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BREAKING NEW GROUND; Puget Sound Agriculture



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Abstract

Farmers in Western Washington experience challenges when making business decisions. Among these challenges are regulations, input prices, and development pressures. With these challenges has come opportunity for the development of common ground. It is this potential for common ground which this research seeks to explore.

Specifically, this study will explore the role of regulation (policy) and perceived profitability (beliefs/optimism) of the future of farming here. The research will provide insights on the influence of land use management regulations on farmers (optimism about the future) and their subsequent business decisions. Implications of these findings will be applied to understanding local food production, the economy, and food security. In order to investigate these factors, a survey questionnaire containing 25 quantitative questions was delivered to 37 farmers or their proxies identified at farmers markets in the Seattle area representing farmers from around the region and many types of farms. Findings suggest that the relationship between "I intend to continue farming for the next five years" and "I believe that agriculture has a bright future" generated a moderate direct relationship. No statistically significant relationships were found relating "I have plans for nonfarm development of my land" with what factors contribute to a farmers decision to not farm. Statistically significant relationships between independent variables concerning this question were generated however.

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INTRODUCTION

Farmers, like all business people, face challenges when making decisions about their futures. These challenges stem from the difficulties experienced by many businesses. One challenge for farmers is population growth. Though population growth provides for increased markets, at the same time it increases a demand to convert farm land into nonfarm development. These developments lead to systemic changes such as increased zoning and regulation and taxation issues; all of these impact farmers' business decisions.

Therefore, the purpose of this study is to understand and document the factors that influence farmers' business decisions in Western Washington. Specifically, this study will explore the role of regulation (or policy) and perceived profitability (or optimism/ beliefs) about the future of farming. This research will provide insights into how regulations, policies and farmers optimism influence their decisions to continue farming in the future. This study is important because sustainable growth and development, local food production, the economy, and food security are predicated by the decisions farmers make to continue farming. Implications of these findings will be applied to understanding local food production, the economy, and food security.

The result of this research could be utilized by organizations currently concerned with maintaining and developing sustainable agricultural development. These include, for example, The National Wildlife Federation, The American Farmland Trust (AFT), and local and federal legislators with the aim of a) sharing and discussing preliminary outcomes of the research b) exploring the data and outcomes of the research, c) considering different methodological approaches and, d) identifying research gaps and contributing to the research agenda concerned with preserving farmland and developing agriculture in Washington State.

Literature Review

As population grows it spurs greater rates of already burgeoning development. As population increases, urban development increases and rural communities also expand changing the face of those communities (AFT, 2010). We are now experiencing the growth of rural communities as people seek lower land prices and the environment associated with rural areas (Clouser, 2005). These growth patterns and developments require updated methods for cooperation and understanding of needs between stakeholders including farmers, rural inhabitants, rural/urban fringe inhabitants, developers, as well as local, state, and federal agencies in order to ensure a productive future for our state (Clancy, Esseks, Lapping, Oberholtzer, Zurbrugg, 2009).

Identifying some of the trends and themes associated with sustainable development and farmland preservation helps to provide an understanding of the literature concerned with rural land ownership and land use management as they affect farmers' business decisions (Clancy et al., 2009) in Western Washington. Identifying and understanding the attitudes and experiences of rural landowners, and farmers in particular, is integral to maintaining viable farming communities. Including farmers in the political and regulatory process can be a strategic asset when seeking to gather support for sustainable development and agriculture as part of the effort to ensure the continued growth and the health of farming in Western Washington (Buijs, 2009; Gobster et al., 2007).

When farmers chose not to farm their land, the quality of life in Western Washington declined. Between 1982 and 1997 there was a 25% decrease in the amount of farmland in the Puget Sound region. In King and Snohomish counties alone during that period there was a loss of 30% of those county's farmlands; that 30% included 32,000 acres of conversion in Snohomish County (Canty & Wiley 2004). The farmland conversion in Puget Sound that took place between 2002 and 2007 was about 5% (US Census of Agriculture, 2007). In western Washington Farmland conversion was the result of the population increases in the Puget Sound region. These sorts of land use changes are the result of population and demographic shifts. Communities which previously supported environmental services through an agricultural economy wilted as the roots of the previous land and water management practices which helped preserve natural resources and ecosystems declined.

The history of land use regulations is important to understand. A salient theme in the literature is the historical and current work of the courts (and local land use managers) affecting land owner rights (Sax, J., 1993; Spencer, R., & Municipality of Metropolitan Seattle, Wash, 1977; Stimpert, M, 2006). The social history of private property rights (which create stewardship) were established and are historically recognized. In combination with the 5th and 14th amendments, concerning due process and eminent domain, many American private property owners view their claim to their privately held lands as inviolable. Landowners prioritize the right to unobstructed land use decisions over what might be good for society as a whole (Stimpert, 2006). As American as apple pie, these ideas are part of attitudes which require public confidence when creating sustainable agricultural policies.

