

AN ABSTRACT OF THE DISSERTATION OF

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Title: Defining Agricultural Sustainability in the Marys River Region of Oregon.

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This ethnographic study explores the social aspects of agricultural land-use in the Marys River region. The study seeks to understand how farmers define sustainability and how their views on agricultural issues help to define a sense of place and identity in the Marys River region, within the context of the globalized agricultural system. This project builds on past research utilizing the theory and praxis of political ecology, but also incorporates elements of bioregionalism to develop a theoretical model of regional political ecology for an integrated and multidisciplinary approach to answering the research questions. The study asks:

- 1) How do farmers in the Marys River region define agricultural sustainability?
- 2) What methods do farmers use to develop more sustainable agroecosystems?
- 3) What do farmers consider to be the most important issues in developing a more sustainable regional community within the globalized system of agriculture?

A critical synthesis of information is developed establishing bioregional political ecology within the conceptual framework of the project. The study then

describes the broad social and economic contexts that potentially shape and constrain farmer conceptualizations of sustainability, focusing on the contrast between the development and characteristics of the globalized system of industrial agriculture and more traditional systems-based methods considered to be alternative forms of agricultural production.

The study then uses this conceptual framework to integrate an historical account describing the development of agriculture in the Marys River region with contemporary ethnographic information collected through participant observation and semi-structured interviews with farmers to provide a more holistic understanding of contemporary definitions of agricultural sustainability.

This approach of integrating the qualitative information gathered from local farmers with historical and contemporary background information on land-use allowed for a better understanding of farmers' perspectives and definitions of sustainability. A principle finding from this research was that farmers throughout the Marys River region, regardless of farming styles and practices, consider sustainability primarily as the ability to continue farming into the extended future. Farmers' definitions of sustainability are inherently tied to the 'space' of the farm and these findings provide a common ground for dialogue among stakeholders with differing worldviews. This study helps to fill gaps in the existing literature on sustainability and agricultural land-use in the region; namely the perception and conceptualization of sustainability by its farmers. This more comprehensive understanding of how farmers relate to sustainability will help farmers, policy

makers, and other institutions to better work together in making more informed decisions toward building stronger communities and developing a more sustainable bioregion within the global marketplace.

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Defining Agricultural Sustainability in the Marys River Region of Oregon

by

Michael Stanton

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Dean of the Graduate School

I understand that my dissertation will become part of the permanent collection of Oregon State University libraries. My signature below authorizes release of my dissertation to any reader upon request.

Michael Stanton, Author

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Defining Agricultural Sustainability in the Marys River Region of Oregon

Chapter One: Introduction

Our planet is in the midst of an ecological crisis. Global climate change, exacerbated by widespread pollution, and a dramatically increasing human population are some of the more serious issues that must be resolved to provide a healthier environment for the future. As the human population expands globally, it becomes increasingly necessary to intensify food production without depleting soils, water supplies, and biodiversity. Achieving agricultural sustainability is one of the most important goals facing humans today. However, as building robust food production systems becomes an increasingly important global priority, there are fewer farmers involved in the actual work of agricultural production. Therefore, many people have a decreased awareness of where their food comes from or the importance of agriculture in a sustainable society. The decline in the number of people directly involved in agricultural production is partly a result of industrialization and the adoption of technologies that occurred during the development of the present globalized system of agriculture. In many cases this has led to increased agricultural consolidation, resulting in heightened inequalities among farmers, and the continued out-migration of people from rural communities to larger urban areas (Bell 2009; Thompson 2010).

One of the consequences of diminishing numbers and continued marginalization of farmers has been the creation of a social disconnect between the growers of agricultural products, policymakers, and consumers in the marketplace. That disconnect is troubling because societies must know how food is produced and where their vulnerabilities to hunger lie in order to develop effective strategies for achieving agricultural sustainability and food security. Strategies for creating more

sustainable and productive agricultural systems that ignore the perspectives of farmers or that marginalize their input are more likely to fail. Many have instead called for a paradigm shift that would help agricultural producers and the consumers of food to reconnect, thus allowing for the development of a more integrated understanding of sustainability. Several approaches involve moving away from the dominant system of globalized industrial agriculture to develop more regionally focused systems that foster meaningful interactions between farmers and other members of societies (Bell 2004; Bell 2009; Shiva 2000; Harper 2008; Haenn and Wilk 2006; Thompson 2010).

The goal of developing more regionally focused food systems is at least partially predicated on the assumption that farmers and other stakeholders within societies share common beliefs about what sustainability is and what the appropriate strategies are for achieving those sustainability goals. Whether that assumption is true, or even whether all farmers share a common definition of sustainability is far from clear. Therefore, it is often unclear to what degree farmers' perspectives on sustainability and their practical manifestations reflect the existing conceptual models of sustainability. Developing a better understanding of how farmers define sustainability is therefore a critical aspect of creating more sustainable food supply systems.

Defining Sustainability

One of the greatest difficulties in defining sustainability in a global context or within a particular region is that each term describing sustainability is a social construct interpreted differently by various stakeholders and is therefore affected by externalities that must be observed through multi-scalar measurements over time.

Definitions of sustainability are determined to a great extent by peoples' perspectives and beliefs. For instance, if a person believes that the methods and technological innovations developed within the industrialized agricultural system are inherently valid they are likely to include them in conceptualizations of sustainability and to view those practices as appropriate for achieving the goals of solving issues of hunger and environmental degradation on a global scale. However, if a person is not invested in, or is mistrustful of the industrialized agricultural system, they will often consider those practices to be unsustainable and seek out alternative methods to solve agricultural issues (West 2007; Robinson 2004; Paulson et. al 2003). The differing perspectives on sustainability issues based on opposing philosophies and worldviews has made dialogue among stakeholders increasingly difficult and controversial.

There are distinct contrasts in the opposing views of what Thompson (2010) calls industrial and agrarian philosophies, creating an ongoing dispute and power struggle for dominance of one philosophy over the other within many societies. Those living in industrialized societies are operating within a globalized food system dominated by the modern utilitarian industrial philosophy, which often makes a clear distinction between humans and nature. However, for peoples and cultures throughout the world who subscribe to the agrarian philosophy that dualistic perspective does not apply. Instead, agricultural practices tend to focus on finding a balance in human relationships with nature. Regardless of personal philosophy, farming requires an active participation in use and management of land. According to Pretty, "Everything we know about the world, we know because we interact with it, or it with us" (2002:12). It is most important to remember that whether a person espouses a

worldview promoting the sustainability of industrial methods or a worldview encouraging more traditional farming methods, the actual work of agriculture always occurs at the level of individual farms located in particular regions (Geertz 1983; Jackson 1994). Because of the multiple definitions of nature, development, degradation, and sustainability held by diverse interest groups, it is vital to maintain an ongoing dialogue between stakeholders so that equitable measures can be taken that will ensure the long-term preservation of both lands and livelihoods.

While personal philosophies and worldviews play an integral role in defining sustainability, most models describing and measuring sustainability focus more on reductionist indicators. Economic and biophysical indicators are often used to define and assess sustainability in terms such as crop yield, soil erosion rate, or input use. Agricultural researchers are often hesitant to consider socio-cultural externalities involving value judgments and so they confine sustainability metrics to those based on biological and economic efficiency (vanLoon et al. 2005). However, using only narrow indicators to define sustainability leaves out many important social and environmental aspects of sustainable agriculture and therefore those models do not provide a complete understanding of sustainability. Social perceptions of risks to natural resources or the sustainability of particular practices may poorly correlate with quantitative measures due in part to the fact that quantitative data are often not readily available or easily interpretable. Moreover, people are more likely to make transitions in lifestyle based on their ideals and perceptions rather than quantitative evidence of local degradation based on scientific measurements (Blaikie 1995).

One of the appeals of metric based definitions of sustainability is that they can be generalized and therefore be applied across systems and regions. However, in a previous study involving farmers in the Ten Rivers region of Oregon I argued that sustainability cannot be measured by universal standards with grades of pass or fail given to different communities across broad geographic regions (Stanton 2010). Instead, a more complete understanding of sustainability issues is essentially a qualitative endeavor that must be relevant to specific regions where unique social, environmental, and economic constraints may be viewed and analyzed from the perspectives of local stakeholders (Moran; 2006 Walker 2003; Stanton 2010). At the same time, questions of sustainability must consider the context of those local issues within the broader global system. Although, as Blaikie and Brookfield (1987) suggest, there are a number of external social, economic, and political issues that influence decision-making, farmers practice methods they feel will work best for them using place-based knowledge inherited or accumulated through actively participating in the daily activities of farming in a specific geographical area over time. There is a growing body of research describing the merits of more integrative agricultural sustainability models that incorporate social, environmental, and economic components (Rhoades 1984; Netting 1993; Drost 1996; Nazarea et al. 1998; Bell 2004; Bell 2009; Robinson 2004; Harris 2000; Stanton 2010).

Questions and Goals of this Study

This dissertation project explores a key element that is often ignored in discussions of agricultural sustainability: how do farmers define sustainability and what issues inform their approaches to agricultural sustainability? This research builds

on a previous study conducted among smallholder farmers in Linn, Benton, and Lincoln counties; an area known as the Ten Rivers region. My past research, based on the theory and praxis of political ecology, was directed toward discovering what barriers prevented farmers from adopting more sustainable practices as they pertained to the three interrelated social, environmental, and economic components of sustainability (Stanton 2010). In the Ten Rivers study, the farmers I worked with all practiced fairly similar methods on farms of less than fifty acres, but, they faced different barriers to achieving sustainability due to variations in microclimates, differences in historical land-use patterns, and proximity to viable markets across the relatively large socially and environmentally heterogeneous study area.

To reduce the influences of geographic variability, new research focuses on the relatively more homogenous area of the Marys River region, located primarily within Benton County Oregon. My goal is to better understand how farmers with potentially differing conceptions of place develop definitions of sustainability within the context of a shared bioregion. Because different worldviews and concepts of place play such an important role in understanding the behaviors of individual farmers, it is appropriate to incorporate bioregionalism into the theoretical model of this study to better understand how farmers come to define and conceptualized sustainability. Bioregionalism goes beyond political ecology to address the moral and spiritual concerns of those living within a more ecologically defined boundary rather than working within the politically defined boundaries of a region. According to Thomashow, bioregionalism,

seeks to integrate ecological and cultural affiliations within the framework of a place-based sensibility, derived from the landscape,

ecosystem, watershed, indigenous culture, local community knowledge, and environmental history, climate and geography. [1999: 121]

Farmers' definitions and priorities for achieving sustainability within the bioregion could have significant implications for how farmers and other stakeholders interact on issues pertaining to sustainability and influence how regional food systems will develop in the future. However, we currently have very little understanding of how precisely farmers develop their definitions and concepts of sustainability or how farmers' perspectives relate to more general theoretical concepts of sustainability used by other stakeholders and policy-makers. This dissertation research project explores the ways in which farmers, working within the same bioregion but across different scales of farms and using different farming methods, understand and define agricultural sustainability. This research addressed farmers' perspectives by asking the following questions:

- 1) How do farmers in the Marys River region define agricultural sustainability?
- 2) What methods do farmers use to develop more sustainable agroecosystems?
- 3) What do farmers consider to be the most important issues in developing a more sustainable regional community within the globalized system of agriculture?

Study Area and Approach

The Marys River region is home to a diverse mixture of farmers, some practicing what I call industrialized farming methods, and some practicing what I consider traditional methods. The choice of this research setting allowed for a comprehensive examination of farmers with potentially differing constraints and motivations but who are nevertheless united within a socially and ecologically bounded area. As Holliday states, "Bounded social settings provide an important

means for thick description” (2002:79). The purpose of this exploratory study is to consider and interpret a number of different issues faced by farmers, providing what Geertz (1973) called a ‘thick description’ of the interconnected components of sustainability as seen by farmers in the Marys River region.

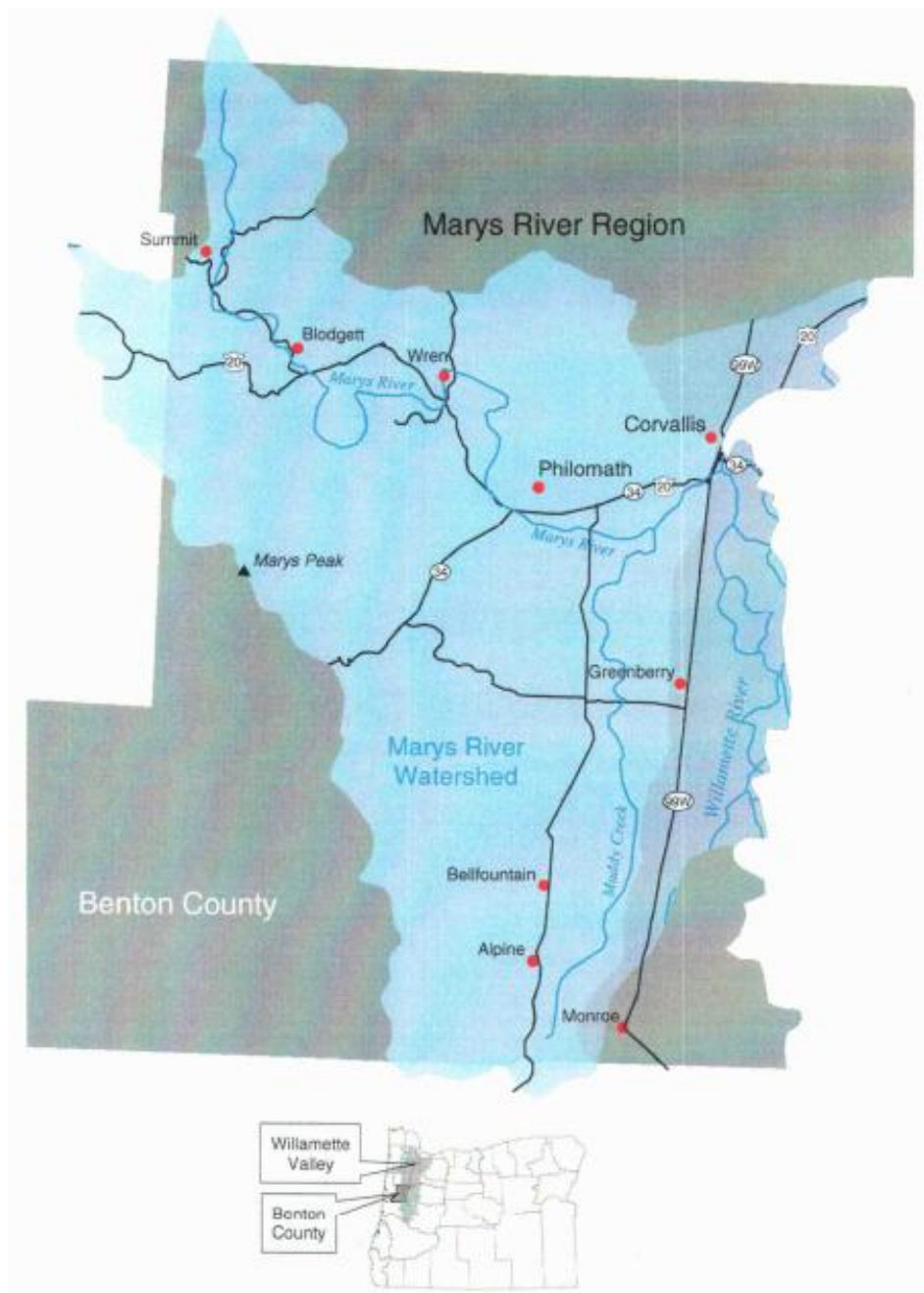


Figure 1: Marys River region (Burke 2003)

This is an ethnographic study of agriculture in the Marys River region. Simply stated, an ethnography is a method of research where the fieldworker goes out into a community or region, preferably for an extended period of time, and explores through participant observation the activities and way of life within that setting. More specifically, this research follows the semiotic approach of what Geertz (1973) called interpretive ethnography to gain a better understanding of farmers' perceptions on sustainability and how their views on agricultural issues help to determine a sense of place and identity in the Marys River region of Oregon as well as the larger ecoregion of the Pacific Northwest and within the context of the globalized system of agriculture. According to Geertz, "the whole point of a semiotic approach to culture is...to aid us in gaining access to the conceptual world in which our subjects live" (1973:24).

Over a four year period in the Marys River region, I compiled information about the history of agricultural land-use and how it has changed over the years. I also observed and interacted with local farmers to determine how they function within the regional agricultural system and how they develop their perspectives on sustainability within the context of the globalized agricultural market. According to Thompson (2010), many people don't see the connection between sustainability in agriculture and the importance of understanding that a philosophy of agriculture is closely related to the history, geography, and politics of a particular region. Integrating the information gathered through interviews with local farmers with historical and contemporary background information on land-use in the Marys River region allowed me to determine how closely the perspectives of farmers were related to the dominant social,

economic, and environmental views on sustainability held by policy makers and other institutions in the Marys River region and within the broader globalized system of agriculture.

I then use the information and insights gathered from interviews with farmers to critically assess how well farmers' views are reflected in the existing literature on agricultural sustainability. The broader goal of this research is to develop a more comprehensive understanding of sustainability that is better aligned with the perspectives of farmers in the Marys River region. By explicitly including the perspectives of farmers in sustainability concepts and approaches, it will be possible to facilitate more inclusive dialogue within the community of stakeholders in the region. The information will also serve to inform the creation of policies that will aid farmers and develop a more sustainable bioregion within the globalized marketplace.

This work consists of six components. In chapter two I begin by explaining the development of bioregional political ecology to illustrate my theoretical approach to this research. The chapter is part of a critical synthesis with the aim of analyzing social discourse within differing 'lines of argument' based on opposing worldviews (Geertz 1973; Noblit and Hare 1988). Because of the prevalence and influence of the agribusiness industry, it is necessary to describe the development and characteristics of the globalized system of industrial agriculture and the implications for farmers. I also examine more traditional systems-based forms of agricultural production and definitions of sustainability that are considered to be alternatives to the globalized system of industrial agriculture. The review and synthesis of information from various studies examining relevant aspects of differing agricultural perspectives serves to

provide context for the integration of knowledge from the broader national and global scales down to the regional level. In chapter three I describe the methods used in this research project. Chapter four summarizes the historical background of agriculture in the Marys River region as a continuation of the synthesis of information designed to provide a more holistic understanding of contemporary definitions of agricultural sustainability. In chapter five, I present the qualitative findings gathered from interviews among farmers in the region. Chapter six is a discussion and interpretation of findings in relationship to existing regional political ecology theory. The final chapter considers the implications of this research project for developing more comprehensive sustainability concepts that could facilitate the implementation of more sustainable and resilient food and farming systems in the Marys River region and beyond.

Chapter Two: Political Ecology, Globalization, and Sustainability

One of the foundational elements of this study is an awareness that sustainability cannot be measured by a universal standard with grades of pass or fail given to different communities across broad geographic regions. Instead, a more comprehensive understanding of sustainability requires addressing issues relevant to specific regions where unique social, environmental, and economic constraints may be viewed and analyzed from the perspectives of local stakeholders (Moran 2006; Walker 2003; Robbins 2006). At the same time, questions of sustainability must emphasize the interconnectedness of all three components while considering the context of those local issues within the broader global system. The first step in understanding definitions of agricultural sustainability among local farmers within the Marys River region is to examine some of the terms that were used for this study. Some researchers have begun using the term agrarian in place of sustainability to describe more systems-based forms of agriculture. Therefore, the term agrarian is seen at times in this study to describe the findings of other researchers. Farming methods practiced within the industrial agricultural system are often considered conventional by today's standards and organic or systems-based methods are often deemed the alternative. The term conventional implies a customary set of methods practiced over a long period of time. However, the reality is that before World War II industrial agriculture was for the most part not possible or applicable and even well into the 1960s could have been considered an alternative approach. Humans have practiced many systems-based forms of agriculture throughout the world for the past 600 generations while we have only become dependent on the globalized system of industrial agriculture in the last

two or three generations (Pretty 2002; Weizsacker 1994; Thompson 2010). Therefore, agricultural practices that focus on improving agroecosystems more correctly fit the definitions of conventional, or what I call traditional, than what I consider to be the alternative of industrial agriculture. The term traditional is appropriate for defining systems-based agriculture because that is the goal of those methods; to develop and maintain a tradition of environmentally, economically, and socially sustainable farming practices within local regions. Also, I would like to clarify the meaning of industrial agriculture practices as those within the globalized *system* of industrialized agriculture, geared toward increased production of commodities for the global market, and not simply the use of large-scale equipment on very large acreages.

Chapter two is part of a critical synthesis of literature and findings that were analyzed and referenced for this research project. According to Noblit and Hare, “A lines-of-argument synthesis, following Geertz’s formulation, draws from studies the ‘structures of signification’ both within each study *and* for studies as a whole...the goal of lines-of-argument synthesis is to discover a ‘whole’ among a set of parts” (1988:63). Because differing worldviews tend to guide individual practices, it is necessary to consider the various social structures which make up those divergent “lines-of-argument” (Geertz 1973; Noblit and Hare 1988). The goal of a critical synthesis of information in this study is to examine, interpret, and compare multiple accounts of agricultural practices and systems to provide context and a clearer understanding of key elements in differing forms of agricultural production and the relationships among them. A more detailed analysis of events that have led to

changing worldviews and farming practices allows for a more comprehensive understanding of agricultural perspectives in the region.

I begin the chapter with an examination of the theoretical model of bioregional political ecology as a basis for investigating agricultural sustainability in the Marys River region. Beginning with a summary of the evolution of political ecology and bioregionalism, I will describe the development of regional political ecology and how it is most applicable for this study by giving examples of case studies by various authors within the field. I then examine some of those processes leading to the industrialization and globalization of the dominant system of agriculture, establishing a comparable context for the historical development of agriculture in the Marys River region. Expansion of the agribusiness industry, geared toward specialization and consolidation is discussed in some detail. Multinational corporations, the treadmills of production and consumption, and biotechnology all play a significant role in the broader globalized agricultural system. Once the industrialized agricultural system has been explored, an examination of opposing worldviews and the resulting conflicts set the stage for describing alternatives to the dominant industrialized agricultural system. I describe several different approaches for developing more sustainable agroecosystems, the importance of place-based agriculture, and enhancing the sustainability of communities and bioregions. In this study, bioregional political ecology provides a basis for what and where to look for information on ecological and cultural issues in the area of the Marys River region; using the methods of interpretive ethnography is how those issues are more thoroughly described and understood. It is important to remember that although sustainability tends to mean sustainability for a

certain population, often within a particular regional area, no system exists in isolation, and therefore sustainability perspectives may be local but sustainable outcomes depend on interconnections among multiple stakeholders and cooperation among various regions (Thomashow 1999).

The Development of a Bioregional Political Ecology

Political Ecology

The field of political ecology has a great many contributors, providing a multitude of case studies in a number of different disciplines and geographical regions. The many perspectives and definitions of political ecology make it difficult to determine a universal theoretical model. Practitioners of political ecology often take a normative approach that focuses more on political policies and power relations as a cause for ecological degradation and social marginalization rather than the more narrowly focused apolitical approaches that often blame ecological problems on overpopulation and ecoscarcity (Robbins 2004). Robbins states, "It is not so much that political ecology is 'more political' than other approaches to the environment. Rather it is simply more *explicit* in its normative goals and more outspoken about the assumptions from which research is conducted" (2004:11).

Political ecology has roots in the theoretical model of cultural ecology, which focuses on a positivist approach to determining patterns of cause and effect through quantitative measurements of subsistence strategies to explain human-environment interactions (Haenn and Wilk 2006). According to Robbins, cultural ecologists, "approached human-environment issues ecosystemically: humans would be seen as part of a larger system, controlled and propelled by universal forces, energy, nutrient

flows, calories, and the material struggle for subsistence” (2004:28-9). Rappaport (1968, 1975) and Vayda (1969) took an eco-functionalist approach, using quantitative methods to measure energy flows within ecosystems as a way of explaining how humans, as part of the local ecology of an area, interact with their environment to maintain a level of homeostasis. One of the criticisms of cultural ecology is that assumptions of systems tending toward equilibrium are only useful in closed systems and therefore disregard the importance of external factors. Such limitations make it difficult to explain or compare the outcomes they observed from isolated studies with those of other regions. As Moran has stated, “the worldwide incorporation of scattered sociopolitical units within larger economic and political systems makes it impossible to treat local communities anymore as closed systems even for analytical purposes” (1990:20).

While the model of cultural ecology was useful, the focus of many researchers within the field of political ecology began to shift from the study of energy flows within closed systems to the influences of external factors. Peet and Watts state, “Market integration, commercialization, and the dislocation of customary forms of resource management—rather than adaptation and homeostasis—became the lodestone of a critical alternative to the older cultural or human ecology” (1996:5). Research done from the perspective of political ecology focuses more on the causes rather than the symptoms of environmental and social problems and considers the influences of both political economy and political policies on environmental degradation.

Because of the multiple definitions of political ecology based on the large numbers of case studies of researchers in many different disciplines, there is a broad list of what could be considered political ecologies (Robbins 2004; Biersack and Greenberg 2006; Peet and Watts 1996). A useful definition of the term given by Blaikie and Brookfield states that political ecology “combines the concerns of ecology and a broadly defined political economy. Together this encompasses the constantly shifting dialectic between society and land-based resources, and also within classes and groups within society itself” (1987:17). Because “degradation is perceptual and socially defined” (1987:26), researchers must understand that measuring land and environmental degradation can be influenced by the persons who are measuring resources and that their perspectives also affects the outcomes of those studies. The regional political ecology developed by Blaikie and Brookfield (1987) makes the land manager a central focus in studies of local areas existing within an array of external relations caused by global influences. The authors articulate the importance of remembering that; “Class interests, actual bureaucratic practice, different perceptions of the problem by various levels of the bureaucracy and rural population itself, all serve to transform original intentions” (Blaikie and Brookfield 1987:99). While the definition developed by Blaikie and Brookfield is broad, it was useful in guiding my research with local farmers in the Marys River region because it can be applied within the context of constantly shifting social and political forces that affect the regional market which in turn affects farming practices that may have adverse effects on local agroecosystems. As Robbins states, “Changing political and economic conditions therefore alter the context of decision-makers and set the terms for their use of the

environment” (2004:79). As the upcoming chapter on the history of the region will show, farmers’ decision-making processes are often affected external influences as well as by things that may have happened generations ago, from the effects of deforestation to the previous crops and animals raised in particular locations.

According to Peet and Watts (1996), political ecology offers too many diverse explanations for degradation and marginalization based on multiple case studies to develop a sound theoretical base. Peet and Watts state:

Notions like ‘environmental imaginary,’ which draw on the Marxist conception of consciousness, poststructural ideas about imagination and discourse, and, dare we add, environmental determinism from early-modern geography, open political ecology to considerations so different that we propose a new term to describe them—liberation ecology. [1996:37]

For this study, the useful element within the concept of liberation ecology is that it takes a poststructuralist view in reassessing the dialectic between nature and society and developing discursive analyses that include multiple perspectives of different populations. Peet and Watts (1996) present two differing views of poststructural political ecology that were useful in the development and understanding of a bioregional political ecology. Bebbington’s (1996) study discusses alternative methods of development practices by indigenous peoples, while Escobar (1996) argues for cultural resistance and alternatives to development by outside agencies.

Bebbington (1996) states that, rather than accepting State controlled modernization technologies, indigenous peoples in the Ecuadoran Andes have joined together with NGOs to develop grassroots federations that embrace new technologies and market strategies while maintaining their own cultural stability. The goal of agrarian programs controlled by indigenous federations is to increase local influences

on how the processes of social change occur. According to Bebbington, development projects that focus only on local ecological knowledge make the assumption that all local people are farmers and indigenous knowledge is the key to solving rural poverty. Unfortunately, emphasis only on what they know about pre-modern technology draws attention from the importance of addressing what they do not fully understand:

“markets, politics, and the machinations of a world beyond the farm gate” (1996:91).

Competitive pressures caused by neo-liberal development strategies require higher levels of inputs and more efficient technology to increase productivity. Economic transformations that are a product of those strategies have forced many rural people to move to cities in order to find better economic opportunities, causing serious subsistence issues for both urban and rural areas within the Andes. For many regions in both First and Third World countries, a restructuring of agricultural markets, with a larger focus on regional community relationships, and greater local control of production and distribution, will increase individual farm income and reduce out-migration of rural people.

Escobar (1996) suggests that poststructural political ecology requires considering both exploitative and conservationist forms of capital through discursive analysis. According to Escobar, “social movements and communities increasingly face the double task of building alternative productive rationalities and strategies, and culturally resisting the inroads of new forms of capital and technology into the fabric of nature and culture” (1996:48). Escobar argues that the problem of environmental degradation should be managed and controlled by local communities. According to Escobar, conventional forms of sustainable development are a means of reconciling

economic growth with the social construct of the environment. “What is problematized is not the sustainability of local cultures and realities, but rather of the global ecosystem, ‘global’ being defined according to the perception of the world shared by those who rule it” (Escobar 1996:51). Escobar suggests that indigenous communities develop alternative methods of sustainable production to deter conventional methods of development. The sustainability of a socially constructed nature must be articulated through alternative discourses by rural communities to reach a consensus view of life and culture.

Because of the many differing perspectives on nature, development, degradation, and sustainability, it is crucial to create and maintain an ongoing dialogue between disciplines and among stakeholders to ensure equitable treatment in the preservation of land and livelihoods. Political ecology is useful in providing a means for improved discourse but, as noted earlier, it is important for this study to include the component of bioregionalism to get a broader understanding of those perspectives held by farmers and other stakeholders in the Marys River region.

Bioregionalism

According to Aberly (1999), bioregionalism became popular during the 1960s, a period when sweeping social changes occurred across the United States. The development of bioregionalism was concurrent with the growth in the environmental movement in the United States. Although it would be unfair to suggest that environmentalists were nonexistent before the 1960s, there was a growing awareness among many people in the country during that period, particularly among those involved in the back-to-the-land movement, that natural resources were being

extracted from the environment at an unsustainable pace. Growing numbers of people were becoming concerned about the degradation of both the social and environmental quality of life. Aberly suggests that the poet Gary Snyder was an integral player in the development of the bioregionalism movement. Snyder saw the connections between "place, politics and ecology as the touchstone considerations necessary to animate a new link between social activism and a sustainable life and livelihood" (1999:17).

Although, according to Aberly (1999), the term bioregionalism was first developed by Alan Van Newkirk, it wasn't until 1977 that the concept of bioregionalism was clearly defined through the work of Berg and Dasmann. Berg and Dasmann (1977) defined the terms living-in-place, reinhabitation, and bioregion to describe the northern region of California.

Living-in-place means following the necessities and pleasures of life as they are uniquely presented by a particular site, and evolving ways to ensure long-term occupancy of that site.

Reinhabitation means learning to live-in-place in an area that has been disrupted and injured through past exploitation. It involves becoming native to a place through becoming aware of the particular ecological relationships that operate within and around it.

