-farm jobs. Interestingly, 8 of the 11 farmers (73%) who did not rely on off-farm employment also sold their products through other avenues, including wholesale, CSA, and restaurant sales.

Research Question 2

The second research question concerned how the spatial-temporal variation of consumers affects demand for agricultural commodities offered at north shore farmer's markets. Two questions on the farmers' questionnaire were designed to extract what farmers perceived as the obstacles and opportunities to increasing their supply of food. The data revealed that times and locations (spatial-temporal variations) of farmers' markets were not primary obstacles for farmers in the study. In fact, three farmers and one market organizer indicated there were too many farmers' markets in operation, resulting in saturated consumer demand. Therefore, the farmers had difficulty making adequate incomes from their traditional market activities, forcing them to participate in more farmers' markets to bring in more revenue. This was an important concern because of the time and effort needed to participate in each market.

The perceived geographical isolation of north shore farmers' markets was also not a dominant concern among respondents. Only two farmers (8%) felt that some sort of distribution system would be beneficial to transport their products to the larger consumer markets in

Honolulu. The farmers' market organizers also did not suggest that the times and locations of their particular markets were affecting the farmers' ability and desire to produce more local food. Both market organizers focused their market operations on supporting the communities of north shore Oahu through strict locally produced standards for market vendors, community outreach such as school garden programs, and farmers' market publications rather than on attempting to reach the larger audience of Honolulu.

Research Question 3

The third research question concerned how current government land use and agricultural policies affect the willingness and ability of farmers involved in direct-sale at north shore farmer's markets to supply agricultural commodities. This question concerning the greatest obstacles to increasing farm business resulted in a wide variety of responses (see Figure 4, Appendix). Of the 62 responses given, 43 (69%) were predominantly related to government land use and agricultural policy. Of the remaining responses, five were related to the high price of farm inputs, such as equipment and fertilizer; and one response each was related to the cost of bottling honey, the inflexibility of supermarkets to work with small farmers, agricultural theft, building relationships with customers, pest control, weather, the priorities of society to increase local food production, diluted consumer demand due to the abundance of farmers' markets, farmers' market organizers' lack of management experience, and the cost of farmers' market stalls for vendors.

The farmers' market organizers also perceived government land use and agricultural policy as the primary obstacles facing direct-sale farmers. Market organizers mentioned increased regulations, such as food safety certification and domination by large agriculture companies, particularly within the biotechnology industry, as some of the biggest hurdles to increasing locally produced food. The one participant involved in both organic and food safety certification, however, indicated food safety certification is needed only by farmers interested in expanding their operations into wholesale and retail outlets that require such certification. Not surprisingly, the participant from the local food supporting organization mentioned that the costs of local food production in general were much greater than the costs of imported food from mainland sources because of government land regulation and agricultural policy.

The question concerning opportunities for farmers to increase their business revealed similar results. Of the 57 responses from farmers, 35 (61%) were related to government land use and agricultural policy (see Figure 5, Appendix). The remaining responses (39%) included one to three each for the following: decreasing the price of farm inputs, altering the perception of what good food should be, product labelling, the development of a distribution system to aid CSA activities, creation of a community kitchen for the production of value-added products, lower costs for vendor booths at farmers' markets, limits on the dominance of wholesalers on agricultural commodities, plants that are easy to grow, advertising, cooperative liability, and cooperation among farmers participating in north shore farmers' markets.

Research Question 4

The fourth research question concerned the most effective way to link the escalating demand for locally grown agricultural commodities with farms operating at north shore farmers' markets. As described previously, the perceived dominant opportunity (61%) for farmers to

increase their business and thus produce more food for the established, high consumer demand was overwhelmingly dependent on government land use and agricultural policies. In fact, 26 of the 57 responses (46%) indicated that financial support for farm equipment, property taxes, extension support, water, labor, infrastructure, and land prices would be the greatest benefit to farmers participating in north shore farmers' markets.