Examples of the contest between property rights and the courts are common (Sax, 1993; Spencer, R., & Municipality of Metropolitan Seattle, Wash, 1977; Stimpert, 2006). The controversy

surrounding the Endangered Species Act of 1973 is one well known example. Every stakeholder has weighed in and the controversy continues. The issue continues to reflect the larger issue of landowner rights versus resource management; that same year (1973), the U.S. Department of the Interior listed the Northern Spotted Owl as a potentially endangered species. In 1990 government biologists recommended setting aside 3 million acres to protect the owl; 1,500 Grays Harbor (Washington State) residents, fearing massive layoffs in the timber industry, blocked Highway 101 to demonstrate against proposals to protect the Spotted Owl. Nevertheless, in 1995 The U.S. Supreme Court ruled that spotted-owl laws can be applied to private land (Welch, 2006).

Private Property issues which affect farmers' attitudes have particular relevance (Sax, J. L. (1993). Just after passage of the Endangered Species Act, wetland protection also began to be legislated. The Swampbuster provisions of the 1985 Food Security Act denied federal farm program benefits to farmers who destroy wetlands to grow food (Gelso, 2008), while the Wetland Reserve Program (WRP) introduced in the 1990 Food, Agriculture, and Trade Act provides incentives for restoring farmed wetlands to their original condition through easement payments and cost sharing. Since the early 1990s the goal of federal wetlands policy has been one of "no net loss," with losses offset through restoration and creation of new wetland areas. The 2002 Farm Act provides for increased wetland restoration via expansion of both the Conservation Reserve Program (CRP) and the Wetland Reserves Program (WRP). For example, of the 2.8-million-acre increase in the CRP, up to 500,000 acres could be used for restoration of farmed wetlands (Claassen, 2003).

Challenges Facing Farmers in Western Washington

Farmers' optimism is one aspect of their desire to continue to farm in the face of challenges. For some, farming stakeholders are integral community members and provide invaluable environmental services; for others, protecting endangered species and habitat is a primary goal; yet for others, ensuring, as the King County Comprehensive Plan allows in its "No Net Loss of Farmland" provision, the sustainably developed nature of Western Washington remains a priority. Competition from foreign sources poses a challenge. The priorities and interests of various stakeholders sometimes collide. The need for urban style development as the population of the region increases presents yet another challenge; that challenge is the opportunity cost of maintaining open spaces and the comparatively undeveloped nature of farmland in the face of rising property values (and concomitant taxes) as farmers face increasing difficulties in maintaining the profitability of their farms.

Policy Problem

Puget Sound agriculture is currently facing a number of challenges. Farms are shrinking in size overall and the number of farms is decreasing annually due to in part to land conversion; from a high in 1937 of 84,800 to a low in 2006 of 34,000 and with a slight rise by 2009 to 39,500 (USDA, 2009). Any of the land that is not enrolled in the Washington State's Open Space Taxation Act and may be subject to very steep property tax increases, which can significantly reduce farmer's net profit.

Another challenge, in addition to the increased price of land, is that with the increased population of new neighbors, the encroaching suburban areas often make the farmer feel unwelcome in

their own communities. This is accomplished by filing complaints about noise, odor, or tractors on the roadway, etc. Farmers are not subject to lawsuits per the Right to Farm Act, but over time those complaints can become a burden reducing farmers' optimism leading the farmer to consider leaving the industry (Canty & Wiley, 2004).

Change is needed at a management level to develop solutions which respect the requirements and unique interests of various stakeholders. The issue of appropriate and thoughtful land and water management is key to sustaining critical environmental services. Estimates vary, but projections for the effects of climate change on the Puget Sound area demonstrate a distinct likelihood of increased flooding in floodplains and watersheds. This has implications for critical wildlife habitat and residential areas in and around floodplains at a time when farmland is increasingly converted to residential development reducing permeable surfaces and soil filtration capabilities. The retention of floodplain areas for agricultural purposes has the potential to protect, or in some cases enhance, ecosystem services provided by floodplain and wetland areas. Failing to act on the need for more functional floodplain areas (regardless of whether applying a status quo or increased flooding due to climate change scenario) will inevitably lead to increasingly unsustainable losses in revenue, infrastructure and critical habitats.

In Western Washington, water in general, and irrigation and drainage in particular are salient sources of frustration for farmers. One might assume that here in Western Washington where precipitation is renowned, irrigation for farming would not present an obstacle to sustainable agriculture; that, ironically, is not the case. For example, despite the facts that even a local educational non-profit farm ("The 21 Acres Center is an innovative, community-driven project that serves as an agricultural and environmental learning center for people of all ages" (21 Acres, 2010) is known to have a holistic, considered and demonstrated stewardship approach to sustainable agricultural development, county, state, and in some cases even federal regulations designed to protect our waterways, wetlands, open spaces, and endangered species is hobbling 21 Acres' efforts to remain contributing members of the farming community by limiting water consumption during peak need times as well as limiting drainage options during peak precipitation.