Bioregion...refers both to a geographical terrain and a terrain of consciousness—to a place and the ideas that have developed about how to live in that place. Within a bioregion conditions that influence life are similar and these in turn have influenced human occupancy. A bioregion can be determined initially by the use of climatology, physiography, animal and plant geography, natural history, and other descriptive natural sciences. The final boundaries of a bioregion are best described by the people who have long lived within it through human recognition of the realities of living-in-place. [Berg and Dasmann 1977:399]

Dasmann (1976) further distinguished between those he called ecosystem people, those living within and dependent upon their local ecosystems for survival, and biosphere people, those who exploit resources on a global scale regardless of

ecosystem constraints. Although the concept of bioregionalism had become more clearly defined and unified among bioregionalists, the difficulties of determining the borders of a bioregion remained.

Bioregionalism focuses on the importance of natural systems. According to Dodge, “Bioregionalism is simply biological realism; in natural systems we find the physical truth of our being, the real obvious stuff like the need for oxygen as well as the more subtle need for moonlight, and perhaps other truths beyond those” (1981:356). Dodge (1981) considered a number of different criteria for determining the boundaries of bioregions. The first criterion was biotic shift. As the percentage of a particular plant and animal species within a region changes in composition, along with differences in soils and climates, a permeable but distinguishable border can be determined based on those ecological changes. The problem is in deciding on the percentage of species change that will determine the biotic shift. Another way of considering bioregions is by watershed. For example, the borders of the Marys River Watershed, which constitutes a considerable portion of the Marys River region, can be easily determined by looking at topographical maps of the area as outlined by the Watershed Council (Ecosystems Northwest 1999). The problem with using watershed boundaries as the sole criterion for determining the bioregion is that the Marys River Watershed is also part of the Willamette Basin, which is in turn part of the Columbia Basin. Also, in the case of the Marys River region, using only the watershed criterion for determining the boundary of the bioregion leaves out much of the socially significant Corvallis area and farmland bordering the Willamette River. The cultural/phenomenological criterion for distinguishing the bioregion states: “you are

where you perceive you are; your turf is what you think it is, individually and collectively” (Dodge 1981:360). The cultural/phenomenological view adds the element of human experiences and values to the equation. Dodge suggests, and I agree, that we should consider all of these relevant criteria when determining bioregional definitions and boundaries.

The everyday choices that people make in their lives determine the outcomes of development and sustainability in their particular bioregion. Dodge (1981) states that practices should focus on resistance and renewal. Resistance by what Dasmann (1976) called the ecosystem people, against the biosphere people who would exploit and degrade the natural systems where people live. Renewal of those natural systems requires an intimate knowledge of the land and understanding the ecological constraints of those systems. Merchant states; “The local community is the best body to keep development within the guidelines of human-nature reciprocity” (2005:239). For this study, it is appropriate to expand the focus and concerns of bioregionalism to include considerations of the complex interactions of local and global relationships.

According to Thomashow, bioregionalism is a response to power relations within a global political economy and the resulting loss of place-based values. “Contemporary bioregionalism necessarily includes an ecopsychology of global change -- a place oriented agenda for everyday decisions, grounded in material life, cultural exchange and ecological relationships” (1999:125). One of the foundational ideas of bioregionalism is the concept of place-based reinhabitation. Developing place-based knowledge is necessary to gain a better understanding of local ecology as well as human and political relationships. That knowledge comes from learning and

understanding the geographic, ecological, and human history of an area. “The local landscape can no longer be understood without reference to the large patterns of ecosystems, economies and bureaucracies.” (Thomashow 1999:126)

The juxtaposition of space and time is necessary to increase the scale of observations in understanding natural systems and patterns within bioregions. Observing changes that take place over time on a larger scale gives us context for change while observing smaller scales gives us the mechanism for change (Thomashow 1999). To gain a more thorough understanding of the Marys River region, it is necessary to gather information on the perspectives of multiple stakeholders within the local area over time, within the context of the larger ecoregion, and as part of the global community (Thomashow 1999; Bailey2002).

Understanding the interconnections between different levels of multi-scalar research is vital for developing a more complete understanding of the conceptual framework of a bioregional study. Thomashow states that, “In global economy, people identify with many places at once, forming networks and allegiances based on pluralistic identities. This is the essence of local/global dialectic in which regions unfold within and between each other.” (1999:129). While the exchange of physical resources within and between bioregions is important, what is equally important is the exchange of ideas within and between regional communities.

Bioregional Political Ecology

Hipwell (2004) argues that the role of political ecology is not so much to explain environmental change but rather a basis for analyzing the causal influences that political and economic factors have in directing such change. Political ecology

should therefore be considered an important addition to the tools already available for research among social scientists. According to Hipwell;

Bioregionalism is a geographical approach to political ecology that suggests that in order to achieve globally agreed-upon objectives of peace and environmental sustainability, units of political administration and resource use management must be redesigned. [2004:741]

Rather than using politically defined boundaries that often divide ecosystems and cultural groups, bioregionalism combines cultural and geographic features to improve the decision-making capacity of local communities. Local communities should be re-inhabited, based on a combination of eco-geographical and cultural features, to create overlapping and inter-nested political units. Those units will in turn likely be part of bioregions that overlap with other bioregions and are part of larger bioregions.

Cultural features include history, land-use practices, language, and self-identification with the region. Eco-geographical features comprise the ecology, topography, and climate of the region (Hipwell 2004). In the case of my study of the Marys River region, it is important to consider both the cultural and eco-geographical features in determining the sustainability of the bioregion.

There is a growing consensus among researchers that effective resource management systems must involve local people as both sources of ecological knowledge and as participants in the decision-making process. "Research into bioregional management emphasizes governance over government suggesting that effective governance must actively involve all residents of the bioregions on equal footing" (Hipwell 2004:749). This type of governance suggested by Hipwell is more complex than simply decentralizing local governments. The idea is for local governments to maintain an equal share of the cost as well as responsibility for the

management of the region, but with more people taking an active role and developing a more democratic means of actualizing widespread stewardship within bioregions. Throughout the literature on bioregionalism the goal has been to allow members of communities to tell their stories about their relationship with the natural world in which they live. According to Hipwell;

Bioregionalism effectively addresses, in practical terms, poststructuralism's call for attention to discourse, ontology, epistemology and ethics. As such, bioregionalism is not meant to replace poststructural political ecology. Rather, it is simply one way of actualizing it. [2004:750]

Bioregional political ecology considers both the top-down political policies and the bottom-up reactions of local communities within regions and ecosystems and allows a wider range of voices to be heard.

One of the difficulties in developing a bioregional political ecology framework for research is that the vast majority of case studies have taken place in Third World countries among smaller groups of indigenous peoples, leading to what many consider to be a broad list of political ecologies (Robbins 2004; Biersack and Greenberg 2006; Peet and Watts 1996). However, it is important to note that as the globalized system of industrial agriculture has developed, more farmers in both North American and European agricultural communities have gone out of business or have become part of the disadvantaged work force within the agribusiness industry which is increasingly controlled by multinational corporations (Bell 2004; Bell 2009). Schroeder et al. (2006), argue that these global processes have altered property, labor, and production methods, and effectively created Third World conditions in several rural areas throughout the United States that were once thriving.

Changes in agricultural and migration policies have led to large Third World populations living within First World nations, bringing unique cultural and economic practices and creating a highly politicized social dynamic that is often exacerbated by nationalist and racial tensions. Schroeder et al. (2006), state that there are two possible approaches to developing a political ecology framework in North America. The first argues that there are aspects of the Third World within the First World setting that are caused by lack of power and agency in remote areas or within marginalized populations, suggesting remnants of pre-industrialized societies. The second approach rejects the idea of the Third World within the First World and suggests that;

Rather than discover the Third World within, this approach, post-structural in leaning, 're-reads' the first world for heterogeneity and diversity, asserting that spaces we have always assumed to be purely capitalist always carry within them elements that we now commonly associate with the Third World. [Schroeder 2006:166]

To better understand how these approaches to political ecology theory can be applied to my own research in the Marys River region, I will present three examples of similar case studies by McCarthy (2002), Robbins (2006), and Walker (2003). Elements of these studies serve as a basis for implementing the theoretical model of bioregional political ecology for research on resource use in the American West.

Example 1:

McCarthy (2002) based his claims that many of the tools and methods of political ecology could be applied to First World resource conflicts on his case study of the Wise Use movement in the rural American West during the 1980s and 1990s.

Wise Use claimed to be a grassroots social movement, rooted in the regional culture, responding to overly intrusive outsiders. It defined itself mainly in opposition to the environmental movement, environmental regulations, and federal agencies governing land uses, all

of which it portrayed as arrogant, ignorant outsiders intruding on local communities and denying them their livelihoods and right to self-determination. [McCarthy 2003:1282-3]

The movement focused mainly on the ideas of cultural identity, local knowledge, and local rights as opposed to the expert knowledge or outside knowledge of more centralized government agencies. The Wise Use movement was dismissed by environmental groups as a corporate front that would allow people to continue securing government subsidies and use of federal lands. Case studies done in Third World countries are often done by sympathetic researchers focusing on indigenous movements contesting centralized environmental governance by state agencies. However, in the case of Wise Use, the movement was written off by hostile environmental journalists after “remarkably cursory ‘research’ on the individuals and communities involved” (McCarthy 2002:1282). McCarthy argued that the Wise Use movement was unsuccessful because it took place in the First World country of the United States rather than in a Third World country.

Although there are a number of different approaches to political ecology, there are also some major themes that are present in the disparate case studies that help to unite the field. According to McCarthy, those themes include:

access to and control over resources; marginality; integration of scales of analysis; the effects of integration into international markets; the centrality of livelihood issues; ambiguities in property rights and the importance of informal claims to resource use and access; the importance of local histories, meanings, culture, and ‘micropolitics’ in resource use; the disenfranchisement of legitimate local users and uses; the effects of limited state capacity; and the imbrications of all these with colonial and postcolonial legacies and dynamics. [2002:1283]

McCarthy points out that while the approaches of political ecology have been specific to either Third World or First World studies, the distinction is often unstable. Perhaps

one reasonable distinction, particularly in the instance of the American West, is that when considering local knowledge in Third World settings, the accumulation of that knowledge usually goes back several more generations than what is experienced among Euro-Americans in the United States. Although I certainly do not wish to disregard indigenous claims to resources or issues of internal colonial domination in the US, when considering the definitions and keepers of local knowledge for both McCarthy and the Marys River region studies, we are mostly talking about immigrants who moved into those regions in the last 150 years or so from outside areas. It is important to note that, when establishing both the cultural/phenomenological criteria of the bioregion (Dodge 1981) and defining who is indigenous to a region (Corn tassel 2003), self-identification with 'place' is the determining factor. McCarthy states, "Virtually all research in political ecology focuses on access to and control over rural lands and resources: this is one of the most striking commonalities across geographic contexts" (2002:1284). Transferable private property is an important aspect of property relations in the United States where development institutions continue to press for privatization as a requirement for economic growth and access to global markets. In response to those legally formalized arguments, proponents of the Wise Use movement have emphasized the regional traditions of long-term and customary use of federal lands. McCarthy states that for many rural people in the West, "federal lands are a communal resource: the only legitimate reason for reserving such plans from privatization at the turn of the last century, in their view, was to ensure a sustainable source of raw materials for communities in the region" (2002:1291). Those ideas and motivations for conservation of public lands were based primarily on the

utilitarian ideals of Gifford Pinchot who suggested that resources should be sustainably preserved in order to be used by humans (Merchant 2005).

According to McCarthy, Wise Use presented an important geographical claim to use of federal lands suggesting that land rights were tied to the ability of claimants who were able to, “demonstrate some combination of historical continuity, residence in the rural communities in question, productive use of federal lands, and contributions to the local economy” (2002:1291). While participants in Wise Use objected to attempts by environmentalists to remove federal lands from all commodity production, they also objected to attempts at opening those lands to privatization and an unrestricted free market. McCarthy states that, “human - environment dynamics in the heart of capitalist modernity include *ongoing* struggles over nature, including ongoing resistance to the perennial dynamics of capitalism in the form of newly articulated moral economies” (2002:1291). McCarthy suggests that researchers too often assume that participants in First World capitalist countries are no longer subject to local cultures and traditions and all have been fully integrated into modern capitalist markets. Claims of traditional land use and customs were used by Wise Use activists to develop definitions of culture and customs to present their arguments on why they should be allowed to determine and control their land-use practices in the regions where they live. Environmentalists argued against those definitions by suggesting they were developed by corporate interests and therefore not valid. McCarthy (2002) points out that claims of cultural and regional identity made by Wise Use participants were most significant to the arguments over environmental politics, rather than a focus on determining whether those claims were valid.

One of the themes that play an important role in political ecology is colonialism. The connections to property rights, conservation, and integration into world markets are well documented by political ecology case studies in Third World countries but, colonialism and a frontier worldview (Wells 1999) has played an equally important role in developing patterns of resource use and land access in areas of the United States West like the Marys River region. While case studies using political ecology methods in Third World countries often focus on subsistence economies, exports of primary commodities, and the lack of power and agency of those groups within the context of the political institutions of the nations they live in, it is important to note that the very same complaints can be heard from residents of many rural areas in First World countries, particularly in regions dependent on resource-based economies. While complaints are similar among peoples in First World and Third World countries, the social, economic, and environmental conditions are often viewed differently. However, McCarthy (2002) clearly shows how researchers can adapt the themes of political ecology from Third World case studies to the issues of land and resource use among local cultures and regional communities in the western United States.

Example 2

Robbins's (2006) research examines a conflict in northern Yellowstone Montana among ranchers, environmentalists, and government agencies over issues of conservation, grazing rights, and game farm regulations. The focus of the study was on arguments that have emerged over proper elk and wolf management in the region. In that study Robbins asks; "how does local hunter knowledge diverge or converge with that of state officials, environmentalists, ranchers, and other constituencies, and

to what effect on wildlife management policy?" (2006:186) According to Robbins, the outcomes caused by the success or failure of diverse constituencies to form coalitions are based on the complex relationships between those directing policy, those with power, and differing perceptions of knowledge, leading to the acceptance or rejection by various participants.

Robbins (2006) considered three things in the Yellowstone region that were important to the study; the elk herd, introduction of wolves into the area, and an influx of new land owners into the region. Land-use changes in the region have often led to the removal of livestock, expansion of the elk herd, and changes in access to traditional local hunting grounds. Licensing fees have gone toward the management of the elk herd and to landowners for promotion of wildlife habitat. Payments are designed to promote the development of more wildlife and watershed friendly rotational cropping systems. State and national land trusts like the Montana Elk Foundation have instituted habitat easement and grazing retirement systems to purchase land rights contracts on private and federal ranch lands. "These easements reflect recognition that production rights in land are paramount, but that the exclusiveness of rights can give way to environmental interests through proper incentives" (Robbins 2006:188).

There were many uncertainties and unknowns among stakeholders over how best to regulate and manage the elk herd and land-use in the region. Robbins states, "Such uncertainties arise from a range of controversial and contradictory scientific and lay claims made about the regional ecosystem" (2006:189). Changes in climate and weather, leading to wetter or drier summers, harder winters or droughts, all can affect

the outcomes of the research study. Robbins also considers the changing economies in the region. As the primary extraction economies of ranching and mining have become increasingly marginalized and less economically feasible in the area, new economies based on environmental consumption have developed, often introduced by newer members of the region. According to Robbins, "As ranching and mining slowly die, a new generation of landowners arrive. Their visions and goals for the land immediately come to conflict with those of earlier residents and lead to more conservation oriented practices" (2006:190). Robbins cites McCarthy (2002) in making comparisons to the conflicts between Wise Use activists and environmentalists. According to Robbins, McCarthy suggested that the Wise Use movement, "reflects an environmentally sophisticated understanding of the produced character of the natural world (as opposed to an assumption of pristine wilderness) and a critique of the classed and geographic parochialism of many environmentalists" (2006:190). Again, there is a connection among differing views to the political ecology theme of colonialism and the ways that history has affected views of land rights and access in the northern Yellowstone region, the Marys River region, and throughout the western United States.

Robbins suggests that simple right and wrong answers to ecological questions as a measure of local knowledge among individuals in the region can be problematic. Political ecology research, "seeks instead to reveal varying knowledge communities within a nexus of property and labor relations that condition variable and shifting discourses of society and nature" (2006:191). Knowledge is, therefore, not entirely a question of more or less, but rather reflects what is most useful to the individual based on daily needs as well as shifting political and environmental activities. Robbins's

assertions are similar to what I discovered in my own study of the Marys River region; that farmers have varying priorities when considering sustainability issues based on long-term or short-term residency in the region and what is most useful in determining individual farming practices in the area.

A political ecological approach requires understanding the perspectives of the various stakeholders in the particular study and developing a more holistic view of important issues in the region. Robbins states;

By showing the positionality of all claims in the region, such an approach not only turns the gaze of critical ecology ‘inwards’ towards the first world, but also ‘upwards’ towards the state and institutions that participate in, but are not independent from, struggles for environmental power in the region. [2006:191]

Resolving debates over policy issues is based on power struggles between diverse constituencies with varying degrees of power and differing types of knowledge.

Robbins suggests that efforts in scientific research will continue to intervene in the mediation of future policy debates. Although there are many uncertainties in the proper management of northern Yellowstone and other areas like the Marys River region, it is likely that those coalitions with the most power will continue to be considered legitimate while those with less economic and political power will continue to struggle to be heard or likely be pushed to the side.

Example 3

Researchers using the methods of political ecology often conduct case studies located primarily in Third World countries and focusing on a local scale. Walker (2003) calls into question the problem of the binary geographic framework that separates First World and Third World studies in political ecology. He suggests there is some danger that the field of political ecology will not be in a position to address

broader scale processes if there is a continued focus on small-scale frameworks.

According to Walker, a reconsideration of the concept of regional political ecology, as introduced by Blaikie and Brookfield (1987), would allow political ecologists to expand the focus beyond the local scale to include regional and global processes that will provide a greater level of context while avoiding a loss of specificity and distinctiveness.

Walker (2003) illustrates the applicability of regional political ecology by following Blaikie and Brookfield's definition: "combines the concerns of ecology and a broadly defined political economy. Together this encompasses the constantly shifting dialectic between society and land-based resources, and also within classes and groups within society itself" (Blaikie and Brookfield 1987:17). Walker also considers the usefulness of Blaikie and Brookfield's Chain of Explanation and nested scales, and the marginalized peasant as the focus of concern. Blaikie and Brookfield (1987) make the land manager a central figure in regional political ecology, directed primarily by regionally based practices, but within an array of external relations radiating outward in an ever increasing scale of study. A significant factor to consider when measuring land and environmental degradation, according to Blaikie and Brookfield's definition, is that "degradation is perceptual and socially defined" (1987:26). Therefore, Walker (2003) finds it necessary to include moral economy, local knowledge, and the social constructions of nature and scientific knowledge to provide a poststructural component in his definition of political ecology.

Walker argues that many of the social analysis tools developed for use in Third World contexts are more relevant to First World resource conflicts than were once assumed.

While it is true that advanced industrialized societies often have more centralized and institutionalized rules of resource use (centered largely upon property laws), these laws are nonetheless expressions of *social relationships* and consist of ‘bundles’ of separable rights that are fluid and negotiable in practice, and are themselves constructed through particular social narratives. [Walker 2003: 9]

According to Walker, even though rules and practices governing resource use in industrialized societies are often more formalized and institutionalized, they still share many features of the socially embedded politics of resource use that is often found within non-industrialized societies.

While considering which differences are important and why in the political ecologies of the First and Third Worlds, Walker (2003) addresses the subject of different ways industrialized societies are shaped by exposure and manipulation of mass media culture. One of the most important comparative questions asked by Walker (2003) is how do we compare definitions of poverty or marginality among the poor of industrialized societies, with the poor of Third World countries that have no state-managed social safety nets, and where poverty and marginalization could have different and more severe definitions. As Walker has suggested, there is some fear that as political ecology expands into new settings, because of the uncertainties of answering those comparative questions, the discipline is in danger of dissolving into incoherency as a field.

In defining regional political ecology, Walker (2003) moves away from the problematic assumption that there is a separation, or can be a real separation, between

First World political ecology and Third World political ecology by asking whether either of these terms “describes societies with sufficiently like features to merit agglomeration into a single conceptually coherent and valid category” (2003:12). Walker suggests that a better question would be to ask whether there are significant differences between specific areas within the context of a regional analysis framework. According to Walker, advocates of a new regional geography “argue that the region remains an important *meso*-scale that mediates between local and global processes” (2003:12). In a field where the central focus has been on local-scale studies nearly exclusively, a key challenge for the future will be to integrate the region as a mediating scale in the transition from the local to the global. An important benefit of expanding focus to a more regional context is that specific problems and policy discussions are often expressed in terms of larger ecoregions like the Columbia Basin or the Pacific Northwest. It is in addressing this line of thinking that I focus on the Marys River region within the context of the larger Willamette Basin, lying within the larger Columbia Basin, and expanding toward the national and global scales. By discussing the specific problems and policies within a particular region, researchers will be able to explore possible comparative analyses among diverse regions with similar issues but in different geographical areas. Walker states, “Comparative approaches are hardly rearguard movements away from theory—they hold the capacity to reveal *why* particular social and environmental outcomes of, say, global processes are seen in one place but not another i.e., fundamentally *theoretical* questions” (2003:13). To illustrate his version of a regional political ecology, Walker examines some of the political dimensions of what he calls the gentrification processes

that are taking place in many rural areas of the US West. Walker begins with a case study in the Sierra Nevada Mountains of California, describing the transformation of what were once resource-dependent communities into areas with economies and cultures that are more diversified through the influx of an increasingly dominant exurban population.

Walker describes the political dynamics within the area of his case study based on three differing ideological perspectives among stakeholders: “the older resource-based economy (ranching, timber); a development industry; and the newer rural-residential, amenity-based economy” (2003:15). Developers in the region see opportunities for growth and financial gain, farmers and timber owners see development as an infringement on their livelihoods and use of the land, while environmentalists focus more on the aesthetic and spiritual amenities of the landscape. Each of these perspectives has its own ideologies that range from the suspicion of government interference to a reliance on government control as the key to preserving economic and cultural values.

According to Walker (2003), it is necessary to understand the regional context of local studies like these to better understand local specificity and differences. Walker defines the American West as those thirteen US states west of the 100th meridian. These states constitute a distinctive region that can be based on the similarities among them which include large portions of public land and the common issue of water scarcity in the region, contributing to a common ground for political and ecological dialogue. Changes in capitalist approaches over time have caused a shift in focus from the older resource-based economy of production and resource extraction to the newer

amenity-based economy of consumption in many areas of the western region in the US. Walker points out that the defense and electronics industries in the West made a significant contribution to the boom in urban real estate prices, driving the large-scale 'equity migration' of those who sold their homes in the inflated urban markets and bought cheaper homes in rural areas. While those newcomers to more rural regions were often able to live comfortably on the net gains from home sales, residents who were dependent on production economies were faced with the challenges of lowered land-based commodity prices and rising taxes as land values shifted toward a focus on development potential. In what Walker (2003) calls the new consumption-based rural capitalism, real estate and tourism become the prominent local industries and depend heavily on rural landscapes that fit the imagined view of a pristine nature that will attract wealthy urban migrants and tourists to the area. According to Walker, "The inevitable local conflicts that emerge as this capitalism clashes with older, production-based capitalism's, are, thus, central elements in a distinctive regional political ecology of the rural American West" (2003:17). The following chapters will show how some of the same changes in regional economies described by Walker have taken place in the Marys River region and have contributed to differing perspectives on land-use practices in the area.

As newcomers to regions become more economically and demographically dominant, differing ideas and definitions of what it means to be local have become significant. Some exurban migrants suggest that defining local should be based on how well one knows the ecology and history of an area, while others dismiss the importance of being local and argue that majority should rule in making political

decisions. As Walker argues, “This represents a radical departure from the principle of ‘first in time, first in right’—perhaps the most entrenched of all Western ideologies—and a dramatic remaking of a distinctive regional political ecology of the American West” (2003:18). Walker reiterates that while it is necessary to examine the political interactions between the local and the federal, it is also important to examine the ‘meso-scale’ of regional and county level political forces. “County and regional level institutions are in fact far more politically diverse and complex, and, thus, more important as focal points for political ecology research” (Walker 2003:20). Regional political ecology is useful in examining the relationships between opposing ideologies to better understand the discursive politics of social and economic change in the West.

Each of the three examples I have given for applying the theory and praxis of political ecology to regions of the US West show how differing worldviews and ideologies among stakeholders influence how land-use practices are established and managed. Determining agricultural land-use practices in any region begins at the farm and proceeds to the local community level, but those practices are also affected by larger scales of influence through what are often external and conflicting political agendas. Addressing those issues requires a theoretical model of regional political ecology focusing on the bioregion, in this case the Marys River region, with boundaries determined by both cultural and ecological criteria, existing within and among larger regions, and within the context of a globalized world. In the following sections I will describe the development and expansion of the globalized system of industrial agriculture as the context in which regional agriculture operates and the opposing views of those who advocate alternative agricultural practices.

Globalized Industrial Agriculture

Although this research project focuses on the Marys River region, it is necessary to establish an understanding of the globalized food supply chain as the context in which the region's agricultural system operates. The analysis of pertinent aspects of the globalized system of industrial agriculture is part of a critical synthesis of information designed to provide a more thorough, or thicker, description (Geertz 1973) of what it means to be a farmer living and working in the Marys River region. By examining the development and expansion of the industrialized agricultural system, it becomes easier to understand the roles of both consumers and producers of agricultural goods and services as well as the opposing views of those who advocate alternative agricultural practices.

People define sustainability based on individual perspectives and beliefs. Many feel that industrial agricultural methods and technological innovations are sustainable and can be used to solve the issues of hunger and environmental degradation on a global scale. However, there are growing numbers of people who believe in the necessity of seeking out alternative and more traditional methods to solve their agricultural issues. The opposing views of industrial and agrarian philosophies have led to ongoing disputes and power struggles for dominance of one philosophy over the other in defining sustainability within societies. While conducting research on the relevant literature for this study, it became increasingly evident that differing beliefs and worldviews plays a significant role in determining sustainability and the acceptance or refusal of various agricultural practices. Many of the same issues, like use of synthetic fertilizers, pesticides, and innovations in irrigation technologies, were

addressed from opposing viewpoints; one side seeing the effects as positive, the other as negative (Thompson 2010; Ikerd 2008; Manning 2004; Coleman et. al 2004).

Populations living in industrialized societies like the United States are operating within a food system dominated by those who control the major agribusiness industries. Because of the multiple perspectives on nature, development, degradation, and sustainability issues, it is vital to maintain an ongoing dialogue between stakeholders to ensure the equitable treatment of individuals when addressing social and environmental problems relating to land and livelihoods.

Agricultural Industrialization

Throughout agricultural history, until the advent of modernized agriculture, increases in food production have been achieved through expanding the arable land base by increasing the number of fields under plow (Manning 2004). As the Industrial Revolution progressed during the 1800s, a number of innovations took place in the United States accelerating the movement toward today's modern society. As the industrial economy became increasingly predominant, more lucrative opportunities were made available, allowing many rural residents to leave the tasks of farming for work in factory and office jobs available in many cities. Also, as agriculture became more efficient, fewer farmers were needed to produce larger amounts of food, often at costs lower than what was possible before industrialization. More people working in urban areas meant more income was available for buying agricultural products and the items that were produced by the new manufacturing industries (Manning 2004; Ikerd 2008).

One of the fundamental characteristics of industrialization is specialization, or the division of labor. In order to facilitate specialization, components within the production process must be standardized, allowing those production processes to be mechanized and simplified within the management system. As the control of production became more consolidated and centralized, fewer people were making decisions about how to best manage land, labor, and capital. The methods and economic outcomes of industrialization are commonly referred to as ‘economies of scale’ (Manning 2004; Ikerd 2008). According to Ikerd, “Through specialization, standardization, and consolidation of control, we bent nature to serve our material needs” (2008:25). The new industrial technologies reduced costs of production and gave farmers the incentive to adopt new strategies for expanding their profits through increased production. However, as farm production increased, market prices for farm goods began to decrease to levels at or below the cost reductions provided by the new technology (Ikerd 2008).

By the year 1900, more than 40 percent of the US population was still farming and over half of the people continued to live in rural areas throughout the country. At the beginning of the twenty-first century, farmers made up only 1.6 percent of the US population, the average size farm was 432 acres, and only about 25 percent of the population was living outside major metropolitan areas. There were over six million farms in the United States during the 1930s, but the number of farms has continued to drop since that peak period until now there are less than two million farms operating in the US. Most of those people who continue to farm rely on non-farm income to help support their families (Hurt 2002; Ikerd 2008).

Large-scale industrialization of agriculture, at least in the United States, began with the hybridization of seeds, particularly corn. The hybridization of corn began to take off during the Depression years. In 1933, hybridized corn accounted for only about one percent of the total crop in the United States, but only ten years later, 50 percent of all corn was hybridized. While some farmers were better able, or more willing, to adopt the new hybrid crops and growing technologies, others were more skeptical of the new technology and so were less able to compete in the agricultural market. One of the reasons for farm consolidation, at least in those earlier years, was the uneven adoption of growing hybrid crops, allowing more progressive farmers to buy up less successful neighboring farms. The shift to a more industrialized capital intensive agriculture also included more farmers buying the newer synthetic chemical fertilizers and pesticides like 2,4-D and DDT (Manning 2004; Ikerd 2008).

After World War II there was a dramatic increase in the numbers of farmers in the U.S. using tractors as well as synthetic fertilizers and pesticides on crops. Those new technological innovations also allowed farmers to begin farming landscapes that were less productive or previously unfarmable (Manning 2004). As financial investments in machinery and technology increased, farmers began specializing in fewer areas of commodity production and developing mono-cropping practices on a larger scale. John H. Davis coined the term agribusiness in 1955 to describe the vertically integrated system of industrial agriculture that had become dominant in many areas of the US (Hurt 2002).

In the increasingly industrialized agricultural system, large-scale farms were better able to capitalize on federal support programs to buy more equipment and land

to farm more extensively. According to Pretty, “the desire for public subsidies to encourage increases in food production took precedence, and these are more easily applied to simplified systems, rather than the mixed ones” (2002:54). As subsidies became more important to maintaining the system of industrialized agriculture, farmers developed what they called the skills of “farming the Government” (Manning 2002; Bell 2004; Hurt 2002). In the Central Valley of California, farmers began using a method called double dipping; a practice that would allow them to receive payments for using irrigation water and for planting crops that were subsidized by the federal government (Harper 2008). In the early 1970s, Earl Butz, the Secretary of agriculture under President Nixon, “urged farmers to expand by plowing ‘fencerow to fencerow’, or, in other words, to put all land into production” (Manning 2004:95). Unfortunately, many farmers listened and one of the results was a loss of important windbreaks and shelter-belts that were designed to prevent loss of topsoil through erosion. The result of farming too much land was dramatic overproduction, which led to falling prices, “and through the 1980s direct farm subsidies rose to an average of ten billion dollars a year” (Manning 2004:96). A number of government programs were implemented to help farmers and reduce subsidies but, only a few benefited while most farmers suffered. “The Food Security Act of 1985, for example, enabled J. G. Boswell, a California company and one of the largest producers of cotton, to collect nearly \$20 million in subsidies annually” (Hurt 2002:149). In the late 1990s the US Congress passed the Freedom to Farm Act which was designed to phase out farm subsidies but instead payments increased from ten billion dollars a year to almost thirty billion in 2001(Manning 2004). According to Hurt, “One wheat and soybean farmer in Iowa

remarked, ‘To put it quite bluntly, if you’re not farming the Government today, you’re not doing a very good job’” (2002:150).

