

**Can Community Supported Agriculture be an Economically Viable
Approach to Sustainable Agriculture?**

by Ishani Shrestha

Under the direction of

Professor Michael Robinson

Professor Sarah Adelman

A Thesis Submitted to the Faculty of Mount Holyoke College

In Partial Fulfillment of the Requirements for the Degree of

Bachelor of Arts with Honors

Economics Department

Mount Holyoke College

South Hadley, MA 01075

December 2012

ABSTRACT

The purpose of this thesis is to examine the economic viability of Community Supported Agriculture (CSA) . The growing concern over food safety and a desire to be closer to the source of their food has led consumers to demand local and organic produce. CSA farms use sustainable agricultural practices to provide its shareholders in the community with fresh and quality fruits and vegetables. The system is one of mutual commitment where farmers and consumers share the inherent risks and potential bounty of the harvest.

This study examines the characteristics of CSA farms to understand the economic, environmental and social motivations behind running or joining a CSA operation. We find that current share prices of CSA farms do not reflect all of the costs of production, and hence might not be an economically viable approach to sustainable agriculture if CSA farms continue their current pricing strategy.

We discuss the possibility of raising share prices and providing government subsidies to CSA farms, after conducting a Contingent Valuation (CV) survey. The CV survey is designed to understand how much consumers are willing to pay for the different aspects of CSA, including the positive externalities that are not captured in the share prices. In particular, we find that CSA farms have potential to raise their share prices without losing sales and the U.S. government may in the long run benefit from subsidizing farms that practice sustainable agriculture rather than subsidizing industrial agriculture.

Keywords: community supported agriculture, economic viability, contingent valuation, subsidies

ACKNOWLEDGEMENTS

I would like to express my deep gratitude to Professor Michael Robinson and Professor Sarah Adelman, my thesis advisors, for their patient guidance, enthusiastic encouragement and useful critiques of this research work. They have helped me develop a deep understanding of ties between Economics and environmental issues. I would like to thank Professor Adelman also for igniting my interest in Econometrics, which I have come to realize, is a powerful tool in understanding and conducting Economic research.

I am also deeply grateful to Professor Lauret Savoy and Professor Jens Christiansen for inspiring me to pursue my interest in sustainability. I am grateful to the Mount Holyoke Economics Department for giving me the opportunity to write a thesis on a subject I am deeply passionate about. I would also like to thank the Mount Holyoke Environmental Studies Department and the Miller Worley Center for the Environment for motivating me throughout the research process. And Dawn Larder for the formatting of this thesis.

I would also like to thank Professor Timothy Farnham for serving on my thesis committee and the Hampshire College Community Supported Agriculture farm for providing me valuable insight into the workings of a CSA farm.

Last but not least, I want to thank my family and friends for their continuous support and unconditional love. I couldn't have completed this project with them by my side.

TABLE OF CONTENTS

CHAPTER 1	INTRODUCTION.....	1
	1.1 Background.....	1
	1.2 Research Objectives.....	4
	1.3 Thesis Organization.....	5
CHAPTER 2	WHAT IS COMMUNITY SUPPORTED AGRICULTURE.....	6
	2.1 Introduction.....	6
	2.2 Operating Model of CSA.....	8
	2.3 Core Group vs. Non-core Group CSAs.....	10
CHAPTER 3	IMPACTS OF CSA.....	12
	3.1 Impact on Consumers.....	12
	1 Social Benefits.....	13
	2 Nutritional/Health Benefits.....	14
	3 Economic Benefits.....	14
	3.1.1 Potential Disadvantages of Joining a CSA..	15
	3.1.2 Customer Value Creation.....	15
	3.2 Impact on Farmers.....	17
	3.3 Impacts on the Community.....	18
CHAPTER 4	CSA SHARE PRICES.....	19
	4.1 The CSA brand.....	19
	4.2 Issues with Share Prices.....	20
	4.3 Setting Share Prices.....	21
CHAPTER 5	LOCAL AND ORGANIC FOOD.....	25
	5.1 Local Food.....	25
	5.2 Organic Food.....	28
	5.2.1. The Organic Industry.....	28
	5.2.2. Environmental Benefits of Organic Agriculture.....	29

CHAPTER 6	MARKETS AND THE ENVIRONMENT.....	32
6.1.	Introduction.....	32
6.2.	Externalities.....	34
6.2.1.	Externalities Related to Conventional Agriculture.....	35
6.2.2.	Externalities Related to CSA.....	38
CHAPTER 7	POSSIBLE APPROACHES TO ENSURING ECONOMIC VIABILITY FOR CSA FARMS.....	42
7.1	Increasing Share Prices.....	42
7.2	Market Based Policies: Agricultural Subsidies.....	43
CHAPTER 8	CONTINGENT VALUATION AS A TOOL TO UNDERSTAND CONSUMERS' WILLINGNESS TO PAY FOR CSA.....	47
8.1	Introduction.....	47
8.2	Theoretical Model.....	52
8.3	Methodology.....	53
8.4	Validity of the Study.....	56
CHAPTER 9	CONCLUSION.....	59
9.1	Summary of Main Findings.....	59
9.2	Recommendations.....	59
9.3	Further Research.....	60
APPENDIX.....		62
BIBLIOGRAPHY.....		73

LIST OF FIGURES

Figure 1	Negative Externalities Due to Industrial Agriculture.....	37
Figure 2	Positive Externality in the CSA Market.....	39

CHAPTER 1

INTRODUCTION

1.1 Background

The United States Department of Agriculture (USDA) claims that “sustainable agriculture” is a term that defies definition. However, it chooses to discuss sustainable as it pertains to agriculture as “farming systems that are capable of maintaining their productivity and usefulness to society indefinitely. Such systems...must be resource-conserving, socially supportive, commercially competitive, and environmentally sound.” Sustainable agriculture and sustainability in general, is an issue much debated in today’s postmodern world. Some may think of it as an impractical concept that radical environmentalists advocate for, while others may argue that sustainable agriculture is our only way of feeding the seven billion (and increasing) global population while ensuring the quality and availability of natural resources for the future. In general, there is agreement that sustainable agriculture must combine economic, environmental and social objectives. The sustainable agriculture literature includes three main themes: food sufficiency (which includes economic concerns of productivity and efficiency), environmental stewardship and community well-being (James, 2006).

Proponents of environmental protection often argue that free-market economics makes no provisions for farmers to pursue sustainability because they will be willing to compromise the quality of soil, air, water, human health and wildlife in order to pursue profits by using chemical fertilizers that are cheaper than organic fertilizers, choosing monocultures over polycultures and selling their produce to large multinational food companies. They may even suggest that people should put environmental ethics before their monetary interests.

The famous moral philosopher and pioneer of modern market-oriented economics Adam Smith argued that if people are free to follow their self-interests, or in other words, pursue profits, then by doing so they will promote the wellbeing of the society as a whole, more so than by intentionally pursuing public interest. But he also contended that in our pursuit of self-interest, we must exercise restraint in order to balance economic considerations with social and environmental considerations (James, 2006).

I suggest that sustainable agriculture, especially Community Supported Agriculture (CSA) should be studied in a framework of modern market-oriented economics, whilst taking into consideration the fact that some of its fundamental aspects like community building and environmental benefits cannot be left out of the equation. CSA is a system of mutual commitment, where the farm provides quality produce to its customers and the customers support the farm and share the inherent risks and potential bounty. Even though revenue or profits may not be the

driving force behind a CSA operation, it must seek economic viability if it wants to continue providing its services for a long time.

A CSA operator can determine the economic viability of his/ her farm if the returns from farming are competitive with other alternatives such as small business. Earnings from the farm after, expenses, taxes and debt services have been subtracted should be high enough that it deters the farmer from taking a different career path or using the land for something else. Community Supported Agriculture must offer farmers some reward so that people will want to start a CSA farm. In order for it to be a healthy market, people must be free to join the business and people must be free to leave the business. If this is not the case, then the system cannot sustain itself for a long time.

It is also important to consider the farm's asset value because if farming is not the best use for the land, there will always be competitive pressures for its conversion to something else. Would a rational person be willing to invest their money in operating the CSA farm? Would they be able to make a living out of it? In a survey of 354 CSA farms in 2001, farmers were asked if they have discontinued or are planning to discontinue their CSA operation, what the main reason would be. The most frequent reason given was insufficient income, or the farmer finds a better paying job (Henderson 2007). Hence economic viability is an important part of ensuring the sustainability of CSA farms.

1.2 Research Objectives

The primary purpose of this paper is to discuss the dynamics behind ensuring economic viability of a CSA farm and what are some ways that CSA farmers can earn higher incomes in order to stay in business. I discuss the main reasons why a consumer would want to become a shareholder of a CSA farm and discuss the key features of this system that are attracting an increasing number of customers. However, the current share prices barely cover the overhead costs and labor costs in most CSA farms, so in order to ensure economic viability, farmers must consider raising prices. Furthermore, because most CSA farms practice organic farming, I argue that it produces positive externalities in the form of Environmental Goods and Services that have not been captured in the share prices. Another issue CSA farms must consider is the competitive pressures from conventional farms that receive agricultural subsidies from the U.S. government. In this paper, I discuss why the U.S. government should reconsider its agricultural subsidies program so that it supports sustainable farming practices.

Another purpose is to discuss how we can study consumers' willingness to pay (WTP) for shares of a CSA farm based on people's attitudes towards the different characteristics of CSA. Past studies about CSA consumers have focused on member satisfaction and what people value most using questionnaires which ask respondents to pick options they find most compelling. Despite various problems associated with the stated preference nature of contingent valuation (CV), a CV survey better captures what CSA consumers value most and how

much they would be willing to pay for the unique features of a CSA service. A CV survey incorporates prices and hence would be more useful for CSA farmers to fully understand consumer preferences. They can then capitalize on the information they obtain from such a study and alter prices accordingly.

1.3 Thesis Organization

The rest of this thesis is organized as follows. Chapter 2 introduces the concept of Community Supported Agriculture and Chapter 3 discusses its impacts on consumers, farmers and the community. Chapter 4 describes the pricing mechanism of CSA shares and discusses some problems related to it. Chapter 5 provides an overview of the local and organic food movement, which are key to understanding the rise in demand for CSA. Chapter 6 is a discussion about markets and the environment, and focuses on externalities created by industrial agricultural practices and CSA. Chapter 7 provides some possible approaches to ensuring economic viability for CSA farms and Chapter 8 discusses the idea of using contingent valuation studies to understand consumers' willingness to pay. Chapter 9 concludes with a summary and some concluding remarks.

CHAPTER 2

WHAT IS COMMUNITY SUPPORTED AGRICULTURE?

2.1 Introduction

Since the 1980s, the United States has seen an increasing demand for locally grown organic food as people have become more concerned about their health, the environment and the local economy (Wang and Sun 2003).