According to the Municipal and Research Services Center of Washington, inadequate water and competition for water as a result of complying with land use regulations is a top issue challenge facing farmers in Western Washington; the issue of drainage ditches on private farmland flowing into a federally regulated EPA controlled Salmon habitat (the Sammamish Slough) at 21 Acres is just one example. In an effort to preserve preexisting ditches in favor of no new ditches thereby reducing silt flow into the slough which could impact the endangered Salmon species which rely on the Slough for habitat, regulations disallow any modifications to the ditches. This negatively impacts the ability of agricultural efforts to irrigate when water is required or to promote field drainage when precipitation leads to flooding of the fields. Herzon & Helenius (2008) present the understanding of the integral part that drainage ditches perform in the elegant yet complicated mosaic that comprises environmental services as they relate to farming and land use management. They argue that ditches like the ones which predate the ESA when maintained, support common species, as well as providing "valuable wet vegetated non-cropped habitats to both aquatic and terrestrial taxa, supply food resources lacking in

otherwise dry and intensively managed cropland, and perform connectivity functions within a wider landscape.”

Water quality regulations also are a challenge as well for Puget Sound farmers. Changes to water storage, structures, etc. all require multiple permits from many of the different smaller agencies over-seeing water quality (Canty & Wiley 2004). In Whatcom County for example, farmers are concerned that water quality and instream flow levels standards are so exacting that they negatively impact the production and income of farmers (Canty & Wiley 2005). This is significant because Whatcom is the largest farming county in the Puget Sound area, containing 18% of the total farming acreage in the region (US Census of Agriculture 2007). The Skagit River watershed is 1,433,205 acres in size (farming acreage is 108,541); it provides one third of all Puget Sound inflows and is home to the largest Salmon runs in Puget Sound. These Salmon runs are at 50% below their historic levels (USDOC 2008). In Skagit, the second largest farming county in the Puget Sound area, a Critical Areas Ordinance update recently took place that was a source of contention for local farmers and salmon conservationists in relation to the local watershed. The current 2003 Critical Areas Ordinance version requires no habitat enhancements from farmers but does include monitoring for harm. Farmers in Skagit County are also concerned that riparian buffers are going to be required on drainage ditches because native Salmon now live in the ditches. Farmers need control over the water flow in these ditches for purposes of field drainage and they also need these ditches to be free of salt water to maintain crop quality. Self regulating tidewaters to allow Salmon to pass through but keep saltwater out are one option, but farmers are concerned that salt water may still enter the system and ruin the water quality (Canty & Wiley 2005). Overall farmers prefer to address these challenges on a local level allowing them greater opportunity for input and creativity. In addition, farmers are more apt to comply with regulatory changes when they are incentive based and voluntary versus mandated and required (Canty & Wiley 2004).

To understand opposition to management plans, a comprehensive study of farmers’ business decision making processes as they are affected by land use management must be conducted from the perspective of both before and after the implementation of regulations. Buijs (2007) investigated the opposition to river restoration in the Netherlands where, as in many European countries, those regulations draw opposition from the public in the effected proximal communities including farmers. The investigation into the motivations for opposition and support for land use management policies conducted there incorporated questionnaires and interviews with the result of allowing quantitative descriptors in addition to qualitative data in the effective effort to determine ways to “strategically frame...management policies;” the rationale and reasoning for this Capstone research incorporates this concept.

Efforts to consider farmers’ attitudes toward regulations and its effects on farmers’ business decisions have precedents and have provided some benefit in creating a cohesive, comprehensive, and effective land use regime (Buijs, 2009; NSW Department of Environment and Climate Change, 2008; USDA Natural Resources Conservation Service and American Farmland Trust, Farmland Information Center, 2008; United States Department of Agriculture, Forest Service, 2006; Williams, E., & Lathbury, 1996). Gelso (2008) examined the effects of Swampbuster provisions by quantifying the “analysis of

farmers' perceived costs of having wetland areas in cropland." The surveys administered in that study "find that perceived costs vary across respondents, implying that the social cost of regulations that restrict wetland conversion may depend on *who* bears those costs." Interestingly, the age and education level of the respondent impacts that respondent's idea of who is bearing the cost. The study states that a "reviewer" has suggested that indeed this phenomenon implies that including receptive farmers in inclusive forums to achieve confidence and involvement by farmers would "modify perceived costs."

A prime example of how to determine and incorporate "community consultation" which is absolutely applicable to understanding how farmers' business decisions are impacted by land use management is provided by the Macquarie River Floodplain Management Plan. "Community consultation" (which can include questionnaires and newsletters, meetings with landholders, landholder focus groups, review panels, technical meetings were held on-site with individual landholders.) formed an integral component in the development of that plan. Achieving community confidence and involvement requires outreach, assistance, and education (Duerksen, C., Snyder, C. 2005; Israel, 2003, p.315)). The overall design for farmer input and inclusion is succinctly described by saying that it involves coordinated management and development which addresses the environmental, social, and economic concerns of all stakeholders. To accomplish this goal, a comprehensive model is essential. Analyzing the environment including economics and social considerations for the purpose of predicting future challenges is necessary along with the required strategies for managing development; all these together work to "support the language and set of priorities" developed after devoting a large amount of energy to ensuring understanding and "buy in" from all stakeholders.