Many of the farm programs that were designed to help keep family farms in continuing production have also led to further consolidation and integration of the agribusiness industry. Manning (2004) states that by the year 2000, only four crops; corn, soybeans, wheat, and hay, comprised 85 percent of all crops planted in the United States and the majority of livestock are produced in Confined Animal Feeding Operations (CAFOs). The process of industrialization has led to increased farm size but fewer farms, increases in production but fewer crops produced, and an overall increase in petrochemical-based farm inputs.

Globalization of Agriculture

According to Coleman et al. (2004), since the end of World War II, the movement from poly-culture subsistence farming toward commercialized production has caused farming to become more specialized. As farmers continued to invest in larger machinery and technology after the war, it became more cost effective to develop mono-cropping methods on a larger scale. The higher costs of mechanized farming and specialization led to an increase in contract farming with agricultural corporations to produce commodities for a specific market price. Coleman et al. state;

Processing companies buying from farmers have demanded more evenness in quality and standardization in size and the markets for these more specialized and standardized products are extending gradually further away from the locality in which crops or animals are grown. The greater emphasis on monocropping has come to rest on various expert systems to achieve economies of scale and higher productivity, including sophisticated farm equipment, chemicals to control pests and weeds, and to stimulate growth, and biological science to improve yields from plants and to raise output from animals. [2004:7]

One result of the industrialization process was that only the most efficient large-scale farms were able to compete in an increasingly globalized market. Large-scale farms were better able to capitalize on federal support programs in order to buy more equipment and land to farm more extensively while many small-scale farms were forced to give up their operations. As farms continued to consolidate, many younger people from farming families moved to cities in search of jobs.

As increasing economies of scale began to exceed the financial capabilities of the individually owned family farm, those operations began to be consolidated under corporate control. Because publicly held corporations have more access to capital from a number of different sources, they are better able to finance businesses and are therefore more economically competitive (Coleman et al. 2004). It has become increasingly evident in the last few decades that the system of industrialized agriculture will continue to be controlled primarily by large publicly owned corporations. According to Ikerd (2008), the process of industrialization will ultimately lead to the corporate control of economies and societies and the movement from capitalism to corporatism. "Corporatism is not capitalism. Corporations facilitate industrialization, and thus, facilitate production of ever-increasing quantities of cheap stuff. Beyond this, there is no reason to believe that corporations will serve the needs of society as well as individuals" (Ikerd 2008:52). The goals of industrial agriculture are based on the market system and so increasing productivity and efficiency to meet the socially just objective of feeding of global population is not really that useful because, within the market system, the first requirement for consumers is the ability to buy food. Therefore, those people without the financial means to buy food or other

retail goods do not figure in as part of the globalized market system (Ikerd 2008; Thompson 2010).

The increased corporate control of the global food supply chain has led to increased standardization of agricultural production models for planting, harvesting, and processing agricultural products throughout the world. Transnational corporations play an increasingly significant role in the globalization of industrialized agriculture as those involved in agribusiness and food processing continue to expand into new territories in search of cheap labor and new markets for products (Hamilton 2009; Phillips 2006). Farmers are part of a global food supply chain that many consider to be more efficient and which includes multiple sectors.

The food supply chain extends back from the farmer to include the suppliers of inputs such as finance, seed, veterinary medicines, fertilizers, other agricultural chemicals and machinery and equipment. It extends forward to include the sectors that process those inputs and to the trading, wholesaling and retailing firms that distribute processed foods. [Coleman et. al 2004:31]

Producers within the food supply chain continue to consolidate so that a much smaller proportion of farms produce the majority of outputs. According to the USDA, there are two million farms in the US, a farm being defined as an operation producing a minimum of \$1000 worth of products annually. Among those two million farms, there are 150 thousand with sales over \$250,000 producing over 70 percent of the total output for the country (Coleman et al. 2004; Manning 2004).

An important component of the food supply chain within the globalized industrial agriculture system is the establishment of linkages in the horizontal and vertical integration processes which control all aspects of production. Horizontal integration occurs when different firms at the same stage of production merge to form

a larger company. Vertical integration is the merger of companies at different stages of production and distribution (Harper 2008; Bell 2009). For example; DuPont, Monsanto, Syngenta, and Limagrain, control 29 percent of the world market in commercial seeds (Norberg-Hodge 2001). "Cargill, the global grain, oilseed, and meat processor and trader, acquired the grain storage, transportation, export, and trading operations of its rival, Continental Grain Company" (Hurt 2002:163). ConAgra, IBP, Cargill, and Farmland National together control 87 percent of the cattle slaughter market. Cargill/CHS, ADM, and ConAgra control 55 percent of the flour milling market (Hendrickson and Heffernan 2007; Hurt 2002). Multinational corporations have increased control of the global food supply chain by forming alliances leading to the emergence of what are called clusters of firms, controlling everything in the food supply chain from development of seed, production and sales of animal feeds, agricultural equipment, chemicals and fertilizers, to sales of the end products to consumers. According to Coleman et al., by supplying all of the inputs necessary to produce the required commodity; "the assured market transforms the farmer from an individual entrepreneur to a manager of the stage in the chain" (2004: 48). Three of the most prominent clusters are: "Cargill and Monsanto, ConAgra and its affiliates, and ADM and Novartis" These are all corporations with extensive global interests. As Coleman et al. state, "The concentration of market power in these kinds of groupings thus has the possibility of influencing the conduct of global markets and determining the performance of the food system" (2004:33). Another aspect of the global food supply chain that is important for agriculture in general and which will be expanded

upon in the later discussions among farmers in the Marys River region is the development of biotechnology within the agribusiness industry.

Biotechnology

Several multinational corporations like Monsanto and Bayer Life Science have moved into the biotechnology sector to develop new genetically engineered seeds for field crops. The United States now has over 70 million acres planted in genetically engineered crops (Mendelson 2002). Genetic engineering uses recombinant DNA techniques in the transference of genetic information from a particular gene or gene sequence to another organism. Unlike past breeding efforts with plants, “A gene can be removed from a living organism found in one physical location in the world and placed in another living organism that would never have had any physical contact with the first” (Coleman et al. 2004:65). There are a number of controversial aspects to biotechnology, one being the possibility of transferring genetic information between different species, which have led to disputes between those who are in favor of and those who oppose genetic engineering.

Proponents of genetic engineering argue that the technology may increase production while using less land and lowering the amounts of necessary agricultural inputs like fertilizers and pesticides. Advocates suggest that more effective control of pests with use of fewer pesticides will increase yields and therefore do less damage to the environment. Although evidence of economic benefits are so far varied and inconsistent, “The short run attraction is thus better quality crops with inbuilt herbicide and pest resistance” (Coleman et al. 2004 69-70). According to advocates of

biotechnology, genetic engineering is necessary to feed the growing human population and avoid widespread famine in the future.

Those who oppose genetic engineering, or genetic modification, of agricultural products argue that, “it is not natural, not ethical, not necessary, not in the public interest and not safe” (Coleman et al. 2004:72). Advocates counter the argument that genetically modified (GM) crops are unnatural and unethical by saying that all crops are the product of human intervention and therefore unnatural. Other arguments against GM crops include concerns over allergic reactions, genetic contamination, increased pesticide and antibiotic resistance, and loss of biodiversity (Mendelson 2002; Coleman et al. 2004).

Opponents of genetic engineering, including many who live in the Willamette Valley, argue for the labeling of food products that contain GM ingredients. According to Coleman et al. (2004), those who have invested heavily in biotechnology argue that labeling their products implies that they may be unsafe, and, “they argue that mandatory labeling contravenes the agreements on sanitary and phytosanitary measures and on technical barriers to trade at the WTO” (2004:80). Because agricultural products containing GM ingredients have become so widespread in a short period of time, an ongoing argument continues over what is the allowable percentage of GM ingredients before foods would require labeling. The many issues surrounding the use of biotechnology are the result of differing worldviews that allow some to accept those technologies as positive and others who have serious concerns that those innovations could lead to imbalances in agroecosystems and increased environmental risks.

Transportation and Distribution

One of the most important components of agricultural globalization and consolidation of the food supply chain is the transportation and distribution of food and agricultural products. As noted earlier, industrialization led to the standardization and specialization of agriculture through mono-crop production of commodity crops. The standardization of production systems assisted in the development of globalized sourcing and distribution of agricultural products and has led to the creation of what Phillips calls the “concept of a global food regime” (2006:39). Many are concerned that long distance transportation of foods has become part of an unsustainable distribution system based on cheap labor and relatively low petroleum prices with most benefits going to a few highly consolidated agribusinesses and speculators. According to Barker, "In 1998, Britain imported 240,000 tons of pork and 125,000 tons of lamb at the same time that it exported 195,000 tons of pork and 102,000 tons of lamb" (2002:257). As fossil fuel prices continue to rise, many are beginning to question a production and distribution model that promotes importing and exporting the same commodities to different locations throughout the world.

Increased global distribution of peoples and cultures also plays an important role in the globalization process. Culture plays an integral part in the ways that people and communities make choices about food and how those foods are prepared for meals. Increased migration among populations has led to transnational communities being established in diverse locations. The influx of new populations into communities often leads to establishing new styles of restaurants and the introduction of new foods into supermarkets, increasing the demand for foods that must be imported to those

new locations. According to Coleman et al., “This exposure and the incorporation of foods from transnational communities into the mainstream cultures of the new host nation-states adds to economic demand and fuels further the economic globalization of the agri-food sector” (2004:18). An in-depth understanding of the globalized system of industrial agriculture shows that increasing production and consumption are both integral elements of the food supply chain.

Creating the Treadmills of Production and Consumption

The goal of the agribusiness industry is to increase production of farm commodities within a globalized system that is increasingly controlled by multinational corporations. Many farming operations are losing their status as independent entities and are becoming mere links in the food supply chain. To maintain their position within the system, farmers must continue expanding production to make enough money to stay in business. Since prices of agricultural commodities are controlled by the global market, most farmers are unable to set their own prices for the commodities they produce. Therefore, industrialized farming operations must compete with each other by acquiring larger equipment in order to farm more acres of those crops that are in demand and so receive more subsidies. The system I have described, where the focus is on short-term growth through increased output without concern for long-term consequences for environment or social equality, is called the treadmill of production (Schnaiberg 1980; Bell 2004; Bell 2009). According to Bell, the ongoing process of agricultural industrialization has changed the social, political, and geographical landscape of food production until; “Farming is no longer the same thing as agriculture” (2004:35). There are a great many treadmills of production within

different sectors of the agribusiness industry, from the development of new hybridized seeds and animals, to the manufacture and marketing of new processed foods for supermarket shelves. However, for this study, it is important to keep the farmer as the central focus within the context of the larger agricultural system.

Bell's (2004) description of the 'farmer's problem' explains what is happening in many areas, including the Marys River region, where the majority of farmers are participants in the treadmill of production. If everything works out on the farm during a particular season, meaning the right amount of sun and rain at the proper time and well running machinery that is able to handle the job, inputs like fertilizers, pesticides, and irrigation may be relatively low and production should be high. However, if things go well for one farmer, there is a good chance that other farmers in the area, who are growing the same crops suited to that region, will also have a good year. The result is that the increases in production will be reflected in lower prices for those commodities that were grown. The same elements of production are affected in bad years. If conditions in the region are bad for producing a crop, production for that year will be low and prices for limited commodities will be high. But, since everyone in the area was likely affected by the same poor conditions, no one has much product to sell on the market. The only way to be financially successful in a situation where farming neighbors are all growing the same crops and using the same technology is to have a good year when everyone else's crops fail, and that is not likely to happen very often. Therefore, the only reliable solution to the problem for competing farmers is to expand production and buy or rent more land in order to knock other less aggressive farmers

in the area off the treadmill and out of business (Bell 2004). (For further examples of treadmills of production see Appendix D).

Farmers continue to struggle for increased production and profit because they, like everyone else, are also consumers. Farming the largest parcels of land and owning the latest equipment and technologies is not only about increasing production, it is also about conspicuous consumption. This constant desire for more and better everything leads to what is called the treadmill of consumption. The reason people are so vocal in criticizing the unequal distribution of wealth and status is because those are things which are important to us all (Harper 2008; Bell 2009). Bell describes conspicuous consumption as “a forever receding place to try to stand” (2004:48). As consumers work to continually outdo each other, the rewards become harder to achieve and the treadmill of consumption continues to accelerate. Advertizing agencies are constantly bombarding consumers with slogans for new products that are purported to improve quality of life. Parenti states that advertisers do more than just sell particular products; “they sell an entire way of life, a way of experiencing social reality that is compatible with the needs of a mass-production, mass-consumption, capitalist society” (1986:63). Many argue that the display of consumer goods to enhance social status have become a substitute for the social needs that were once provided for by community (Harper 2008; Bell 2009). Multinational corporations working within the globalized food supply chain which thrives on the treadmills of production and consumption have for the most part been able to convince the public that their products will make life better or more convenient and that the inequality and environmental degradation caused by

large agribusiness industries are a reasonable, or even an inevitable tradeoff (Bell 2004).

Concluding Thoughts on the Industrialization of Agriculture

Describing the industrialization and globalization of agriculture provides a context for considering relevant aspects that are similar in the historical development and contemporary issues of agriculture in the Marys River region. The parallels between those processes, including the issues of biotechnology, transportation and distribution, and the treadmills of production and consumption are part of the interpretation and critical synthesis of information designed to enable a more holistic understanding of differing lines-of-argument within the broader context of agriculture (Noblit and Hare 1988; Dixon-Woods et al. 2006).

According to Harper (2008), the industrialization of agriculture is based on the paradigm that assumes nature can be dominated through modern technology. The industrial philosophy of agriculture promotes the concept that, “agriculture is not different from any other sector of the industrial economy and sees more productive technology as a good thing on both utilitarian and egalitarian grounds” (Thompson 2010:33). There were sound reasons behind the industrialization of agriculture which improved the economic and social welfare of many citizens and nations. The early gains in agricultural production helped farmers to expand beyond subsistence farming and made the industrial revolution in the United States possible. However, the application of the industrial paradigm to agriculture becomes more problematic as the requirement for constant growth confronts the limits of carrying capacity in agroecosystems. Like Ikerd (2008), I would argue that the majority of benefits from

the industrialization of agriculture were mostly realized by the latter part of the 1960s and many of the more recent technological advances have likely done more ecological and social damage than any benefits they may have provided.

Green Revolution technologies were successfully designed to increase production through inputs of synthetic fertilizers, resistance of seeds to pesticides, and increased irrigation. Corn yields in the United States that stood at about 20 bushels per acre in 1900, had increased to more than 130 bushels per acre by the end of the century. "In just a single eleven-year period, 1975 to 1986, rice yields jumped 32 percent worldwide, wheat yields by 51 percent" (Manning 2004: 93). Unfortunately, increasing irrigation and chemical inputs to expand or maintain production levels are more expensive than traditional agricultural methods. Unlike traditional methods of saving a percentage of each year's seed crops for replanting, using hybrid seeds often requires buying new seed each year. Newer biotechnologies are increasingly run by multinational corporations; putting pressure on scientists to develop new applications for the commercial market while the indirect costs of pollution and environmental degradation are most often borne by local communities and future generations (Gibbon et al. 1995). Genetic engineering has been widely promoted by multinational corporations that sell both genetically modified seeds and chemical herbicides as a package deal, thus promoting the treadmills of production and consumption (Norberg-Hodge et al. 2001; Harper 2008). Scientific research that was once considered neutral and objective and therefore authoritative in policy matters has come into question more frequently in recent years. Ikerd (2008) suggests that as a new postindustrial society develops in the United States during the twenty-first century, it is important

that the system of industrialized agriculture follows other sectors to develop a new paradigm. That paradigm shift has already begun with an introduction of the more systems-based concept of sustainable agriculture.

Sustainability and the Alternatives to Industrial Agriculture:

Introduction to Sustainability

Although the term sustainability has been used, and misused, so often that a number of researchers have adopted agrarianism as a replacement term (Thompson 2010; Kimbrell 2002; Berry 2002), I think that it is better to give a fuller explanation of what is meant by the term sustainable agriculture rather than ascribing new a term to what is essentially the same concept. A more detailed examination of several views on sustainability is an integral part of the synthesis process and serves in providing a more comprehensive understanding of agriculture in the region of study. There are three components of sustainability important to this research: the economics of food production and food sufficiency, the environmental considerations of ecological integrity and equilibrium, and the community and place-based perspectives of social sustainability (Thompson 2010). An agricultural system does not need to be healthy, nor appropriate, to last for extended periods and therefore the sustainability of a system should mean more than long-term existence. Consider the feudal system of Europe, or the agrarian system of the early United States based on slave labor. Each system was effective for extended periods of time but morally and physically degrading to those who were doing the actual work of agricultural production. The development of any system of agriculture is based on moral ideals. If we consider the importance of social and community stability, then equality and social justice become

significant elements in definitions of sustainability. However, values and ethics can often be adjusted to suit different perspectives. Many of the controversial issues surrounding agricultural production can be traced to differing worldviews and the place of humans in nature.

The Values and Ethics Influencing Agricultural Philosophies

Social scientists have often struggled with developing a universal theory explaining the place of humans within, or separate from, nature. Developing such a universal theory immediately leads to the problem of what Bell calls, "the contradiction between what can be termed moral holism and moral separatism" (2009:187). A holistic perspective of the global biosphere suggests that humans are part of nature and many of the environmental problems we face today are the cause of humans assuming otherwise. Those with a separatist perspective would argue that, since we are separate from nature, when considering environmental or social problems there is no need for us to follow a course of action in line with nature. Bell (2009), Merchant (2005), and Harper (2008) cite the work of Catton and Dunlap (1978) in their use of the terms Human Exemptionalism Paradigm (HEP) and the New Ecological Paradigm (NEP) to describe the differences between the contradicting perspectives. Those who adhere to the HEP assume that humans are exempt from ecological constraints because of a unique ability to solve environmental problems with technological innovations. The NEP argues that humans are subject to the same environmental limitations and ecological constraints as any other organisms living within ecosystems. According to Pretty, the contradiction between holism and separatism has become increasingly prevalent since the Enlightenment period, "when

Newton's mechanics and Descartes' nature as a machine helped to set out a new way of thinking for Europeans" (2002:12). Francis Bacon was another influential figure from the Enlightenment period who promoted the idea that we treat nature as an inert machine, to be broken into parts and dominated for the benefit of humans. The separatist, or dualistic view, based on Cartesian philosophy, has led to a loss of understanding and denial of human interconnections with the natural world (Pretty 2002; Jackson 1994; Thompson 2010). Many of the obstacles faced by those seeking to define and measure sustainability are based on oppositions caused by these differing perspectives and worldviews.

Industrial modernization is based on what Merchant (2005) calls the mechanistic worldview, and is focused on economic growth through the domination of nature. This separatist perspective suggests that humans, because they are unique in having culture, are able to solve any social or technological problems that occur and so there are no limits to growth. Proponents of the mechanistic worldview tend to see nature as a resource base to be accessed for the benefit of human beings (Merchant 2005; Harper 2008). The organic, or ecological worldview, suggests that humans are an interdependent part of nature and subject to the finite limits of the global environment. This view tends toward a more community oriented concentration on system well-being (Jackson 1994; Merchant 2005; Harper 2008).

These opposing worldviews present different answers to the same ethical question of how one should best live within the world. Originally, the term ethic described customs but, today its philosophical usage is directed more toward how people ought to behave in determining duties, goals and values in society (Curry 2006;

Thompson 2010). If an ethic is a concept of how one ought to behave, that concept must be based on an understanding of values. This study explores the distinction between instrumental value and intrinsic value. Finding value in something as a means for getting something else is considered instrumental value. If something is valuable in and of itself, it has intrinsic value (Curry 2006; Merchant 2005; Callicott 1985; 1994).

The differing positions within environmental ethics that guide personal behaviors are further broken down by Merchant (2005) to describe three different group perspectives: the egocentric, homocentric, and ecocentric. The egocentric ethic is “grounded in the self” and is most closely associated with the development of industrial capitalism and the mechanistic worldview. From this perspective, nature has instrumental value in providing resources for human consumption. The homocentric or anthropocentric ethic is grounded in society, focusing on interdependence and what is best for the community. The ecocentric ethic is grounded in the cosmos or, self in the context of creation, where there is intrinsic value in all of nature (Merchant 2005). In each of these perspectives there are differing views of self, community, and nature; from the human centered, competition driven model, to the more holistic philosophy that I think is best described within the agricultural context by Leopold’s land ethic.

Leopold states;

Examine each question in terms of what is ethically and aesthetically right, as well as what is economically expedient. A thing is right when it tends to preserve the integrity, stability, and beauty of the biotic community. It is wrong when it tends otherwise. [1949 224-5]

Merchant recommends a synthesis of these environmental ethics models that she calls the partnership ethic. “*A partnership ethic holds that the greatest good for the human and nonhuman communities is in their mutual living interdependence. A partnership*

ethic is grounded, not in the self, society, or the cosmos, but in the idea of relation” (Merchant 2005:83). The partnership ethic is useful to this study because it provides a basis for integrating the differing perspectives on sustainable agriculture into a more equitable interpretation that does not require a widespread return to simpler farming technologies and therefore less production in the fields, but rather a return to the idea of success being measured in the health of the entire community, ecosystem, and bioregion rather than just the success of individuals within that system.

Changing Values in the Agricultural History of the United States

The symbolic role of the family farm is a significant part of history in the United States. While it is important to understand the symbolic meaning of agriculture in this country, it is perhaps even more important to understand the separation between the romanticized view of the family farm and the actual practices of industrialized agriculture today. According to Thompson;

It is the cultural and symbolic components of farming that are critical to sustaining our commitment to communal life. If community is something we want to sustain, if sustainability has anything to do with reproducing and reinvigorating our ability to live and work together, we neglect the symbolic dimension of agriculture at our peril. [2010:166]

As chapter four will show in by describing the agricultural history of the Marys River region, to better understand the philosophies behind agricultural practices, and therefore the symbolic meaning of agriculture in a particular area, it is necessary to examine the history and politics of the region under study.

According to Burkhardt (1991), agrarianism focuses on the value of family farms in achieving sustainability by providing enough food, but also by developing important human values that include fairness, respect, and improving quality of life for

future generations. Presidents Thomas Jefferson and Theodore Roosevelt considered farming and farmers to be the basis for the establishment of moral character and that character was to be developed in the rural countryside. Jefferson believed that farming itself formed that character and that “tying a person's economic interest to land also cultivated the virtues of patriotism and citizenship” (Thompson 2010:47).

In the United States, land tenure has been greatly influenced by federal policies. Consider the Homestead Act of 1862, which encouraged Western settlement through offers of land title to those who occupied and improved individual plots of land over a five year period. “The developmental and egalitarian goals of this federal policy were deeply interwoven with a set of values that linked responsible citizenship and economic prosperity (if not sustainability) to farming (Thompson 2010:9).

President Lincoln created the Department of Agriculture (USDA) and in 1862 the Morrill Act launched the Land Grant College system. Each of those Acts implemented by the federal government had dramatic impacts on the development and expansion of agriculture in the US and in the Marys River region. Federal influence became an integral part of farm policy when the first farm bill was passed in 1933 (Thompson 2010; Manning 2004). Those government programs were set up to promote the welfare of smaller family owned farms. However, along with the new programs and technologies encouraging the industrialization of agriculture, a new ethic evolved grounded in the theory that success could be measured entirely by capital gain rather than the growth of human virtues based on the development of healthy communities, and ecosystems. (Thompson 2010). Today, while the symbolic meaning of the family farm is still being promoted by institutions and policy makers in the United States,

many transnational agribusiness corporations are able to reap the benefits of government policies while moving their manufacturing centers from one nation to another in search of the cheapest labor and lenient environmental laws.

Modern Definitions of Sustainability

The idea of sustainability is based on the permanence and resilience of agriculture. However, one of the greatest difficulties in reaching consensus on a widely accepted definition is that terms describing sustainability are social constructs interpreted differently by various stakeholders (West 2007; Robinson 2004; Paulson et. al 2003). There is often a distinct contrast between those who hold to the mechanistic worldview and those who endorse the organic or ecological worldview. That opposition creates an ongoing dispute and power struggle for dominance of one philosophy over the other (Merchant 2005; Jackson 1994).

Because of the multiple perspectives on nature, development, degradation, and sustainability among various interest groups, it is important to develop a dialogue that includes both moral and political philosophies connected with farming (Bell 2004; Thompson 2010). According to Thompson (2010), environmental ethics has often focused on wilderness and largely ignored land and water use in agricultural production. Multiple perceptions of environmental problems and degradation often leave the reliability of data subject to the ideology of those who are measuring the problem. In the midst of shifting environmental policy and global markets it is important that the long-term place based land manager be central to agricultural sustainability (Rhoades 1984; Blaikie and Brookfield 1987).

To develop and maintain more sustainable agroecosystems, steps should be taken to improve our understanding of environmental, social, and economic aspects of the present globalized agricultural system through increased dialogue between farmers, researchers, policymakers, and consumers. Most definitions of sustainability follow, at least to some degree, the findings of the Brundtland report and include a statement or proviso that a sustainable system “meets the needs of the present without compromising the ability of future generations to meet their own needs” (Brundtland 1987). However, it is not just the practices of agriculture but the ideals that people hold when developing a truly sustainable agricultural system focusing on social, economic, and environmental connections in a balanced and resilient bioregion. According to Thompson (2010), the Brundtland report was used to develop a working definition of sustainability that could be used in the broader context of global development. It became necessary to operationalize the concept of sustainable development in designing and planning projects. “Legions of resource and development economists leapt to the task, producing a plethora of technical measures to specify sustainability in a manner consistent with the existing economic concepts” (Thompson 2010:200). Unfortunately, many qualitative variables related to farmers’ experiences often do not fall within the parameters of scientific studies and are therefore not considered. Sustainability indicators are a simplification of complex and holistic systems. According to Pretty and Chambers, “Feedback and learning from farmers’ experiences are essential for further improvement of technologies and for sustained dialogue between scientists and farmers” (2000:205). Participation in dialogue among farmers with local knowledge is often more constructive than the

unilateral monologue of authoritative science which often assumes that everyone is arguing from the same perspective (Bell 2004). The question of sustainability must consider both human practices and natural processes working in equilibrium over an extended period of time. In the end, any transition to more sustainable agricultural practices must be acceptable to farmers and requires a balanced consideration of the social, environmental, and economic components of sustainability to achieve the goal of healthy farms, families, and communities.

The Agroecosystems Approach to Sustainable Agriculture

A sustainable agroecosystem is a human built farming system designed to emulate and interact with the surrounding natural environment and maintain a balanced level of naturally occurring inputs with healthy outputs to achieve a state of equilibrium. Agroecology is meant to reflect the diversity of natural ecosystems containing a variety of flora and fauna (Altieri 1995; Gliessman 2005). The paradigm of agroecology “recognizes that a farm is also an ecosystem and uses ecological principles of diversity, interdependence, and synergy to improve productivity as well as sustainability” (Harper 2008:183). Traditional agricultural practices using the agroecosystems approach are often more labor intensive than industrial methods and therefore tend to be adopted on smaller acreages. However, when the benefits of healthy soil and crops are balanced with savings from fewer input costs; many farmers are finding the tradeoff worthwhile (Altieri 1995; Norberg-Hodge et al. 2001; Pretty 2002; Harper 2008). The agroecosystems approach is centered on the idea that, for the individual farm to be sustainable, the environmental, economic, and social aspects of

the farm must be maintained in relative equilibrium within the larger community and bioregion.

The agroecological practices of integrated pest management and integrated nutrient management seek to balance resilience and diversity to reduce the need for inputs in the form of pesticides or fertilizers. The practices of conservation tillage and integration of livestock into agroecosystems are also designed to reduce mechanical and chemical inputs and more closely emulate natural systems. However, as farmers and environmentalists within the sustainable agriculture movement strive to develop small-scale appropriate technologies designed to decrease their environmental footprint, there must be an understanding that those technologies alone will not actualize important social changes necessary for increasing widespread sustainability (Altieri 1995; Pretty 2002).

A too narrow view of sustainable agriculture as a means of returning to a romantic past is simplistic and is unlikely to change the foundational structure of an agricultural system that was the basis for expansion, consolidation, and specialization to begin with. As Altieri states, "This technological determinism has, to a significant extent, prevented environmentalists from understanding the structural roots of environmental degradation within capitalist agriculture" (1991:130). According to Thompson, "One problem with the social movement view of sustainability is that it threatens to become a groupthink bandwagon, while demonizing people who do not fit comfortably within the in group's ideas" (2010:255). However, a more diversified system of mixed agriculture, with many different farm types, will allow for a more

egalitarian partnership ethic and a renewed focus on the development of communities and positive land reforms (Thompson 2010; Altieri 1991; Merchant 2005).

A transition from the dominant industrialized agricultural system to a more sustainable systems based approach must focus on resolving the broader political issues which emerge from struggles between groups with opposing worldviews. Understanding and resolving the issues of farmers, despite differing worldviews, ethics, or farming practices, begins with the physical location of the farm and the farmer's concepts of space and place.

The Importance of Determining Farmers' Views on Space and Place

A great deal of information has accumulated in recent decades on the ideas of space and place. The dualism that is a dominant feature of the mechanistic worldview, based on Cartesian philosophy, has led to differing notions of what determines space and what is place. For many the idea of space is considered to be objective while the concept of place is subjective (Thompson 2010). According to Thompson, "The literature of rural studies sees place identities as social constructions that are rhetorical products of various discourses conducted in connection with the control, utilization, or representation of certain locales" (2010:131). Space, the physical reality of a particular location, is represented by, and is a product of the various discourses among specific parties with varying interests in describing how those rural spaces are defined, resulting in a social construction of place. "Place exists only in the mind, and the experiences and practices of perceiving or discoursing subjects. It is a secondhand copy of actual spatial locations mediated by cognitive or linguistic processes" (Thompson 2010:132). The point of clarifying the differences between space and

place is that, although it has become quite common to suggest that we humans are all part of the global village, the reality is that we as individuals can occupy only a very small space on the planet at any one point in time.