Market organizers expressed similar responses to government land use and agricultural policies. The organizers also prioritized the importance of building community through various programs, as mentioned previously, to develop a stronger social and political stance toward increasing local food for north shore Oahu.

Research Question 5

The fifth research question concerned whether the sustainable agricultural capacity of currently occupied farmland was being utilized on the farms involved in direct sales at the north shore farmers' markets. Many of the farmers who participated in the study were hesitant in describing their farming practices or were not familiar with organic or natural methods. Of the 25 farmers who participated, 10 (40%) claimed to employ completely organic farming practices; however, only one farmer (4%) was actually certified to sell produce as organic. Six farmers (24%) utilized local inputs for their farming operations, such as on-farm composting or locally grown animal feed. Four farmers (16%) claimed to employ other sustainable farming practices such as cover crops, beneficial insects, vermiculture, sheet mulching, and water and soil conservation. Eleven farmers (44%) claimed to use limited or no pesticides in their farming operations out of concern for the health of their customers.

Only two farmers (8%) reasoned that they could not increase their farm business because they had already reached their productive capacity. Six farmers (24%) were more than content with their current market activities and/or farmed strictly as a hobby. For them, the productive capacity of their farms was not relevant. Only eight farmers (32%) indicated they had the ability to increase food production with their current business structure. Figure 6 (Appendix) shows the sustainable production methods used by the eight farmers who indicated they had the ability to increase their food production within their current business structure. Seven of those farmers provided estimates of their increased capabilities, which totalled 51.25 acres for food crops and 35 to 60 acres for animals (dairy cows and chickens).

CONCLUSIONS

The initial objective of this study was to uncover the effect of the spatial-temporal variation of consumers at north shore farmers' markets on direct-sale farmers' ability and desire to produce more agricultural food commodities and to increase their economic prosperity. However, the results of this study revealed that access to consumers was not the main concern of the participating direct-sale farmers. Rather, they perceived government land use and agricultural policies as the primary areas affecting the demand/supply dynamic of local food. The evidence from the study suggests that many policies are not favorable to the priorities and needs of direct-sale farmers.

Unfavorable conditions were quite apparent. Nearly half (48%) of the participating farmers were not able to make an adequate living from their farm business and had to rely on off-farm employment for supplemental income. This lack of greater success by the study group is

significant considering the diversification and self-reliance shown through this research. Although the HSTF (2007) indicates that economic prosperity is achieved through diversification and self-reliance, many direct-sale farmers conducting business at north shore farmers' markets appear to be marginalized despite their sustainable production methods, diverse products, and continuous ability to practice self-reliance in a highly competitive environment.

A viable solution to address the particular circumstances of direct-sale north shore farmers is redistribution. The redistribution strategy involves the reallocation of resources and financial capital through policy legislation spurred by government involvement and public commitment for local agriculture (Grewal & Grewal, 2011; Meert et al., 2005). Such a solution can evolve from the implementation of an alternative economic system such as the Paradise Index or Gross National Happiness. In these alternative economic systems, positive externalities from business operations are prioritized, such as limited carbon dioxide emissions and the protection of biodiversity and open space (Daly & Farley, 2011; HSTF, 2007).

Recommendations

Heightened consumer awareness and demand for local food has coincided with the rising importance of farmers' markets as a key to the local food movement. The analysis in this study shows that the relationship between consumer demand and the ability and desire of direct-sale farmers to supply local food is reliant not so much upon access to consumers but upon favorable land use and agricultural policies. The price of land, agriculture regulation, import competition, and the limited availability of capital for improvements are some of the areas related to land use and agricultural policy perceived by direct-sale north shore farmers as having the greatest effects on the demand/supply dynamic of local food. As a result, farmers who participated expressed that they are being marginalized due to policies that are beyond their control. They are experiencing only limited economic prosperity despite the self-reliance of their business operations, their diversification of products grown, and their abilities to access consumer markets.