"Buy in" means acceptance, confidence and involvement in the program. Involvement and participation is accomplished through "community consultation" (Gamper, 1999). Representatives from the "landholders, rural farm groups, government agencies and environmental organizations" were regularly and often met with and consulted to contribute to the general knowledge regarding development of the plan. In addition to newsletters and surveys which were distributed, feedback was evaluated and presented and subsequently redistributed. Focus groups were also used to include and create community around the plan and to attend to specific issues. Meetings with individual landholders were held on their land to discuss and assist with individual issues. Formal regulatory council meetings were convened as well as the focus group meetings. Information from all interested stakeholders and communities was collected, collated, redistributed, and utilized to inform the management plan (NSW Dept. of Environment and Climate Change, 2008).

While habitat conservation may not obviously align with farmer's business interests, farmers throughout Puget Sound are trying to find ways to co-exist with native species and their habitats while positively impacting their production and/or income levels. One Puget Sound farming trend which aligns well with this goal is smaller size farms providing specialty and organic crops marketed directly to the consumer. Puget Sound farms on average compared to the state as a whole tend to be smaller (Canty & Wiley 2004). For western Washington, one successful alternative is direct marketing to consumers and growing specialty products such as organic products. Direct marketing is on the rise in Washington State. Selling directly to local consumers and restaurants allows farms to keep more of the

profit. One well known example is The Pike Place Community Supported Agriculture Program started in 1997. It has seen a 10% to 50% growth rate annually (Canty & Wiley 2004). Many farmers involved in community supported agriculture have to turn away customers because they cannot meet the demand (Canty & Wiley; 2004). There are a few year round markets in Washington with most operating 4 to 5 months out of the year; the numbers and frequency of farmer's markets is increasing yearly (Washington State Farmers Market Association 2009). This trend towards direct marketing is actively being supported by municipalities such as the City of Seattle, counties, and the Washington State Legislature through the WSDA Small Farm and Direct Marketing Program (Canty & Wiley 2004).

On the national level there has been a 20% to 25% annual increase in the sales of organic food products. Washington State is averaging a 24% growth rate from 1997 to 2001; from \$70 million in 1998 to \$200 million in 2001 (Canty & Wiley 2004). In 1993 there were less than 10,000 acres of agricultural land being used for organic farming. In 2007 there were over 60,000 acres of land being used for organic farming (WS Dept. Agriculture, 2007).

Current growth patterns and developments require updated methods for cooperation to ensure sustainable development for a productive future for our region and our nation. An examination of the historical development of landowner rights as well as the ways various levels of government can cooperate with rural landowners to produce land use management programs and regulations helps to inform how future growth can be sustainable is invaluable. As the population in Western Washington continues to grow, a progressive forward looking a program of growth management is essential because we wish to maintain productive habitat for the population as well as food security and a salutary, viable place to live. Including the voices of every stakeholder, especially farmers, is essential in achieving this goal (Gamper, 1999; Tilt, 2007; Growth management Act; 2010).

Design and Methods

The purpose of this study is to conduct an exploratory investigation of the factors which influence farmers' business decisions. The first research question is "What factors contribute to a farmer's decision to continue farming?" The dependent variable for question 1 is "I intend to continue farming for the next five years. The independent variables for question 1 are: whether a farmer believes agriculture has a bright future, whether a farmer feels that farmers are land stewards, whether a farmer believes that markets will remain profitable, and that currently markets are adequate (see conceptual model #1 appendix 2). The independent variables are defined as components of a farmers' belief that his chosen field will continue to allow her or him to remain profitable and a contributing member of the community. The variables for question 1 are operationalized by a statement (e.g. I believe that agriculture has a bright future.) followed by a set of response categories (1,2,3,4,5,6,7) ranging from 1, "does not describe" to 4, "not sure" to 7, "very definitely describes."

The second research question is "What factors contribute to a farmer's decision to discontinue farming?." The dependent variable for question 2 is "I have plans for nonfarm development of my land in the next five years." The key independent variables for question 2 are: the perceived negative impact of water regulations, belief that nonfarm development is likely despite preservation regulations, belief

that loss of farm communities creates alienation in farmers who remain, and the hindrance of land use regulations on farming business(see conceptual model #2 appendix 2) The variables for question 2 are operationalized by a statement (e.g. I believe that in controversies between farmers and non farmers local authorities tend to side with nonfarmers".) followed by a set of response categories (1,2,3,4,5,6,7)ranging from 1,"does not describe" to 4,"not sure" to 7, "very definitely describes."

This study employed a cross-sectional research design utilizing a self administered questionnaire. A convenience sampling method was used where I approached individual farmers at farmers markets. Data was collected at 3 Farmers Markets; Seattle West Seattle, Ballard, and University District. I employed a convenience sample method by walking up to the prospective respondents. I informed them of the purpose of my research. I assured them that their responses would be anonymous in that I would not be recording names and that there would be no reward for participation. I asked them if they were not the farmer, could they answer with knowledge of the farmer. If they responded that they could, I allowed them to respond as the farmer. I requested that they participate in the survey to which each agreed. Dates of collections were 4/2, 4/3, 4/9, 4/17. I included both farmers and farmer representatives. Participants had to self disclosed that they had adequate knowledge of the farming in question in order to be able to speak on behalf of farmer. Thirty-seven surveys were distributed and collected including a range of different types of farming operations.