Although local areas are not outside the scope and influences of globalization, it is important to recognize that the acceptance or denial of those influences are determined by relationships between identity, power, place, and geographic area. The feelings of uprootedness and homelessness experienced by many people, particularly those living in industrialized countries, are the result of the globalization process. The technologies of mass media, long distance transportation and communication, as well as the standardization of both production models and consumer products have not led to increased feelings of inclusiveness but rather to feelings of isolation and loss. An essential part of the transition to a more sustainable planet is to change our views on the importance and value of place, and to develop a better understanding of how much belonging to a particular place matters (Feld and Basso 1996; Escobar 1999; Thompson 2010).

To make sustainable agroecosystems a reality it is necessary for farmers to be part of a sustainable community. Jackson (1994) suggests we adopt an ecological worldview that focuses on developing sustainable solutions for living within the limits of ecosystems. Kloppenburg et al. examine similar efforts at alternatives to the globalized system using a more localized approach to agricultural production describing bioregions as foodsheds. "Within the existing food system there already exist alternative and oppositionalist elements that could be the building blocks for developing foodsheds: food policy councils, community supported agriculture,

farmers' markets, sustainable farmers, alternative consumers" (1996:114). Bailey (2002) argues that it is not enough to conserve small isolated parcels of land. It is necessary to sustain larger bioregions that will provide wildlife corridors and are more resilient to natural processes like flooding and fires. The cumulative effects of harmful activities from multiple sources and communities make it necessary to evaluate larger regions for a more holistic understanding of regional ecology. Issues like urban sprawl and the development of new roads between existing communities, as well as the conversion of farm and forest land to housing, all play a part in determining the ecological carrying capacity of a bioregion. Each of these alternative examples for developing more sustainable agroecosystems describe a decentralization of the globalized agricultural system that is now in place and replacing it with more durable local economies. Those alternative practices shift the focus from producing profitable commodities for the global market to concentrating more on providing for the welfare of both the human and nonhuman elements within bioregions before expanding into broader ecoregions or the global context.

Because the Marys River region is an area with multiple stakeholders, with an array of external relations within the global marketplace, it was appropriate to take a qualitative approach in constructing a critical synthesis of information gathered from several different sources and considering multiple perspectives on agricultural sustainability. Addressing the issues of farmers as the central figures in this study called for an approach to the research based on a theoretical model of bioregional political ecology. Upcoming chapters will show that the history of agricultural production in the Marys River region followed shifts common to the United States in

the adaptation of more industrialized capital intensive farming methods and technological innovations. The increased corporate control of the global food supply chain has led to most farmers in the region being highly influenced by the agribusiness industry with its mechanistic focus on constant economic growth and production. Increased participation in dialogue among stakeholders with differing perspectives will allow for more voices to be heard on important agricultural land-use issues. A better understanding of those differing perspectives will also increase the possibility of developing a more diversified system of mixed agriculture with a greater focus on building stronger healthier communities within the bioregion.

Chapter Three: Methodology

This dissertation project evolved from a pilot study begun during the winter of 2008 examining vertical integration in agriculture. That early research was based on an analysis of quantitative data compiled by Ken Meter (2004) on agricultural practices in Linn, Benton, and Lincoln counties: an area known as the Ten Rivers region of Oregon. To add a qualitative element to the study, I also gathered ethnographic data from local farmers and retailers in the region. The aim of that study was to examine some of the practices that could be used to increase regional control of marketing and processing locally grown farm products. I was interested in examining the potential for building a more vertically integrated, regionally based, agricultural system in opposition to the dominant top-down methods of the vertically and horizontally integrated agribusiness industry. The results of that initial project led to further research on the system of globalized industrial agriculture and the issues related to the treadmills of production and consumption as the context for addressing possible transitions to a more sustainable regionally based system of agriculture.

One of the primary difficulties in reaching consensus on sustainability issues is that terms describing sustainability are social constructs interpreted differently by various stakeholders in particular regions (West 2007; Robinson 2004; Paulson et. al 2003). Past research among smallholder farmers in the Willamette Valley helped me to better understand the significance of personal philosophy and identity in determining the practices of individual farmers. (Stanton 2010). Although there are a number of external social, economic, and political issues that influence decision-making on the farm, individual farmers practice methods they feel will work best for

them using place-based knowledge inherited or accumulated through actively participating in the daily activities of farming in a specific geographical area over time (Blaikie and Brookfield 1987; Geertz 1983; Jackson 1994). Because, as Rhoades (1984) suggests, the farmer is held accountable for decisions made on the farm, it is necessary to determine how the farmer defines sustainability to better understand differing perspectives within local communities and the region. This ethnographic study is a culmination of what I have learned over a four year period focusing on the central role of farmers in defining sustainability and determining sustainable practices to promote a continuing dialogue among stakeholders in the Marys River region.

Creating the Sustainability Questions Tripod

An earlier project, in partial fulfillment of requirements for the degree of Master of Arts, focused on smallholder farmers in the Ten Rivers region and was directed toward discovering what barriers prevented those farmers from adopting more sustainable farming practices. The goal of that study was to apply the information gained from those interviews to a model representing relevant barriers as sustainability indicators. Economic indicators are often used in models of large-scale industrial crop production to measure degradation by monitoring agricultural crop yields. Decreasing crop yields indicate that changes in agricultural inputs are required to increase productivity. Agricultural researchers are often hesitant to consider social and cultural externalities involving value judgments and so measuring sustainability is often confined to biological and economic efficiency (vanLoon et al. 2005). However, using only quantitative indicators leaves out many important social and environmental aspects of sustainable farming and therefore results in an incomplete understanding of

sustainability. Measuring environmental degradation or sustainability in an area is difficult but, it is often the perceptions of potential risks to natural resources that motivate responses to impacts which in turn affect driving forces of change (Hak 2005; Bell 2009; Harper 2008; Robinson 2004). According to Morse and Stocking (1995), people are more likely to make transitions in lifestyle based on their ideals and perceptions rather than the quantitative evidence of local degradation based on scientific measurements. Studies that include a focus on farming practices which address long-term environmental and social impacts are crucial to more fully understanding problems of achieving agricultural sustainability. Like other researchers, I struggled for some time with the problem of quantifying subjective information that was based on individual perceptions and personal experiences.

In the Ten Rivers study I chose to follow the examples of previous researchers in an attempt to develop an integrative sustainability model incorporating economic, social, and environmental components into a diagrammatic representation of agricultural sustainability (Rhoades 1984; Netting 1993; Drost 1996; Nazarea et al. 1998; Bell 2009; Harris 2000). The model was based on the sustainability tripod models developed by Hak (2005) and van Loon (2005). However, unlike most quantitative models designed to measure gradations of sustainability, my goal was to develop a model representing the three components of sustainability and listing the most prominent barriers suggested by farmers as qualitative themes showing how issues within each of the three component interacts with others to determine relative sustainability within the region. The result was a sustainability questions tripod that

continues to serve in this research as a guide for developing appropriate questions and relevant themes addressing sustainability issues among farmers (Stanton 2010).



Figure 2: Sustainability Questions Tripod (Stanton 2010)

Interacting with farmers in the Ten Rivers region helped me to realize that the subjective aspects of sustainability cannot be measured by a universal standard with grades of pass or fail given to different communities across broad geographic regions (Robbins 2004; 2006). Understanding sustainability ideas and goals must begin with a focus on specific regions where unique social, environmental, and economic constraints may be viewed from the perspectives of local stakeholders (Moran 2006; Walker 2003). However, it is equally important to understand that communities and

regions are never completely isolated and therefore sustainability questions must be considered within and among bioregions, and within the context of the broader global food supply chain (Bell 2004; Nazarea et al. 1998; Bailey 2002; Walker 2003).

Developing a Critical Synthesis of Studies

I spent a great deal of time over the last four years as a participant observer talking and listening to farmers in many different settings; from farms, to markets and conferences. At the same time, I conducted research on literature pertaining to various agricultural methods including sustainable, organic, and industrialized practices. My research also included the historical development of agriculture in the broader region of the Pacific Northwest and in the United States to provide context and expand the timeframe of the study. My objective in considering the many relevant background issues associated with agricultural production was to address the problem of ethnographic description as stated by Geertz;

In finished anthropological writings...this fact—that what we call our data are really our own constructions of other people's constructions of what they and their compatriots are up to—is obscured because most of what we need to comprehend a particular event, ritual, custom, idea, or whatever is insinuated as background information before the thing itself is directly examined. [1973:9]

By including relevant background information gained from a critical examination and interpretation of literature, I was able to develop a thicker description of agriculture in the area of study.

As noted previously, “A lines-of-argument synthesis, following Geertz’s formulation, draws from studies the ‘structures of signification’ both within each study *and* for studies as a whole...the goal of lines-of-argument synthesis is to discover a ‘whole’ among a set of parts” (Noblit and Hare 1988:63). I incorporated the methods

of grounded theory to conduct an analysis that would provide linkages between the information gathered from farmers as primary sources in the region and secondary literature sources. The sustainability questions tripod developed from past studies provided the initial themes, or, “presumptive signifiers” (Geertz 1973:26) as a starting point for research, and served as a guide in directing the disaggregation and comparison of relevant research topics. Using methods similar to those of a Critical Interpretive Synthesis, developed by Dixon-Woods et al. (2006), allowed me to select and critique appropriate literature to construct new themes throughout the study process and provide links between the different scales of research. According to Dixon-Woods et al.; “Processes of question formulation, searching, selection, data extraction, critique and synthesis are characterized as iterative, interactive, dynamic and recursive rather than as fixed procedures to be accomplished in a pre-defined sequence” (2006:9). The result was a critical synthesis of research findings designed to link discourse on agriculture from the broader national and global scales with discourse at the regional level, broader agricultural history with regional history, and to link broader agricultural issues with regional issues.

Because differing worldviews tend to guide individual farming practices, I began the synthesis process by considering the various social constructs which make up those divergent “lines-of-argument” (Geertz 1973; Noblit and Hare 1988; Dixon-Woods 2006). I knew that the mechanistic worldview is dominant within the industrialized agricultural system and therefore it was necessary to describe the development and prominent aspects of that system to provide context and a basis for comparison. The sustainability movement is directed by the organic worldview and so

it was equally necessary to examine those alternative perspectives. While conducting interviews among farmers in the region, relevant themes developed and became clearer through the grounded theory process. I was then able to use those themes in making connections and comparisons between the data collected from primary and secondary sources and provide a more in-depth interpretive synthesis of information applicable to the region of study. Because there are multiple stakeholders within the Marys River region, with an array of differing perspectives and relations within the global marketplace, I conducted this study using a qualitative approach based on an integrated theoretical model of bioregional political ecology.

Bioregional political ecology served as a theoretical foundation directing me in what to look for during this research but, interpretive ethnography was the approach I took to describe how farmers in the Marys River region construct their views on sustainability. While bioregional political ecology provides a basis for establishing context and motivations for the actions of the group being studied, interpretive ethnography furnishes the ways of creating a ‘thick description’ of various features of social actions within the interrelated components of sustainability to construct a more complete story of farming in the region. According to Geertz, “what the ethnographer is in fact faced with...is a multiplicity of complex conceptual structures, many of them superimposed upon or knotted into one another, which are at once strange, irregular, and inexplicit, in which he must contrive somehow to first grasp and then to render” (1973:9). Analyzing and representing the modalities of social organization, including discourse, space, place, and time, is the goal of ethnographic research (Atkinson et al. 2008). The goal of developing this critical synthesis of information was to examine,

interpret, and compare multiple perspectives and practices to provide context and a clearer understanding of agricultural production in the Marys River region.

The Area of Study

My previous research in the larger area of the Ten Rivers region allowed for a representative sample for a narrower focus on sustainability among smallholder farmers using organic and traditional farming methods. A significant discovery in that research was that farming practices, and therefore barriers to achieving sustainability, were more often motivated by variations in regional micro-climates and geographical differences influencing access to viable markets than a universally held concept of sustainable agriculture. I chose the Marys River region as a research area because there are fewer bio-geographical variations affecting farming methods than in the Ten Rivers study as well as a broader focus on practices including a mix of farm sizes and farming styles, making a smaller study area possible and more appropriate.

The Marys River region supports a diverse mixture of farmers practicing a number of different methods, from large-scale highly industrialized farms to smaller scale and more traditional farms. The difficulties faced by those farmers in achieving sustainability are a reflection of the broader issues within agriculture today. Conducting research in this setting allows for an appropriate representation of the research topics and a representative study sample within a socially and ecologically bounded region. According to Holliday, “Bounded social settings provide an important *means* for thick description” (2002:79).

To mark the boundary of the study area, I followed Burke’s (2003) example of expanding on the area of the Marys River Watershed (Ecosystems Northwest 1999) to

include areas that have significant ties to agriculture in the region. Because of the extensive historical and ecological influences of the Willamette River on farming in the region, it was appropriate to extend the eastern boundary to include the area of land from the confluence of the Long Tom River in the southeast, to the base of Spring Hill in the northeast. Corvallis is both socially and economically important for many farmers in the region, and it was therefore necessary to include the city and the more densely populated surrounding area within the boundary of the bioregion.

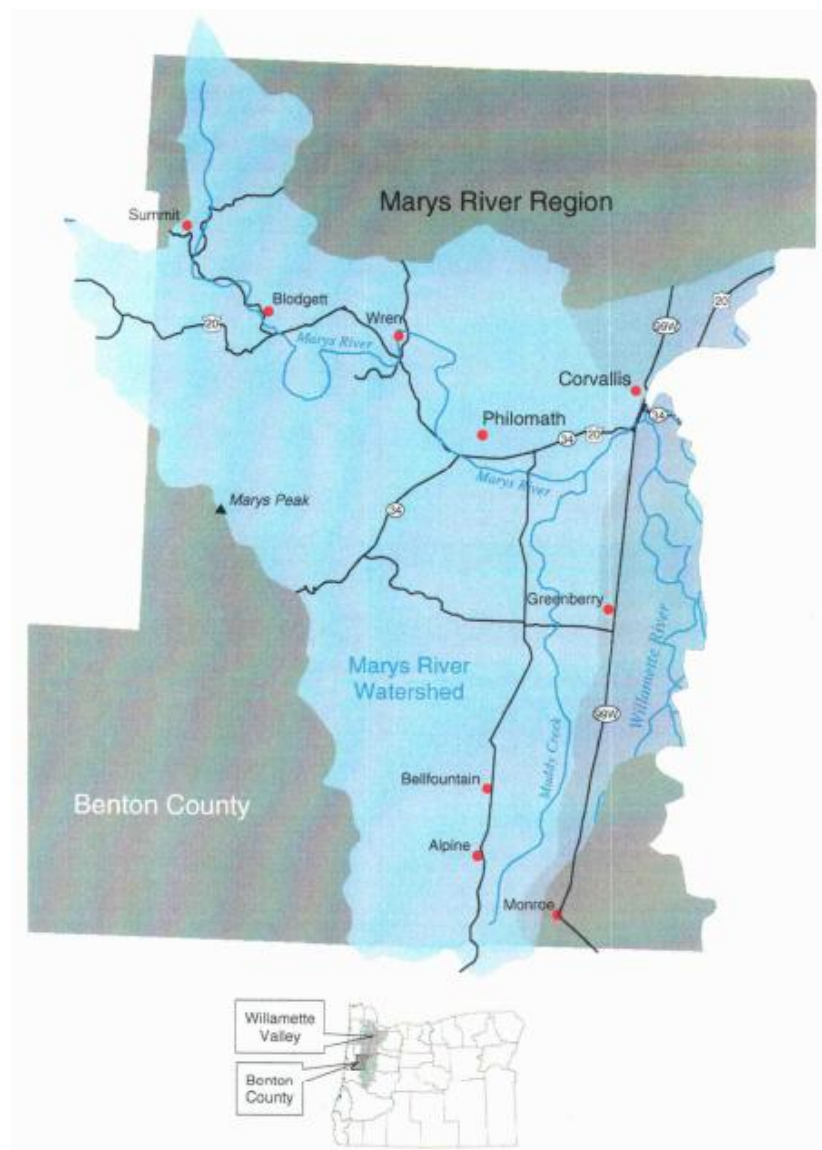


Figure 3: The Mary's River region (Burke 2003)

The research area for this study is bounded by socio-ecological notions of space and place, with a number of regional changes having occurred over time, influencing present-day farming practices. Studying the visual appearance of each individual farm, the type of farm, and its physical setting within the local landscape was critical to addressing space and place for a more complete understanding of the farmer's identity in the region. Through participant observation among farmers in the region over time, I was able to build on that local knowledge and adjust the focus of study and research questions within the critical synthesis accordingly. There are aspects of this research project which are similar to those of McCarthy (2002), Robbins (2006), and Walker (2003) in that many farmers in the region are from several different areas of the country and various walks of life but they all live, interact, and do business in the Marys River region. Like many other regions in the rural American West, communities in the Marys River region have become more diversified due to a loss of resource dependent economies, based predominantly on large-scale crop production, canneries, and the timber industry. Changes in political policies and the priorities of agribusiness industries within the region and at the national and global levels have led to shifts in crop and livestock production throughout the area.

As Thompson (2010) has stated, understanding the worldviews of stakeholders involved in a study requires looking at the history, geography, and politics of the particular region. Many of the historical changes in land-use patterns and agricultural practices throughout the Marys River region are relevant to understanding contemporary issues and definitions of sustainability. Therefore, it was appropriate to

include the following chapter as part of the critical synthesis of literature reviewing the history of agricultural land-use and assessing geographical data pertaining to the region. Examining historical and ethnographic literature, including maps and photos allowed for a more complete understanding of the study area and how it has changed over time. Historical documents provide more than just information; they are artifacts that provide a narrative describing the culture of the area (Holliday 2002). Seeing documents as artifacts and the ordering of topics within documents helped me to understand what issues the writers considered most important, along with insights into the values and ideology of those who put those documents together.

During this study I also collected ethnographic information through semi-structured interviews with farmers and continued participant observation in the Marys River region. Participant observation at local farms, farmers' markets, and farm stands allowed me to gather information about agricultural production and to recruit participants for possible interviews. During the winter of 2011-12, I approached 86 different farmers via e-mail, telephone, or in person, using a scripted introduction, asking for permission to conduct personal interviews with farm owners. Interviewees were chosen by non-random, opportunistic, purposeful sampling from the lists of farmers found on various websites and through participant observation and interacting with local farmers (Bernard 2006). Participants had to meet the qualification of farming within the Marys River region. The outcome of my search was a 33% positive response rate, allowing me to conduct 28 semi-structured interviews with farmers from 24 different farms. Four of the interview sessions were with two participants working on the same farms. At two farms I spoke with the husband and wife owners

separately, at another farm I spoke with the husband and wife owners together, and at one farm I interviewed the owner and manager separately. The participant population consisted of all adults, male and female, over the age of eighteen farming within the Marys River region. To create a more representative sample for the study, people from various family and farming configurations were interviewed. I also worked to seek out participants from diverse areas within the region and to develop a fairly even range of different farm-sizes, farm types, and differing landscapes for a more representative sample. To ensure confidentiality for all research participants, a pseudonym was assigned to each participant so that their interview information cannot be traced to any particular individual. I have included a table listing the pseudonyms used and the farm size of each participant in Appendix (A).

Each interview was approximately one hour in length and conducted at the convenience of the interviewees, at the location of their choice. Interviews were confined to adults with the ability to answer questions through their own abilities and each participant was given a consent form to sign prior to being interviewed. Part of the consent process involved authorizing the use of a digital recorder for interviews with the majority of participants agreeing to have interviews recorded. Questions were open-ended and designed to stimulate conversations relating to sustainability and farming practices. A list of questions asked during interviews can be seen in Appendix (B). All interview data was stored in a locked storage space, with only the Principle Investigator and student researcher having access to the storage area. For digital data, one computer was used, with all names expunged and replaced with pseudonyms.

Transcripts from interviews were analyzed and coded using a grounded theory

approach to develop themes (Bernard 2006; Holliday 2002; Charmaz 2008). The constructivist approach to grounded theory developed by Charmaz (2008) was particularly useful for this study. According to Charmaz;

Constructivist grounded theorists take a reflexive stance on modes of knowing and representing studied life. That means giving close attention to empirical realities and our collected renderings of them—*and* locating oneself in these realities. It does not assume that data simply await discovery in an external world or that methodological procedures will correct limited views of the studied world. Nor does it assume that impartial observers enter the research scene without an interpretive frame of reference. Instead, what observers see and hear depends upon prior interpretive frames, biographies, and interests as well as the research context, their relationships with research participants, concrete field experiences, and modes of generating and recording empirical materials. [2008:206]

This interpretive approach helped me to find my own place in the research and consider past studies and field experience to develop an interpretive synthesis of information examining and comparing the sustainability definitions of study participants and those of academia and other outside sources. The constructivist perspective allowed me to remain reflexive while simultaneously collecting and analyzing data, comparing findings during the study, and refining the theoretical framework of the study throughout the research process. Use of participant observation, historical and contemporary background information, and semi-structured interviews served as a means of triangulation for this research. That process helped establish familiarity with the setting and ensured a deeper grasp of the meanings behind social actions among farmers in this study. Using a constructivist grounded theory approach for examining and interpreting information acquired through discourse on agriculture at the local level, integrated with themes acquired through a review and synthesis of relevant studies within the broader context of global

agriculture, provided a basis for developing the proper research questions for this study. The themes that developed while considering the multiple issues addressing farmers' perspectives of sustainability resulted in the following research questions:

- 1) How do farmers in the Marys River region define agricultural sustainability?
- 2) What methods do farmers use to develop more sustainable agroecosystems?
- 3) What do farmers consider to be the most important issues in developing a more sustainable regional community within the globalized system of agriculture?

Integrating the qualitative information gathered from local farmers with historical and contemporary background information on land-use in the region allowed for a more complete description of farmers perspectives on the social, economic, and environmental aspects of sustainability in the Marys River region. The resulting information will help fill gaps in the existing literature on sustainability and agricultural land-use in the area. A more complete description and understanding of farming issues will allow farmers, policy makers, and other institutions to better work together in making more informed decisions that will help build stronger communities and a more sustainable bioregion within the global marketplace.

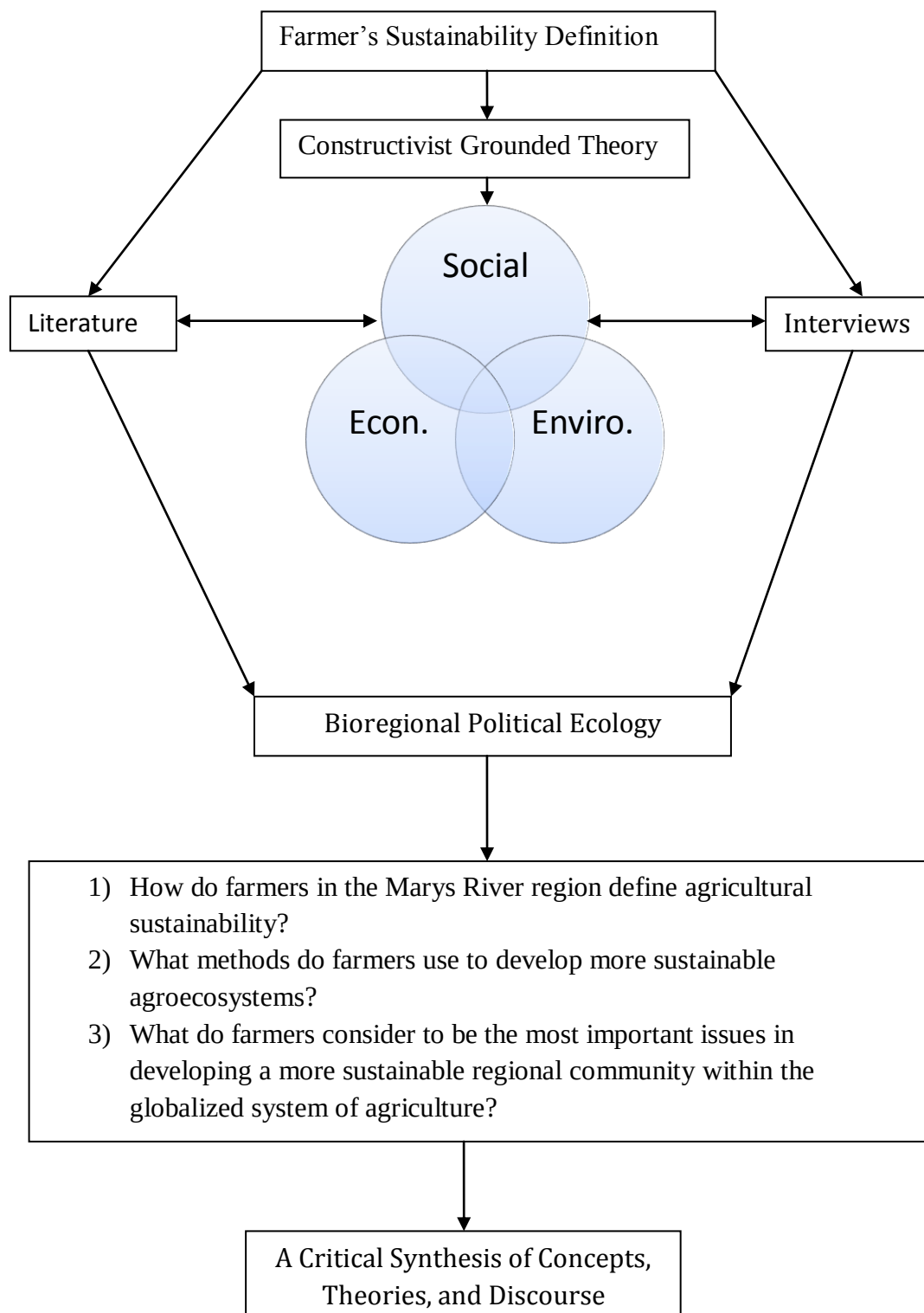


Figure (4) Theoretical Framework

Chapter Four: Agricultural History of the Marys River Region

A foundational concept of bioregionalism and sustainability is reinhabitation through the development of place-based knowledge. Such knowledge is necessary to understand ecological relationships as well as social and political relationships within local communities throughout the bioregion. Place-based knowledge comes from an intimate understanding the geographic, ecological, and human history of an area based on the perspectives of multiple stakeholders over time. As Thomashow states, “The local landscape can no longer be understood without reference to the large patterns of ecosystems, economies and bureaucracies” (1999:126). Hipwell (2004) argues that it is possible for communities to be reinhabited through an increased understanding of both eco-geographical and cultural features within particular regions. Eco-geographical features comprise the ecology, topography, and climate of the area while cultural features include history, land-use practices, language, and self-identification with the region. This brief agricultural history of the Marys River region and the broader Willamette Basin is designed to provide insight on how important the history of the region is in determining agricultural practices and resource use today. By developing a more complete diachronic understanding of the area through an examination of eco-geographical and cultural features, it is possible to increase place-based knowledge of the bioregion.

Physical Landscape of the Marys River Region

The Marys River region encompasses approximately 236,138 acres of lands that include agricultural, forested, and urban areas. The majority of the region falls within the 432,961 acre Benton County, located on the western side of the 12,000

square mile Willamette Valley. From the headwaters to the mouth of the Willamette River, the Valley is 175 miles long and averages 80 miles in width, measuring from the crests of the Cascades and Coastal mountains. The Valley floor drops from about 450 feet in elevation at Eugene to nearly sea level at Portland, with an average drop of less than three feet per mile. The city of Corvallis lies at 250 feet elevation while Marys Peak is 4,200 feet, the highest point in the Coast Range. The Marys River is 40 miles long from the headwaters located high in the Coastal range to the mouth in Corvallis where it empties into the Willamette River. The Marys River, like most west slope river systems, tends to have high water flows during the winter months and low flows during the dry summer months (Burke 2003; Ruttle et al. 1974; Willamette Valley Project 1936; Ecosystems Northwest 1999).

Most of the Marys River region falls within Benton County but small outlying areas fall within Lincoln, Polk, and Lane counties. The western border of the Marys River region begins at the source of the Marys River in Lincoln County and runs through the Coastal mountain range while the Willamette River forms the region's eastern border. A small portion of the South Muddy Creek sub-basin lies in Lane County. The Upper Marys River runs through a small portion of southern Polk County. There are several tributaries of the Marys River including the Tumtum River, Muddy Creek, Norton Creek, Wren Creek, Blakesley Creek, and Horton Creek. Sub-basins of the region are within the Marys River watershed and the Muddy Creek drainage basin. The Marys River empties into the Willamette River in the city of Corvallis and about five miles upstream from the mouth of the Marys River is the confluence of Muddy Creek (Ecosystems Northwest 1999).

The Marys River region can be broken into three separate zones; the upland zone, where forestry is still one of the more important industries, the valley zone, where agriculture is prominent, and the urban zone, which consists of Corvallis and Philomath. The western and northwestern areas of the region are mostly covered by second growth forests growing on steeper slopes, with farms that are mostly smaller in size located in flatter valley areas. The eastern portions of the region are located on the Willamette Valley floor where agriculture is more prominent and farms are often larger than in the western foothills. Corvallis, with a population of 54,462, is located about eighty miles southwest of Portland. It is the Benton County seat and the largest city in the Region (Ecosystems Northwest 1999; Bowen 1978).

Land-Use and Population

Land-use in the valley zone of the Marys River region is a mixture of large grass seed farms and Christmas tree farms, as well as smaller acreage farms producing a number of agricultural crops. Land-use patterns in the valley are shifting from mostly rural farm holdings to more residential homes and housing developments in rural settings. Land-use laws in Oregon have regulated growth in urban areas and controlled growth in areas zoned for agriculture and forestry use. However, there have still been major landscape modifications in the Marys River region due to increases in population, new homes, roads and recreational activities in the region (Robbins 2004; Census of Agriculture 2007).

Geology and Soils

The Marys River region of the Willamette Valley contains a broad alluvial plain with many different soil types. The catastrophic Missoula Floods that occurred near the end of the Pleistocene epoch, between 18,000 and 12,000 years ago, carried

glacial ice and waters filled with ‘erratic’ boulders and sediments that were left behind after the floodwaters receded. According to Loy, “the Willamette Formation represents fine sediments that settled out of the turbid waters onto the lakebed before the valley drained out to the north” (2001:133). There are also marine sediments in the Coastal Range on the western margins of the region that were deposited up to 50 million years ago when the area was underwater (Loy 2001). Table (1) gives an outline of the various soil series encountered throughout Benton County. A detailed description of these soil types can be found in Appendix (C).

Table 1: Acreage for each soil series in Benton County.