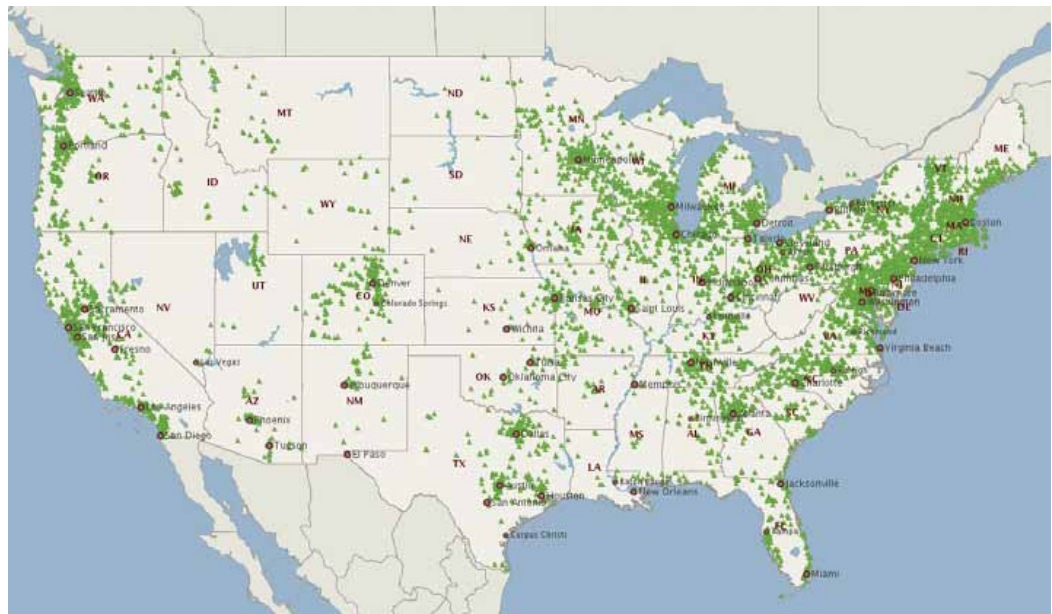
Community Supported Agriculture is a mechanism that promotes food quality, ecological sustainability and support for the local farmers. The concept of CSA originated in Switzerland and Japan in the 1960s. The first CSA farms in the U.S. were started in Massachusetts and New Hampshire. Traditionally, they required a one-time payment at the beginning of the season, but contemporary CSAs are often more flexible and offer two –to- four installment payment plans or payments on a monthly basis.

In a CSA, customers buy farm shares before the growing season so the farmer can then focus on production rather than on budgeting and marketing (Sanneh et. al 2001). The share price generally ranges between \$200 and \$600. By buying shares beforehand, the shareholders share both the rewards and the losses of the harvest with the farmer. In other words, because consumers pay a fixed amount in advance regardless of the quality and quantity of the harvest, they bear

some risk. Shareholders may also be able to buy shares at a cheaper price by becoming a worker member i.e. by providing labor in substitution for some portion of the share cost. The shareholders' investments earn returns in the form of a weekly box of organically grown produce for five to seven months. The boxes may be delivered to homes, a centralized pick up point like a farmer's market, or may need to be collected at the farm itself. CSA farms often organize events like farm tours, food tastings and potlucks to encourage community building amongst members (Thompson and Coskuner-Balli, 2007). Thus the customers know where their food is coming from, how it is produced, and get an opportunity to make a personal connection with the farmer (Lizio and Lass, 2005). According to the USDA, there were 1,144 CSAs in 2005, up from 400 in 2001 and 2 in 1986.

Although the Robyn Van En Center in 2010 estimated that the number of CSAs in the U.S. was slightly over 1,400, an online registry estimates that the number of CSAs in 2010 exceeded 2500; they are concentrated in the Northeast region and the coastal regions of the West as shown in the following map (Martinez et. al , 2010).

Community Supported Agriculture Locations, 2009



Source: Local Harvest, 2010. Available at: <http://www.Localharvest.org>. (USDA 2011)

With the rise in the number of CSA farms, research on CSA has also increased but most of them are descriptive research or case studies of a small number of farms in a specific region.

2.2 Operating Model of CSA

The business organizations for CSA comprise of sole proprietorships (single farm), partnerships and farm cooperatives (multiple farms), and limited liability corporations. Some farms work with others to form a multiform CSA so that each can specialize and provide more variety in the total share (Martinez et al, 2010).

A survey conducted by Woods et.al. in 2009 about CSA producers in the U.S. found that the average CSA surveyed had operated just over four seasons. The average number of CSA members grew 50% between 2007 and 2009, which suggests rapidly growing demand. Only 43% of the farms required their members to sign a contract.

The study found that nearly 29% of CSA farms surveyed did not produce all the products they distributed in their shares. They work with other CSA farms and local farmers to form a co-op. This distributes risk amongst all the members of a co-op and provides a greater variety of produce in a share. Around 70% of the respondents reported using computer software to track their production costs. CSAs with over 50 members were the ones who used computers the most. This issue calls attention to the fact that smaller CSAs either do not have computers or choose not to use them and find manual bookkeeping better. An easy and very effective way to help CSA farms manage their money well would be to encourage the use of computers and provide farmers or farm operators with training in accounting. This can be especially useful for farmers without previous experience.

A survey conducted of CSA farms across 43 states in 2001 by Lass et al. found that on average, income from a CSA operation was \$33,541 annually. The median income was \$15,000. There are several farms for which the CSA represents a small part of total farm activity. These farms may be experimenting with CSA, which shows potential for the expansion of the CSA concept.

Lass et. al conclude that the CSA movement is characterized by young highly educated farmers, relative to U.S. farming. Thus as a relatively young movement that is supported by a relatively educated population, CSA has the potential to be a major player in the field of sustainable agriculture in the future. Those who run these farms care deeply about the movement and are open to experimenting with non-traditional business structures.

2.3 Core Group Farms vs. Non-core Group Farms

CSA farms can be categorized into core group farms and non- core group farms based on their management system. In a core group CSA, the shareholders and farmer both decide the share prices and collectively make decisions about the operations of the farm whereas in a non-core group CSA, the farmer makes the decisions himself. A study found that core group CSAs had higher net incomes and all but those with active core group members were price takers in the competitive market. Core-group CSAs earn higher prices per share because the group is more willing than the farmer himself to make sure that he earns a living wage (Lizio and Lass, 2005). Tegtmeir and Duffy which surveyed 144 CSA operators in 2002, found that in 76% of the operations, it is the farm owner who decides the share price. The owner and/or manager and members are involved in price setting in 16% of the CSA farms and only 2 respondents mentioned the core group setting the share price (Tegtmeir and Duffy, 2005).

The Lizio and Lass (2005) study found that in terms of advertising, the farms which participated in farmers' markets and had a farm stand had higher profits. The study also found that the growth of a CSA meant more shares sold but it did not necessarily improve the profit levels. Hence CSAs might earn greater revenues by pricing their shares better in addition to selling more shares.

CHAPTER 3

IMPACTS OF CSA

3.1 Impact on Consumers

Most people join a CSA to support local farming and for the quality of produce (Cooley and Lass 1998). Environmental and food safety concerns are also important reasons for membership, along with the opportunity to get to know the farmer and supporting the community services like food donations performed by CSAs. Researchers have also found that in general, participants of a CSA can reap large savings compared to shoppers at a retail store because transportation, transaction, marketing and packaging costs are lower in the former one (Cooley and Lass 1998).

Today, consumers in developed economies have become accustomed to a variety of vegetables meats, fruits, beverages etc. that defy the constraints of seasonality and location. A growing disconnect between food producers and consumers means many people do not know how their food is produced or where it comes from. Consumers these days hardly have time or make the effort to know the people who grow their food. Joining a CSA provides an opportunity for people to become personally involved in the production of the food they consume, and hence have more control over their source of nutrition.

Literature on CSA in general suggests that it can have three types of impacts on consumers: social, nutritional/health and economic. I argue that CSA can have environmental impacts on customers as well in the form of positive externalities created by practicing sustainable agriculture, which will be discussed in Chapter 6.

1. Social Benefits

A study of CSA members in an Illinois based program found that members reported high levels of satisfaction from the social “club benefits” that a CSA membership provides (Brown and Miller, 2008). In a study conducted by Kolodinsky et. al amongst CSA members in Vermont, it was concluded that in general, individuals derived utility from visiting the farm and interacting with the farmers. This study used household incomes to evaluate the value of the time individuals spend doing certain activities related to their CSA membership. They found that both putting away groceries at home and visiting a CSA farm yield positive utility (Kolodinsky et. al 1999). Also, people enjoy being members of a CSA in an area with a strong sense of community, where people can influence each other to join a CSA farm. Shareholders also feel recognized as a community member who is involved in the betterment of the local economy.

Thompson and Coskuner-Balli in their paper argue that CSA embodies “enchanted” moral virtues which influence consumers to become members, despite its choice restrictions compared to a grocery store. They interviewed

several consumers, to gain insight on what drives people to join a CSA. One of them, in support of CSA said “We have a community in voting, we have a community in neighborhood associations, we have community when you meet people in the park, but this city to country, food producer and food eater, just the getting away from over processed things...there is such a pleasure in real food.” (Thompson and Coskuner-Balli, 2007). The woman’s sentiments are common amongst CSA members who feel that food, as a source of life, connects everyone on the planet and hence must be viewed upon as a community building force.

2. *Nutritional/Health Benefits*

Perez, Allen and Brown (2003) found that CSA members in California had healthier eating habits. Another study found CSA members in Minnesota and Wisconsin said that their participation in a CSA led to eating more, fresher and a greater variety of vegetables. They also reported shopping less, and developing healthier eating habits (Brown and Miller, 2008). While the current American industrial food system is increasingly being blamed for the rise in obesity, CSA members are voting with their dollars to opt out of this system.

3. *Economic Benefits*

The economic benefits of CSA on consumers have been measured by calculating what it would have cost to purchase the same produce from local markets. In a study conducted on three Massachusetts CSA farms, Cooley and

Lass (1998) found that local organic retail values of CSA produce 1.5 to 2.5 times the values of customers' shares. In Illinois, CSA members' produce value was at least as high as the share price and up to 1.2 times its value. Furthermore, CSA saves consumers a lot of money compared to purchasing the same organic produce from a local supermarket or a larger retailer of organic food. Members of a Canadian CSA saved 39% in this way (Brown and Miller 2008).

3.1.1 Potential Disadvantages of Joining a CSA

Joining a CSA farm does have some potential disadvantages for the consumer. Some complain about the limited choice of produce while others about the provision of too much produce leading to waste. However, some CSA farms facilitate a small-scale bartering economy where consumers exchange unwanted items from their shares with each other. In fact, some see it as an opportunity to make closer communal ties. They may also donate the excess vegetables to food banks and homeless shelters.

If the farm does not deliver, then the customers may find the pick-up times or the trip to the farm inconvenient. And there is always the possibility of a bad season which causes skepticism about the share prices (Cooley and Lass 1998).

3.1.2 Customer Value Creation

Forsman and Paananen (2007), in their discussion about value creation in local food supply chains, mention specifically two important approaches to

studying the customer value creation process. Firstly, Woodruff's customer value hierarchy model suggests that customer satisfaction can be studied by dividing it into attribute-based satisfaction, consequence-based satisfaction, and goal-based satisfaction. Accordingly, it is important to approach value creation by CSA in terms of the product attributes customers attach to a CSA share, what desired consequences a CSA membership provides to customers, and what goals and purposes customers will achieve by their CSA membership.