The questions and responses are formatted in a Likert scale survey questionnaire. The survey consists of twenty-five Likert scale question. The scale is "agree" corresponding to the number one and "disagree" corresponding to seven with "not sure" corresponding to four. With this method of data collection, the instrument will indicate the extent to which the participants agree or disagree with each of the items covered in the questionnaire. The Likert scale is the "most favored attitude-measuring tool." The Likert scale has interesting and useful properties: the index is ordinal and though the response does not provide a quantity measurement, it does provide ranking; and adding the numbers assigned to the ranking, the measurement is treated as an interval (McNabb, 2008). The questions for this study were developed in two ways: through the literature review process as well as through an in-depth exploratory interview with Dr. Dave Muehleisen former Education Director of 21 Acres and who is currently teaching Environmental Studies/Agriculture at the Evergreen State College.

Ethical Considerations

Data was collected in an ethical manner informing each participant of the aim of the research. Participants were informed that there would be no remuneration for their participation and assured them that their identities were not being recorded and I requested their consent for participation. In these ways the two most important ethical issues for this study were respected: those are anonymity and informed consent.

Results

The analysis strategy utilized in this study generated the correlation coefficient for the dependent and independent variables for both research question 1 and research question 2. Spearman's rank-order coefficient was utilized to compare the strength of the relationship between the dependent and independent variables measured on an ordinal scale. A larger sample will be required for a 95% confidence interval, though with 37 samples I am able to test for a 94.7% confidence interval. (Appendix 2, SPSS correlation analysis output tables).

Correlational relationships between the variables described in the conceptual model #1 (appendix 2, research question #1, "What factors influence a farmer to continue farming?") were analyzed. Statistically significant results include the correlation between the two independent variables: "I believe agriculture has a bright future" and, "Markets for products I produce will be profitable for the next five years" has a moderately strong direct relationship (Spearman's rho = 0.51). Also, the relationship between the dependent variable (I intend to continue farming for the next five years) and the independent variable "I believe that agriculture has a bright future" generated is a direct moderate relationship (Spearman's rho = 0.38).

Correlational relationships between the variables describe in the conceptual model #2 (research question #2, "Which factors influence a farmer to discontinue farming?") were also analyzed. No statistically significant relationships were found relating the dependent variable, "I have plans for nonfarm development of my land " with the independent variables described in conceptual model #2 for the research question, "What factors contribute to a farmers decision to not farm?" Statistically significant relationships between independent variables were generated however. These statistics are: "Water regulations create hardships for farmers" with "Land use regulations hinder my farming business," moderate inverse relationship, rho -0.36; "Non-farming development is likely even if regulatory zoning promotes maintaining an adequate supply of agricultural land" with "I believe that the loss of farm related businesses reduces agricultural "community" which leads to alienation of the farmers who remain in business," also generated a moderate inverse relationship, rho -0.38.

Additionally, selected responses were tabulated and showed that 73% of respondents will definitely continue farming for the next five years.

Discussion

Summarizing the results reported above, regarding research question #1, the decision to "continue farming," it can be inferred that farmers in the sample population count their confidence in the adequacy of markets and their belief that "agriculture has a bright future" as factors which are a part of their decisions to continue to farm. Also, from the results above, there is the result that the more a farmer believes that "regulations hinder my business" the less likely was it reported that "water regulations create hardships" and vice versa. Somewhat similarly, the more likely a respondent was to report the belief that "nonfarm development is likely despite zoning designed to preserve it," respondents reported the belief that "loss of farm related business reduces agricultural 'community' in a moderate inverse relationship. These results point to a need for further explorations of these variables

as results remain inconclusive regarding how farmers view regulations and the state of agricultural community. The results do though appear to suggest that the impact of farmers' perceptions of current markets and their beliefs about the adequacy of future markets play a role in their decisions to continue farming; of which 73% of respondents indicated that they indeed would.

There exist limitations surrounding this study. The sample is too small for a statistical analysis of the results. At the same time, a seven point Likert scale for response variables may not have been optimally appropriate for the variables tested. Likewise, the operationalization of the variables devised to represent the research questions is not optimally focused. Further, internal/external validity is only relevant in studies that try to establish a causal relationship. It's not relevant in this study which is merely exploratory. Therefore this study is limited in its generalizability.

Validity is a concern in the research. Internal validity the approximate truth about inferences regarding cause-effect or causal relationships is only relevant in studies that try to establish a causal relationship. It's not relevant in most observational or descriptive studies which this one is. External validity, on the other hand, is more relevant in this research. External validity is concerned with being able to generalize conclusions. The results of the survey cannot be generalized to most farmers however.