Soil Series	Acres	Percentage of County Area
Rough Mountainous Land	153,344	37.0
Melbourne	53,568	13.0
Olympic	39,872	9.8
Aiken	38,720	9.3
Chehalis	31,936	7.7
Amity	18,112	4.4
Wapato	16,896	4.1
Newberg	16,448	4.0
Willamette	14,976	3.6
Dayton	9,152	2.2
Sites	6,144	1.5
Carlton	5,632	1.3
Cascade	3,392	.8
Grande Ronde	2,688	.6
Cove	2,112	.5
Salem	512	.1
Riverwash	512	.1
Camas	448	.1
Whiteson	256	.1

(Benton County Resource Atlas; Ruttle et al. 1974)

Climate and Hydrology

The climate of the Marys River region is temperate. Winters are mild and wet, with about 70 percent of precipitation falling during the winter months, while summers are warm and usually dry. Higher elevations within the Coastal Range can receive over 100 inches of precipitation per year, and rainfall decreases to about 40 inches per year in the lower elevations of the Valley. The average growing season on farms near Corvallis is 215 days (Ruttle et al. 1974). With the Willamette River bordering the eastern edge of the county, and the Coastal Range to the west, the Marys River region experiences a number of different microclimates, rainfall, plant and animal habitats, and soil types at various elevations. These factors all influence what can be grown by farmers and how farms are managed in different areas within the region.

Historical Background of the Marys River Region

In order to present a more complete historical description of the Marys River region, it is necessary to go beyond the boundaries of the study area to include the process of human settlement that took place within the Willamette Valley and the Pacific Northwest ecoregion. Examining the history of European and Euro-American settlement via the long-term influx of immigrants from the larger nation and beyond helps provide context for the study and gives some explanation for the current agricultural conditions in the region. This is by no means an exhaustive history of the region, but rather a summary of relevant events and time periods that helped shape the development of contemporary social, economic, and environmental issues in the Marys River region.

The Kalapuya Influence

Although the main focus of this study is agriculture, it is useful to set the stage for how agriculture in the Willamette Valley developed over time. Before there was contact with Russian and Spanish, and later British, Canadian, and US traders, the indigenous peoples called the Kalapuya inhabited the region. Estimates of native population density at the time of European contact vary somewhat. Boyd (1996) states that, according to the Hudson's Bay Company and Lewis and Clark figures, the estimated population of Kalapuyans in the Valley ranged from 7,785 to 9,000 inhabitants. However, "Allowing for mortality from two earlier smallpox epidemics (circa 1775 and 1801-1802) yields a conservative aboriginal population of 14,760..." (Boyd 1996:99). By 1841, about 400 Kalapuyans were left in the Willamette Valley (Boyd 1996; Bunting 1997). The not unfamiliar story of decimation of native tribes through lack of resistance to exotic diseases like smallpox, malaria, and influenza, while being pushed off the land by incoming settlers, describes the dramatic decrease in population over a few short decades.

The Kalapuyans managed the landscape through the use of fire to maintain the prevailing oak savanna ecosystems within the Willamette Valley. There are a number of different references to burning made by Euro-American traders, missionaries, and settlers in the Valley. A journal entry made by missionary Henry Eld in 1841 describes the geography of the region during the summer burning season;

Atmosphere filled with smoke consequently unable to see much of the surrounding country. Country much burnt...Our route has been through what might be called a hilly prairie country, the grass mostly burnt off by recent fires, and the whole country sprinkled with oaks, so regularly dispersed as to have the appearance of a continued orchard of oak trees. [Boyd 1996:104]

Frequent burning of large areas in the region controlled the spread of unwanted plants while encouraging the growth of those which were useful to the human inhabitants. Fires also made hunting and gathering of foods more effective. Controlled fires were used as a deer hunting tactic, restricting deer to unburned feeding areas where they were easier to find and allowing hunters to encircle the animals (Gibson 1985; Boyd 1996). Fires were also used as a tool for collecting grasshoppers: “When it was summertime they burned over the land when they wanted to eat grasshoppers. When they burned the land, they burned the grasshoppers (too). And then they (women) gathered up the grasshoppers, and they ate those grasshoppers it is said” (“Kalapuya Texts” in Boyd 1996:115). The gathering of staple foods like tarweed (*Madia spp.*), acorns (*Quercus garryana*), and hazel nuts (*Corylus cornuta*) were also facilitated by the burning of fields prior to harvest. Although Euro-American settlers in the region took full advantage of the already cleared landscape for agricultural purposes, the displacement of the Kalapuya peoples and subsequent repression of field burning by settlers led to a changed landscape. Fewer fires in the Valley caused an influx of new plants and encroaching Douglas fir forests into the region (Bunting 1997; Gibson 1985; Towle 1974).

Early Pioneers—pre-1850

Early expeditions to the Pacific Northwest by Spanish, Russian, and British explorers were sporadic and claims of sovereignty over the region were few. However, with the arrival of explorer Captain James Cook in 1778, and the subsequent publishing of Cook’s journals in 1784, European contact, primarily through the fur trade industry, became more intense. Although competing nations argued over

possession of the land, Russian interests were focused primarily on the regions farther north toward Alaska, while the Spanish continued to withdraw toward the south until, by the 1790s, the United States and Great Britain were the principle nations struggling for control of the region. The British and Euro-American settlers to the region would continue to struggle for control for the next several decades (Bunting 1997).

Lewis and Clark's Corps of Discovery expedition (1804-1806), arranged by Thomas Jefferson was designed to establish a transcontinental route to the Pacific Northwest. Although the expedition focused on geographic and scientific discovery, it was also intended to promote the expansion of American interests into the region, further establishing control and sovereignty of the United States (Bunting 1997). While political disputes between the British and US governments had a continuing influence on the settlement of the Pacific Northwest, it was the business interests of the fur industry, through the US owned Pacific Fur Company, and the British owned Hudson's Bay Company that perhaps had the most dramatic cultural and geographical impacts on the region. During the early nineteenth century, the influx of Americans into the Pacific Northwest as a means of countering the British presence there was primarily the result of opportunities available to individuals in the extensive fur trade industry (Robbins 1997).

The first European settlements in the Willamette Valley were established to provide goods for the major fur trading companies in the area. By the 1820s, 'Bay men' were settling the Willamette region, which provided deer and elk hides as well as pasture for horses and cattle. It was mostly servants and trappers retiring from the

Hudson's Bay Company who began to settle the area for any lasting period of time (Gibson 1985; Robbins 1997). In 1836, Reverend Samuel Parker stated;

It being necessary that the gentlemen, who are engaged in transacting the business of the [Hudson's Bay] Company west of the mountains, and their laborers, should be better and less precariously supplied with the necessities of life, than what game furnishes; and the expense of transporting suitable supplies from England being too great; it was thought important to connect the business of farming with that of fur, to an extent equal to their necessary demands. [Gibson 1985:9]

The favorable geography and mild climate of the Willamette Valley provided open grasslands and ample grazing for livestock. The Valley was attractive to the Bay men; "partly because they were used to, and fond of, the lower Columbia, partly because they were aware of the agricultural advantages of the Valley, and partly because they knew that their country wives and children would be ostracized in the Canadas" (Gibson 1985:130).

The success of the Pacific Northwest fur trade was built on the expansion of global capitalism and market demand for furs. Competition in the region led to decimation of the beaver population as well as other fur-bearing animals and caused what were called 'fur deserts', altering the natural and cultural environment of the region (Robbins 1997). The overharvesting of fur bearing animals like beaver and otters, along with a shifting consumer demand toward a preference for silk instead of beaver hats led to a decline in the Pacific Northwest fur trade (Bunting 1997). As the fur trade was declining, the slow trickle of American settlers and retired mountain men continued to move into the Valley. According to Gibson, "The first American homesteaders were dropouts from the two abortive trapping, fishing, and trading ventures of Nathaniel Wyeth in 1832-33 and 1834-35" (1985:131). Many of the new

arrivals to the region were very poor and had suffered losses along the overland trail. New settlers often needed to be fed and sheltered until they were able to build homes and provide for themselves. Bartering of labor and food commodities like wheat, potatoes, pork, and beef were the primary means of exchange during that early period (Fagan 1885; Bowen 1978). According to Bowen, “Wheat, the main cash crop both for local consumption and export, was especially important, for in the absence of an official currency the provisional government made it Oregon’s legal tender” (1978:68). In those first years of Euro-American occupation, the goal of settlers was to establish farms that would meet subsistence needs for themselves and others living in the region.

While the international market determined export of furs and agricultural products out of the region, it was the continuing exhortations of outside political forces geared toward expansion that began to affect the influx of settlers into the region. ‘Oregon fever’ was beginning to build up during the 1830s as increasing numbers of farmers from eastern and Midwestern portions of the County sought new lands farther west. Expansionist desires were “inflamed by the intemperate charges of British oppression and conspiracy by publicists like Hall Kelley and Senator Thomas Benton of Missouri, all of whom petitioned and appealed for extension of American Sovereignty and settlement to the Pacific” (Gibson 1985:133). The focus of expansion began to shift from promotion of the fur trade to establishing an agrarian presence in the region.

Joel P. Walker’s family was in the first wagon train to leave Missouri in 1840 for the express purpose of settling in the Willamette Valley. That migration marked

the transition toward more permanent agrarian based settlement. The “Great Migration” of 1843 brought another 800 settlers to the region and by the end of 1845 there were 4000 to 5000 Americans living in the Willamette Valley (Gibson 1985; Bunting 1997).

By 1849, a population of 870 people had settled in what was then Benton County. It is important to remember that, at that time the county was much larger and covered an area extending to the Pacific coast in what is now a large portion of Lincoln County (Bowen 1978; Fagan 1885). Fagan describes a few important land claims in the region;

During the winter of 1845 several claims were taken, notably that of J. C. Avery, on which the southern portion of the city of Corvallis is now built, while the northern part was taken up in the spring of 1846 by William F. Dixon. That year too came Nahum King, who gave his name to King’s valley, with his sons Isaac, Stephen, and Solomon and his son-in-law Rowland Chambers; on Soap Creek, Arnold Fuller and David Carson, had located; where Philomath now stands. [1885:324]

During the winter of 1847, Avery began to lay out the town of Marysville at the mouth of the Marys River. In 1853, the name Marysville was changed to Corvallis.

According to the Benton County Historical Society, postal authorities asked that the name be changed because the town of Marysville California was on the same stage line as Marysville Oregon Territory. There are conflicting stories about the identity of the ‘Mary’ responsible for naming so many landmarks in the region (Fagan 1885; Ecosystems Northwest 1999).

1850-1900

Although there were a number of gold discoveries in the Pacific Northwest region, mostly in coastal areas, it was the prime agricultural lands of the Willamette Valley that attracted the majority of Euro-American settlers between 1840 and 1860.

Promoted as a 'garden' environment that could be easily converted to agricultural production;

The Willamette Valley was a mosaic of foothill forests, oak openings, riverine woodlands, marshlands, and prairies. Shaped by moisture, soil, and fire, Willamette Valley was a physical landscape that settlers deeply appreciated both materially and perceptually. [Bunting 1997:73]

The settlers who continued to pour into the Valley preferred farming sites that were on the edges or transition zones between the prairie and woodland areas where the necessary resources for establishing farms were available. "If the grassland was preferred for agriculture and livestock range, timber for fencing, shelter, implements and fuel was a necessity better acquired from one's own land than elsewhere" (Towle 1974:82). The influx of immigrants into the area, along with the removal of indigenous peoples from the Valley, led to far less fire-based management of the grasslands and resulted in an increase in the amount of woodlands in the area that had previously been part of the savanna geography (Towle 1974; Robbins 1997). Fagan tells of one man who settled a land claim in what is now Corvallis;

There were just four or five log cabins and a few people and a little stock. But, I tell you, you should have seen this valley then! Grass up to your waist for miles—it was a fine country—you could ride just where you liked. There was no brush till you came right to the timber on the hills. You see, the Indians used to burn the grass every year and the brush did not grow up till these fires were stopped. [1885:332]

Settlers also altered the natural makeup of the Valley by further harvesting of local wild animal populations. "To protect their domestic animals and crops, the new settler population waged wholesale campaigns to liquidate wolves, cougar, bear, and elk" (Robbins 1997:77).

The farming practices of those early settlers were the first step in the alteration of the landscape but, it was the increasing intervention of market driven government policies aimed toward increasing the commercialized extraction of agricultural and timber resources which caused the more dramatic transformations of the Willamette Valley. The federal government established the boundaries of the Oregon Territory in 1848 and “assumed formal control of Northwest land policy” in 1850 (Bunting 1997:97). Ideas of patriotism and manifest destiny may have played a part in motivating the migration of settlers to the region but, in the end, it was the lure of 640 acres of free land through the Oregon Donation Land Law, and after 1862, the Homestead Act that brought the greatest influx of homesteaders to the area (Gibson 1985; Bunting 1997). Robbins states;

In September of 1850, Congress passed the Oregon Donation Land Law. The legislation validated legal title to land already claimed by white settlers (most of it in the Willamette Valley) and served as an inducement to encourage additional immigration to Oregon Territory. Before the act expired in 1855, it is estimated that 25,000 to 30,000 immigrants, mostly of Euro-American descent, entered the territory, and increase in that population of nearly 300 percent. [1997:83]

As the more open areas of prime arable land in the Valley became occupied by farms, new settlers began to move into the more heavily forested upland areas. The difficulties of removing heavy timber growth and weeds caused many farmers to use fire to clear the land for agriculture. The large areas of forest that were often cleared by fires well beyond the land-claims of individual settlers were seen as a positive effect of forest removal. According to Bunting, “As Frances Fuller Victor commented, forest fires could reveal ‘fine level benches of land fit for farming’ that otherwise would have remained hidden” (1997:82). As the Willamette Valley became increasingly populated, there was an overall transition in agricultural practices from

subsistence farming and bartering to a more commercialized system of growing grain crops, primarily wheat, for export.

The California gold rush brought increasing numbers of people to the West and was influential in the expansion of the grain market in the Pacific Northwest. According to Robbins, "Wheat output in the Willamette Valley increased from fewer than 200,000 bushels in 1850 to 660,081 bushels in 1860 and then burgeoned to 2,086,826 bushels in 1870" (1997:100). The substantial increases in wheat production can be attributed to planting larger fields in the more fertile alluvial soils of the floodplains and improved river transportation for sending crops to outside markets. In Benton County, wheat was also a major crop with total yields reaching 300,000 bushels by 1873. The Marys River was used for transporting crops to markets and granaries but, the primary use of the river during that period was for driving logs to the several sawmills in the Valley (Farnell 1979).

Although the floodplains provided excellent soils for growing wheat, they first had to be drained through a labor intensive process of ditching that diverted waters away from the fields and reduced crop flooding (Bunting 1997). One of the greatest difficulties in the earlier years of settlement as well as today in the floodplains of the Valley is the problem of flooding occurring fairly often and causing great destruction to livestock, crops, and farm buildings. The major alterations to the Willamette Valley's waterways through clearing debris and snags from the rivers were designed to both improve transportation of crops to the markets in Portland, and to help speed floodwaters away from farmlands. In 1871, the federal government funded the building of a steam powered "snag puller" that was designed to remove debris from

the Willamette waterway (Robbins 1997). According to Robbins, “Along with the diking and revetment work that soon followed, the Willamette and its major tributaries were in the process of being converted into rationalized components of a transportation infrastructure that linked material abundance of the Willamette Valley with distant markets” (1997:101). It is important to consider the position of Portland at the junction of the Willamette and Columbia Rivers as a hub for the transportation of wheat and other resources on the commercial market. Robbins states;

With only five or six commercial houses in 1850, Portland expanded to more than 40 mercantile establishments by 1853. In addition, the booming town had four steam sawmills, a planing mill, and several small manufacturers, while sailing vessels from San Francisco arrived daily. And where a single steamboat plied the Columbia and Willamette between Astoria and Portland in 1850, three years later that number had increased to fourteen. [1997:102]

The expansion of wheat production in the Marys River region and within the Willamette Valley during that period was spurred on by new technological innovations in farming and transportation leading to further commercialization of the agriculture industry.

Robbins (1997) argues that although the navigable waterways of the Willamette and Columbia River’s were important to expanding agricultural production in the region, it was the railroads that had the greatest impact on agriculture in the Willamette Valley. Before rail lines were available for transportation, shipment of wheat downstream to Portland was limited mostly to the rainy season. Completion of railways connecting Oregon and California, and an increased volume in overseas wheat sales were responsible for the most dramatic expansion in wheat production of the nineteenth century; from 2,086,826 bu. in 1870 to 5,365,117 bu. in 1880 (Boag 1992; Robbins 1997). In 1883, the Northern Pacific Railroad tied Tacoma to Duluth

Minnesota, while the Southern Pacific linked Portland with Sacramento in 1887. Interregional railways continued to connect with each other until, by the early twentieth century; all the major western cities were joined to other cities throughout the country (Bunting 1997). The opening up of new wheat growing regions in eastern Oregon and the Palouse Country during that time lured many farmers from the Willamette Valley and increased market competition within the larger ecoregion of the Pacific Northwest (Towle 1974). Although the focus of this study is on agriculture in the region, new technological innovations and improved transportation systems also had a huge impact on the timber and salmon industries as well as the mining industries throughout the Pacific Northwest.



Figure 5: Harvesting wheat: <http://oregondigital.org/u?/archives,1960>

Although the dominant crop grown by settlers in the Valley was wheat, it is important to note that a number of other staple crops, along with livestock, were also grown for local consumption and export. While many wild berries and a fair amount of hazel nuts continued to be available to settlers, declining deer and elk populations made owning livestock important for both trade and consumption. The following

tables show the increases in production of various agricultural products within Benton County. The results of the Ag Census for the year 1900 was left out of these tables because there were significant changes in the way products were evaluated and categorized. Adding the extra data would have made analyzing results unnecessarily complex since my goal is to simply describe what crops and livestock were grown in the region during the last half of the nineteenth century. The tables show a fairly sharp increase in the numbers of animals being raised and the amounts of grains grown between 1850 and 1860, suggesting the impact of the Oregon Donation Land Law resulting in a population increase in Benton County from 870 to 3074 in one decade.

Table 2: Livestock and Animal Products

Census Year	Horses	Mules	Milch Cows	Other Cattle	Working Oxen	Sheep	Swine
1850	675	26	111	2771	665	629	3586
1860	3188	79	3138	6035	222	6588	6338
1870	2263	126	2665	3494	70	12,957	8081
1880	3300	86	2500	3752	144	28,750	6599
1890	3507	41	3915	9242	158	25561	7726

(Census of Agriculture: Benton County Oregon)

Table 2: Continued

Census Year	Poultry	Eggs Dozens	Butter in Pounds	Cheese in Pounds
1850	N/A	N/A	41,065	12,080
1860	N/A	N/A	108,445	9067
1870	N/A	N/A	100,880	5530
1880	23,037	80,010	87,684	5127
1890	44,188	153,435	172,726	120

(Census of Agriculture: Benton County Oregon)

Table (2) shows that while butter continued to be a high production commodity in the region, the production of cheese declined. A growing population and more stable

infrastructure in the Marys River region allowed for increased diversification of farm production to include poultry and eggs as saleable commodities. In table (3) the 1890 census for the first time listed the bushel amounts of various orchard products grown in the County.



Figure 6: Irrigating young fruit trees: <http://oregondigital.org/u/?archives,2789>

Table 3: Orchard Products

Census Year	Apples	Apricots	Cherries	Peaches	Pears	Plums & Prunes
1890	46,029	22	1233	1541	3959	6582

(Census of Agriculture: Benton County Oregon)

Table 4: Seed Crops and Potatoes

Census Year	Wheat	Indian Corn	Oats	Peas & Beans	Irish Potatoes	Barley	Buck-wheat
1850	14,913	40	193	231	1402	N/A	N/A
1860	55,125	5201	66,996	1643	14,882	265	129
1870	175,322	2343	146,235	470	38,320	7414	138
1880	497,008	790	256,822	315	84,202	5108	304
1890	394,533	534	391,842	126	53,288	8433	116

(Census of Agriculture: Benton County Oregon)

The amounts of seed crops and potatoes shown in table (4) gives an idea of which crops were most useful as market commodities and those grown more for local consumption. As noted earlier, peas, beans, and potatoes were important staple crops in the region while wheat and oats obviously became important market commodities. Corn was not grown extensively in the region, likely because of the need for irrigation later in the growing season.

Table 5: Seed Crops and Market Gardens

Census Year	Rye bu.	Grass Seed bu.	Flax Seed bu.	Flax in Pounds	Hay in Tons	Market Gardens
1850	N/A	N/A	N/A	100	N/A	\$5987
1860	N/A	511	N/A	N/A	1110	\$10,610
1870	211	164	3124	1050	4176	N/A
1880	165	208	453	N/A	10,798	\$41,373
1890	1689	4		N/A	14,695	\$15,758

Census of Agriculture: Benton County Oregon)

Table (5) shows that grass seed was harvested in smaller quantities even during the nineteenth century while market gardening also has a long history as an important component of agricultural production in the Willamette Valley and the Marys River region. These tables suggest a system of mixed agriculture with both smallholder farms and larger operations existing together in the area.

It is important to remember that, while urban business and manufacturing interests were promoting expansion and development through ties with outside markets, many farmers remained focused on a regional economy designed to meet the needs of local inhabitants while exporting surpluses. Still, there were many complaints about the lackadaisical practices of many farmers on large Land Donation Claims. Frances Fuller Victor stated;

In the first place, the farming community of the country was derived originally from the border States, as they were thirty years ago. They had never been *good* farmers in the States of Missouri, Illinois, or Kentucky. Upon immigrating to Oregon they received a large body of land—too large to cultivate properly—with no adequate market for its productions, if they could or would work it. They consequently fell into the habit of raising a little grain indifferently well, of raising stock in the same manner, without caring to improve it materially; of living on what they could buy with the money obtained for what they had to sell—instead of producing—a hundred things which the careful and thrifty farmer supplies himself with...[Bunting 1997:99-100]

Toward the end of the nineteenth century, farming practices began to reflect the social and economic changes of the Pacific Northwest region. Farms began to be broken into smaller tracts and managed more intensely. However, as Bunting states, “agribusiness was still not the dominant ethos, and much of the land remained ‘unimproved.’ The homogeneity, self-governance, isolation, and early settler spirit maintained itself long after settler society gave way to a more urban, industrial Oregon” (1997:101).

Although the dominance of industrialization continued to grow into the twentieth century, the pioneer spirit of independence and self-sufficiency was, and is, firmly ingrained in the people of the region.

1900-WWII

To help develop a better understanding of the predominantly instrumentalist views of business leaders in the Willamette Valley region at the turn of the twentieth century, it is useful to consider the 1905 Lewis and Clark Centennial Exposition and the words of organizing committee president Jefferson Myers;

Oregon alone, he said, had ‘more native underdeveloped resources than any other commonwealth within the United States.’ Its virtually untouched and immense forests, its mines barely past the stage of discovery, and its fisheries were ‘only producing a small part of the revenue’ they were capable of. What the state required, Myers reported, was the ‘industry, ambition, and wealth’ to turn those resources to its advantage. [Robbins 1997:197]

The dominant mechanistic worldview of business leaders at that time focused on management of resources through the engineering of the natural landscapes for utilitarian purposes. While conservation was an important issue, the focus was on the instrumental value of resources and development oriented conservation through the highest utilization of resources. Resource management goals were based on the utilitarian ideals of Gifford Pinchot, which argued for development as the greater good for the greater number of people (Merchant 2005; Robbins 2004). That motivation led to major impacts on the waterway systems throughout Oregon and the building of the extensive dam system on the Columbia River and its tributaries. The goal of business and investment communities that promoted development throughout the region was to harness nature by establishing hydroelectric power, improving transportation on waterways, and reclaiming arid sections of land for agriculture through improved irrigation systems (Robbins 1997; 2004).

While regional planning and resource development continued during the first decades of the twentieth century, it was primarily during the Great Depression years that the major dam projects were undertaken. President Franklin Roosevelt was very influential in promoting the building of dams on the Columbia and Snake Rivers. Roosevelt saw the potential of those rivers in providing work for people during the Depression and also for providing hydroelectric power. The prevailing attitude during the Depression years was that any large-scale projects that put people to work were considered patriotic and done for the good of the Country rather than simply profit opportunities (Robbins 2004). Although the larger dam projects on the Columbia River are outside the scope of this study, examining those events helps to give a better

understanding of when and how the federal government became more influential in the region and in the development of industrialized agriculture. As Robbins states, “the engineering efforts directed at western Oregon's major waterway provide insights to the integration of politics and economics and to the complex of motives that inspired the infinitely more intrusive human presence in the Willamette Valley landscape” (1997:283).

Early in 1935, a regional plan called the Willamette Valley Project was initiated to promote development of natural resources in the region under the auspices of the Works Progress Administration, a New Deal agency designed to provide jobs during the Depression. The elements of the Willamette Valley Project plan relevant to this study were “A coordinated water plan for control and use of waters through stream flow regulation and storage of now wasted runoff” and “A Program for agriculture and agricultural land use, including soil conservation” (Willamette Valley Project 1936:13). Both the water and agricultural land use plans of the project aimed at more intensive use of agricultural lands through flood control, proper drainage, and irrigation. Project work was focused mainly on bank protection and clearing of flood channels. The idea was to clear downed trees and snags from the waterways to reduce erosion and speed the removal of floodwaters from crop field areas. Funding for the Willamette Valley Project allotted \$70,000 to channel clearing on the Marys River.

During the 1930s over 55 percent of Benton County was designated farmland and in 1935, there were 1,678 farms with the average size farm being about 146 acres. Of those 1,678 farms, 1,034 were fully owned by individuals. While the total agricultural area of the County remained about the same from 1900 to 1935, the

average farm size had decreased by 47.2 percent while the number of farms had increased 87.5 percent, due to subdividing of lands settled on Donation Land Claims. The changes brought about by the Willamette Valley Project allowed for the intensification of agriculture in the floodplain regions of the Valley. Increases in farm production were the result of that intensification rather than expansion of agricultural lands in the region (Willamette Valley Project 1936; Towle 1974). While flood control during the wet season made farm production more stable, it was increased irrigation that allowed for a more prolonged growing season and therefore greater crop diversification in the region. Irrigated acreage in the Valley increased from 3,000 acres in 1930 to 27,000 acres in 1940 (Highsmith 1956; Towle 1974). The goal of industrialization and agricultural intensification was to improve efficiency in land-use and provide water in the right quantities where and when it was needed.



Figure 7: Strawberry processing: <http://oregondigital.org/u/?archives,5039>

An important issue concerning water control in the Willamette Valley was the often insufficient supply of water necessary to maintain production in the canning industry. By the early 1920s, the food processing industry in Salem was booming. However, by the 1930s, Salem was beginning to experience problems with insufficient water supplies along the Willamette River, particularly during the busiest times of the canning season when several canneries were operating at the same time. Until a pipe bringing water from the North Santiam River was installed in 1938, the city system was unable to supply water to all of the canneries at the same time. Another problem for the canning industry was the lack of waste treatment facilities and the discharge from the canneries into the Willamette River. A treatment plant for wastewaters from canneries was not completed until 1952 (Lucas 1998). According to Lucas, “In the years before the treatment plant went into operation, you could tell by the color of the Willamette River which of the Salem canneries were operating” (1998:18). By the time of the Second World War, the mechanistic approach to solving the ‘problems’ of nature was firmly in place throughout the region. Increasing agricultural production was seen as a task that could be solved with improved efficiency, technology, and the transformation of resources into market commodities.

1945 to Present

Oregon’s contributions to the war effort during World War II caused a huge expansion in the timber industry, shipyards, the aeronautics industries, as well as increases in canning and agricultural production. The food processing industry, which had provided a great many jobs for workers in the region, had a significant role in agricultural production of the Valley. According to Lucas, “In 1945, canned fruits and vegetables were a vital part of the War effort, and all plants were working at full

capacity” (1998:1). Although demand for industrial manufacture of goods lessened after the War, many of the people who were involved in the labor force during that period decided to settle in the region. At the same time, the mechanization of agriculture both in field and dairy operations meant that less human labor was required on the farm, leading to more young people moving from rural areas to larger cities. Though the rural population continued to decline in the decade after the War, farm production and average farm sizes increased.

Oregon Agricultural College, which would later become Oregon State University, played an influential role in promoting the latest farming technologies and practices.



Figure 8: Extension agents and combine: <http://oregondigital.org/u/?archives,4124>

As Robbins states;

With most initiatives originating in Oregon State College in Corvallis, the combined effect of USDA, Experiment Station, and Cooperative Extension Service efforts fostered an ideology of progress and a belief that seemingly endless increases in agricultural productivity were possible. [2004:83]

Agricultural interests in Oregon became more closely tied to state and federal agencies that continued to adopt more progressive farming practices. As soils on the poorly drained floodplains of the Valley became less productive and wheat markets became more competitive, the far reaching political and economic ties of the regional agricultural industry allowed for new markets to develop. Although after World War II the goals of federal agencies were increasingly geared toward the notion of feeding a growing global population, increases in agricultural production in the Willamette Valley began to take a different turn.

The Oregon Department of Agriculture and other state agencies took an active role in promoting new agricultural markets and practices that had serious implications for crop production in the Valley, particularly in the expansion of grass seed production. Federal subsidies for grass seed production in the Willamette Valley began in 1939. The growing demand for grass seed at that time can be attributed to the need for decreasing erosion and rebuilding of soils in the southern states of the US (Towle 1974; Robbins 2004). According to Towle, “seed crops are among the few types for which the region has a strong natural advantage. A combination of summer drought and the absence of prolonged temperature extremes is ideal for seed culture” (1974:126). Many of the seed varieties grown in the region are ideally suited to the heavy clay soils of the Valley. Grass seed production has had a dramatic effect on the geography of the Willamette Valley. The marketing success of the grass seed industry

prompted farmers to expand economies of scale by clearing trees and shrubbery from lands to create ever larger fields, some encompassing more than 1000 acres. Larger fields and increasing demand also created a need for investing in larger farming equipment for planting and harvesting. One of the most significant outcomes of the expansion of grass seed production was the reintroduction of fire as a means of land management (Robbins 2004).

The burning of post-harvest fields solved many of the problems of weed control, disease control, and elimination of straw residue in the fields. Post-harvest burning promoted the re-growth of perennial grasses, increased seed production, and allowed for more effective application of the new chemical pesticides and fertilizers that were being developed in the first decades after World War II.



Figure 9: Field burner and crew: <http://oregondigital.org/u?/archives,2008>

According to Robbins, “open burning raised yields from an average of 300 pounds per acre to more than 1,000 pounds. Finally and most important, because burning destroyed shattered seeds following harvest, it enhanced the genetic purity and marketability of grass seed” (2004:89). The grass seed industry continued to enjoy increased market success for a number of years. However, the long-term environmental and social effects of field burning eventually became a concern for residents in the Valley.

As the population within the Willamette Valley increased over the years complaints over the burning of harvested fields also increased. Although open field burning began to decline during the 1960s with the advent of anti-burning activism, it was likely the major auto accident of August 3, 1988, on Interstate-5 near Harrisburg, killing seven people and injuring 37 others, that had the greatest impact on field burning restrictions. Changing agricultural land-use restrictions resulted in a decline of open-field burning from 315,000 acres in 1968, to 52,934 acres in 2001 (Robbins 2004). As the population of the Willamette Valley continues to rise, land-use issues have become a constant source of contention among the various stakeholders with differing worldviews in the region.