A second approach, called the customer value mix model, suggested by Kemperman and van Engelen , argues that customer value is not only what a customer receives. Customer value of CSA should be considered as a trade-off between associated benefits, sacrifices and risks. Customers may be exposed to certain risks and additional sacrifices compared to buying food from conventional food retailers. For example, the price customers have to pay for a CSA share (financial sacrifice) may be higher than the price they would have to pay to buy the same bundles of fruits and vegetables from a conventional supermarket. This is because the cost control of growing food organically is higher, and since most are small scale operations, they lack scale economies (Forsman and Paananen, 2007).

It is important the CSA operators understand the process of customer value creation in order to price their shares correctly and provide services that are most in demand. Chapter 8 makes a case for why CV can prove to be a very

useful method in understanding what customers value and how much they are willing to pay for it.

3.2 Impacts on Farmers

For the farmer, the CSA system has risk sharing and a guaranteed consumer base built into it; it provides them funds before the growing season. A case study on a Canadian CSA revealed that a CSA operator earns more from selling his produce through CSA shares than by selling into the wholesale market and using conventional line-of-credit or loan financing (Brown and Miller 2008). By cutting out the middle men, the CSA farmer is directly paid by the consumer. The CSA system enables small-scale farmers to feel economically empowered rather than being subject to broader institutional dominance. The farmers also gain existential satisfaction by developing intimate connections with the land and by facilitating similar experiences for their customers (Thompson and Coskuner-Balli, 2007).

Woods et. al's study found that the average operator was 45 years old, and 25% of the operators had no farming experience before they started their CSA. Another 25% of respondents said that the CSA was their first horticulture direct marketing experience. They conclude that while CSA serves as a great entry-level marketing method for small farmers, they must learn to manage the farms finances properly for their long-term financial success.

3.3 Impacts on the Community

In a community with well organized CSA farms with large consumer bases, the prevalence of such a system can have a significant impact on the local economy. This is especially true for customers spending their disposable incomes on locally grown food in a community with significant food imports.

Consumption of locally grown food also entails little food spoilage, little packaging and low distribution costs. Sustainable farming practices by a CSA farmer can prevent the transformation of open landscapes and farmlands can also be placed in a trust for preservation. Promoting CSA would also maintain rural communities and prevent the disappearance of small scale farms (Sanneh et.al 2001).

CHAPTER 4

CSA SHARE PRICES

4.1 The CSA Brand

It is possible that CSAs are not fully charging what they could be. Lass et al in 2004 argued that CSA farms have the potential of practicing monopoly power because they have some characteristics that grocery shops do not. There are generally only few farms in a region that practice CSA and they can be looked upon as a brand. Because they provide fresh organic food from a known, local source, the “CSA brand” has the potential to harvest customer loyalty. And by participating in a CSA, shareholders earn recognition in the society for supporting local farmers and the local economy. These features make the “CSA brand” unique, such that groceries from conventional stores make for a poor substitute. The authors argue that because of such unique features, CSAs have the potential of pricing their shares above the marginal cost and earning greater profits.

However, CSA farmers do not prioritize profit maximization for many reasons, one of which is altruistic feelings towards their customers and the desire to maintain a close relationship with them. A study conducted amongst Northeastern CSA farms in 1995, 1996 and 1997 found that they only practice 3.5% of their potential monopoly power (Lass et al 2004). The Tegtmeier and

Duffy study concludes that environmental and social values are the primary motivations for CSA farmers. Even though more than half of the respondents, who were CSA farmers, stated that their share prices don't offer a fair wage, almost all of the respondents said they were satisfied with their operations (Tegtmeier and Duffy 2005). Perhaps a guaranteed market and risk sharing are enough economic incentives for farmers to operate a CSA, such that profit maximization receives minimal attention. Even though a CSA farm may not target profit maximization, it must at least aim to achieve economic viability by earning at least normal profits. Without covering its

4.2 Issues with Share Prices

Research shows that CSA farm shares are underpriced, and the farmers fail to utilize their market power. This leads to inefficiencies in the CSA market, and in a context as important as sustainable agriculture, it is crucial that we address these problems. Economic viability is critical in encouraging existing CSA farms to continue their work and encourage the establishment of new CSA farms. In a study conducted by Lizio and Lass in 2001, they define viability by a farm's ability to earn normal economic profits (i.e profits=0). It is consistent with the ideology of CSA: the share price should reflect the cost of producing the share, including a living wage for the farmer. They found that most CSA farms do not take into consideration the full economic cost of production, especially the

wages for the farmer. On average, those CSA farms that paid the farmers a wage earned negative profits.

Lizio and Lass (2005) use three regression models to reveal that CSA farmers behave as price takers. They concluded that share price does not influence the number of shares supplied, but a higher share price does increase net income. Lass et al.'s study (2005) which examined the market power of CSA farms in the Northeast, found that the market power coefficient is positive and significant. They also found that demand was greater at areas with a higher population density, and having a core group management structure increased demand by 105 shares and the share price by \$155 per share.

In order for CSA to be a viable approach to agriculture, the farms must fully understand their full cost of production and price their shares accordingly. In fact, CSA farms should also take into consideration the positive externalities they accrue and change prices based on consumers' WTP for these externalities.

4.3 Setting Share Prices

People are not only concerned about their own expectations from a CSA farm, but are often also concerned about the farmer's wellbeing and the farm's economic viability. Because organic farming is labor intensive, labor is the largest cost in a CSA farm whereas depreciation of capital assets is the second largest cost.

A farm is said to be “economically viable” if it makes at least normal profits. A study conducted with data from CSAs throughout the country for years 1995, 1996, 1997 and 2001 found that imputed net incomes were often negative because the farmers did not report their own labor costs. However, it was noted that cost management in CSAs has been improving over the years because the shortfalls decreased over the years (Lizio and Lass 2005). In theory, a CSA share price should be set such that it covers operating costs and yields a fair return to the farmer’s labor which would lead to financial benefits for the farmer but in reality, farmers often don’t include payment for their own labor (Brown and Miller 2008).

A study conducted by Woods et. al in 2009 surveyed 205 CSA producers in nine states (IL, IN, OH, MI, PA, WV, KY, MO, TN) and asked respondents to indicate the importance of seven economic factors in determining their annual price on a Likert scale of 0-10. A “0” represented “Very minor factor” and “10” represented “Very Important Factor”. The most significant factors in determining share prices were overhead and fixed costs of production (average= 6.18), share prices at other local CSAs (average=5.84) and variable operating costs of production (average=5.83). The remaining factors were “whatever the market will bear” (average= 5.06), required gross margin above expenses (average =4.93), income levels of the community (average= 4.91) and non-CSA competition for member’s food dollars (average= 4.19).

The authors also found that there was a distinction between different sizes of CSAs and the way they price their shares. The CSAs were divided into three groups based on the number of shareholders: less than 25, 26-50 and over 50. Variable operating costs of production were more important to larger CSAs in determining share prices, than to smaller CSAs. While 63% of those with more than 50 members rated variable operating costs as “important” or “very important”, only 46% of those with 50 or fewer members rated variable operating costs as “important” or “very important”. The difference is even greater when it comes to overhead and fixed costs of production. 79% of CSAs with more than 50 members indicated that overhead costs were important whilst less than half of CSAs with 50 members or less indicated the same. This may suggest that the system of upfront payments as a financing mechanism is more important for larger CSAs.

Another interesting factor to look at is the share prices at other CSAs. Whilst 13.2% of CSAs with 25 members or less responded that competitor share prices were very important in determining their own share price, only 4.3% of CSAs with more than 50 members thought it was important. This indicates that in general, larger CSAs consider their fixed and variable costs as more important a factor than competitors’ share prices when setting their share prices. The opposite appears to be the case for smaller CSAs.

Tegtmeier and Duffy in 2002 surveyed CSA farmers in nine Midwestern states and asked respondents to rate the importance of factors considered when

determining share price, on a scale of 1 (least important) to 5 (most important). In their study, the mean response for “operational cost” as a pricing factor was 3.75, for “consumer’s willingness to pay” was 3.74 and “CSA’s operational cost plus my labor” was 3.50 and for “CSA’s operational cost plus family labor” was 3.18. It appears that they find their customer’s opinions regarding the share prices more important than their operational costs (even when labor costs are added to them), when calculating share prices.

When respondents were asked if they track their share costs down to the dollar per share, only 14.9% agreed and 19.0% disagreed. About 20% of the respondents answered by ranking the statement either a “5” or a “6” on the 0-10 scale. The same study also found that only 43% of the farmers felt that their share price provided a fair wage. 87% of them were not completely satisfied with their CSA farms because of high number of working hours, labor problems, feeling underpaid and/or having a low net return.

However, 84% reported being satisfied most of the time, even though majority of the farmers feel overworked and underpaid. This calls attention to the influence of “intangible benefits” that farmers associate with their CSA operation. Perhaps the intangible benefits of environmental stewardship and community involvement are what sustain the outlook of these farmers, despite feeling underpaid and overworked (Tegtmeier and Duffy 2005).

CHAPTER 5

LOCAL AND ORGANIC FOOD

This chapter discusses the local food movement and the organic food movement- two issues that are key to understanding the reasons behind a rise in demand for CSA.

5.1 Local Food

In 2008, the U.S. Congress adopted the Food, Conservation and Energy Act (2008 Farm Act) which defines a “locally or regionally produced agricultural product” as having travelled “less than 400 miles from its origin, or is (sic) within the State in which it is produced”. Generally people associate local food with direct-to-consumer arrangements such as regional farmers’ markets, CSAs and direct-to-retail/ food service arrangements such as farms to schools (USDA 2011).

One of the key reasons why people choose to join a CSA is for the local food. In today’s globalized world, food markets are becoming increasingly international. While there are many benefits of a global food market such as more variety and enough food supply for countries with limited agricultural capacity, the “locavore” movement is gaining traction as many people find eating local food healthier, better for the community and more sustainable. Many are

becoming conscious about the social, environmental and economic costs of global food, and are choosing to buy their food from local farmers' markets, CSAs or retailers that feature local produce. Hence, paradoxically, we can identify the emergence of new localized small-scale markets alongside the globalization of the food sector (Forsman and Paananen, 2007). A study released in 2008 conducted surveys in farm markets, farmers' markets and retail grocery stores in Ohio to find that consumers prefer locally grown over US grown, even when freshness is held constant. They also found that consumers are willing to pay almost double for a product from a closer location (Brown and Miller 2008).

Forsman and Paananen argue that the rise in the importance of "localness" is born out of customers' realization that there is not only a widening physical divide between producer and consumer, but also a growing mental gap between food production and consumption. As matters regarding food safety and environmental issues come to the forefront, consumers are increasingly becoming interested in improving transparency in the food supply chain. Place and mode of production alongside traceability have become important indicators of food quality (Forsman and Paananen, 2007).

One can define local food in terms of three dimensions:

- 1) Distinct product characteristics – Differentiation of local products from non-local products in terms of taste, appearance and other sensual attributes.
- 2) Ecologically embedded features – Origins of the product's raw materials and methods of production.

- 3) Socially embedded features – Localized distribution, short supply chains and scale of production. Social embeddedness is currently receiving special importance in the case of local food.