In order to understand how to consider and promote sustainable, productive and forward looking land use management policy in regards to agriculture, it is imperative to understand how farmers perceive their places in society, the development of the economy, food production, and future of Western Washington. To this end gaining an understanding of how farmers' business decisions are impacted by land use management policy and regulation as well as their beliefs about the future viability of Puget Agriculture is an invaluable undertaking. To include farmers' input in the development of a sustainable, profitable, and comprehensive land use management policy is absolutely essential; this study and this methodology is one step in seeking that achievement. Findings from this study, suggest that future research should seek to investigate what policies can be augmented and which can be adjusted in order to allow farmers to maximize their potential here in Western Washington thereby creating a sustainable, exciting, and vibrant quality of life here in the Puget Sound Region.

APPENDICES

This survey will take about 10 minutes. It will be analyzed by the graduate student investigator who devised and distributed the instrument. The student will be trained to keep your identity confidential. In the survey you will be asked a series of questions about your experience. You can refuse to answer any questions that you are asked in the survey. Please mark the box to the right of the questions which on a scale of 1-7 (1 being very definitely describes your feelings and 7 being does not describe your feeling at all) best describes your experience or beliefs.

| | very definitely describes ↓ | | | | not sure ↓ | | | does not describe ↓ |
|--|--------------------------------------|--------------------------|--------------------------|--|--------------------------|--------------------------|--------------------------|------------------------------|
| | 1 | 2 | 3 | | 4 | 5 | 6 | 7 |
| 7. I believe that in controversies between farmers and non-farmers, local government authorities tend to side with the non-farmers. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 8. I expect to make agricultural investments on my land in the next 5 years. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 9. Custom produce targets a product or service to a small portion of a market that is not being readily served by the mainstream product or service marketers. I am interested/involved in this type of marketing. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 10. Non-farming development is likely despite regulatory zoning which seeks to maintain an adequate supply of agricultural land. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 11. I am interested in selling to organic grocers. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

This survey will take about 10 minutes. It will be analyzed by the graduate student investigator who devised and distributed the instrument. The student will be trained to keep your identity confidential. In the survey you will be asked a series of questions about your experience. You can refuse to answer any questions that you are asked in the survey. Please mark the box to the right of the questions which on a scale of 1-7 (1 being very definitely describes your feelings and 7 being does not describe your feeling at all) best describes your experience or beliefs.

| | very definitely describes ↓ | | | not sure ↓ | | | does not describe ↓ |
|---|--------------------------------------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|------------------------------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| 21. I believe that the federal program for migrant labor can pose a challenge in finding farm labor. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 22. Land use regulations hinder my farming business. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 23. Loss of farmland reduces the opportunity for habitat and species protection. | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| 24. I sell the products I produce through alternative venues (e.g. farmer's markets, community supported agriculture-CSA, contract farming) | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 0-15% | 15-30% | 30-45% | 45-60% | 60-75% | 75-90% | 90-100% |
| 25. Which age group best describes you? | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| | 0-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 | 70-90 |

This survey will take about 10 minutes. It will be analyzed by the graduate student investigator who devised and distributed the instrument. The student will be trained to keep your identity confidential. In the survey you will be asked a series of questions about your experience. You can refuse to answer any questions that you are asked in the survey.

Open ended questions:

What are the most important factors which will inform your business decisions in the next five years?

Would you please describe land management regulations experience you have had?

Would you describe your farm? (e.g. number of employees, seasonal production, type, size etc.)

Please write any other thoughts you feel are important.