According to Walker (2003), it is necessary to understand the regional context of areas like the Marys River region among states in the American West with similarities that include large portions of public land and the commonality of water scarcity. Discussing parallel issues among communities and regions can help provide a common ground for political and ecological dialogue. There has been a shift in focus from the older resource-based economy of production and resource extraction to the

newer amenity-based economy of consumption in many areas of the larger western region. As Walker states, "The inevitable local conflicts that emerge as this capitalism clashes with older, production-based capitalism's, are, thus, central elements in a distinctive regional political ecology of the rural American West" (2003:17). A growing population with multiple interests and perspectives, generating increased economic and technological diversification within the Valley, has caused dramatic effects on the agricultural industry and on land-use over the last few decades. The continuing influx of people from other parts of the Country, along with those from the Pacific Northwest who are taking advantage of business opportunities in light manufacturing and skilled professions, have led to a dramatic increase in bedroom communities and smallholder farming operations in the region. Those demographic changes have led to a shift in focus from the utilitarian value of forest and agricultural lands to the development of residential and recreational business interests. However, the land-use system in Oregon is still closely tied to agricultural interests and the concerns about urban sprawl that often accompany increases in regional populations (Robbins 2004).

Land in farms has decreased over the last several decades in Benton County and the Marys River region. In the 1930s over 55 percent of Benton County was designated farmland but in 2007 land in farms was 114,558 acres, just over 26 percent of the total. In 1935, there were 1,678 farms with the average size farm being about 146 acres while in 2007 the numbers had decreased to 906 farms with an average size of 126 acres (Willamette Valley Project 1936; 2007 Census of Agriculture). The following tables show how agricultural land-use has changed over time.

Table 6: Changes in Farm Numbers in Benton County Oregon

Year	Number of Farms	Acres Land in Farms	Average Farm Acres
1945	1293	427,520	164.8
1954	1153	214,342	185.9
1969	575*	129,034	224.4
1978	588	117,883	200
1987	645	124,792	193
1997	726	130,818	180
2007	906	114,558	126

* USDA Farm definitions changed between 1954 and 1959, causing the number of farms to decrease by 119 farms but, the decrease in numbers is still significant and the average farm size shows that consolidation was a factor. (USDA Census of Agriculture)

Table 7: Change in Farm Size in Benton County Oregon

Year	1-9 ac.	10-49 ac.	50-179 ac.	180-499 ac.	500-999 ac.	1000+ ac.
1987	137	251	135	60	37	25
1997	182	293	130	67	26	28
2007	301	363	153	48	17	24

(USDA Census of Agriculture)

Table (7) shows a significant increase in smaller scale farms in the last several years that is indicative of the economic diversification and demographic shifts that have led to land-use changes in the region. One of the more significant developments that have occurred in recent decades allowing more smallholder farmers to prosper is the increase in organic production.

Organic food production, as a percentage of total food production in the United States, has increased from 1.2 percent in 2000 to 4 percent in 2010 (Organic Trade Association 2012). Of the 906 farms in Benton County in 2007, 36 of those farms, with a total of 1,912 acres, were certified for organic production, an increase from twenty farms in 2002. Seventeen farms in Benton County, with a total of 304 acres, were being converted to organic production in 2007. Table (8) shows the dollar value of certified organic products that were raised and the number of farms in each production category. While the 2002 Census of Agriculture did not break product

values into categories, the total value of certified organically produced commodities for Benton County in 2002 was \$341,000 (Census of Agriculture 2002, 2007).

Table 8: Value of US certified organic products in Benton County 2007

Value of sales of organically produced commodities	Number of farms	Total Amounts
Total organic product sales	30	\$3,564,000
Value of sales \$1 to \$4,999	16	\$23,000
Value of sales \$5000 or more	14	\$3,541,000
Crops, including nursery and greenhouse	25	(D)*
Livestock and poultry	3	(D)
Livestock and poultry products	3	(D)

(Census of Agriculture 2007) *(D) Withheld to avoid disclosing data for individual farms.

It is easy to see from the figures shown that the growth in organic production has allowed more smallholder farmers to find a niche in the agricultural market in the region.

While agriculture in the Marys River region still has many large-scale farms focusing primarily on grass seed and Christmas tree production, there are increasing numbers of growers who are diversifying production and experimenting with wheat, dry beans, and other row crops. Grains and legumes that were once staple crops in the Valley are making a comeback due to higher prices caused by growing consumer demand. Changes in markets and land-use policies have allowed smallholder farmers to develop high-value niche markets in organic and locally grown products, which are also beginning to alter the ecological landscape of the region. The following chapters will examine how farmers believe those land-use changes affect agricultural sustainability.

Summary

There is a reciprocal relationship between the social and ecological changes that have occurred in the Marys River region of the Pacific Northwest and the changes that have occurred throughout agriculture over the years. Just as humans shape the environment around them, so the environment to some degree shapes human behaviors. Examining the history of the Marys River region is vital to understanding those relationships within the regional environment. Although the first Euro-American settlers to the region intended to reestablish agricultural practices based on the knowledge they had brought with them from other parts of the Country, it was the intensive management practices of the Kalapuyans who had previously inhabited the region that made settlement desirable and possible (White 1983). However, with the removal of the Kalapuya, the use of fire to manage vegetation on the grasslands and oak savannas of the Valley was repressed and the landscape that was not being farmed was left to the encroachment of conifer forests.

The Donation Land Law of 1850 brought increasing numbers of settlers to the region intent on increasing production and profits through technological innovation and expansion of the industrialized agricultural market. In the process of improving the landscape for more efficient resource extraction, the Willamette and Marys Rivers, along with many other tributary streams were increasingly modified to fit the needs of humans in the area. Alterations to streambeds were caused by log drives, snag removal, bank stabilization and revetments designed to improve transportation and control flooding. Expansion of railways into the region had dramatic impacts on the landscape and provided greater access to outside markets, thus increasing both the

export of resources and the import of consumer products. It is interesting to note that while we often see issues of globalization, reinhabitation, and regional sustainability as modern day problems, in 1885 Fagan had this to say about the same subject;

Much has been written upon the subject of retrenchment, and the time is ever present when such a theory might be put in practice. From the date of the first white settlements on the banks of the “Oregon” and its tributaries, the great bane of the State has been, and still continues to be, that the imports exceed the exports, and that money is being continually sent abroad for articles that should be produced and manufactured at home. To-day even, farmers are eating butter and bacon shipped from other States; are wearing fabrics from abroad while, cows, hogs and sheep are running at large, by the hundred, without particular care or attention. [1885:335-6]

As industrialization of resource extraction and production grew through the end of the nineteenth century and into the twentieth century, traditional practices and attitudes were increasingly viewed as impediments to modernization.

The growing dominance of the mechanistic worldview led to further landscape modification through the development of dam systems on major waterways, innovations in agricultural production through increased use of irrigation, agrichemicals, and mechanical technologies, all designed to improve the well-being of humans through the harnessing of nature. Today, the multiple perspectives of various stakeholders in the Marys River region have led to questions about what is best for the well-being of both humans and the environment. We know what growth oriented business leaders consider most important for a sustainable region. We also know the primary goals of the preservation and restoration minded environmental movement. The following chapter considers what farmers in the Marys River region feel are the most important issues in developing a more sustainable and healthy bioregion.

Chapter Five: Findings on Farmers' Sustainability Perspectives

The geographic information and historical summary of farming in the Marys River region and the Pacific Northwest provides useful information about values, trends, and changes in methods of production that have taken place over time but, there are a number of sustainability questions left unanswered by the information found in the previous chapter. Agriculture has been an important element of the regional landscape since permanent Euro-American settlement began in the early nineteenth century. While dominant views and practices have changed over time, with industrialization and specialization becoming increasingly important over the last several decades, it is clear that a mix of different agricultural practices continues to be the norm in the region. Much like the region of Walker's (2003) study, there has been a transformation in what were once primarily resource-dependent communities in the Marys River region. The multiple perspectives of stakeholders in the region have begun to include a focus on other forms of development geared toward more diversified amenity-based economies, while the role of agriculture in the region becomes increasingly complex. Because of the diverse mixture of farming styles in the region, the addition of new farmers among long-term farmers, and the dramatic variability in farm sizes and styles, it is appropriate to address the issues and perspectives of those various stakeholders to better understand their views on agricultural sustainability. This chapter focuses on answering the research questions:

- 1) How do farmers in the Marys River region define agricultural sustainability?
- 2) What methods do farmers use to develop more sustainable agroecosystems?

- 3) What do farmers consider to be the most important issues in developing a more sustainable regional community within the globalized system of agriculture?

Examining the various definitions of sustainability begins with an understanding of differing worldviews that help define individual perspectives. According to Merchant (2005), the mechanistic worldview is focused on the domination of nature through technological innovation, thus allowing for continually increasing economic growth. The organic worldview suggests that humans and nature are interdependent and focuses more on community and system well-being. The environmental ethics guiding the personal behaviors affecting farming issues run the gamut from the egocentric to the ecocentric (Merchant 2005; Curry 2006). Because farmers' views of sustainability issues often vary depending upon individual understandings which tend to evolve over time, this study proceeds on the platform of Merchant's partnership ethic, "grounded, not in the self, society, or the cosmos, but in the idea of relation" (2005:83). By focusing on a partnership ethic, I approached this study with a view toward understanding relationships among farmers and agroecosystems as well as the relationships of farmers with consumers and other stakeholders. This is my own position as an ethnographer interpreting the relationships and perspectives among stakeholders in the region and presenting the findings of this research.

Answering the research questions is founded on a synthesis of information gathered through speaking with and observing farmers and farms over an extended period, combined with historical and background data on agricultural land-use, and culminating in the final interview process among farmers in the Marys River region.

Examining the results of those interviews provides a better understanding of farmer perspectives on the social, economic, and environmental components of sustainability as well as perceptions of place and identity in the Marys River region, the larger ecoregion of the Pacific Northwest, and within the context of the global agricultural system. I interviewed twenty-eight farmers from twenty-four different farms throughout the Marys River region. Farm sizes ranged from less than five acres to over 1000 acres and the types of farms varied considerably. The men and women I spoke with were for the most part very open and helpful in sharing their insights on the sustainability issues that farmers face in the region.

As noted earlier, my studies with farmers in the Ten Rivers region helped me to realize that agricultural sustainability cannot be measured by universal standards of pass or fail, using the same indicators across broad geographical regions. Farmers in the Marys River region have unique social, environmental, and economic experiences that should be viewed from a local perspective focusing on the interconnectedness of all three components while considering the context of the region within the globalized agricultural system. The sustainability questions tripod developed during the Ten Rivers study was a useful guide in my research on the Marys River region for the disaggregation of information within the three components of sustainability and for helping to develop useful themes in the coding process. It was also helpful as a means for maintaining focus on the interconnectedness of those agricultural issues.

After conducting content analysis to develop themes from the data collected during my interviews with farmers in the Marys River region, I compared those themes to the categories that had developed during my earlier research. It was not

surprising to find, since the majority of the Marys River region lies within the larger Ten Rivers region, that most of the issues farmers talked about were the same as those of the previous study. It became clear that farmers share the same agricultural concerns regardless of farming style and therefore the sustainability questions model was useful in addressing issues beyond those of smallholder farmers.

The sustainability questions tripod was helpful in categorizing themes developed from analyzing and comparing the answers of farmers addressing different questions throughout the interview process. Those themes could then be unpacked and presented individually, providing a ‘thicker description’ of the complex interrelationships within the three components of sustainability. The model is a way of contextualizing those relationships, making it easier to understand why farmers do what they do and what farmers think is most important in defining sustainability. The themes that developed during the interview process became part of the critical synthesis of information from diverse studies on the relevant issues. That interpretive process helped me to realize that there is more to understanding sustainability than just dividing the subject between industrial agriculturalists with mechanistic worldviews focusing on the instrumental value of the farm and sustainable farmers with organic worldviews based on the intrinsic value of nature.

In this chapter I will first examine the foundational elements of sustainability based on farmer definitions, and then describe how those definitions affect agricultural practices and issues within the three interrelated components of sustainability. By developing a more balanced dialogue among stakeholders, through a better understanding of farmers’ place-based perspectives and definitions of sustainable

agriculture, it may be possible to facilitate positive changes in the movement toward actualizing stronger and more sustainable communities within the Marys River region.

Laying the Groundwork for Defining Sustainability

Some of the most revealing aspects of agricultural practices and priorities can be better understood through observations of individual farms in their local settings within the regional landscape. Driving through the western areas of the Marys River region, with the wooded hillsides and smaller valleys, it is easy to see why farms tend to be smaller, often with a mixture of timber and fields or pastures. Many of the larger farms in the western part of the region grow Christmas trees because the uneven terrain and water availability provides optimal growing potential for conifers in those areas. In the eastern parts of the region there are more large-scale farms, with the majority of grass seed and grain crops grown in the flatter bottom lands of the valley zone. It was through observations of farms in the region that I came to understand how intricately farmers of every type are tied to the land and how those ties determine the ‘place’ of the individual farmer in the region.

Normally we take the notions of space and place for granted. However, because farming must occur in a particular location, understanding farmers’ definitions of sustainability begins with considering the ‘space’ of the individual farm and the part it plays in defining the ‘place’ of the farmer in the bioregion. I considered ‘space’ to be the physical aspects of each farm but, notions of ‘place’ are based on the perceptions and discursive practices of stakeholders in the region. As Thompson states;

Space—the underlying reality—is represented as place by subjects who experience a given spatial locale in association with certain cognitive or

emotional affects, on the one hand, or through the interpretive filter of certain discourse practices on the other. Place is thus dependent on the cognitive processes of subjects. Place exists only in the mind, in the experiences and practices of perceiving or discoursing subjects. It is a secondhand copy of actual spatial locations mediated by cognitive or linguistic processes. [2010:131-2]

While discourse is essential in describing and understanding the farmer's sense of place, the physical aspects of the farm itself also makes a statement and helps to represent the place of the farmer in the local community. The way that the physical space of the individual farm is kept, in relation to the surrounding area, says a great deal about the place of the farm owner. In other words, the place of the farmer cannot be separated from the space of the farm. An important element in constructing a sense of place is the look of the farm as seen by other farmers.

A well kept farm indicates a successful farmer and a shoddy looking place suggests a lackadaisical farm owner. But, what is a good looking farm? The answer of course depends on what image the farmer is trying to present to the surrounding community. There are a number of large-scale farms, often focusing on monocropping methods, which tend to fit the image of the industrialized farm. Many of these have well-kept farm buildings housing very large equipment for planting and harvesting, and large rectangular fields. Crops on those very large farms are often grown right up to the edges of the roads, with very few weeds anywhere in sight, showing that the owner means business. There are also several small-scale farms throughout the region. Some are tucked away in isolated areas but, many are surrounded by very large farming operations or are located on the edges of towns. Many of those smaller operations conform to the image of the diversified sustainable operation with multiple crops and animals. However, the size of the farm is not the

only indicator of farmers' priorities and practices. There were farms of all sizes that were very shipshape, with well ordered fields, no weeds, and well kept buildings and machinery. There were smaller operations, between ten and 100 acres that practiced very intensive methods and were certified organic while some very large operations practiced cover-cropping on fallow fields, worked to minimize inputs, and were careful about leaving easements between fields and waterways. Observations of farms and farming practices in the region provided essential information in conjunction with discourse among farmers for a more complete understanding of space, place, and identity.

It is difficult to talk about place and so a lot of what we know about it comes from the way people describe experiences (Tuan 1977; Thompson 2010). I found this to be true and a great deal of what I learned about place and identity came from questions that allowed farmers to describe their experiences. As Bell (2004; 2009) has suggested, farmers identify themselves as types of farmers and so, to break the ice and get people to relax a bit by talking about themselves, I began my interviews by asking each farmer; "why do you farm and what type of farmer would you say you are"? Every farmer that I spoke with answered the question by saying in one form or another; 'I farm because that's what I enjoy doing.' For each person, farming was the lifestyle that they enjoyed, but for most it was also equally important that farming provide an income for the family. While only ten of the farmers that I spoke with had been farming all their lives, most made some mention of growing plants or raising animals as youngsters, often through 4-H projects. All of the people who farmed over 200 acres had either farmed all their lives and so had accumulated or inherited large

acreages or, they had ‘married into’ the ownership of a large farm. Most of the newer farmers, who most often had smallholder operations of less than fifty acres, had either spent a lot of time gardening and wanted to take that skill to the next level by marketing produce or, they had some influential family member that had given them the basic knowledge and willingness to go into farming.

The reason for farming most often stated was that it's just something that they always wanted to do. Kurt, one of the lifetime farmers said,

I farmed initially because it was the family business. My family's been farming for a really long time, and in this area since the 60s. My dad and his dad moved here in the 60s, bought a place near Philomath, and started farming there. The family started farming in North America in the mid-1800s, so, farming's been in the family for a long time.

Mary, one of the newer growers in the area, stated,

I farm because I've always wanted to participate in a community that produces food, and have a job where I was connected to the production of that food, and the growing side of it. I don't have a background in agriculture or horticulture but I wanted to live in a rural setting because I grew up in rural Connecticut.

Very few of the farmers actually said outright that their reasons for farming were based on a life philosophy, it was most often stated as something like farming “gets in the blood”. However, Alex, a farmer who had been in the region for a number of years answered by saying; “That's a good question because I think you will rarely hear that we are farming for the economic potential of it. It's more a way of life, it's almost a philosophy for me, and I love it so that's why I do it.” Although the sizes and types of farms ranged from very small diversified farms to very large mono-crop oriented operations, that basic passion for farming was the same for everyone.

A lot of my interviews took place at individual farms and nearly every farmer I spoke with asked if I would like to see their farming operations as a way of describing the type of farming they practiced. I always said yes and in walking around farms it was easy to see that farmers enjoyed showing off their plant crops and livestock. The passion of individuals for farming became most apparent when they would show me new projects and innovations that they were working on to expand their farming operations or make them more efficient and sustainable. Although there were several variations in the types of farms I visited, and there were many stories about particular experiences and the methods of other farmers around them, everyone was careful and sincere about never criticizing neighbors farming styles as long as they respected each other's independence.

Since a significant part of my research questions focused on the different ways that farmers expressed their identity and sense of place, I asked each person interviewed, "how do you perceive your place, as a farmer, in the community, and in the larger region, and in the context of the global agricultural system"? It was interesting to discover that the term 'place' was often interpreted as impact and most farmers answered the question by describing the extent of their marketing base, often expanding outward from the very local region. Farmers also discussed the interactions they had with other farmers in local communities and through agricultural organizations in the larger ecoregion. Those relationships were often geared toward cooperation and sharing information on agricultural practices. James described an important aspect of community interactions among farmers by saying,

How I perceive my place in the community becomes a really complex question because of the difference between cooperation and

competition, because they are at cross-purposes with one another. To succeed means that you have to out-compete, and to out-compete compromises your cooperative spirit to a degree. So, it's a hard balance to achieve.

It was said several times that, due to time constraints, social interactions with other farmers are often limited to scheduled meetings and conferences. Ruth and Ben said, “in terms of the Pacific Northwest, we have been on different committees and we just feel like we had to give back because we got so much information from those trade associations and so we feel very connected with them.” While most farmers acknowledged being part of the globalized agricultural system, they often described their place within that system by either saying their operations really had no impact at the global scale or, they felt that the type of farming they practiced at the local level could be a model for other farmers in different regions throughout the world. Kurt told me,

I think if we can succeed here in the Valley, to establish a model that really works, with relationships between community and farm, and to make it work in today's market and resource scarce economy and teach other people how to do it, then that's probably the best thing we can do for them. I know that a lot of other regions don't have the climate that we have here, that allows us to grow such a huge variety of crops but, they may be able to modify that model a little bit to make it work for their region.

An important discovery in the process of hearing about how farmers define place and identity was that, regardless of farm size or the size of their market base, all of the farmers I spoke with described farmers and farming as having an integral place within the Marys River region. Whether they were describing their place in the local community, the larger ecoregion, or within the context of the globalized agricultural system, farmers spoke in terms of the importance of individual farms and agricultural

lands within the Marys River region. Determining why a person farms and how that person sees herself or himself in relation to others is the beginning of understanding individual definitions of sustainability.

Farmers Defining Sustainability

When I asked farmers the question, “how do you define sustainability”, I had expected answers to be pretty diverse; and at first glance they were. I had expected major differences in the answers of large-scale and small-scale farmers, as well as differences between organic and non-organic operations. However, an in-depth examination of interview content, using constructivist grounded theory methods (Holliday 2002; Charmaz 2008), combined with the background information gathered from secondary sources, allowed me to develop a more complete understanding of farmers perspectives on sustainability in the region. Even though the wording and descriptions varied somewhat, the basic definition of sustainable agriculture among farmers is the ability to continue farming into the extended future. In the remainder of the chapter, I will describe how this deceptively simple definition is the core of farmer identity and paramount to understanding the reasons behind farmers’ practices. As noted, there were some fairly significant differences in the backgrounds of various farmers that influenced the language used to describe individual farming methods and experiences. Several long-term farmers were practicing sustainable methods before the term sustainability became popular. Therefore, the best way to provide a context for showing the similarities and differences in farmers’ perspectives on sustainability was to give more complete examples of the background stories of James, a lifelong and

very large-scale farmer in the Marys River region, and Matt, a smallholder farmer who is relatively new to the region.

James's Story

James told me that farming had always been his “life’s passion”. He grew up on a ranch in Lincoln County and started raising animals in 4-H at age nine; “Those animals were essentially given to me in return for chore labor, which is typical”.

James said,

I came to Corvallis, well, for two reasons. One, the family had purchased some property out here but, primarily because of the Ag program at Corvallis high school and the instructor there. An opportunity had presented itself so I came out as a Junior in high school to enter into that program and to manage the family properties out here. My grandmother came out and stayed in the house and was our so called adult in the situation. But I was farming from that period on in partnership with the family.

James purchased his first farm in 1961, and had been farming or working in related fields since that time. He said,

I had a period of time when I left this particular operation and went into farm management, and then I got involved in farm machinery, and fertilizers and chemicals, not in that order but, it was a continuing education on my part. I didn't finish college because I got involved as a State Officer by the FFA organization and my farming operations had grown, at that point, to where I couldn't cover it all. Opportunity is a lot of what directs us in life but, I have been in the farming business for a lot of years.

I use this story as an example but, there were other farmers who had lived their entire lives in the Valley region with similar experiences. A key element to consider here is opportunity. Each farmer had a strong urge to work in agriculture in some way but, opportunity often decided the type of farming they pursued. Those farmers like James who were able to purchase or inherit large acreages often practiced different methods

and were more specialized than those who farmed smaller acreages. When I asked James how he defined sustainability he answered,

That's a broad question. I've seen a number of different answers that are probably more precise than what I will give but, I see it as farm production, producing a positive product or margin while improving the basic resource without mining the original soil or capital investment. That's what I see as sustainability but it goes much beyond that. It has to include family and all those kinds of things because they enter into it, both from the standpoint of the family that you came from and the family that you have and, ultimately, the family that you produce. So, that would be my broad idea of sustainability. What do we consider sustainable and what methods do we use? Again, this can get rather complex and diverse but, I think I see it as a considered balance of inputs; labor, capital equipment, animals, whatever you're involved with to produce a saleable product. And then, you add family and all those other things into it. I see so much production that is so geared to volume, and obviously margin is involved but, over the years I've seen a lot of models and technology to increase production, and I don't think that has always increased our sustainability. So, I certainly see where there has to be a balance there.

Already we see that in this farmer's view, the ability to continue farming entails more than simply increasing production to provide a larger profit margin. Although economic stability is crucial to sustainable farming, one of the primary keys to achieving sustainability is maintaining a balance between inputs and outputs on the farm. Listening to James's story also helped to personalize some of the twentieth century agricultural history of the region discussed in the last chapter. In answering my question of how his farming methods had changed over the years. James said,

Yeah, my methods have changed considerably. You have to understand that my father and my grandfather came through the Depression and developed a farm style of homesteading and dairy, and livestock production that was very primary, there wasn't a lot of money involved, basically dealing with the resources that were available, and, as I progressed, went to school, learned new things, all the new technologies were fascinating, enticing, and we've tried a lot of them. I've been involved with a blueprint for expansion in sheep. I've seen an awful lot of production advances. I've seen the costs rise considerably

and the margins have been up and down, and I've seen a lot of success and a lot of failure. One of the things that I've learned over the years is that, a lot of this exciting technology that was presented to us has not proven to be completely sustainable. We didn't understand that at the time. We didn't even consider that. Our goal was to see if we could achieve the dollar, that was what we were trying to accomplish and if we couldn't accomplish a margin, we weren't going to stay in business. So, we've chased that goal, and politics, and tax laws, and all of that have entered into it. In the inflationary years we were able to lever forward and stay in business because we could borrow more money, or, we could sell and lever up again... I've seen a number of evolutions. I think the land has primarily been used in an agricultural sense, either for intensive large-scale operations or, it's gone to the hobby type residential thing, and, I don't see that as always being sustainable. The big keep getting bigger and the other people either have a good job or, they've been able to sustain themselves some other way. I see Christmas tree production as a good example of one of the imbalances that has come about. A lot of that country that was good agricultural livestock land was turned over to Christmas trees or something like that, and it was a big money crop for a few years but now it's on the wane, and it's certainly changed the culture of the community and the culture of the soil. Vineyard production is another area that I see coming in, and whether it's sustainable or not, those people have a different approach to agriculture, and it may last a little longer but, again, it's only going to be sustainable depending on the farmers ability to sell a crop... I started out on a pretty broad basis, row crops, wheat, hay, the reason we came out to this country was to get some flat ground to produce hay for our hill country over there (west), and because of the fact that, we were already into this sustainability thing, in conflict with the Forest Service and BLM. Dad had lots of Forest Service grazing contracts in the hill country over there. Our problem was that, on the grounds that we grazed, we were increasing the fertility and keeping the weeds down because of the livestock, and the trees would grow rampant and, the Forest Service had ground out there but they were concerned about the animals damaging the trees. So, they would keep us off and they would grow brush. Dad converted a lot of those homesteads by trading them to the Forest Service for tree ground because our trees were better than theirs, and we'd take their poor ground and clean it up, but, we didn't have hay on it. So, that was one of the primary reasons for coming out here. Of course, when we got out here on this number one river bottom, irrigated soil, our intent was not only to grow hay but, we got caught up in the concept of production and moving forward so, we got into the higher level of crops and, got into the row crops; vegetable crops and seed crops. Of course our input costs went up and our machinery costs went up, and as we grew and moved forward with that, those became our primary goals, rather than

the livestock aspect of it...Of course that's become more involved in these later years and part of that effort at sustainability and bringing livestock back into the operation is, the best way to regenerate these soils is to go to the grass-based culture and recycling, and instead of making hay, we're putting the manure back on the ground and trying to manage from that standpoint. So, that's part of my evolution.

The most important aspect of understanding James's evolving concept of sustainability, as well as every other farmer I spoke with, was recognizing the need to keep farm land in agricultural production. That realization is critical to understanding the farmer's perspective as a stakeholder in the region. The central goal of keeping the land in agricultural production over an extended period of time, combined with the necessity of acting on available opportunities, helped to explain why farmers practice different methods. I asked James why some farmers change to what many call alternative methods while others do not. He said,

I can't speak for a lot of people but, from my perspective, it was a gradual learning process. We got involved in the new technology and what was being presented to us, and I understand what's behind this, and I respect it but, I also think that the Universities and the Extension and some of those people have lost a little bit of focus in the sense that they over-emphasize the production and the new technology. I think some of those processes weren't fully thought out, and certainly weren't always totally sustainable. One of the great revelations that I've had in recent years is the fact that I didn't appreciate as much as I should have, a lot of what I was born into and what I learned early on. We've tried to use some of these new technology ideas as levers or crutches to move ourselves forward when, sometimes, reducing our costs and becoming more attuned to what's there in front of us rather than trying to build a model that is outside of what is reasonable probably wasn't the best way to go. I have a conflict here because I spent a number of years in the fertilizer business and farm management. I fully appreciate the advances that the technology has given us, and, I also fully appreciate the tax law and policies but, ecological concerns and misinformed priorities I think cause us a lot of grief. At least in the farming industry, I feel like the farmer is the true conservationist and a lot of this information that we're being given is not rational; it's not fully borne

out in what I call realistic study. We have a lot of people that have come up with ideas and I find that, it's not only in this area but, we see it in a lot of the things that we do. There are a lot of ideas and a lot of concerns but, quite often, there are very few feet on the ground when it comes to understanding the problem and getting the situation corrected. Most people seem to have an idealistic view of what farming is. Some preconceived notions are based on what I would consider unrealistic premises and lack of any real experience. Production models and support are primarily geared toward inputs and greater production volume, rather than the more important goal which is a profit margin. So, we have a lot of help with this sustainability that really isn't any help, in my opinion.

I have presented a more complete version of James's answers in this section because I think it is important for gaining a better understanding of the language and perspective of a long-term, large-scale farmer in the region and comparing those answers with those of Matt, a small-scale newcomer to the region.

Matt's Story

Matt told me that he farmed for both income and because of the lifestyle that afforded more time to spend with his family. In describing why he farmed and what type of farmer he was, Matt said,

I derive a very strong sense of purpose from growing food for people. To be in a market farming situation where you follow that chain all the way through, and you see the person actually buy it from you after you've spent months growing it, I find it really rewarding. I'm a small, diversified, family, market produce farmer.

The importance of both family and the love of farming are keys to understanding sustainability from the farmer's perspective. I next asked Matt how he defined sustainability,

Right off the bat I can see that people would have different definitions. For me, in practice, it means ensuring that we can continue to do this on this scale. It means very low off-farm inputs. Really, the only

substantial input that comes here from off-farm is the chicken feed. It means keeping as much of the nutrients that are available here, here, except in the form of very saleable produce and eggs. So, it's a lot of recycled materials, and that integrated approach where our biggest nutrient input probably is the chicken feed, and it ends up being the main nutrients for the entire operation, besides what we're growing here. So it's a lot of those little tools, like rotational cropping, that's a huge part of being sustainable in this area, with our soils and the pests we have, I think it's more important here than it is in a lot of places because of our year-round growing climate. We don't have that break in the winter where everything freezes. You can't just go until the ground freezes and it kills everything. So, it means kind of having a light touch, because you can really mess things up, and it means being patient, because nothing is going to happen fast. The bottom line part is, you have to spend money to make money but, you can definitely spend too much. There's not a lot of money on the profit end of it. So, I am here because we were able to buy this place almost outright. In sustainability, there's got to be profitability there. So, I'm lucky in a way that a lot of people aren't, and maybe that gives me a little more flexibility in not needing to really push the crops because, I don't have a huge payment on a big expensive place. For me, and a lot of people, when we talk about sustainability, it's the notion of the inputs, and not wearing out the land, and not trying to make it do too much, and giving something back. We grow vegetables, I've only been on these fifteen acres for five years now but, we typically only grow veggies on the same ground for three years, and don't expect anything more than that, and then it really needs to sit for three years. And you can really see it by that third year, the yield is markedly smaller, we're so limited in micronutrients here, and it's hard to get the manures and fertilizers spread evenly I think.