Stefani et. al (2006) state that there are two ways by which consumers value food products based on the region of origin. First, the region of origin can act as a cue for quality, and hence other characteristics of the good. Secondly, it can affect the value of food directly because of its symbolic or affective role. Studies have also shown that consumers report a higher WTP for food from a narrowly defined geographical area. The rationale used to explain this behavior is based on the assumption that consumers are risk averse. So uncertainty related with a broadly defined area should lower the WTP (Stefani et. al 2006). This has implications in the context of CSA because shareholders are well aware of exactly where and how their food is grown. By getting to know the farmer personally, CSA members feel more confident about food safety. It is one of the leading reasons behind a consumer's decision to join a CSA rather than buy local food at a supermarket. Even though a consumer trusts produce from a CSA more than the same local food from a supermarket, they pay less for the same basket of produce from a CSA. CSA farmers have not been able to capitalize on the trust customers have in their agricultural practices. Lass et al. (2001) report that this might be because of altruistic feelings and a general idea that it would be unethical for a CSA farm to aim for profit maximization.

From the producer's view point, there are certain barriers to entry and expansion in the local food-market. Most farms that supply food locally are small-

scale operations and due to capacity constraints, may not be able to meet consumer demand. There may also be lack of distribution systems for moving local food into mainstream markets like supermarkets or large grocery stores because they often have contracts with large food companies. Other barriers include limited research, education and training for marketing local food, and uncertainties regarding regulations (for example food safety requirements) that may affect production (Martinez et. al, 2010).

Forsman and Paananen (2007) claim that the geographical aspect of local food is not a dominant feature in determining the “localness” of it. It can instead be defined in terms of distinct product characteristics and its social and environmental features. Product attributes such as freshness, high quality, safety, credibility, minimum use of packing material, non-industrial and taste are essential in driving consumer demand for local food in general but in the case of CSA, social and ecological features of the produce are crucial in determining demand.

5.2 Organic Food

5.2.1 The Organic Industry

According to the Organic Trade Association’s 2011 Organic Industry Survey, organic food represented approximately 4% of overall food and beverage sales in 2010. The sale of organic food and beverages in the U.S. has grown from \$1 billion in 1990 to \$26.7 billion in 2010. It was a 7.7% growth over sales in

2009. Organic fruits and vegetables saw the highest growth in sales in 2010 (11.8% over 2009 sales) and now represent 11% of all fruits and vegetables sales in the U.S.

In 2010, mass market retailers (mainstream supermarkets, club/warehouse stores, and mass merchandisers) accounted for 54% of the total sales in organic food. 39 % of was sold by natural retailers, while the remaining 7% of sales occurred via export, the internet, farmers' markets/ CSAs, mail order and boutique and specialty stores. Hence CSAs represent a very small portion of the organic foods sales. However, the fact that the organic food industry grew by 7.7% when the U.S. food sales grew by less than 1%, shows that more consumers are switching to organic foods. This industry's growth is not only increasingly contributing to the economy, but is also making a positive contribution to rural livelihoods. Approximately 94% of all CSAs in the U.S. claim to practice organic agriculture (Martinez et. al , 2010).

5.2.2 Environmental Benefits of Organic Agriculture

The Food and Agriculture Organization of the United Nations (FAO) describes organic agriculture as taking a proactive approach as opposed to treating problems after they emerge. Organic agriculture, as opposed to conventional non-organic agriculture, considers the medium and long-term effects of interventions in the agro-ecosystem. We can better understand the environmental benefits of organic farming by looking at specifics:

1. **Soil-** Organic farming practices crop rotations, inter-cropping, symbiotic associations, cover crops, organic fertilizers and minimum tillage. These practices are essential in the soil building process. They also encourage soil flora and fauna and improve the soil structure. This encourages nutrient and energy cycling and improves the ability of the soil to retain nutrients and water. By limiting the length of time that the soil is exposed to erosion, enhancing soil biodiversity and reducing nutrient loss, soil productivity is maintained.
2. **Water-** Organic agriculture prohibits the use of synthetic fertilizers and pesticides, which are a leading cause of groundwater pollution and contamination. Governments of France and Germany encourage organic agriculture as a restorative measure because synthetic chemicals in the farms posed a real problem in water pollution. Some mineral water companies, like Perrier and Vittel in France, even pay local farmers in the area of the springs they get their water from, to adopt less intensive farming methods (Keohane and Olmstead, 2007).
3. **Air and climate change-** The production of chemicals used in synthetic fertilizers and pesticides require high quantities of fossil fuels. Organic agriculture thus reduces the use of non-renewable carbon intensive energy in addition to increasing the soil's ability to sequester carbon. Studies have revealed that organic farming increases soil organic carbon content, which increases the potential of agriculture to mitigate climate change. Minimum tillage, returning crop residues to soil, using cover crops, crop rotation and greater integration of nitrogen-fixing legumes are responsible for enhancing carbon storage in soil. However, this field needs much more research.
4. **Biodiversity-** A study conducted in 2011 that reported on a meta-analysis of 766 scientific papers concluded that organic farming produces more biodiversity than other farming systems (FAO). Organic farmers often use traditional and adapted seeds because of their greater resistance to climate stress and diseases. They also combine diverse plants and animals to optimize nutrient cycling. By using under-utilized species, they prevent the erosion of agrobiodiversity and create a healthier gene pool. Organic fields are suitable areas for wildlife habitats because they have minimal chemical inputs. They also attract new or re-colonizing species, and organisms such as pollinators and pest predators, which are beneficial to the system.

5. **Genetically Modified Organisms (GMOs)**- Organic farms do not intentionally use GMOs because we do not fully understand their impacts on the environment and health. Thus it is a precautionary approach that chooses to encourage natural biodiversity and prevent exposure to potentially dangerous GMOs.
6. **Ecological services**- Soil forming and conditioning, soil stabilization, carbon sequestration, predation, waste recycling, nutrient cycling, pollination and maintenance of natural habitats are all ecological services that are produced by organic farming. It is a less polluting agricultural system which reduces agriculture's impact on natural resource degradation (FAO)

CHAPTER 6

MARKETS AND THE ENVIRONMENT

6.1 Introduction

CSA is not just a business for the farmer but it also produces environmental goods and services through its sustainable agriculture practices. This chapter is concerned about valuing these intangible goods and services, both in the case of external benefits and external costs. Many economists believe that we need not worry about the impacts of economic activities on the environment, arguing that the market will take care of any needed adjustments. They believe that as natural resources grow scarce, people will make amends to their consumption habits by using resources more productively because people will have more incentives to conserve. They also think that the development of new technologies will keep output in pace with demand. However, the very nature of some irreversible changes in the environment and the complexities of ecosystems make it difficult to argue that the market will solve all problems. For example, once a cropland is paved over to build new houses or roads, no matter how severe the food shortages, it is unlikely the buildings will be torn down or roads destroyed to bring the cropland back into production. And once a species becomes

extinct (biodiversity loss), there is no economic mechanism or technology by which we can bring them back into existence.

Hence there is constant debate over whether the environment and nature should be valued in monetary terms and what these numbers mean in practical terms. Critics of national accounting measures such as the Gross Domestic Product (GDP) sometimes argue that they do not take into consideration the environmental goods and services that are produced and consumed. In a popular article published in *Nature* magazine in 1997, Robert Costanza and his colleagues estimated the total worldwide annual value of ecosystem services is US\$16-54 trillion, with an estimated average of US\$ 33 trillion. The authors of the study claim that the real value would certainly be much larger even when the US\$33 trillion was 1.8 times the global GNP at the time. To put an exact number on the global GNP which also values ecosystem services is a rather difficult task because there is often no market for exchange of environmental goods and services, and many ecosystem services are literally irreplaceable so their value would be infinity.

Costanza et. al's innovative measure of world GNP is a major step towards understanding the true cost of our activities. The article gave rise to the idea that the global price system would be very different from the existing system if ecosystem services were actually paid for in term of their value contribution to the global economy. The composition and magnitude of the global GNP would be very different, and the authors recommend that national accounting measures

should better reflect the value of natural capital. They even go as far as to say that initial attempts to do so indicate a leveling of welfare since around 1970 even though the global GNP has continued to increase. Another use of estimating the value of natural capital and ecosystem services is during project appraisal. More often than not, these values are ignored or undervalued because they are largely outside the market and difficult to measure. This leads to flawed valuations of projects and approvals of those whose social costs far outweigh the benefits.

6.2 Externalities

Economic interpretation of environmental impacts is important to understand the true costs and benefits of an economic activity that yields environmental externalities. Environmental externalities are born out of the economic system where the production and consumption of goods and services does not record in any economic way, the environmental impacts. Economics is an important tool in understanding environmental problems. It can help explain why consumers choose certain products over others (for example Hummers vs. Priuses) or why governments choose to promote certain sources of energy and discourage others. It also helps predict how individuals and firms will respond to incentives and new regulations such as emission limits and increasing gas prices. Economics helps us comprehend how society should make use of scarce resources and what are the optimum levels of consumption. For example, by conducting a cost-benefit analysis that includes not only financial outcomes but also

environmental impacts of a proposed water dam project, economists can make recommendations that would maintain or improve social welfare.

An OECD report released in 2001 titled “Multifunctionality: Towards an analytical framework” discusses the joint production of non-commodity goods and services in agriculture. Joint production refers to some inter-connectedness among the outputs from the agricultural production process. In our context, we see that CSA farming not only produces fruits, vegetables and sometimes other commodities such as meat and flowers, but also jointly produces Environmental Goods and Services (EG&S) and community building. The report refers to “multifunctionality” as the fact that an economic activity can have multiple outputs some of which are externalities or public goods. This means the activity can contribute to multiple societal objectives at once and agriculture is a prime example. It states that “the multiple positive and negative outputs of the agricultural production process contribute to or detract from social goals- the viability of rural areas, environmental quality (including biodiversity and land conservation), food security, sustainability, animal welfare, and cultural heritage”.

6.2.1 Externalities Related to Conventional Agriculture

Industrial agriculture has many negative impacts on the environment, health and rural communities. The main channels through which current practices in industrial agriculture in the U.S. yield negative externalities are:

- i) Soil loss and erosion- It reduces crop yields and impairs natural and manmade water systems.

- ii) Runoff of agricultural chemicals – It contaminates groundwater and disrupts aquatic ecosystems.
- iii) Monocropping – It threatens diversity and increases the risk of foodborne pathogens and antibiotic resistance in humans. It also increases pest resistance to chemical controls.
- iv) Declining community involvement- It negatively affects the health of rural communities and increases division of social classes.

Tegtmeir and Duffy (2004) estimate the annual external costs of US agricultural production in 2002 US dollars. The damage to water resources is estimated to be \$419.4 million, damage to soil resources is \$2242.7 million - \$13,394.7 million, damage to air resources \$450.5 million, damage to wildlife and ecosystem biodiversity is \$1144.9 million - \$1174.1 million, damage to human health due to pathogens is \$416.4 million - \$441.5 million and damage to human health due to pesticides is \$1009.0 million. In total, the costs are estimated to be \$5682.9 million - \$16,889.2 million.

While the total estimated costs of agricultural production in the U.S. is estimated to be \$5.7- 16.9 billion per year, the USDA, the Environmental Protection Agency (EPA) and the Food and Drug administration (FDA) spend only \$3.7 billion annually to mitigate the damages from the conventional system of agriculture in the US. The \$3.7 billion does not include direct subsidies and other support mechanisms for farmers.