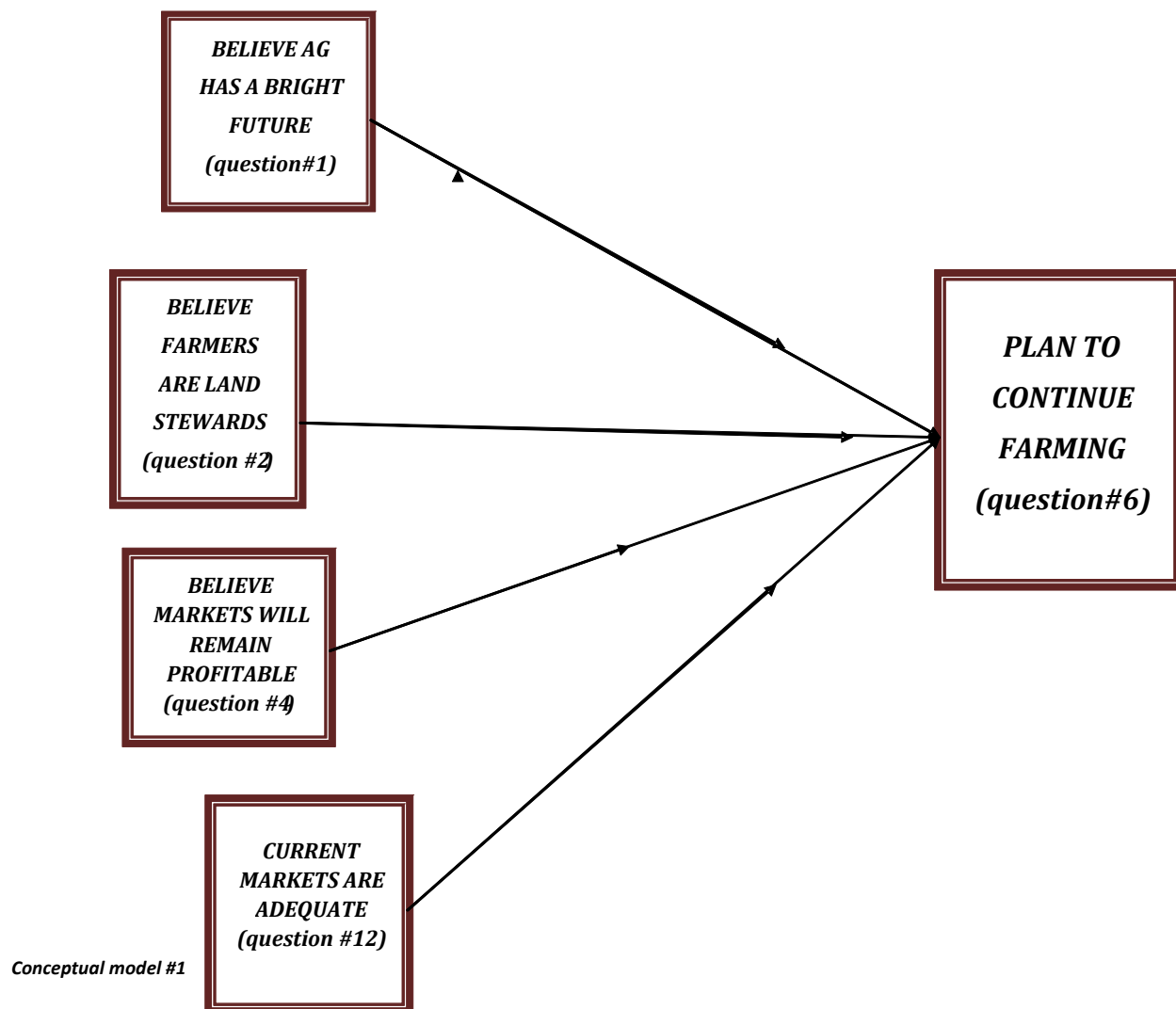
Correlations

| | | | I intend to continue farming on my present land for the next 5 years. | I believe that agriculture has a bright future. | I believe that farmers can be stewards of the land they work. | Markets for products I produce will be profitable for the next 5 years. | The markets for the agricultural products I produce are adequate. |
|---|---|-----------------------------|---|---|---|---|---|
| Spearman's rho | I intend to continue farming on my present land for the next 5 years. | Correlation Coefficient | 1.000 | .382* | .027 | .231 | .241 |
| | | Sig. (1-tailed) | . | .012 | .438 | .091 | .082 |
| | | N | 35 | 35 | 35 | 35 | 35 |
| | | Bootstrap ^a Bias | .000 | .017 | .018 | .019 | .007 |
| | | Std. Error | .000 | .195 | .176 | .192 | .180 |
| | 94.7% Confidence Interval | Lower | 1.000 | -.244 | -.263 | -.062 | -.095 |
| | | Upper | 1.000 | .753 | .440 | .726 | .661 |
| | I believe that agriculture has a bright future. | Correlation Coefficient | .382* | 1.000 | .165 | .512** | .128 |
| | | Sig. (1-tailed) | .012 | . | .172 | .001 | .231 |
| | | N | 35 | 35 | 35 | 35 | 35 |
| Bootstrap ^a Bias | | .017 | .000 | .012 | -.006 | .002 | |
| Std. Error | | .195 | .000 | .160 | .159 | .193 | |
| 94.7% Confidence Interval | Lower | -.244 | 1.000 | -.162 | .102 | -.201 | |
| | Upper | .753 | 1.000 | .474 | .844 | .587 | |
| I believe that farmers can be stewards of the land they work. | Correlation Coefficient | .027 | .165 | 1.000 | .013 | .190 | |
| | Sig. (1-tailed) | .438 | .172 | . | .470 | .137 | |
| | N | 35 | 35 | 35 | 35 | 35 | |
| | Bootstrap ^a Bias | .018 | .012 | .000 | -.017 | -.002 | |
| | Std. Error | .176 | .160 | .000 | .176 | .167 | |
| 94.7% Confidence Interval | Lower | -.263 | -.162 | 1.000 | -.342 | -.295 | |
| | Upper | .440 | .474 | 1.000 | .378 | .461 | |
| Markets for products I produce will be profitable for the next 5 years. | Correlation Coefficient | .231 | .512** | .013 | 1.000 | .129 | |
| | Sig. (1-tailed) | .091 | .001 | .470 | . | .230 | |
| | N | 35 | 35 | 35 | 35 | 35 | |
| | Bootstrap ^a Bias | .019 | -.006 | -.017 | .000 | .019 | |
| | Std. Error | .192 | .159 | .176 | .000 | .162 | |
| 94.7% Confidence Interval | Lower | -.062 | .102 | -.342 | 1.000 | -.223 | |
| | Upper | .726 | .844 | .378 | 1.000 | .554 | |
| The markets for the agricultural products I produce are adequate. | Correlation Coefficient | .241 | .128 | .190 | .129 | 1.000 | |
| | Sig. (1-tailed) | .082 | .231 | .137 | .230 | . | |
| | N | 35 | 35 | 35 | 35 | 35 | |
| | Bootstrap ^a Bias | .007 | .002 | -.002 | .019 | .000 | |
| | Std. Error | .180 | .193 | .167 | .162 | .000 | |
| 94.7% Confidence Interval | Lower | -.095 | -.201 | -.295 | -.223 | 1.000 | |
| | Upper | .661 | .587 | .461 | .554 | 1.000 | |

* Correlation is significant at the 0.05 level (1-tailed).