The language used and farming methods were a bit different in comparing with James's farming style but, the goal is still to strike a balance between inputs and outputs in order to continue farming into the future. In each case the importance of opportunity helps define what type of farming a person goes into. I then asked Matt what he considered sustainable farming methods and he said,

I would come back to the materials. I think that if we're bringing in a bunch of fertilizer and manure and material from somewhere else that involves a lot of transportation costs, that doesn't sound very sustainable to me. I really try to keep everything here. We do a lot of water conservation, rain catchment, and all drip irrigation. It may be

more sociological, or psychological, but I think a lot of it is just the notion of not expecting too much, of having reasonable expectations for what you can grow on a piece of ground, and what plants are actually capable of doing. I'm a big fan of Steve Solomon, and he talks a lot about thinking like a plant, and thinking about what a plant needs. We try to apply some of that in our situation. Things like spacing are so key for veggies, to get that good crop yield and quick growth and vigor that you need. I think sustainability may just take a kind of awareness. You just always need to be paying attention. And then the note taking, and comparing things year to year, is probably a big part of it. There is a need to stick to it, and figure out what we're doing, and what we did wrong, and learning from your mistakes. Sustainability has this kind of cachet right now, and I think it's kind of unusual that it even comes up that you should be sustainable because, it just seems like common sense to me. If you think of your soil as your soil bank, then you don't break the bank every year. What may be to my advantage is, I'm relatively new to growing veggies, and so I will often try new things, and other growers may ask why I'm trying those things, but often that does work, and I think that coming from outside that system helps. Maybe these traditional growers get a kind of tunnel vision, and think this is what we do, and we aren't going to try anything new. And they're good organic growers, I'm not saying that they aren't sustainable or anything but, common sense has a lot to do with it. You can treat your ground right and be sustainable in your practices but, it has to be a business that is sustainable too. So, you may be growing a whole bunch of something, and it's all great but, if no one buys it, is that sustainable?

The previous owners of this property were really big in 4-H projects, and I've talked to several people who had their 4-H animals at this farm years ago. So, part of sustainability is being part of the community, and the people who were here before us knew everyone in the community. And I know from them that there were no pesticides used on this property since 1989, and it's nice to have that direct contact with them. I can still call them to ask questions about some of the plumbing stuff and so on, and they really sort of held our hand in that first year getting started. So, I would definitely call that part of sustainability, I think the human side of it is huge; you have to build relationships with people.

Here again, achieving sustainability is seen as an awareness of the land and understanding what is needed while at the same time having a willingness to try new things and experimenting to improve the quality and volume of production. I asked Matt why he thought some farmers change their farming styles to practice what are considered alternative methods while others do not and he answered,

Well, I think they see the market, that's probably the single biggest thing. I can go to the Corvallis farmers' market in the spring, and there's a grower selling beautiful certified raspberries, and getting \$3.50 a pint, and two stalls down, the non-certified grower is getting a dollar less. Anyone who's still farming at this point, it used to be, everyone farmed, but at this point there is an understanding that you really have to be a businessperson. I think it's a wise business decision. If you look at all these big corporations, they have green programs now, and you can call it cachet, or a lot of fluff, but at this level where we are, it does have an effect on the bottom line. And the inputs, I can't imagine growing vegetable crops conventionally, and spraying and spraying. I know when I have to do a little spraying it's a big effort for me to do it myself. So, there's got to be profit motive for them. I think the one's that aren't going to change, it's just attitudes. The new people generally are younger, and I think there is some resentment there on the part of the older conventional farmers when you talk about organic. They think it's a bunch of BS and it doesn't matter. So I think anyone that doesn't change is thinking that the way they are already doing it is the right way. I think that the people who do make the change are the ones who have been able to see what they've done to a piece of ground, and they've seen it degraded, and they remember how it was when their grandpa was there, and spreading manure all day and remembering how things were done years ago. Most of the people I know, who are doing what I'm doing, are not from farming backgrounds. They are part of the alternative, back to the land movement or have read the Michael Pollan books, and that kind of makes you an outsider in the grand scheme of agriculture but, I think it's more a book knowledge rather than the hands-on knowledge, so that might be part of the reluctance or difference of opinion. So, I think change is just hard for some people. You hear talk about the OFB (Oregon Farm Bureau), and it's like they don't see us. We all are members of the OFB, if you want the affordable farm insurance, you basically have to be a member but, I can't see a single benefit to being part of the OFB in terms of what I do and what my concerns are. And when they send me notices about their legislative actions, it's all things I'm pretty opposed to, so there's a big schism there. I think a lot of us think that they don't represent us. I don't know if there is an opportunity for an alternative organization but, there is a big divide.

It was fascinating to hear both older generation and new generation farmers talk about the importance of learning from the past and applying that information to today's growing practices. Both farmers saw the importance of accessing alternative markets as a way of improving economic stability. Each farmer expressed a feeling of

disconnect between farmers and agencies that were supposed to be providing usable information and guiding farm policies. However, while both Matt and James discussed the importance of the learning process in making changes toward more sustainable practices, Matt's assumption that "older conventional farmers" do not get their farming information from reading did not correspond to what other farmers had told me. A significant number of farmers I spoke with, both young and old, mentioned the different books they read to find new information on farming practices. As I learned with my own research for this study, when finding and analyzing information on farming practices and sustainability, it makes a big difference which books you read in determining what is or is not applicable and sustainable.

Describing the very different farming backgrounds of the two farmers James and Matt shows that, while farming practices and issues may vary somewhat based on farm sizes and styles, the basic definitions of sustainable agriculture, and therefore the pertinent themes describing them are relevant for all the farmers in this study. To provide a more in-depth description of farmers' perspectives in defining sustainability, I disaggregated the primary themes that developed from interviews with farmers and categorized them within the three components of sustainability:

- Social—Community/Family
- Environmental—Inputs = Outputs; Keeping land in agricultural use
- Economic—Financial Stability

Social Definitions

Most of the farmers I spoke with were active in different organizations or attended conferences that allowed them to interact with other farmers and individuals

in the region. Collaboration within communities and throughout the Marys River region was important to all types and scales of farming operations. Several farmers were interested in collaborative projects geared toward strengthening communities by growing and milling grains produced in the Valley as well as growing more beans and other crops that were once more prevalent in the region. As Alex stated,

I think it's a good thing for the agricultural economy and the localness of it. It gives communities more sovereignty, and so you're not stuck in national or global markets like that. I think the local consumer loves that, and there are probably healthcare implications, and all kinds of social value that hasn't even been quantified yet.

Farmers in the region often exchange information with others who are practicing similar methods, especially if the market will bear an increase in production and competition does not become a negative issue. Most agreed that it is important to collaborate with other farmers who are close by, especially for the smallholder farmer just starting out, because it is helpful to share knowledge and sometimes equipment that is too expensive for one farmer to buy. Allison, one of the newer smallholder farmers in the region told me,

There's a thriving community of young farmers around here in the Marys River area so, yeah, we work together a lot, and help each other out as far as processing facilities and things like that... not only the kind of farming that I'm doing, but row crops, and starting their own farms, and restaurants, and things that branch off of agriculture in a lot of ways; meat curing facilities and things like that. So, I feel like we're all really interconnected, what one of us does can really effect the others and help them out in a lot of ways.

The overall consensus among the farmers I spoke with was that food production is the key to a sustainable society. According to Terry, “we need to understand where it comes from and take care of the people who are producing it. We are farming out our food production to other countries and to people in this country who are willing to do

it; often illegal immigrants.” Terry, and others, said that farmers need to consider the importance of being invested in the job of farming and the quality of those products that are being marketed as food for the public. For many, job satisfaction and knowing that they were providing good food to people as a benefit to health and well-being were very important aspects in fostering the long-term sustainability of farming in the region. Those elements give farmers incentive to continue on the job through the tough times and to keep the land in agricultural production for future generations.

From the perspective of farmers I interviewed, the importance of keeping land in agricultural production was paramount to sustainability in the region. While farmers acknowledge the importance of community relations and the place of farmers within the social component of sustainability, the goal was a reciprocal relationship between urban and rural areas focusing on space and place-based improvements of individual farms. As Jean said, “I treat this place like it’s my whole world, and do everything I can to leave it better than when I found it.” Henry explained the importance of keeping the farm for future generations by saying,

Sustainability to me is trying to be a good steward of the land. So, sustainability is thinking of myself as a person who is just passing through. I don’t want to leave this land poisoned. It’s about trying to maintain your property with good practices for the next people down the line.

While farmers considered interactions with other farmers and consumers relating to the social component of sustainability to be important, the central focus of their sustainability definitions was the farm itself. The farmer’s inherent ties to the physical ‘space’ of the individual farm plays an integral role in her social connections to the surrounding region.

Environmental Definitions

For the farmers I spoke with one of the most straightforward elements within the definition of sustainability was to put back into the land as much as is taken out. That basic concept was stated in a number of different ways but, the definition was applicable for each individual farm, regardless of what or how various crop or livestock products were grown. John summed it up well when he said,

From an ecological perspective, it's a whole system where you've got soil, air, and water, and all the organisms in the soil. You also need to consider your borders surrounding the fields, which either harbor pests or harbor beneficials. So, it's just trying to blend that all together with the rotation of crops and cover crops to maintain a good environment to perpetuate the life of the soil.

Most farmers I spoke with raised some form of livestock. Some operations were livestock based farms while others raised animals as a means of producing fertilizer and building the soil or for pest management. For many, animals were the preferred means of increasing fertility rather than using, or at least minimizing use of non-renewable resources. While everyone agreed that sustainability was a difficult goal to achieve, the first step was to minimize the use of hydrocarbon energy and outside resources. Alex defined sustainability by saying,

Sustainability is the farm's ability to generate its own natural resource internally and not be dependent on importing it from the outside. So, even for organic agriculture, and maybe even more so, instead of depending on mining the sea for your inputs for the farm, or buying them in, the management is focused on generating them out of the life of the system itself. Now, that's my personal definition on the farm, and where that goes out into the social side of things is, that becomes a natural resource asset, not a draw on natural resources. That's how I would define it. That's pretty broad but, it's not necessarily easy to do, to take a farming system and make it self-sustainable. That's a huge commitment, and risk. Really, I think return-wise, the word sustainable isn't necessarily going to bring you a higher price or anything, but where it makes sense when you're penciling it out is on the other side,

the expense side. It's like an old car. You can fine-tune it to be running well, and you don't have to put much into it but, it takes a lot of work to get it there. But, once it's there, if it's a living system, it's pretty resilient, and it can withstand drought, and it can withstand climate change, and fluctuations in the price of oil, and all of it because it doesn't depend on it.

An important factor in sustainable land use and building the soil is to grow the right product, plant or animal, for the land available to the farm. Henry stated, “you really have to look at your soil types and the water available to understand what you have when you try to grow things.” Farmers said that to improve sustainability, it was necessary to match the crops and livestock to the land they are grown on so that the plants and animals benefit each other and are working in concert with the land.

A few farmers explained sustainability by referring to early twentieth century methods of growing crops or raising animals. Sustainable agriculture, or living within the limits of the natural environment was seen as the norm before modernization allowed humans to manipulate the environment to a much greater degree. I think Ann gave the most succinct definition when she said; “waste not want not; that’s a pretty simple way of putting it together. And that was from Grandma, before they had all these new terms.”

Economic Definitions

While making a living at what they do is one of the fundamental concerns for farmers in the Marys River region, it was most often mentioned as though the necessity of economic stability was stating the obvious when defining sustainability. As Jim said, “If we don’t have enough money coming in to pay all of our costs, then it doesn’t matter how environmentally friendly we are because we can’t stay in business to farm again next year.” Financial stability is the primary theme in the economic

component of sustainability. However, I consider asking questions about money to be unethical and, for farmers, speaking about money and financial earnings would be divulging proprietary knowledge about their business. Therefore, because the necessity of making enough money to stay in business really is stating the obvious, I found it more appropriate to elaborate on economic sustainability in the following sections to describe how farming practices affect financial stability and what issues deter farmers in achieving that goal.

Examining Sustainable Farming Practices

Understanding how farmers define sustainability is useful but, determining the ways they actually practice farming is necessary for a more complete examination of the farm space and the farmer's place in the region. Therefore, after the farmers I interviewed had defined sustainability, I asked for examples of sustainable farming practices to get a better understanding of their farming priorities. The central focus of farmers in the Marys River region seeking to improve sustainable agricultural practices was to develop and operationalize good management and farm planning strategies that would provide a balance between inputs and outputs on the farm. Farmers described what it means to be good stewards of the land and the methods they used to foster growth of healthy soils, animals, and farming systems. New themes were developed examining how farmers managed the paperwork, labor, what is grown and how it is grown, and when things get done on the farm. I then categorized those themes within the three components of sustainability, keeping in mind the interrelated aspects of each practice within the broader context of sustainability. Some overlap and repetition of key concepts was necessary to better describe themes that were relevant

to more than one of the three components. The themes addressed in this section include:

- Social— Change; Community; Education
- Environmental—Land/Soil; Water; Agrochemicals; Pests
- Economic—Financial Stability; Marketing; Labor; Paperwork

Social Practices

One of the most important findings that falls within the social component of sustainability is the willingness of farmers to change their growing practices. Farmers at any scale are constantly making small changes to improve efficiency and production. However, what makes farmers hesitant to make dramatic changes and grow new products, particularly those very large-scale farmers considering equally large investments, is the risk involved with predicting the uncertainties of future demands for their products while working within market systems controlled by external policies. Most farmers I spoke with told me that increasing diversity on the farm, rather than just doing what everybody else is doing, or what some company or institution says is best, is what made becoming more sustainable possible. Farmers explained that when trying new things it was important to start out small, learning through trial and error to discover how new processes would work over time. The main reason to start out small was that consumers, neighbors, or other members of the community may or may not accept those new practices. So, while changing practices was based primarily on the extent and the risk of economic investment, it was also closely tied to the social aspects of how those changes would be accepted in the consumer or wholesale market and among stakeholders in surrounding communities.

For the smallholder farmers in particular who were practicing direct marketing of products to consumers, determining what changes were most appropriate was a matter of opening up dialogue with customers to help understand their needs. According to Larry, one of the smallholder farmers I talked with, “changing the paradigm of the consumer that says, ‘It’s easier just to go to the grocery store’ is most important.” Farmers agreed that developing a working relationship with consumers in communities within the region was vital to making what they deemed a necessary paradigm shift and expanding the market for their products. It is easy to see the close relationship between the social and economic aspects of addressing sustainable farming practices. As Tom said,

I think the social part plays into the economic part because when people have other motivations besides getting the cheapest food and getting the best deal financially, when they understand a little better what goes into the production of their food, that makes them willing to pay a little more to support the broader issue of sustainability.

Farmers of all types and styles of operations agreed that there has to be increased dialogue among stakeholders so that customers understand individual farming methods and where their food comes from rather than just looking at the price tag or an organic sticker when deciding what to buy.

Dialogue is also important in maintaining positive relationships between neighboring farms and in the distribution of labor on the farm. While farmers work to develop dialogue with consumers when explaining the philosophy behind their farming practices, there must also be communication and agreement between the farmers and the labor force working with them. John told me, “the people that work for you, or work with you, need to agree to your philosophy. So once you get

everybody focused in the same direction, then things run a lot smoother and it's a lot less stressful.” Many farmers said that there were sometimes problems with chemical drift of pesticides and runoff, and so it was also important to have respect between neighbors and to take the necessary precautions that allowed for different farming practices in the region.

Communication among stakeholders in the region was seen as part of the education process that is necessary for positive changes within communities. Several farmers considered educating consumers to be an important part of the necessary dialogue that helped convince customers to buy more of their food from local farmers. The development of a reciprocal relationship between farmers growing healthy foods for consumers and consumers changing their lifestyles to spend more time actually preparing and learning how to prepare those foods was seen as an important part of the necessary paradigm shift toward a more sustainable region. Jenna explained part of the problem by saying, “for some people it's about not understanding how things are grown. When you get past peas, beans, carrots, onions, and potatoes, the question is; how do you cook this stuff. So part of it is educating people on what they can do with their produce.” It is important to note that farmers I spoke with, regardless of farm size or farming style, were conscious of and relatively optimistic about a paradigm shift taking place in the Marys River region and the potential for providing a larger regional market for their goods that will lead to a more sustainable bioregion.

Environmental Practices

For farmers, the central focus of the environmental component of sustainability was taking care of the soils and improving the land for crops and livestock. Farmers

used a number of methods to achieve that goal including increased diversity, crop rotation, using compost and other fertilizers, both organic and synthetic. Closely associated with building up the soils was the goal of reducing inputs, recycling materials, and obtaining necessary materials from local sources as much as possible.

Ann said,

All my byproducts, like manure, I try to reuse instead of having to discard them or take them to the dump. Most of my feed comes on a pallet with a cardboard liner so I can use that to mulch my produce in the garden and it will decompose and keep the weeds down and so to me, that's part of sustainability; using what you've got.

Most farmers discussed the importance of diversity, for the marketing reasons previously mentioned and to improve the health of their farming operations.

Farmers also emphasized the importance of having a good plan for improving fertility of soils, often including a rotation plan working in conjunction with crop and livestock diversity. According to Kurt,

It's important to have a fertility plan that you have control over and doesn't require chemical fertilizers or a lot of outside materials. Ideally that would be a pretty robust composting system. We use compost tea that we make ourselves and we get compost from a local firm that makes awesome vermicompost. We get the inputs from a local outfit and the fish emulsion is from the Northwest. So, all those things are big steps on the way to managing our fertility as sustainably as possible. This all works together. Crop rotation, cover cropping, conservation tillage, are all pieces of the puzzle in what I would define as the sustainable farming model for this climate in this area.

Larger farming operations tended to be more specialized, focusing on either crops or livestock, while many of the smallholder farmers were able to use both animals and different crops in their long-term plans to improve land and soils. Allison said,

By using intensive rotational grazing we are building up the quality of the grass by fertilizing naturally with the chickens, and then rotating

with other livestock so that they're not spending too much time on any given part of the land. They're sort of being forced to eat the grass and the forbs that they may not appreciate as much, but it takes care of a lot of the weed species and we are hoping that it will improve the quality of native plant species and allow more beneficial species to come back.

Another integral part of improving and maintaining the land was the sustainable management of water and irrigation systems.

Nearly all of the farmers I spoke with discussed the importance of a water management plan for minimizing water use while still maintaining healthy crops and pastures. Most of the farmers growing row crops used drip irrigation systems to minimize water use and reduce weeds. Those with overhead systems, mostly larger farms growing grass seed or grain crops, worked hard to be more precise in their irrigation practices to reduce runoff. Mary described her irrigation system by saying,

Managing the sustainability of my farm means, I can't let runoff occur because that would be poisonous. So, to be more sustainable I transitioned from overhead sprinklers to a drip system. Now I can improve the sustainability of the farm through the practice of fertigating through a drip system so that all my fertilizers are applied right into the root system and so I don't have to over apply my fertilizers.

Several farmers had water catchment systems that help to regulate water use throughout the year and lower costs of pumping water for irrigation during the drier summer months. Along with establishing more sustainable water management systems and minimizing irrigation, farmers also tried to reduce inputs of synthetic fertilizers and pesticides.

Fewer than twenty percent of the farmers I interviewed had certified organic operations but, most farmers did talk about the positive and negative aspects of organic fertilizers and pest management practices. While organic production was

mostly seen as positive, some farmers said that organic methods were only a place to start and sustainability should go further to enhance the health of the agroecosystem. Some said that organic fertilizers and pesticides could also have deleterious effects on the environment and so it was more important to minimize inputs whenever possible. Much of the discussion on minimizing “chemical use” on the farm was geared toward reducing consumption of fossil fuels used to produce and apply those chemicals but, the underlying goal was to target only those pests that were a problem so that soils and animals would be healthier and to reduce inputs on the farm. As Ruth said,

We do use some chemicals but the idea is to do an integrated pest management system so that you have more of a choice about what you're doing and most of the time you have lots of choices. The idea is to choose the way that does the least harm and is specific to whether it's a ground cover, or whether it's a pest problem but it's very specific to what you're dealing with.

While most operations were not certified organic, farmers often adopted what were considered organic methods to offset the use of synthetic inputs. Richard's explanation was a good example of what farmers were trying to achieve,

Four or five years ago, we started an experiment where we set limits for ourselves. We would reduce the use of herbicides, reduce the use of pesticides, and reduce the use of fertilizer. We decided that we would take a chance, because we are very self sufficient in terms of being able to do everything on-site to produce our value added product, so we didn't have to worry about a negative reaction from some outside processing plant. We found out that it wasn't as hard as we thought it was going to be, and it wasn't as high risk as we thought it would be. There seems to be an aura of fear around nature and natural systems and that they just don't work, or they are not effective, or they aren't sophisticated. What we have done as a species in the last hundred years is brought sophistication to the planet. The more I learn about microbes and interactions within plant systems, the more I realize that our methods are not very sophisticated at all. So, if you have that level of complexity in these ecological systems, and they are as effective as they have been, and they have proven themselves over time, why don't we learn how to work more within these systems, and see what there

might be for resources in those systems, rather than trying to re-write the process to suit a simpler model, which often ends up needing much higher inputs. It's the ecology that will tell you what the appropriate behavior is and give you a place to start. The organic people have made a move in a very positive direction, they are my brothers and sisters in terms of trying to improve the relationship of humans to the ecology but, I just don't think that it goes far enough; it's only a part of the picture.

The farmers in the region that I spoke with are concerned about the environmental impact of their farming operations and are constantly exploring new techniques to help balance inputs with outputs and so increase the sustainability of their farms. For farmers it is not a matter of seeing one type of farming as sustainable while another is not, the goal is to improve the land on every type of farming operation by whatever means available, and in so doing increase the longevity of the farm as a working agroecosystem.

Economic Practices

Farming is a business like any other and for the farm to be sustainable it is necessary to achieve financial stability. As Richard said, "A big question we need to ask when setting up a farming operation is; what do I need for inputs and who am I writing checks to." It was in the economic component where farming practices had the greatest influence on sustainability and balancing measures of input and output became too complex for simple distinctions between large-scale and small-scale farm acreages. Deciding on the type of farming operation, making the necessary investments to set up that operation, and then developing useful marketing strategies to sell the agricultural outputs all impact the economic sustainability of the farm. A farmer with hundreds or thousands of acres available may set aside large plots of land to try new grain crops or other diversified growing techniques in hopes of making

\$1000-\$1500 per acre. The small-scale farmer owning 20 acres may use very intensive practices in growing row crops to make \$4000-\$5000 per acre. So, while considerations of 'space' and the amount of acreage available to the farmer is important, farm size is not the only factor driving economic output. While the large-scale farmer growing grass seed or grain crops must make big investments in appropriate scale equipment for planting and harvesting, the smaller scale farmer often makes comparatively large investments in human labor. In upcoming sections I will discuss land-use and investment issues in more detail but, the point here is that agricultural output, and therefore farming scale, can be more fully understood by considering product amounts per acre as well as the amounts of acres per farm. The goal of every farmer in this study, regardless of farm size, was to improve economic sustainability through minimizing inputs while increasing outputs. However, large-scale farmers tended to have production models unlike those of smallholder farmers and therefore marketing strategies often differed depending on farming style.

Larger farms most often focused on volume production and sold their products primarily on wholesale markets while smallholder farmers tended to pursue various direct marketing strategies. Diversity still played a large part in becoming more sustainable, or what some farmers called more resilient. Diversity for large-scale farmers often meant having more wholesale buyers for their products so that if one customer was lost, there were other wholesalers to fill the void. For the smallholder farmers, mostly inclined toward direct marketing techniques, diversity focused on growing a number of different products to accommodate more customers. Ann stated, "I had to be diversified because I need constant income. It's better because then if

something crashes, something else will catch it, there's safety there, and a lot of things are interconnected." The goal of diversity was utilizing more outlets for farm products, through both wholesale and direct markets. Most farmers, large-scale and small-scale, had some kind of retail store, either on the farm or online, to provide products for their customers. Farmers growing row crops often used several direct marketing techniques including Community Supported Agriculture (CSA), farmers' markets, and farm stands to market goods. Farmers also mentioned a number of grocery stores and restaurants in Corvallis and other communities as outlets for farm products. The majority of smallholder farms under fifty acres used farmers' markets throughout the Valley as their primary marketing tool. Both large-scale and small-scale farmers said that cutting out as many "middle people" as possible helped to increase their profit margins and improved economic sustainability. Another significant element of diversity was multiple sources of income. It was common for the farmers I talked with, or their partners, to have an outside job to help supplement their farm income. For many, particularly on smaller farming operations, off-farm income was an important and necessary aspect of economic diversity.

Those farmers who relied solely on income from the farm worked hard to reduce labor costs whenever possible. Larger farms often used mechanical methods in the form of tractors and harvesting machines to reduce time and human labor needs while owners of very small operations often did most of the work themselves to avoid outside labor costs. However, for many of the farmers I spoke with, providing income for the local labor force was considered an important part of regional sustainability. As Alex said,

We've been moving more towards local help. One, because it helps the local economy. Two, because we know them, these are kids of people we know. The tradeoff is that, sometimes they don't have the work ethic that a crew of good agricultural leaning labor has. It's a challenge, but we've been much more focused on hiring locals, and it's been easier because the economy is poor, and a lot of people are out of work, families need the extra income, and so they are willing to do it.

For many farmers labor practices were closely tied to the social and environmental components of sustainability and they did not focus solely on making as much money as possible by increasing production through mechanical or human means.

Keeping good records and developing long-term farm management plans were an integral part of optimizing financial stability and “ensuring that the farmer knows where he or she stands within the whole farming system.” A good management plan was an important part of the economic component of sustainability because, as Susan said,

Sustainability is also about keeping the paperwork up so you know if you are charging enough and making some money, planting at the right time so you have enough product for all your customers at the right time, and keeping up the social aspects so that you are maintaining your customer base and recruiting new customers so that the business can continue well into the future.

There are many innovative practices that farmers use to increase economic sustainability on the farm, and they are often closely tied to social and environmental practices. In addition to describing sustainability definitions and practices, examining the issues farmers face in achieving the goal of agricultural sustainability will help to provide a more complete understanding of the role farmers play in the Marys River region.

Sustainability Issues Concerning Farmers

In this section I examine the issues that farmers considered to be most important in becoming more sustainable in the regional community and within the globalized agricultural system. Addressing the issues farmers encounter in becoming more sustainable will help in gaining a more complete description of the perspectives of farmers in the Marys River region. Like the previous sections, sustainability issues have been disaggregated and categorized within the three interrelated components of social, environmental, and economic sustainability. The relevant themes are:

- Social—Community/Region; Education; Policy/Paperwork
- Environmental—Land/Soil; Transportation; GMOs
- Economic—Financial Stability

Social Issues

Nearly every farmer I spoke with said that agricultural land in the Marys River region is under-used and that it could, and should, be utilized more efficiently. Farmers agreed that improving agricultural land-use in the region would require a paradigm shift away from relying on the presently dominant globalized system of industrial agriculture. According to the farmers I spoke with, one of the primary changes to that system, in the Marys River region, would have to include farmers growing less grass seed. As Terry said, “this is a great region to grow grass seed but, it isn't food. What we're producing is just going into people's front yards and onto golf courses and so we're just talking about aesthetics and not necessities.” An important thing to remember is that, while farmers I spoke with agreed that there should be less grass seed grown in the region, and a few were grass seed growers or had been in the

past, all were quick to point out that for many, growing grass seed is what pays the bills. Farmers said that, the way things are now, paying the bills has to come first in managing and continuing operations to achieve sustainability on the farm.

Unfortunately, many large-scale farmers, often with farms that have been in families for generations, feel tied in to the way they produce their crops because they have big investments and so, while many are struggling to stay in business, it is difficult to change their farming practices. As Alex said,

The family farm seems to be going extinct. They're dropping like flies because they can't survive. They're stuck in commodity agriculture, which can make them or break them. You buy into it, and you have to invest in specific equipment in order to make it happen, and it doesn't matter if it's a dairy or a grain operation, grass seed or whatever, if that commodity bottoms out, or some other country comes in and cuts the price, they go out of business. And it's clear that they are dropping like flies everywhere. The US citizen doesn't understand what is happening, and the consequences of that are, we're going to be dependent on China, or Chile, or someone else for our food. It's crazy. I don't know what the solution is but, to me, that's probably the biggest challenge to farmers. And because it's like that, you don't find many young people that want to get into farming, and we're all getting old. I've watched a generation of old farmers pass on, they're dead, and their kids don't want to farm. And you can't blame them. They look at it and wonder, 'how am I going to make it and feed my family'. And they're looking around and seeing farmers going bankrupt right and left. To me, that's the biggest challenge to farmers in the modern day; I could sum it up with the artificial commodity economy that was created, I don't know when or by whom, probably an agricultural historian could pinpoint when US agriculture moved from where it was to where it is now but, something happened there that lost the survival of family farmer in the equation.

So, for many farmers, growing more food was the key to a more sustainable region.

Farmers said that people in the region need to understand where food comes from and take care of the people who are producing it. As Terry and others said, we are farming out our food production to other countries instead of producing and selling products locally and regionally so that the area can become more resilient and sustainable.

Most farmers stated that, while it was important to increase agricultural production of food crops and livestock in the region, an increase in regional consumption of those products was an equally important part of that paradigm shift. The big question for several farmers was whether the paradigm shift would take place because of desire or necessity, and would it happen in time to be useful for today's farmers. Terry explained the severity and scope of the problem by saying,

Historically, most civilizations start to have a serious downturn in their success when the majority of people no longer have anything to do with their food production. When food is produced somewhere else and brought to you, there is a loss of understanding about what it takes to produce that food.

A common statement among farmers in the region was, "we are addicted to cheap food in this country, and people have no idea what their food should cost them." They said more consumers need to consider where their food is coming from and what it takes to provide it instead of just worrying about the price.

Farmers at every scale of operation in the region, from the very large to the very small, suggested that it was necessary to improve the agricultural infrastructure of the region to provide markets as well as processing and storage facilities for farm products. While there are increasing numbers of large-scale farmers in the region who are beginning to diversify through transitioning from grass seed production to grains, dry beans, and row crops, the problem they say is that the majority of those products are shipped out of the region, often to foreign markets. Many of the farmers who are making the transition to growing those crops are focusing on organic production and argue that while storage facilities are presently available for grass seed, those warehouses are not compatible for storage of organically grown products.

The history of the region showed that wheat was once the primary crop for farmers in the Valley but, over time farmers began to grow different crops to match the changing market. Several farmers I spoke with discussed the history of canneries in the region as an example of changing markets and the economic risks they had been subjected to in the past due to the elimination of those canneries and processors. From the farmers' perspective, deciding whether to change practices boiled down to assessing and managing the risk of trying something different. The problem, according to farmers, was that there were too few wholesalers or processors that were based in the region and so those companies were able to control the prices farmers received for their goods. Another related issue farmers faced was having more product than local demand could handle and having too few options in what to do with the surplus. Bob explained the problem by saying,

The system we have now is set up backwards. Instead of an infrastructure that is geared toward taking care of the region first and exporting the surplus, we have a system that brings in the majority of goods from outside while providing a limited amount of locally produced products.