Figure 1
Negative Externalities Due to Industrial Agriculture

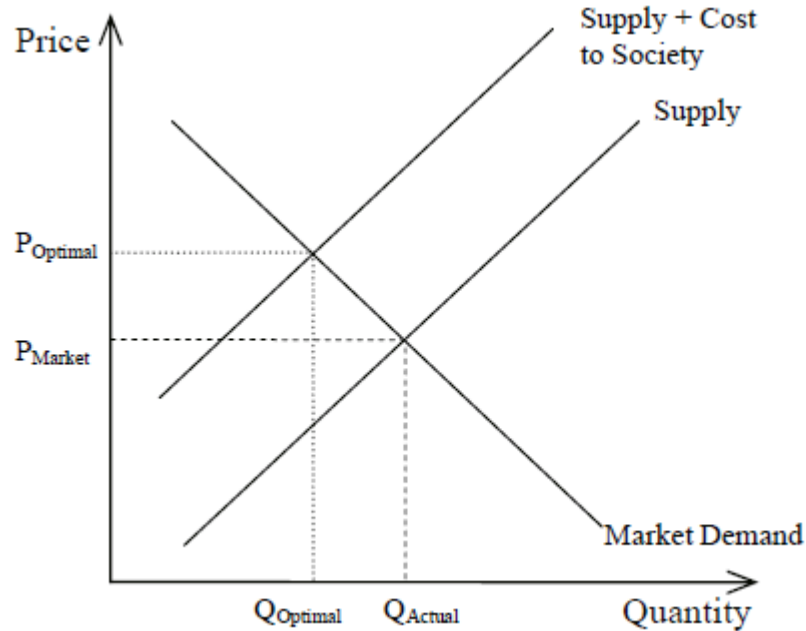


Figure 1 shows the external costs imposed by conventional agricultural production process in the U.S. If the consumers only take into account their own private cost, they will end up at price P_{Market} and quantity Q_{Actual} , instead of the more efficient price P_{Optimal} and quantity Q_{Optimal} . This reflects the idea that the marginal social benefit should equal the marginal social cost, that is that production should be increased only as long as the marginal social benefit exceeds the marginal social cost. The result is that a free market is inefficient since at the quantity Q_{Actual} , the social benefit is less than the social cost, so society as a whole would be better off if the goods between Q_{Actual} and Q_{Optimal} had not been produced. The problem is that people are buying and consuming too much food produced by conventional agriculture. The U.S. is especially proud of its “cheap”

food but consumers are not paying the socially optimal price or consuming at the socially optimal quantities. American consumers may pay lower prices for their food at the supermarket, but they are paying for their food in their utility bills, taxes, and declining environmental and personal health (Tegtemeir and Duffy 2004).

6.2.2 Externalities Related to CSA

Community Supported Agriculture is a system that as of yet, fails to take into account the positive externalities it accrues. Sustainable agriculture practices adopted by most CSAs yield various environmental goods and services, as mentioned earlier in the paper. Thinking systematically about benefits, costs and tradeoffs of CSA helps us understand a central concept in economics- economic efficiency. It is important that we understand the true value of the services that CSA and agriculture in general provides, to design policies and change pricing mechanisms in order to optimize social welfare. Misallocation of resources attributable to an externality will occur when appropriate prices are not charged by supplier for some such service, or to the supplier for some such disservice.

In the case of CSA, farmers are grossly underpaid. Studies show that CSA farms do not cover their labor costs and that they do not utilize their monopoly power in the market. This is a matter of concern for two main reasons. Firstly, any business needs to be economically viable to be sustainable. Secondly, when the market does not account for additional benefits provided by CSA, it is not only

the price that is lower than what the market can bear, but also the quantity produced. In other words, mechanisms that enable CSA farmers to earn more would ensure the sustainability of existing farms and encourage more farmers to start a CSA operation in their community.

Figure 2
Positive Externality in the CSA Market

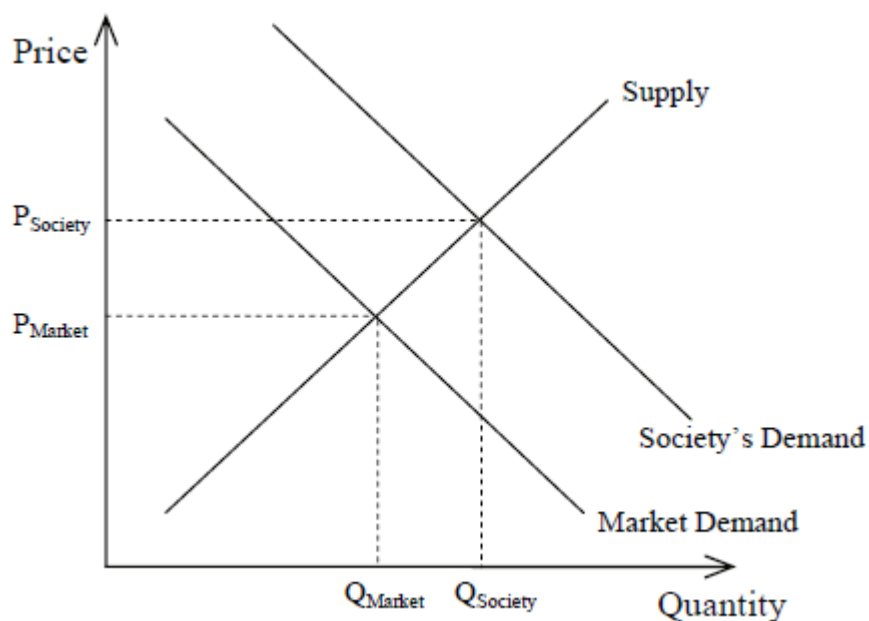


Figure 2 represents the presence of a positive externality in a competitive market. The marginal private benefit of buying a CSA share is less than the marginal social or public benefit by the amount of the external benefit. This marginal benefit of buying a CSA share is represented by the vertical distance between the two demand curves. This is under the assumption that there are no external costs, so that social cost equals individual cost.

If consumers only take into account their own private benefits from buying CSA farm shares, the market will end up at price P_{Market} and quantity Q_{Market} instead of the more efficient price P_{Society} and quantity Q_{Society} . P_{Society} and Q_{Society} reflect the idea that the marginal social benefit should equal the marginal social cost, i.e., production should be increased as long as the marginal social benefit exceeds the marginal social cost. The existing CSA market is inefficient since at the quantity Q_{Market} the social benefit is greater than the societal cost, so society as a whole would be better off if more CSA farm shares were produced. The problem is that people are buying too few CSA shares. Food from CSA farms is under produced and the shares are underpriced. The CSA market does not provide the appropriate signals to producers so that they may make socially and financially optimal decisions.

It is relatively easy to measure the abatement and treatment costs following pollution but it is much more difficult to measure agriculture's external benefits. For example, how do we value the aesthetic beauty of improvement in biodiversity due to organic farming? Thus economists have developed stated preference measures to estimate the value people put on environmental goods and services. This enables economists to calculate people's willingness to pay for these goods and services, or willingness to accept compensation for losses. In Chapter 8, I discuss a contingent valuation approach that would help economists value the external benefits provided by CSA and argue that results from a CV

survey will help us design better policies to promote CSA and sustainable agriculture in general.

In order to encourage these desirable benefits (positive externalities), there are several mechanisms that can capture these hidden benefits, and incorporate them into market decisions. In the next chapter, I discuss the mechanisms that should be in place to promote sustainable agriculture.

CHAPTER 7

**POSSIBLE APPROACHES TO ENSURING
ECONOMIC VIABILITY FOR CSA FARMS**

7.1 Increasing Share Prices

The most convenient and easy to implement strategy by which CSA farms can become economically viable is by earning more from their shares. If farmers are able to increase their farm share prices without losing customers, then they can earn more revenue. Currently, CSA farms do have potential to raise their farm shares, given that they exercise only 3.5% of their monopoly power, barely cover their operational costs and sell their services to consumers who actually care about the farmer earning a living wage. Farms were also able to increase sales as well as share prices simply by having a core-group management.

If consumers and CSA farmers are able to engage in private bargaining which would result in the production of CSA goods and services at a socially optimal level, then government intervention would not be necessary. In this scenario, transaction costs are minimal, since the very nature of CSA encourages direct and frequent meetings between farmer and consumer.

What about the positive externalities created by CSA? Who exactly benefits from them? We can argue that consumers themselves would benefit from more CSA farms operating in their company or the existing CSA operations

increasing production, because they live in the same community where the soil would retain more nutrition, the groundwater will be less likely to be polluted by runoff and biodiversity would be richer. However, because of the public goods nature of these intangible benefits, we cannot exclude non-members of CSA from benefitting from these externalities. Would members be willing to pay more for something even non-members will be able to benefit from?

This situation calls for the use of contingent valuation in order to fully understand what exactly about a CSA do consumers value. Chapter 8 discusses why a CV survey would help farmers better understand how to price their shares and also what is the best way to conduct such a survey. A potential example of such a survey is provided in the Appendix. CV surveys would also help governments better understand the people's willingness to pay for sustainable agriculture and design their agriculture policies accordingly. Thus a CV survey can play a very important role in helping society internalize the externalities created by different agricultural practices.

7.2 Market-Based Policies: Agricultural Subsidies

In contrast to the direct negotiation between farmers and consumers, another set of policies called “market-based” or “incentive-based” instruments incorporate market principles into government policies. Agricultural subsidies are a price-based approach that enables government policies to support farms that produce positive externalities.

In general, agricultural subsidies in the OECD countries are thought to provide incentives for the intensification of agricultural production in OECD countries. The subsidies increase farmers' revenues and provide incentives to increase output through more intensive use of inputs such as synthetic pesticides and fertilizers. Unfortunately, the intensification of agricultural production brought on by US farm subsidies has generated negative environmental impacts such as water pollution, soil erosion, and biodiversity loss (UNISFERA and CEMDA 2003).

The 2002 US Farm bill and the Doha Round make provisions for direct subsidies to farmers as "farm income stabilization". The "Food, Conservation and Energy Act of 2008" continues the provisions of the 2002 US Farm bill. The Environmental Working Group (EWG) reports that the United States has spent \$277.3 billion in agricultural subsidies from 1995 to 2011. They are provided without regard to the economic need of the recipients and has encouraged the system of monoculture, whose negative externalities were discussed in Chapter 6. Corn producers are the top recipients of subsidy payments, followed by meat, cotton and tobacco producers. Farmers who produce fruits and vegetables do not receive any subsidies, and neither do CSA operations.

It is safe to say that the current US agricultural subsidies are encouraging highly intensive agricultural practices that have severe environmental impacts. For example, raising livestock is very carbon intensive and a leading source of greenhouse gas emissions. Research has also shown that artificially low prices of

high-sugar food due to cheap corn syrup, has increased obesity rates in the U.S. Critics also argue that subsidies to large food producers and farms and none for small scale farms that produce fruits and vegetables has increased inequality in the farming community. They also argue that the US agricultural subsidies distort international trade and cause poverty amongst farmers in developing countries by dumping cheap food in their markets.