Given the small sample in the study, statistically significant results were unrealistic without nearly 100% participation from the study group. In future research endeavors, quantitative results should be obtained by including all direct-sale farmers conducting business at north shore farmers' markets. This study should also be extended to all direct-sale farmers on Oahu and on the outer Hawaiian Islands to uncover the unique circumstances of each individual island and/or community in regard to the demand/supply dynamic of local food and their contribution to the economic prosperity of this important economic sector.

Further analysis is also needed to uncover the effects of specific government land use and agricultural policies on the demand/supply of local food. These are key factors that significantly affect the direct-sale farmers' ability and willingness to supply local food and the financial feasibility of doing so. Only by understanding and illuminating how these specific policies affect direct-sale farmers can effective legislation proposals be formulated. This type of piloted study should result in clarifying and supporting the priorities of north shore direct-sale farmers, who serve a large, established group of consumers who purchase their products.

The analysis in this study also revealed the widespread use of organic and sustainable production methods by a majority of the participating farmers who had the desire and ability to produce more local food. An assessment of the specific production methods used by individual north shore farmers should be conducted to calculate the environmental impact of the various

forms of production. Such analyses should also be utilized in the development of effective land use and agricultural policies that benefit farmers who participate in land stewardship and penalize farmers who use detrimental methods of production.

The results from this study revealed the way in which a majority of the participants with the ability and desire to increase food production utilized avenues other than farmers' markets to sell their products. This finding should be the basis for future research on the relationship between capability and aspiration to increase supply and the diversity of avenues for sales. Uncovering this relationship may reveal areas not covered in this study that affect the demand/supply dynamic of local food on the north shore of Oahu.

Finally, the diverse cultural backgrounds that abound in Hawaii are quite apparent not only throughout the island state but also in the north shore farmers' markets. Therefore, an analysis concerning the various cultural perceptions of direct-sale farmers should be pursued. Such research may be very beneficial in uncovering the effects of direct-sale farmers' different cultural backgrounds on their perceptions of various areas of their businesses. Cultural perceptions of economic prosperity, sustainability, and farm production methods should be analyzed to reveal trends affecting farmers and their production capabilities and, in turn, the consumption of local food.