^a Unless otherwise noted, bootstrap results are based on 37 bootstrap samples

** Correlation is significant at the 0.01 level (1-tailed).



Research Question #1, What Factors Influence Farmers to Continue To Farm?

Correlations

| | | | | I have plans for non-farm development of my land in the next 5 years. | Water regulations create hardships for farmers. | Non-farming development is likely despite regulatory zoning which seeks to maintain an adequate supply of agricultural land. | loss of community increases alienation Recode | land use regs hinder farming Recode | | |
|--|--|---|---|---|---|--|---|-------------------------------------|--------|--------|
| Spearman's rho | I have plans for non-farm development of my land in the next 5 years. | Correlation Coefficient | | 1.000 | -.033 | -.184 | .215 | .068 | | |
| | | Sig. (1-tailed) | | | .429 | .157 | .118 | .356 | | |
| | | N | | 32 | 32 | 32 | 32 | 32 | | |
| | | Bootstrap ^a | Bias | | .000 | -.013 | .046 | -.038 | -.036 | |
| | | | Std. Error | | .000 | .218 | .184 | .163 | .163 | |
| | | 94.7% Confidence Interval | Lower | | 1.000 | -.447 | -.426 | -.223 | -.222 | |
| | | | Upper | | 1.000 | .405 | .244 | .435 | .462 | |
| | | Water regulations create hardships for farmers. | Water regulations create hardships for farmers. | Correlation Coefficient | | -.033 | 1.000 | -.062 | .020 | -.362* |
| | | | | Sig. (1-tailed) | | .429 | | .367 | .457 | .021 |
| | | | | N | | 32 | 32 | 32 | 32 | 32 |
| Bootstrap ^a | Bias | | | | -.013 | .000 | -.037 | .040 | .000 | |
| | Std. Error | | | | .218 | .000 | .191 | .191 | .170 | |
| 94.7% Confidence Interval | Lower | | | | -.447 | 1.000 | -.476 | -.329 | -.689 | |
| | Upper | | | | .405 | 1.000 | .288 | .391 | .023 | |
| Non-farming development is likely despite regulatory zoning which seeks to maintain an adequate supply of agricultural land. | Non-farming development is likely despite regulatory zoning which seeks to maintain an adequate supply of agricultural land. | | | Correlation Coefficient | | -.184 | -.062 | 1.000 | -.384* | -.035 |
| | | | | Sig. (1-tailed) | | .157 | .367 | | .015 | .424 |
| | | | | N | | 32 | 32 | 32 | 32 | 32 |
| | | Bootstrap ^a | Bias | | .046 | -.037 | .000 | -.010 | .015 | |
| | | | Std. Error | | .184 | .191 | .000 | .181 | .172 | |
| | | 94.7% Confidence Interval | Lower | | -.426 | -.476 | 1.000 | -.687 | -.330 | |
| | | | Upper | | .244 | .288 | 1.000 | .102 | .284 | |
| | | loss of community increases alienation Recode | loss of community increases alienation Recode | Correlation Coefficient | | .215 | .020 | -.384* | 1.000 | .073 |
| | | | | Sig. (1-tailed) | | .118 | .457 | .015 | | .345 |
| | | | | N | | 32 | 32 | 32 | 32 | 32 |
| Bootstrap ^a | Bias | | | | -.038 | .040 | -.010 | .000 | -.015 | |
| | Std. Error | | | | .163 | .191 | .181 | .000 | .195 | |
| 94.7% Confidence Interval | Lower | | | | -.223 | -.329 | -.687 | 1.000 | -.302 | |
| | Upper | | | | .435 | .391 | .102 | 1.000 | .414 | |
| land use regs hinder farming Recode | land use regs hinder farming Recode | | | Correlation Coefficient | | .068 | -.362* | -.035 | .073 | 1.000 |
| | | | | Sig. (1-tailed) | | .356 | .021 | .424 | .345 | |
| | | | | N | | 32 | 32 | 32 | 32 | 32 |
| | | Bootstrap ^a | Bias | | -.036 | .000 | .015 | -.015 | .000 | |
| | | | Std. Error | | .163 | .170 | .172 | .195 | .000 | |
| | | 94.7% Confidence Interval | Lower | | -.222 | -.689 | -.330 | -.302 | 1.000 | |
| | | | Upper | | .462 | .023 | .284 | .414 | 1.000 | |

a. Unless otherwise noted, bootstrap results are based on 37 bootstrap samples
 *. Correlation is significant at the 0.05 level (1-tailed).

Research Question 2 What Factors influence a Farmer to Not Farm?

Research Question 2 “What Factors Influence a Farmer to Not Farm?”



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