Some researchers have argued that the removal of domestic support policies would generate positive environmental effects. This is because it lowers incentives for the over-application of synthetic pesticides and fertilizers and conversion of vulnerable and marginal land into arable production. Removal of the existing system of agricultural subsidies would reduce the intensification pressures on the environment. The subsidies in place today, are directly and indirectly promoting unsustainable methods of producing food. In other words, negative externality producing activities are being subsidized instead of taxed (UNISFERA and CEMDA, 2003).

According to the National Center for Health Statistics (NCHS), more than 35% of U.S. men and women were obese in 2009-2010. In the same year, 16.9% of U.S. children and adolescents were obese. Obesity increases the risk of several health conditions such as hypertension, adverse lipid concentrations, and type 2 diabetes. In the United States, the prevalence of obesity increased during the last decades of the 20th century (Ogden et. al., 2012). Our society should acknowledge the fact that being obese is much more than an individual choice. In order for

people to make healthy choices, healthy food options must be accessible and available. There is a growing consensus that the current industrial food system in the U.S. contributes to obesity by encouraging the production of cheap processed foods and High Fructose Corn Syrup. Americans however, do not recognize that this cheap food has hidden costs in the form of taxes that they pay to support agricultural subsidies. Furthermore, the public medical costs, which is supported largely by taxes, will increase in the future because of widespread obesity (Tillotson 2004).

Hence the US government should reconsider its agriculture subsidy programs and take into consideration the externalities caused by different types of farming methods. CSA farms at present do not receive any government subsidies. If these farms were to obtain subsidies, not only would it help towards covering costs and helping the farmers make a living, but it would also encourage the practice of sustainable agriculture. Depending on the structure and amount of subsidies received, it might be a better choice for farmers to maintain prices and not risk losing customers by increasing prices.

The government should critically think about what the true cost of agricultural production is (estimated in Chapter 6 to be \$ 5.7-\$16.7 billion per year). It should also think about the long term gains by encouraging sustainable agriculture rather than the conventional system of agriculture which in the future can pose tremendous costs to the government in terms of health costs, pollution costs and other environmental costs.

CHAPTER 8

CONTINGENT VALUATION AS A TOOL TO UNDERSTAND CONSUMERS' WILLINGNESS TO PAY FOR CSA

8.1 Introduction

Contingent valuation is generally used by environmental economists as a “stated preference” approach where respondents are asked to state their preferences regarding the goods in question (Carson and Hanemann 2005).

Contingent valuation was developed when economists noticed that many goods or services could not be valued by market prices. Clark in 1915 and Hines in 1951 argued that unpaid costs and uncollected benefits drove some interesting aspects of a consumer’s choice which could not be captured by the market price (Carson and Hanemann 2005). Economists have constantly debated about using surveys to collect data, but for some goods, surveying has been the only way to do so, especially in the context of public goods which lack monetary values (Carson and Hanemann 2005).

The nonmarket benefits that agriculture in general jointly produces with varying degrees of jointness with rural areas, farmlands or market commodities are referred to as “multifunctional agriculture”. For example, national food security, rural amenities, recreational opportunities, cultural heritage and viability of rural communities are some of the nonmarket benefits that agriculture

produces. In addition, it also provides a broad range of ecosystem services such as nutrient recycling, carbon sequestration and groundwater recharge (Moon and Griffith 2011).

The current market prices for CSA farm shares do not fully capture the intangible environmental and social benefits offered by CSA farms. Sustainable agricultural practices can provide benefits like soil conservation, filtering of water, erosion control, maintaining food webs , carbon capture etc. which are referred to as Ecological Goods and Services (EG&S) (Macewen and Devanney 2008) and are often not represented in the market. The market failure in the case of CSAs is due to the presence of positive externalities mainly in the form of EG&S.

The steps involved in a successful CV survey are:

1. Identification and description of the good or service to be evaluated
2. Description of the sampling procedures and listing of respondents to be surveyed
3. Design of a survey/questionnaire.
4. Conduction of the survey questionnaire through phone, online services or mail. Personal interviews can also be conducted.
5. Analysis of the results and estimation of values (say willingness to pay) for the good or service in question.

There are three major issues regarding contingent valuation that economists constantly struggle with. The first issue is that of obtaining results that correspond to economic theory. It is also difficult to design questions that help

measure the specific economic quantities in context. The second major issue is regarding the logistics behind conducting a contingent valuation survey. Designing the survey, administering it and finally analyzing the data calls for some standardization of the process. There is a general agreement amongst economists when it comes to conducting the survey without any budget constraints but when time and funds are limited, the sample size is large and the survey is important enough to have implications at the policy level, disagreements about resource allocation are likely to build up. The final issue concerns the difficulty in enabling respondents to value the goods and services that don't have a price on the market. The survey instruments need to be strong in making the problem explicit to the respondents, so that they can understand exactly what they are being asked to value (Carson and Hanemann 2005).

It is safe to say that most contingent valuation methods yield results that are consistent with economic theory. The law of demand associates higher prices with lower quantity demanded and it is often true that respondents of a WTP survey report that *ceteris paribus*, they are likely to buy less of a more expensive good. But most CV surveys conclude that consumer demographics and attitudes towards the goods in question play a very important role in determining the WTP. Researchers often conclude that consumers in different places or at different times report very different WTP for the same bundle of goods or services at a given price. In a study conducted to evaluate the WTP for Genetically Modified (GM) vegetable oil vs. non-GM vegetable oil in Japan and China, the researchers found

that consumers were willing to pay higher prices for non-GM oil in both countries but Japanese consumers on average were willing to pay more than their Chinese counterparts (Hu 2006).

Thus it is essential that economists conducting CV surveys evaluate the demographic dynamics of their sample. Income levels, age, length of residence, education levels, some other socioeconomic factors along with the culture prevalent in the population contribute significantly towards shaping consumer preferences. Their perception of a good can also be highly influenced by advertisement schemes, branding and labeling programs, as was the case in a WTP study conducted to analyze “Consumer Preferences for Locally made specialty foods across Northern New England” (Giraud et al., 2005). This study investigated whether consumers in Maine, New Hampshire and Vermont were willing to pay more for a locally produced good than for an imported substitute. The WTP results varied across the three states even though the prices of the specialty goods were kept the same. Another important factor influencing WTP was search costs, since easier access to the good reduces search costs which is equivalent to lowering the price of the good (Giraud et al., 2005).

Because the CV method is based on asking respondents to report the values, a major challenge that the researchers have to deal with is explaining why actual purchased (ex post) quantities are often far less than what the consumers say they intend to purchase (ex ante) (Belzer and Theroux, 1995). Is it that the respondents have difficulty in comprehending the characteristics of the

commodity or do they simply lie? Are their expressed preferences likely to prevail in the real-world conditions?

Belzer and Theroux present a list of issues that contingent valuation researchers need to consider as factors that can yield unrealistic or inconsistent WTP data. First, they emphasize the fact that the results must be consistent with the law of demand, since consumers may sometimes derive moral satisfaction by reporting higher values for a “good” commodity. They might also be inclined to make a general societal judgment rather than reporting their personal valuation. Surveys in general tend to over-estimate the WTP for private goods (Carson and Hanemann, 2005). Furthermore, starting-point bias and high non-response rates have always been a major concern. And to add to the challenge, most studies suggest that people only try to tell the truth if they have some economic incentive to do so, at least in the context of contingent valuation surveys (Carson and Hanemann, 2005).

Some economists argue that an experimental setting approach is a better alternative to contingent valuation survey because it is more realistic (Maynard et al., 2003). They contend that an experimental setting, which in most cases is set up as a store or a market, is more effective than dichotomous choice or other questionnaire style contingent valuation because the consumers are in a non-hypothetical setting, they are made to choose between familiar substitutes and it provides data on both what goods and how much of it consumers are ready to buy. But it is difficult to gather participants who would be considered a random

sample. If otherwise, their preferences may be irrelevant for the larger population. There is also some support for conjoint analysis, which is a method that studies how people value different features or attributes of an individual good. With different combinations of certain attributes and their levels, consumers are asked for their preferences. While some argue that conjoint analysis reduces bias, others argue that contingent valuation involves even less bias by reducing the cognitive burden in making choices (Hu 2006).

Now we discuss a potential CV survey to study WTP for CSA services.

8.2 Theoretical Model

The mean WTP from a CV survey can be obtained from the parameters of a maximum likelihood probit equation for a dichotomous choice survey design. A regression model used to measure the WTP for CSA farm shares can be described as:

$$WTP_i^* = X_i'\beta + u_i$$

$$D_i = \begin{cases} 1 & \text{if } P_j \geq WTP_i^* \\ 0 & \text{otherwise} \end{cases}$$

where i is the observation (1,2,...N) where N is the number of observations and j is the bid (1,2,3). WTP_i^* is a continuous latent variable representing the maximum WTP for CSA farm share; X_i' is a vector of explanatory variables shaping consumers' WTP; the error term u_i is distributed normally and D_i is a

binary variable indicating whether or not WTP_i^* exceeds P_j which is the bid size confronted by each individual (\$38,\$54,\$71 or \$50,\$100,\$150). Thus the probability function can be expressed as

$$\begin{aligned} \text{Prob}(D_i=1) &= \text{Prob}(WTP_i^* > P_j) \\ &= \text{Prob}(u_i/\phi - (P_j - X'\beta)/\sigma) \\ &= 1 - \phi((P_j - X'\beta)/\sigma) \end{aligned}$$

where $\phi(\cdot)$ is the cumulative standard normal distribution function and σ is the standard deviation of error terms. The modified log likelihood function becomes

$$\text{Log } L = D_i \log [1 - \phi((P_j - X'\beta)/\sigma)] + (1 - D_i) \log [1 - \phi((P_j - X'\beta)/\sigma)]$$

The presence of P_j in the log likelihood function enables us to identify the scale of the underlying continuous measures of WTP for the intangible services provided by CSAs. Hence the conditional mean WTP can be calculated with $X'\beta^{\wedge}$ evaluated at the mean values of the vector X' (between 1 and 7 if using the Likert Scale).

8.3 Methodology

The questionnaires can be administered as an online survey or face to face interview. I have used data from an organic food store in the Pioneer Valley, but it is important to use price data from a store in the community in which the survey is being conducted. Those conducting the survey must be careful in selecting a

random sample of people in the community. Ideally, respondents should be comprised of both existing CSA customers and non CSA customers.

The survey is designed to pursue the following objectives:

- (i) To assess public attitudes and perception about the intangible services provided by CSAs.
- (ii) To measure WTP for a basket of produce from a CSA farm compared to one from an organic food store.
- (iii) To measure WTP for a CSA share price increase

It focuses on four topics that help study the public attitudes and perceptions. They are:

1. Environmental Goods and Services (EG&S)
2. Preservation of Farmland
3. Support to local economy and community building
4. Government support to CSA farms

These four variables will be used in the regression analysis as independent variables that determine a consumer's WTP.

There are three sections in the questionnaire (included in the Appendix) – I) Public attitudes and Perceptions II) Contingent Valuation III) Personal background of the Respondent. The questions in the first section are based on a 7-point Likert scale where options range from “Strongly agree” to “Strongly disagree”. There are two types of questionnaires that should be distributed; they differ only in the CV section. Type I is a double-bound dichotomous choice question whereas Type II is a referendum question. Type I asks respondents to

compare a basket of produce from a CSA farm to a basket of produce from an organic food store whereas Type II asks respondents if they would be willing to pay for a price increase in farm shares. The two types of questionnaires should be randomly distributed.