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APPENDIX

Figure 1

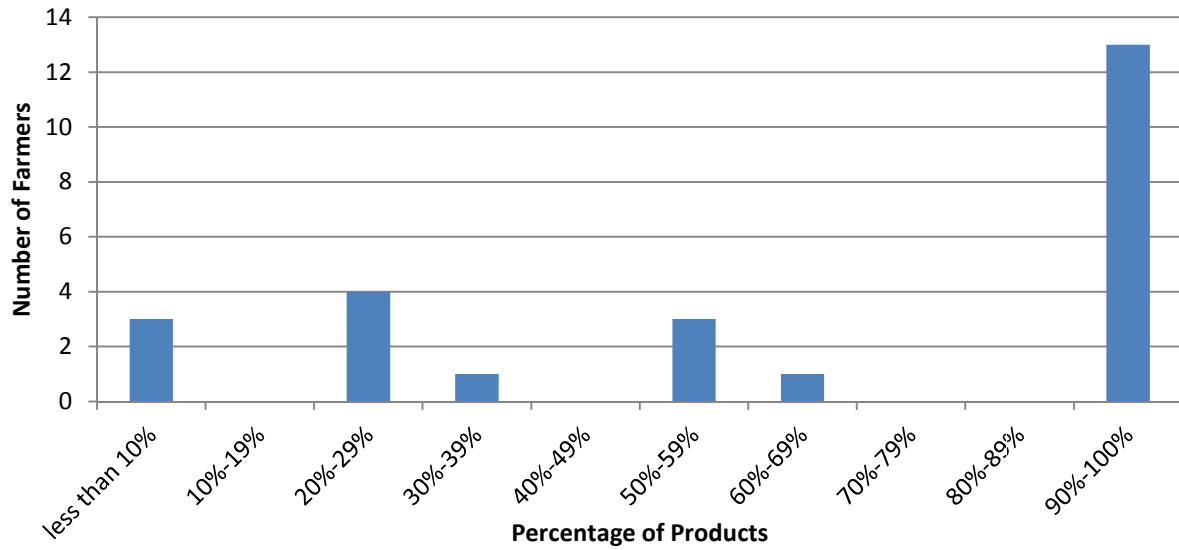


Figure 2



Figure 3

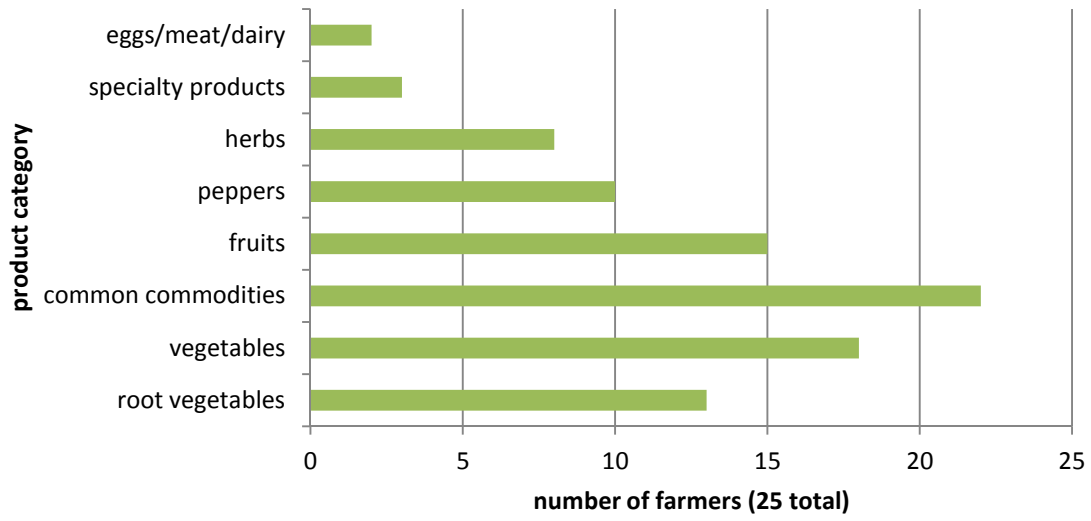


Figure 4

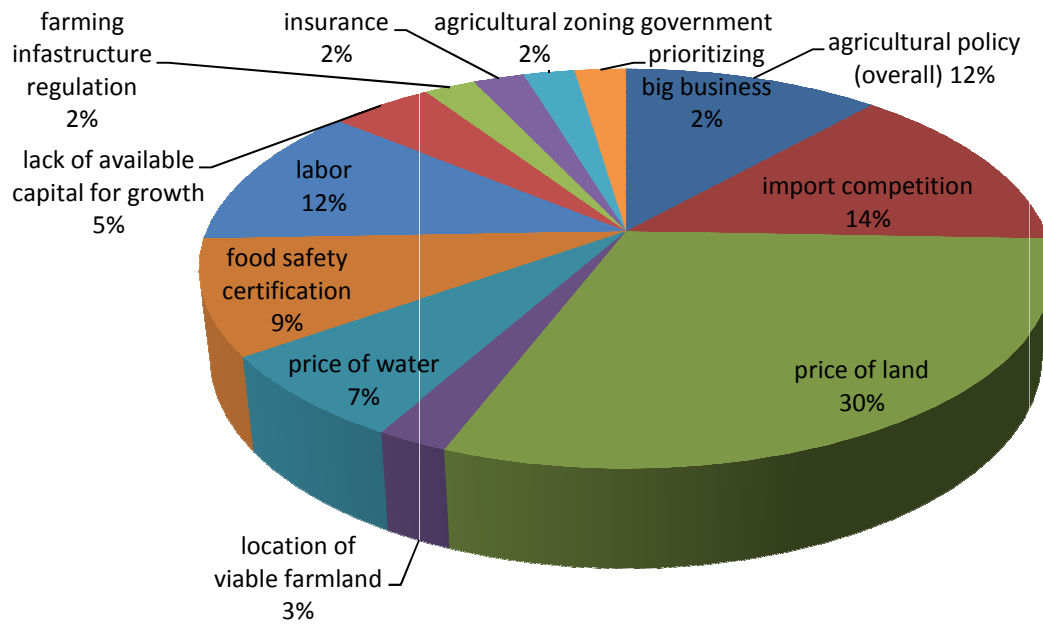


Figure 5

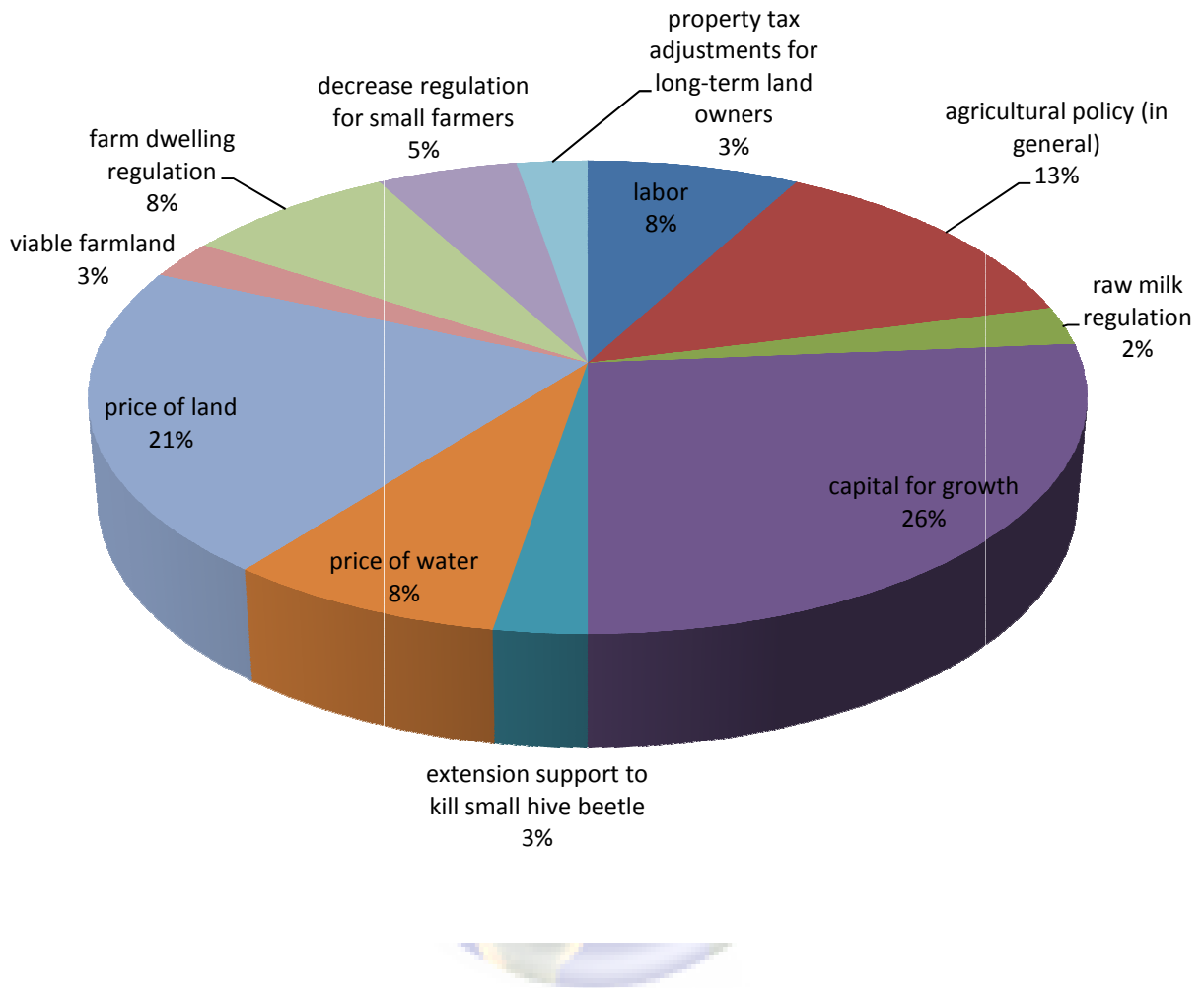


Figure 6

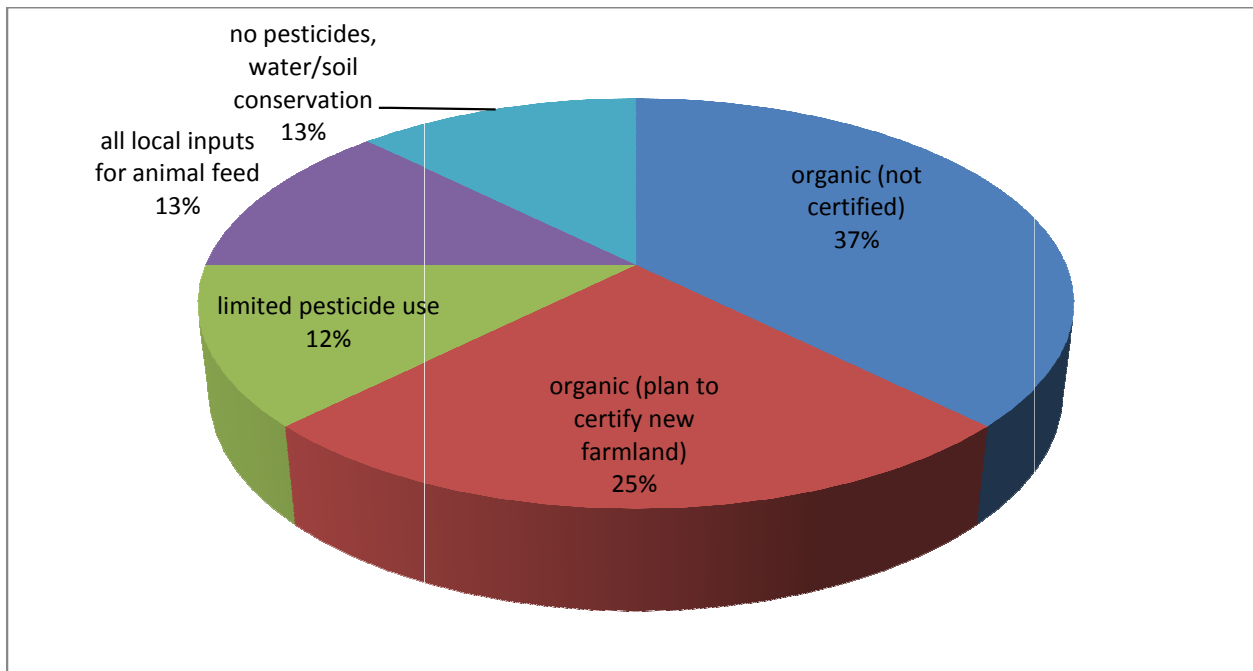


Figure Captions

Figure 1. The total percentage of agricultural food products sold by individual farmers at farmers' markets on Oahu.

Figure 2. Avenues agricultural products are sold by farmers who participate in north shore farmers' markets.

Figure 3. Diversity of agricultural food products grown by category.

Figure 4. Farmers' perceived obstacles to increasing their farm business supply/demand related to government land use and agricultural policy.

Figure 5. Farmers' perceived opportunities to increasing their farm business supply/demand related to government land use and agricultural policy.

Figure 6. Farming practices of farmers with ability to increase their farm business.