Questionnaire Type I

The CV question in Type I states the price of a basket of produce containing certain vegetables. The prices were obtained from Whole Foods Market at Hampshire Mall, Hadley in November 2011 and the price of the basket amounted to \$54. A summer farm share from Brookfield Farm in Amherst providing the shareholders with the same basket of produce every week for 25 weeks, costs \$525. Thus the weekly cost for a shareholder is $\$525/25 = \21 . Given this information, we ask the respondents if they will be willing to pay \$54 if the same basket of produce was from a CSA farm. If they answered “Yes” to the question, they were asked if they were willing to pay \$71 [$54 + \{(54-21)/2\}$] and if they answered “No” to the question, they were asked if they were willing to pay \$38 [$54 - \{(54-21)/2\}$].

Economists in general conduct a pre-test with open ended questions to determine the prices to be used in the dichotomous choice survey. For the purposes of this paper, I use $\$54 + 50\%$ of the difference in prices as my upper bound value and $\$54 - 50\%$ of the difference in prices as my lower bound for the purposes of this paper. I choose a double-bound approach because it is

asymptotically more efficient than the single-bound approach (Hanemann et al 1991)

Questionnaire Type II

Questionnaire Type II is a referendum style questionnaire similar to one used by Moon and Griffith in their CV study on multifunctional agriculture. It addresses the Yea-saying tendency prevalent in closed-ended format, which leads to hypothetical bias. Respondents might indicate a favorable impression of CSA farm shares rather than indicate their true WTP by saying “Yes”. Thus questionnaire Type II uses dissonance minimizing (DM) elicitation method which allows respondents to express multiple attitudes in closed-ended questions and reduces the Yea-saying tendency.

The questionnaire will use three different bid sizes and respondents who get the Type II questionnaire will be subject to one of the three bids [\$X]. The three bids are \$50, \$100 and \$150.

8.4 Validity of the Study

It is important to discuss the validity of a CV survey to measure its theoretical construct under investigation. In this case, it is the maximum amount of money the respondents would actually pay for the intangible benefits/positive externalities of CSA farms. There are three types of validity:

A. Content Validity

Mitchell and Carson in their book *Using Surveys to Value Public Goods* state “Content validity depends on the extent to which an empirical measurement adequately reflects a specific domain of content”. In this study, the relevant domain is the market and description of changes in the CSA share prices. Explicit information about CSAs, relevant prices and referendum scenario is included in the questionnaires to ensure that the description of the services and how it is to be paid for is unambiguous.

B. Criterion Validity

The criterion validity of a study can be tested by comparing the results with actual market prices or hypothetical-stimulated markets. Survey conductors can set up a hypothetical-stimulated market where CSA share prices range from the actual existing prices to one with a range of prices above and below the existing price.

C. Construct Validity

There are two types of construct validity:

- i) Convergent Validity- It tests the correspondence between a measure and other measures of the same theoretical construct. Economists often compare CV results to results obtained from travel cost and hedonic pricing methods. In this study, it is possible to compare the results obtained from questionnaire Type I with that from questionnaire Type II.
- ii) Theoretical Validity- It evaluates the degree to which the results of a study are consistent with theoretical expectations. Thus the aim is to regress WTP on a group of independent variables believed to be theoretical determinants of people’s WTP for CSA farm shares. The independent variables are the bid sizes, respondents’ socioeconomic status (e.g. age, income and education) and the four attributes EG&S, Farmland, Community building/local economy and Government Support. The coefficients on the first three attribute variables are likely to be positive because people who believe that organic local food are good for the environment and their health, support farmland preservation and believe that CSAs support the local economy and foster community building will probably be willing to pay more for a CSA farm share. And respondents who think that the government should subsidize CSA farms will be willing to pay less themselves. The independent variable bid size according to the law of demand should have a negative coefficient.

I have designed a CV survey (included in the Appendix) that can serve as a framework to study consumer’s WTP for CSA. Governments and farmers

should understand the importance of intangible benefits that CSA produces as they can play a crucial role in determining how consumers value CSA. By increasing share prices and subsidizing CSA farms, the CSA market has the potential to achieve efficiency.

CHAPTER 9

CONCLUSION

9.1 Summary of Main Findings

After looking at the various characteristics and impacts of Community Supported Agriculture, we found that CSA farmers are not earning a living wage from their CSA operations such that the number one reason for the discontinuation of CSA farms is because of insufficient income. We also found that CSA farms have a potential to increase their share prices because they are not fully utilizing their market power and not taking into account the positive externalities. The U.S. government itself is doing little to support sustainable agriculture and is instead providing subsidies to industrial farms that practice farming that causes ecological degradation.

9.2 Recommendations

From this research we are able to make some recommendations to both CSA operators and the U.S. government regarding how best to ensure that CSA farms are economically viable and sustainable in the long run. We propose the following:

1. It is imperative that CSA farms consider the economic viability of their operations while pricing their shares. They should:
 - i) Identify the economic costs and benefits
 - ii) Quantify the costs and benefits as much as possible
 - iii) Value the costs and benefits
 - iv) Compare the benefits with the costs
2. CSA farmers should consider developing a core-group if they do not have one. Farms with core-groups have shown a record of being able to increase both prices and sales, and hence revenue for the farm. Core-group farms are generally not price takers.
3. They should also consider joining a Co-Op as that enables farms to provide more variety, and share risk with other farmers as well. By working together, they can build a stronger network of local farms and save on advertising costs.
4. To understand better the elasticities of demand for CSA farm shares, farmers can conduct a CV survey of the type provided in the Appendix.

The recommendations for the U.S. Government in terms of agricultural policy are:

1. Reconsider the system of agricultural subsidies to support more sustainable agricultural practices like CSA.
2. Slowly decrease the subsidies for industrial agriculture
3. Invest in R&D to help CSA farms, organic farms and other small scale farms to help them maintain competitiveness with industrial farms. Also provide technical assistance.
4. Conduct CV surveys to find out how consumers value CSA and provide financial support to these farms accordingly.

9.3 Further Research

In order to make progress in the field of sustainable agriculture, further research needs to be done on the effect of subsidies to industrial farming on

smaller scale sustainable farms. We also need to research the effects of potential subsidies to these farms and gain insight on how the society can gain welfare through the internalization of positive externalities. In addition to conducting economic and environmental research on CSA, we also need to research on the social aspects of CSA. For example, how does supporting local food change the dynamics of a community and whether it promotes social cohesion?

APPENDIX

OBJECTIVE: TO KNOW YOUR OPINION ABOUT THE INTANGIBLE BENEFITS OF COMMUNITY SUPPORTED AGRICULTURE

Community Supported Agriculture (CSA) is a farming system that promotes food quality, ecological sustainability and support for the local farmers. In a CSA, customers buy farm shares before the growing season so the farmer can then focus on production rather than on budgeting and marketing. By buying shares beforehand, the shareholders share both the rewards and the losses of the harvest with the farmer. Thus the customers know where their food is coming from, how it is produced, and get an opportunity to make a personal connection with the farmer.



Most people join a CSA for the following reasons:

- To support local farming and for the quality of produce.
- Environmental and food safety concerns
- Opportunity to get to know the farmer
- Supporting community services like food donations performed by CSAs

Researchers have also found that in general, participants of a CSA can reap large savings compared to shoppers at a retail store because transportation, transaction, marketing and packaging costs are lower in the former one. People are not only concerned about their own expectations from a CSA farm, but are often also concerned about the farmer's well being and the farm's economic viability. For the farmer, the CSA system has risk sharing and a guaranteed consumer base built into it. It also provides the farmers with finance before the growing season and fosters community building. In a community with well organized CSA farms with large consumer bases, the prevalence of such a system can have a significant impact on the local economy. Consumption of locally grown food also entails little food spoilage, little packaging and low distribution costs. Sustainable farming practices by a CSA farmer can prevent the transformation of open landscapes and farmlands can also be placed in a trust for preservation. Promoting CSA would also maintain rural communities and prevent the disappearance of small scale farms.

However, joining a CSA farm does have some potential disadvantages:

- Limited choice of produce
- Provision of too much produce leading to waste
- The pick-up times or the trip to the farm is inconvenient
- Possibility of a bad season which causes skepticism about the share prices

Studies show that CSA farmers could be charging more but they do not prioritize profit maximization for many reasons, one of which is altruistic feelings towards their customers and the desire to maintain a close relationship with them. Some surveys conclude that environmental and social values are the primary motivations for CSA farmers. Agriculture subsidies provided by the government are not available for vegetables so CSAs are unlikely to qualify for government subsidies. A study conducted in nine Midwestern states found that even though more than half of the respondents, who were CSA farmers, stated that their share prices don't offer a fair wage, almost all of the respondents said they were satisfied with their operations.

I. Public Attitudes and Perception

A. Attitudes Towards Social and Environmental Benefits of CSAs

Please indicate how strongly you support or oppose each action

1. I agree that CSAs provide social and environmental that have not been captured by the current share prices.
 - Strongly agree
 - Agree
 - Agree somewhat
 - Undecided
 - Disagree somewhat

- Disagree
 - Strongly disagree
2. The community must compensate farmers for the intangible benefits produced by CSAs.
- Strongly agree
 - Agree
 - Agree somewhat
 - Undecided
 - Disagree somewhat
 - Disagree
 - Strongly disagree

A. Environmental Goods and Services

3. Most produce in supermarkets come from other countries or states so buying locally from CSAs saves energy and reduces my carbon footprint.
- Strongly agree
 - Agree
 - Agree somewhat
 - Undecided
 - Disagree somewhat
 - Disagree
 - Strongly disagree
4. Organically grown food in a CSA farm is good for the environment.
- Strongly agree
 - Agree
 - Agree somewhat
 - Undecided
 - Disagree somewhat
 - Disagree
 - Strongly disagree
5. Fresh, organic produce from a CSA farm is good for my/ my family's health.
- Strongly agree
 - Agree
 - Agree somewhat
 - Undecided
 - Disagree somewhat

- Disagree
- Strongly disagree

B. Farmland

6. Farmland should be protected from urban sprawl
 - Strongly agree
 - Agree
 - Agree somewhat
 - Undecided
 - Disagree somewhat
 - Disagree
 - Strongly disagree
7. There should be no developmental restrictions on the use of farmland.
 - Strongly agree
 - Agree
 - Agree somewhat
 - Undecided
 - Disagree somewhat
 - Disagree
 - Strongly disagree

C. Community/Local economy

8. I agree that being a CSA member means helping a local farmer earn a living.
 - Strongly agree
 - Agree
 - Agree somewhat
 - Undecided
 - Disagree somewhat
 - Disagree
 - Strongly disagree
9. I agree that a CSA member is recognized in the community for supporting the local economy.
 - Strongly agree
 - Agree
 - Agree somewhat
 - Undecided
 - Disagree somewhat

- Disagree
- Strongly disagree

10. CSAs with a sliding scale payment option (paying what you are able to) have been able to subsidize low income consumers.

- Strongly agree
- Agree
- Agree somewhat
- Undecided
- Disagree somewhat
- Disagree
- Strongly disagree

D. Government

11. Farmers should compete in a free market without government support

- Strongly agree
- Agree
- Agree somewhat
- Undecided
- Disagree somewhat
- Disagree
- Strongly disagree

12. The government should provide CSA farmers with subsidies for the intangible benefits they provide.

- Strongly agree
- Agree
- Agree somewhat
- Undecided
- Disagree somewhat
- Disagree
- Strongly disagree

B. Contingent Valuation

TYPE I

A. The cost of a basket of produce including the following items from an organic food store costs **\$54**. Amongst these vegetables, the eggplant, potatoes and onions are conventionally grown (not organic).

1 head of lettuce-1.99 each

2 lb. of mixed greens-6.99/lb

1 head of celery-2.99 each

1 lb. of broccoli- 2.99/lb

1 lb. of eggplant-1.99/lb

4 lbs. of tomatoes-4.99/lb

1 lb. of zucchini-2.99/lb

1 acorn squash-1.29/lb

1 lb. of beets-2.49/lb

3 lbs. of potatoes-1.49/lb

1 lb. of onions-1.49/lb

A CSA farm providing the same basket of produce (all organic) every week charges \$525 a farm share that lasts 25 weeks. Thus the cost of the basket is $\$525/25 = \mathbf{\$21}$.

Please answer **Yes** or **No** to the following questions

- (i) I would be willing to pay \$54 if the same basket of produce from a CSA farm _____
- (ii) If you answered **Yes in question (i)**, would you be willing to pay \$71 if the basket came from a CSA farm? _____
- (iii) If you answered **No in question (i)**, would you be willing to pay \$38 if the basket came from a CSA farm? _____

TYPE II

Suppose that CSA shareholders decide to hold a referendum designed to determine whether to increase summer share prices by [\$X] for CSAs in the foreseeable future. The referendum would indicate if you agree with the idea that CSA farms provide environmental and social benefits that are not captured by the share prices even after the provision of government subsidies. Agreeing would also mean that you are willing to pay an additional [\$X] to support CSA farms because they practice sustainable agriculture and support rural economies. If the referendum were rejected, you would continue paying current market prices for farm shares. In short, this is asking how much the intangible benefits of CSA farming is worth to you and how much more would you be willing to pay for a farm share price.

Please choose only one option from the following questions.

A.

- (i) I agree CSA farms provide intangible social and environmental benefits and their summer shares are worth [\$X] more per year to me and I would be willing to pay the farmer [\$X] more.
- (ii) I agree CSA farms provide intangible social and environmental benefits and am in favor of increasing farm share prices, but they are not worth [\$X] per year to me.
- (iii) I agree CSA farms provide intangible social and environmental benefits, but oppose the idea of increasing share prices.
- (iv) I disagree CSA farms provide intangible social and environmental benefits regardless whether the share prices increase.

B.

- (i) I would be willing to spend [\$X] for the intangible benefits provided by CSA farms, if an alternative, acceptable way of collecting the money could be found.
- (ii) I would be willing to pay more for a share if I am convinced that is the only way of ensuring the intangible benefits provided by CSA.
- (iii) I believe that the cost to pay for the intangible benefits provided by CSA should be paid by the government instead of by consumers.

III. Background Information

1. Age
2. Education
3. Gender
4. Town of Residence
5. Length of residence
6. Number of members in household
7. Annual Household Income
8. Are you currently a shareholder of a CSA?
 - Yes
 - No(If you answered “No” to Question 7, skip to question 9)
9. Are you satisfied with your membership?
 - Yes
 - No
10. If you are not currently a shareholder of a CSA, do you intend to become one in the future?
 - Yes
 - No

Thank you very much for participating in this study.
Your participation was very valuable. We
greatly appreciate the time you devoted in taking the survey.

BIBLIOGRAPHY

- Belzer R.B. and Theroux R.P. (1995) “Criteria for Evaluating Results Obtained from Contingent Valuation Methods”. *Valuing food safety and nutrition*: 341-362.
- Brown C., and Miller S. (2008), “ The Impact of Local Markets: A Review of Research on Farmers Markets and Community Supported Agriculture (CSA)”. *American Journal of Agriculture Economics* 90: 1296-1301.
- Carson R.T. and Hanemann W.M. “Contingent Valuation (2005). *Handbook of Environmental Economics* 2. Edited by K.-G. Mäler and J.R. Vincent: 821-936.
- Cooley J.P and Lass D.A. (1998) “Consumer Benefits from Community Supported Agriculture Membership” *Review of Agricultural Economics* 20, no. 1: 227-237.
- Costanza R., D’arge R., Groot R.A., Farber S., Grasso M., Hannon B., Limburg K., Naeem S., O’Neill R.V., Paruelo J., Rasking R.G, Sutton P., and Belt M.V.D. (1997) “The value of the world’s ecosystem services and natural capital” *Nature* 387: 253-260.
- Douglass, G.K. (1984) “The meanings of agricultural sustainability”. In G.K. Douglass (ed.) *Agricultural Sustainability in a Changing World Order* (pp. 3-29). Boulder, Colorado: Westview Press.
- Environmental Working Group Farm Subsidies “The United States summary information” < <http://farm.ewg.org/region.php?fips=00000>>
- Food and Agriculture Organization. “What are the environmental benefits of organic agriculture?” fao.org <http://www.fao.org/organicag/oa-faq/oa-faq6/en/>
- Forsman, S. and Paananen, J. (2007). “Value Creation in Local Food Supply Chains: Market Opportunities and Challenges”. MTT Agrifood Research Finland, Economic Research.

- Giraud K.L., Bond C.A. and Keeling J. (2005) "Consumer Preferences for Locally Made Specialty Food Products across Northern New England". *Agricultural and Resource Economics Review* 34, no. 2: 204-216.
- Henderson E. (2007) *Sharing the Harvest : A Citizen's Guide to Community Supported Agriculture*. Vermont : Chelsea Green Publishing Company, 2007.
- Hanemann M., Loomis J. and Kanninen B. (1991) "Statistical Efficiency of Double-Bounded Dichotomous Choice Contingent Valuation". *American Journal of Agricultural Economics* 73, no. 4: 1255-1263.
- Hu W.(2006) "Comparing Consumers' Preferences and WTP for non-GM oil using a Contingent Valuation approach". *Empirical Economics* 31: 143-150.
- James H.S. Jr. (2006) "Sustainable agriculture and free market economics: Finding common ground in Adam Smith" *Agriculture and Human Values* 23: 427-438.
- Keohane N. O. and Olmstead S.M. *Markets and the Environment*. Washington DC: Island Press, 2007.
- Kolodinsky J.M, Wang Q and Pelch L.L. (1999) "Community Supported Agriculture (CSA): A hypothesis test of membership activities" *1999 Annual Meeting of the American Agricultural Economics Association(AAEA)*. Tennessee 1999.
- Lass D.A., Bevis A., Stevenson G.W., Hendrickson J. and Ruhf K. (2001) "Community Supported Agriculture Entering the 21st Century: Results from the 2001 National Survey". University of Wisconsin-Madison : Center for Integrated Agricultural Systems,
- Lass D.A., Lavoie N, Fetter T.R. (2004) "Market Power in Direct Marketing of Fresh Produce: Community Supported Agriculture Farms" *American Agricultural Economics Association Annual Meeting* , Aug 1-4 2004.
- Lizio W and Lass D.A (2005) "An Evolving Platform for Ecological and Economical Agricultural Marketing and Production" *Department of Resource Economics, University of Massachusetts, Amherst*
- Macewen A and Devanney M. (2008) "Internalizing Non-Market Benefits and Costs into Agricultural Producer Decisions". *Nova Scotia Department of Agriculture-Industry Development and Business Services Branch*: 1-21.

- Martinez S., Hand M. , Pra M.D., Pollack S., Ralston K., Smith T., Vogel S., Clark S., Lohr L., Low S. and Newman C., (2010) “Local Food Systems: Concepts, Impacts and Issues” ERR 97 U.S. Department of Agriculture, Economic Research Service.
- Maynard L. J., Hartell J. G., Meyer A. L. and Hao J. (2004) “An Experimental Approach to Valuing New Differentiated Products”. *Agricultural Economics* 31.2-3: 317-325.
- Mitchell R.C. and Carson R.T. (1989) *Using Surveys to Value Public Goods: The Contingent Valuation Method*. Washington D.C.: Resources for the Future.
- Moon W. and Griffith J.W. (2011) “Assessing holistic economic value for multifunctional agriculture in the US”. *Food Policy* 36: 455-465.
- Ogden C.L. , Carroll M., Kit B.K., Flegal K.M., (2012) “Prevalence of Obesity in the United States:2009-2010”.NCHS Data Brief 82.
- Organic Trade Association (2011). 2011 Press Release.
<http://www.organicnewsroom.com/2011/04/us_organic_industry_valued_at.html>
- OECD (2001) “Multifunctionality: Towards an Analytic Framework”.
<<http://www.oecd.org/tad/agriculturalpoliciesandsupport/1894469.pdf>>
- Perez, J., P. Allen, M. Brown. 2003. Community supported agriculture on the central coast: The CSA member experience. Center Research Brief #1, Center for Agroecology & Sustainable Food Systems.
- Sanneh N, Moffitt L.J., and Lass D.A. (2001) “Stochastic Efficiency Analysis of Community Supported Agriculture Core Management Options”. *Journal of Agricultural and Resource Economics* 26. 2: 417-430.
- Stefani G, Romano D, and Cavicchi A. (2006) "Consumer Expectations, Liking and Willingness to Pay for Specialty Foods : Do Sensory Characteristics Tell the Whole Story?" *Food Quality and Preference* 17: 53-62.
- Tegtmeier E. and Duffy M. (2004) “External Costs of Agricultural Production in the United States”. *International Journal of Agricultural Sustainability* 2.1.

----- (2005) “Community Supported Agriculture (CSA) in the Midwest United States: A regional characterization”. *Iowa State University- Leopold Center for Sustainable Agriculture*:1-23.

Thompson Craig J. and Coskuner-Balli, Gokcen (2007). “Enchanting Ethical Consumersim : The case of Community Supported Agriculture”. *Journal of Consumer Culture* 7,no. 3: 275-303.

Tillotson J.E. (2004) “AMERICA’S OBESITY: Conflicting Public Policies, Industrial Economic Development, and Unintended Human Consequences”. *Annual Review of Nutrition* 24: 617-643.

UNISFERA and CEMDA (2003). “Reengineering of Agricultural Policy in OECD Countries: Trends and Policy Implications for Mexico”. <http://unisfera.org/IMG/pdf/INE_-_Report_II_-_Sept_2003.pdf>

United States Department of Agriculture “Sustainable Agriculture, Definitions and Terms”
<<http://www.nal.usda.gov/afsic/pubs/terms/srb9902.shtml#toc2>>

Wang Q and Sun J. (2003) “Consumer preference and demand for organic food: Evidence from a Vermont survey”. *American Agricultural Economics Association Annual Meeting*. Montreal, Canada: 1-24.

Woods T., Ernst M., Ernst S. and Wright N. (2009) “2009 Survey of Community Supported Agriculture Producers”. UK Cooperative Extension Service- University of Kentucky- College of Agriculture, New Crop opportunities Center.