Both large-scale and small-scale farming operations had similar concerns about balancing product availability with consumer demand. While most smallholder farmers of less than fifty acres were struggling to keep up with demand, many were also concerned about the future. Kim summed up the concerns of many farmers that used direct marketing strategies by stating,

As a primarily retail farmer, I think one of the biggest issues is that, right now this is kind of faddish and I'm a little concerned that there is either going to be a backlash, people are going to say that oh this stuff really isn't all that great, or, that people are going to say, well, that's an old fad, I want to go find a new fad to get excited about. So, I don't want to get so dependent on new people coming in that I shortchange my loyal customers or become overly dependent on people who may

not be as interested in staying with us for the long term. Also, because it is popular, there is going to be a lot more people jumping into this type of farming, getting overwhelmed and falling out of love with it. There is already some perception that people who sell at farmers' markets are elitist, and they only want to sell high priced products to people who have more money than sense. And so, there is a certain amount of truth to that because, I don't have the resources to sell [my products] cheaper, and there is nothing I can do with the way that I farm that would allow me to sell to the least common denominator of customer. But, on the other hand, I think there is a place in the selling of food for people who want a quality product. For people to say that; you're just selling to the elite and so we shouldn't pay any attention to you is missing the point.

The point that Kim and other farmers in the region were trying to make was that providing sustainable agricultural products for communities in the region requires a long-term commitment from both producers and consumers.

The theme of education was important in describing how farmers developed their skills, addressing the issues of balancing the needs of growers and consumers, the difficulties and risks of change, and directing the future of farming in the region. The farmers I spoke with who had been farming all their lives tended to explain learning about sustainable agriculture through a process of trial and error. It was also common to hear those farmers who had been working on farms for many years say that they had learned to practice what were considered sustainable methods before the term sustainability was commonly used. Ruth and Ben said; "for us, sustainable is asking; what is the long-term impact. Instead of just getting as much out of the ground as you can, it is asking whether it will harm the land for my kids and grandkids, and defaulting to the long-term over the short-term." Ruth and Ben had developed a system of ground cover strips in their fields to prevent erosion and later realized that those strips were also an effective part of what became an integrated pest management

plan. Other long-term farmers said that they had developed practices over the years like using fish fertilizers, cover crops, and beetle banks which were later called sustainable farming methods.

Many of the farmers I talked with, particularly those who were newer to farming, started out by working or volunteering on other people's farms to learn the ropes and get ideas for setting up their own farming operations. Nearly everyone I talked to said that spending time working on a farm was vital because you can get a college degree in agriculture but then you still need to learn how to farm. Allison told me,

I'm very glad that I went to OSU, and I'm very glad I got my degree in animal sciences but, if you want to go out and know how to run a farm business, you aren't going to learn it in college. You have to learn it by putting your boots on the ground and going out and volunteering, or getting a job on another person's farm, and doing a lot of reading and figuring out how to do it yourself.

In speaking with farmers, Oregon State University (OSU) was mentioned so many times as an influential aspect of agriculture in the region that it became a significant part of the education theme for this study. While researching the history of the region it became apparent that OSU, as the State Land Grant University, has been involved in the agricultural development of the region for a great many years. The University has played a large role in addressing sustainability for many farmers and in directing farming practices in the Marys River region. I felt a detailed discussion of OSU was most appropriate within the issues section because there are both positive and negative perspectives among farmers on the role of the University in the region.

There were several farmers who mentioned particular Extension agents from OSU who they had worked with throughout the years. While farmers tended to

mention Extension agents in a very positive light, those discussions were most often considered in the context of lamenting the fact that many of those agents were retired now and so the knowledge they carried was no longer available to farmers. Several farmers told me that one of their primary concerns was the loss of both farmer knowledge due to old farmers retiring or dying out in the region and also the loss of those Extension agents who were able to travel to different farms throughout the region and were available for farmers to consult with on important issues. Farmers said that Extension agents were able to provide information on pest problems and remedies so that farmers would know what kind of pests they were dealing with and whether their problems were isolated incidents or part of a larger regional problem. It was also noted that in more recent years farmers have been able to access information from universities through various websites and many said that the information they acquired using those technologies was often valuable in their decision-making process. There were a few farmers I spoke with who were conducting agricultural experiments on their farms, working in conjunction with the OSU Extension Agency, to develop new farming practices or try out new crop types. Many smallholder farmers in particular had positive comments about the Extension Agency and many described how helpful OSU was in developing more useful and sustainable farming practices. However, there were also some negative comments on the role that OSU has played and continues to play in the region.

Although positive and negative views of farmers on the role of OSU in the region showed no clear relationship to farming practices, I did notice that the positive comments were most often directed toward Extension agents in particular while the

negative comments were most often aimed towards the institution of OSU. The common complaint among farmers, which has been previously noted, was that the farming models developed by the University were too often geared towards particular specialized crops and toward increasing farm production while neglecting other aspects of the farm like long-term marketability and input costs. As Richard said, “the University wants to promote the high-yielders, and I’m asking them, maybe we should focus less on high yield and focus more on trees that don’t need so many inputs.” Farmers said that it was necessary to carefully consider which suggestions offered by OSU were appropriate for particular farming operations because those ideas were not always cost effective.

Another important issue for farmers was biotechnology and the concern that OSU was focusing too much on genetically engineered, or GMO, crops. I will discuss GMO crops further in the environmental component but, Kurt addressed some of the social concerns about OSU’s role in the development of biotechnology in the region by saying,

We do have OSU to contend with because OSU is very much supported by biotech. To a large degree, they get a lot of royalty’s from people and institutions related to the biotech industry. OSU is the lifeblood of this town, and I don’t really want to go fight them but, there are very powerful interests at that university that definitely would not support an ordinance giving power to the people to ban GMO agriculture. That would have implications for them because of what goes on there. It wouldn’t be pretty but, at what cost do we proceed down this road of researching and implementing these crops that ultimately threaten our whole farming system. It doesn’t benefit us, the community, it benefits the people that own the genes and own the patents. That has proven to be the case everywhere else in the country where this is happening. I just don’t see any long-term benefit for the grower, and that’s who I’m most worried about, the grower, because he’s the absolute front line, and all the risk is on them, they’re in the trenches. So, anything that supports them, I’m all for, and I think that by extension, you’re directly

advocating for the community when you advocate for the farmers. The farmer is one of the most important members of the community because they are growing the food for that community. And if those farmers are threatened, the community will be in big trouble.

Overall, the farmers I spoke with saw OSU as a resource with positive attributes and helpful individuals who were taking practical steps toward making agricultural production more sustainable. However, many said there was still a dominant focus on the industrialized model of increased production through technological innovation at the University that was often problematic in developing sustainable farming practices. Another issue that farmers were concerned with, and which many considered in the context of education, was farming regulations focusing on food safety issues.

Many of the food safety and farm regulation issues that farmers spoke of revolved around the problem that those regulations were directed toward large-scale farmers using industrialized farming practices and therefore made it difficult for smaller scale farmers to operate within that industrialized system. According to Terry and Margaret,

The majority of the problems that hinder us are all the regulations that we have on food production. I think that we've gone way overboard in so many ways. I think that food is the most heavily regulated thing in the world and especially in the US. Our business owns four or five, maybe even six different licenses. We deal with four different government agencies. You know there's just so much hoop jumping and regulatory folderol that really makes it difficult, and they've made it that way to make it difficult for certain people. I don't like to be too much of a conspiracy theorist in this particular case but, I strongly feel like big business and government are in each other's pockets so that they can pretty much write what they want, both ways, in terms of how the regulations go, and so they sit pretty being able to control their own regulations and they can set bars that are not easily achievable when you have more of a small scale production model. So that's the number one problem with our agricultural system I think, is the regulations. And the question that always gets thrown right back at us, whenever we say something like that is; what would you want, no regulation? Well,

no, let's just use some common sense again. Let's teach people how to cook food again. Teach people not to undercook foods so that salmonella isn't a problem. We're so lazy we would prefer another regulation over just learning how to do something properly. Again, it's a paradigm shift.

While many smaller scale farmers discussed the problems that they had with conforming to the rules and regulations for things like slaughtering animals and value added food processing methods, their goal was not necessarily to reduce or get rid of regulations but rather to change the rules so that they would also be applicable to smaller operations and to make available appropriate scale facilities that would allow them to market products on a regional scale. Although many of the smaller scale farmers were very concerned about food safety issues, those concerns were focused mostly on how consumers handled food products after they left the farm. Mary explained one of the problems with consumers and organic certification by saying,

A lot of people get mixed up. They think that if it's organic they can just eat it and that's just stupid. I see some people at an event and they will tell me about how they are only eating organic and so they really don't have to do anything and I think, well, the same birds are flying over their fields.

While many of the smaller scale farmers focused on solving the issues of farming regulations by setting up programs to be exempt from the industrialized agricultural system, larger scale farmers tended to consider the regulatory issues of working within that system.

For larger scale farmers who were more likely to sell the majority of their products wholesale and be part of the global market, their primary concern was with regulations focusing on pest contamination. Richard said,

The FDA right now is zero tolerance, and that's one of our main regulatory agencies, zero tolerance for contamination. I think there are

people in our society and within our industry that try to make you feel like these pest management problems can't be solved without their help and without using their approach.

The concern was that the regulatory agencies simplified the problem of pest contamination by simply spraying more chemicals on agricultural products to eradicate pests instead of seeking out alternative methods. As Ruth and Ben told me, “zero tolerance as a goal puts you in a cycle of just spray, spray, spray, and that's not sustainable, and it's not something we want to do on our farm.” The farmers that I spoke with said that education should include farmers, consumers, and institutions to make possible the paradigm shift that was necessary to increase agricultural land-use and efficiency and thus improve sustainability in the region.

Environmental Issues

As noted previously in the social component of sustainability issues, farmers in the region said that agricultural land should be managed more intensively. Farmers argued that by creating more balanced agroecosystems that included both plants and animals, and by utilizing more pasture land and increasing diversity, they could produce more agricultural products for the region and still do it sustainably. The goal was not only to build stronger healthier communities, but also to keep more land in agricultural production and so avoid urban sprawl and development. Although the majority of farmers I spoke with were in general agreement with Oregon's land-use laws, there were some conflicts over zoning regulations.

One significant problem mentioned was that farmers were often unable to build housing structures on land designated Exclusive Farm Use because of strict land-use laws. Farm operations that use organic methods or do not use chemical sprays on their

crops tend to require more human labor to control weeds and pests. Farmers who are able to provide housing for labor on the farm are better able to hire interns and supplement wages with room and board on the farm. The result of those land-use restrictions was that they were unable to hire the needed help that would allow them to increase production because workers had to travel long distances and farmers couldn't afford to pay wages that would make travel costs worthwhile. Farmers said it was a difficult situation because, while they did not want farms to be subdivided and sold for development, they should still be able to make their own land more productive. Mary said, "it should be considered on a case by case basis, it shouldn't be that you go to the poorhouse with your property."

Oregon State University was mentioned by several farmers in the context of development and expansion of the Corvallis community into the surrounding agricultural area. Again, most farmers realized that growth was inevitable but, as Leon said,

I hate to see Class One soil anywhere get set aside for development. I think of OSU's old South farm, just on the other side of Philomath Boulevard, which is Willamette Class One soil, and what OSU has planned for that space in the long-term has nothing to do with agriculture really. Yeah, it's within the city limits but, it just seems like, isn't there something we could do with that really productive fertile soil, even if it's setting aside part of it for community gardens, something as simple as that would still, in my mind, contribute to the overall sustainability and best use of that particular resource.

Farmers were generally in favor of the state land-use laws but, many said there should be a closer review of how land is utilized and in making distinctions between improving farm land for farmers and selling off farm land to developers.

An issue that was mentioned repeatedly by farmers as a difficult problem in improving the sustainability of the region was transportation. While transportation was another issue that was often considered in the context of economic costs, farmers were also concerned about the environmental impact of transporting agricultural products long distances. Farmers said that by developing and expanding regional markets, they would be able cut down on transportation of agricultural goods and so reduce the ecological footprint of agriculture in the area. Most farmers I spoke with argued that changes in the global food distribution system were necessary to allow increased production in regional markets and therefore reduce transportation costs and environmental impacts of importing the majority of food and agricultural products from outside the region.

Perhaps the most contentious issue discussed by the farmers I interviewed was the use of genetically engineered organisms, or GMOs, and the introduction of GMOs into the Marys River region. When I asked farmers what they considered to be the most important issues facing farmers today, nearly everyone mentioned GMOs in the list of concerns. While some farmers simply mentioned their concerns that genetic engineering of different organisms could have a negative impact in the future, others went into more detail about problems with resistance and contamination of non-GMO fields. Kurt, one of the most outspoken opponents of GMO crops I spoke with said,

I think the threat of genetically modified organisms is one of the biggest threats to farming right now. Because, it threatens not just organic farmers, but conventional farmers that don't necessarily want to work for the biotech companies. The reason I think it's such a big threat is because of what happened in the Midwest and in the South, as soon as the biotech firms came in with their GE seeds, within ten to fifteen years, it's almost impossible to find uncontaminated varieties of cotton, corn, soybeans, and that could happen here. We've got GE sugar beets,

GE alfalfa, and they're talking about bringing in GE wheat. If GE wheat in particular is allowed in here, within a generation we could see a total loss of all organic and conventional varieties of wheat. That's a huge problem. It just takes the control completely out of the farmer's hands because of the patent laws. I mean, a farmer being held liable for contamination of his field; that is bullshit. That is just so nonsensical. Through no fault of his own, his crop becomes contaminated by a GE variety of whatever is being grown, and he gets sued, and loses? That's wrong. It's telling me I can't save my seed now because your volunteers blew into my field; that's wrong. It's bad enough that they are wrecking the seed-stock, the gene pool, but now you're going to come in and sue me? I think that's terrible. A lot of people don't see it as a really critical issue but, I can't help but think that nothing is more important right now because, everything else that we're doing now to improve sustainability, will mean nothing if I can't control what and where and how I plant. Then I'm no longer my own farmer. Then I'm just a tool of that firm. So, I can't think of anything else that would even come remotely close to that. There are growers in the area that have had their seed contaminated by the GE sugar beets already, the table grapes and swiss chard are being contaminated, the organic dairy guys are scared shitless because of the GE alfalfa in their feed, and now Organic Valley and Whole Foods have caved to the biotech industry and said, we will accept a certain level of contamination in our products now. And these are big organic advocacy companies so, there's got to be a line drawn in the sand, and if Oregon can't do it, I don't know who can. It's almost too late in a lot of other places; they're just inundated with all this crap. So, if we don't stop them now, I don't think we'll be able to later, and then you can say so long to organic. That scares me because; organic to a lot of people is still seen as a fringe, or a boutique industry. I've been told that it's really revolutionary what people are doing organically now. Well, not really, this is a throwback. Chemical farming is new and was innovative, and it's a blip on the radar of human agriculture. For ten thousand years we've been growing crops organically, and you're going to tell me now that it's revolutionary?; It's anything but, it's a throwback. It's just funny that industrial agriculture has become so big, so quick; that it's permeated everything to do with Ag, so that if you don't farm using chemicals, you're considered different or revolutionary, and using chemicals is conventional farming. It's just strange, very strange.

Kurt summed up very well most of the concerns voiced by many of the farmers I spoke with. Farmers were dubious about the introduction of GMO crops into the region and very concerned about loss of control over outside influences on their

farming operations. The organic growers I spoke with, as Kurt mentioned, were very uneasy about contamination and particularly about the loss of seed-stock for growing organic crops. Because organic growers in the region tend to be smallholder farmers, their concerns were based on the knowledge that they had very little power over policy and production in the region. However, nearly every farmer I spoke with, large-scale, small-scale, organic or otherwise said that the introduction of GMOs into the region was a complex issue and should be considered very carefully for the protection of agriculture now and in the future.

Economic Issues

A key issue for farmers in the region was achieving and maintaining financial stability while working to improve the social and environmental aspects of sustainability on the farm. As farmers often said, “if we can’t survive financially, it doesn’t matter how sustainable we are.” Farmers often said that it is important to have a good business model for the farming operation that will allow farm managers to keep track of cash flow and to set priorities in farming practices. One of the primary issues that make achieving those farming goals difficult is uncertainty in the market.

Market issues ranged from large-scale farms needing contracts to ship products outside the region as well as meeting the demands of regional markets, to smallholder farmers focusing primarily on local and regional markets. At any farm scale, predicting markets is a difficult aspect of farming. James said,

One of the concepts that we're faced with in agriculture as a whole is determining your market, and if you're in the generic market, you're in a competitive, least cost production model. That means that, if you can't produce it cheaper than someone else, then you're going to fail because, the basic price essentially falls back to cost, and the only other thing is the natural advantage that you have, or the unfair advantage, or the

ability to produce the product cheaper than somebody else. Or, do you have another job, or some other source of income to support your enterprise. So, that's one of the basic areas of sustainability.

James made a pretty fair assessment of the ‘farmers problem’ described by Bell (2004) in chapter two. An important aspect of developing a business model is predicting increases in production costs. Most farmers mentioned the difficulties of rising prices in fuels and everything else related to production. Mary addressed the marketing issue by saying,

The problem for farmers is, they don't get to set the market price. They are the last ones to know what the market price is. So, everybody else is out there making deals around money, and then they come back and tell the farmer what they are going to pay. And the farmer has these increasing costs, whatever they are, whether it's the minimum wage going up, or costs of fuel, costs of fertilizer, all these costs are going up. But, when we try to bump up the costs of food, it's met with huge resistance. Our culture is so accustomed to cheap food that, it's really hard to have any recognition of what the true value is, or what the true cost of production is, and to actually come out in the black. So, it's not like you're in rich city. The farm subsidies that are geared toward the middle of the country around corn and soybeans, don't apply here. So, farmers get a bad rap for getting farm subsidies but, not everyone is growing a crop that is being subsidized.

Several smallholder farmers who focus primarily on direct marketing strategies told me that prices are becoming increasingly competitive. Farmers said that even among organic growers, where customers often buy from certain market stands where they have shopped for years, more people are price shopping. As Tom said; “because a lot of people have lost jobs, it's a tougher market to sell in.”

Another area of financial uncertainty is the issue of labor on the farm. Labor issues have been discussed in previous sections but, it is important to consider the cost and availability of labor and how that affects production. Several farmers mentioned the difficulty of getting local people, usually teenagers, to help on the farm. Or,

regulations and the paperwork involved with hiring interns or temporary help was both time and cost prohibitive. Farmers who used primarily Latino workers were concerned about the future of immigration issues that could have negative effects on farming enterprises. Jean described the farm labor situation by saying,

It takes a lot of work to bring the product to market. I think that all this nonsense about guest workers is just horrible. They've just got the wrong group; they're checking the IDs of the wrong group. These are people that are working; who are actually working. I'm OK with sending people back that are lying on their butts, or working in gangs, or whatever the reason is that they don't like them. But, these are people that go to work every day, and who bring their families to work every day, and carpool, and live together because they're making minimum wage, and working their butts off. We run a waiting list for employees, and there is never more than one or two, I'll just call them white people, on that list. And the list is just there, we didn't call anybody special, we just put up the list. When my kid was at Corvallis high, I used to try to hire high school kids here. It was a total waste of time and money. They all got busy understanding that picking produce wasn't the job that they wanted. That's the learning experience that went on that day. Seriously, the farm labor situation, if we continue to bang that drum, is just wrong. Our workers, and not all of them are English speaking, are really clear about being here to work. I had high school kids that, their mother's would stop by and see that we were going to harvest. So, I would say, we can't harvest in the heat of the day so, my workers are going to show up at 5:30. And they would say, well, he can be here by 9:00. OK but, he'll be off the field by 10:00, because I can't have you out there in the heat of the day so, figure it out. You wonder what people are thinking.

Farmers agreed that working in the fields was very hard, often hot, thirsty work but, it has to be done to get the harvest in. Discussing the many issues farmers face in the struggle to improve sustainability helped in gaining a better understanding of their sense of place and identity in the region.

Summary of Findings

This chapter has examined the findings of my observations and interviews with farmers in an ethnographic study of the Marys River region. The social,

environmental, and economic aspects of sustainability were disaggregated and analyzed in each section of the chapter to present a more complete description of farmers' perspectives as stakeholders in the region. The findings of interviews with farmers helped to answer the research questions for this study.

1) How do farmers in the Marys River region define agricultural sustainability?

Even though farming backgrounds and practices varied among farmers, the basic definition of sustainable agriculture was the ability to continue farming into the extended future. As noted earlier, this deceptively simple definition is the core of farmer identity and paramount to understanding the reasons behind farmers' practices. Because farming must occur in a particular location, understanding farmers' definitions of sustainability must begin with considering the 'space' of the individual farm. Findings show that definitions and practices are influenced to some degree by the different characteristics of individual farms. Location of each farm within the region plays a part in determining what agricultural products will be most successful. The farmer is inherently tied to the space of the farm and therefore her first concern must be the management of that land. As the market for agricultural products changes, farming practices change to meet consumer demands. Therefore, the farmer's goal of achieving sustainability depends on the consumer's demands in the marketplace.

2) What methods do farmers use to develop more sustainable agroecosystems?

The section on sustainable farming practices described in detail the many different techniques farmers use to achieve their goals based on individual philosophies and opportunities provided by land availability and personal circumstances. Farming practices were often adapted to, and determined by considerations like location, farm

size and worldviews but, the central focus of farmers was to develop good management and farm planning strategies that would fill a niche in the marketplace and provide a balance between inputs and outputs on the farm. Although the location of the farm stays the same, farmers make changes in their practices over time to help maintain that balance and better manage the land in order to stay in production. Those changes are influenced by decisions that occur outside the space of the farm but, those outside influences play a powerful role in determining the place of the farmer in the region. Notions of place are built on the perceptions and discursive practices of stakeholders describing their experiences within a particular region. Although the experiences of individuals in local areas are not outside the scope and influences of globalization, it is important to recognize that the acceptance or denial of those influences is determined by relationships among stakeholders with differing worldviews within a particular geographic area.

- 3) What do farmers consider to be the most important issues in developing a more sustainable regional community within the globalized system of agriculture?

The uncertain future of agriculture in the Marys River region was the most important issue discussed by farmers. For farmers in the region, the ability to continue farming is based primarily on financial stability and therefore most issues were focused on different ways of achieving that goal. In the following chapter I will discuss some of the possibilities described by farmers for increasing agricultural production and thereby improving the sustainability of the region.

Chapter Six: Discussion and Interpretation of Findings

Prior to this study my previously held definitions and understandings of sustainability were derived from information gathered through research including many different books, articles, government standards on organic production, and studies among smallholder farmers in the Ten Rivers region (Stanton 2010). The views I had were based on an assumption that those farmers who were practicing organic farming methods had a more clearly defined organic or ecological worldview and therefore had more sustainable operations than those large-scale farmers who were practicing industrial agricultural methods and following the mechanistic worldview (Merchant 2005; Jackson 1994; Bell 2004; 2009). In the beginning I wanted to gain a better understanding of the issues smallholder farmers faced in becoming more sustainable based on those predefined notions of sustainability. As my research studies and experiences among farmers in the region broadened and I became more focused on the possibility of analyzing farming in a particular bioregion, it became clear to me that my assumptions about sustainability definitions were just that; assumptions. While I had retained from the beginning the idea of keeping the farmer central to my research, I realized that to really understand the issues farmers faced in becoming sustainable, I first had to determine how farmers themselves defined sustainability. To establish a more complete understanding of farmers' perspectives, it was therefore necessary to go back and reestablish the foundations of the research to develop a clearer explanation of sustainability definitions for this study. Building on previous research to help guide the direction of this ethnographic project, I approached a broader population of farmers and changed the focus of the research question from

asking farmers; “Are you sustainable?” to; “What is sustainable agriculture?” This research project focused on clearly defining and describing agricultural sustainability from the perspective of farmers in the Marys River region of Oregon. Two of the most significant findings derived from this study were:

- 1) The common definition of sustainability among farmers is the ability to farm in a particular location in such a way that will provide a balance between inputs and outputs and so allow them to continue farming on that land into the extended future.
- 2) Farmers, because they are inherently tied to the ‘space’ of the individual farm, develop a perpetual sense of place within the region, which in turn forms a core component in the farmer’s identity influencing definitions of sustainability.

While these findings may seem rather obvious, they can be seen as a common ground for dialogue among stakeholders with differing worldviews. However, understanding the meaning behind those findings is both complex and necessary to improving sustainability in the region.

The Farmer’s Definition of Sustainability

The farmer’s definition of sustainable agriculture is simple and straightforward; the ability to continue farming into the extended future.

Unfortunately, as the history of agriculture in the United States has shown, accomplishing that objective is difficult and in many cases impossible. So, does the farmer’s definition mean that everyone is sustainable regardless of agricultural practices and therefore the term sustainability is meaningless and should be replaced

with agrarianism as many have suggested? I would argue no, the term is not meaningless but, reaching consensus on a sustainability definition among stakeholders requires a clearer understanding of the farmer's perspectives on the complex issues of space, place, and identity. What I found when asking farmers how they defined sustainability led to a significant discovery. All farmers, from the organic grower with five acres to the grass seed grower with 5,000 acres define sustainability as the ability to continue farming into the extended future. That basic definition provides a common ground from which to proceed in the ongoing dialectic between those stakeholders with a mechanistic worldview and those who hold to the ecological worldview. Farmers choose practices they feel will work best for them based on the geographical attributes of the individual farm, marketability of agricultural products, individual worldviews, ethics and values, and the information they have inherited or accumulated through the experience of living within a region.

The history of agriculture in the Marys River region shows that successful farmers are willing to change, and indeed must alter farming practices when necessary to stay in business. Agricultural management requires balancing a set of complex relationships between land, labor, and capital on the farm (Thompson 2010). Farmers will either construct a particular type of farming operation or make changes and improvements to their ongoing farming operations based on constantly shifting markets (Altieri 1995; Blaikie and Brookfield 1987). However, there are many externalities requiring active social, economic, and political relationships within the broader community that often have a great deal of influence on farming decisions. Therefore, ensuring that the farmer's definition of sustainability is more aligned with

the definitions of other stakeholders in the region requires the creation of a stable regional market that will conform to the ecological limitations of the bioregion while allowing growers to continue making a living.

Ties to the Space of the Farm

One of the significant findings of this study contradicts the notion that farmers with a more mechanistic worldview and who cater to agribusiness see the land only as a medium for production while those with an ecological worldview and who practice traditional methods tend to be more attached to the land (Bell 2009; Jackson 1994). What I discovered is that a common element among all farmers, regardless of farm type or amount of acreage, is an inherent connection to the land, or space, of the individual farm. Even though farming methods may be significantly different, and while beliefs and practices may change over time, the farmers I spoke with all had a clear connection to the land they were farming. The social construction of local knowledge is based on actual farming practices within the physical space of the individual farm but is also built on discourse and interactions among stakeholders, primarily farmers with similar worldviews and attachments to the land.

It has been said that farmers tend to identify themselves by the type of farm they own or manage (Bell 2004; 2009), and to a certain extent that is true. The farm represents the farmer and plays a significant role in the creation of a sense of place in the region. However, since farming practices are also determined by the marketability of the goods they produce and the resilience of their production model, the farmer's identity is defined to a greater extent by the successfulness of the farming operation, which is determined by longevity or, sustainability. While the space of the farm

remains the same, farming practices change to meet the needs of the consumer market. This can be seen as positive news for those who wish to develop a stronger and more independent bioregion. The key to developing a more inclusive definition of sustainability begins with a clearer understanding of the farmer's place in the region while solutions to building a stronger and more independent bioregion lie in mending the disconnect between consumer demands and the realities of agricultural production.

Integrating Sustainability Concepts

An important part of this project was the synthesis of information gathered from farmers in the region with that of background studies to create a theoretical framework for integrating the various concepts relevant to this research. Because of the multiple terms and definitions used to describe nature, development, degradation, and sustainability, it was necessary to consider the viewpoints of stakeholders with differing worldviews on the subjects pertaining to agricultural sustainability. Discussing the history, geography, and socio-political policies of the region was an essential part of establishing relevant background information to determine how the perspectives of farmers fit in with the dominant views on sustainability in the area.

The model of regional political ecology developed by Blaikie and Brookfield (1987), making the regional land manager a central figure in research, was a foundational element in this study. Another key factor was an increased focus on conceptual elements within bioregionalism to achieve a more inclusive model of bioregional political ecology. One of the goals of bioregionalism is to improve and extend the relationships between members of communities and the natural world through the expansion of place-based knowledge (Thomashow 1999). The usefulness

of a study lies in part on the ability to make comparisons with projects by researchers using similar methods in other regions. I described three examples of studies done by McCarthy (2002), Robbins (2006), and Walker (2003) using methods of regional political ecology. I think it is helpful to reiterate the major themes and ideas addressed by McCarthy, Robbins, and Walker to establish a precedent for discussing similar themes found in my own research. The themes presented by McCarthy include:

access to and control over resources; marginality; integration of scales of analysis; the effects of integration into international markets; the centrality of livelihood issues; ambiguities in property rights and the importance of informal claims to resource use and access; the importance of local histories, meanings, culture, and ‘micropolitics’ in resource use; the disenfranchisement of legitimate local users and uses; the effects of limited state capacity; and the imbrications of all these with colonial and postcolonial legacies and dynamics. [2002:1283]

All of the themes discussed by McCarthy (2002) were addressed to some degree in this study. Marginalization and control of production were important issues for farmers in the Marys River region. Integration into, or influence by international markets are a reality that impacts the livelihoods of farmers everywhere. Discussion of the agricultural history of the region showed the changes in resource use over time and the impacts of political policies on farmers in the area. Robbins (2006) discussed the problem of measuring place-based knowledge based on right or wrong answers to ecological questions about a region. According to Robbins, political ecology research “seeks instead to reveal varying knowledge communities within a nexus of property and labor relations that condition variable and shifting discourses of society and nature” (2006:191). By focusing on understanding farmers’ definitions of sustainability, rather than determining whether farms were or were not sustainable based on preconceived definitions, I was able to discover the importance of

appreciating farmers' perspectives in the region. According to Walker, it is necessary to view the region as a "*meso-scale* that mediates between local and global processes" (2003:12). Research findings from the studies of each of these authors helped me to describe the important elements considered in my own research; the pertinent themes of political ecology, the importance of relationships among stakeholders, and the significance of understanding location and the regional scale in conducting research.

Walker's (2003) application of regional political ecology to his study of a rural area in California was most comparable to my own research in the Marys River region. The history and political dynamics of the Marys River region are similar to Walker's examination of three ideological perspectives held by stakeholders in his study; "the older resource-based economy (ranching, timber); a development industry; and the newer rural-residential, amenity-based economy" (2002 15). The history of the Marys River region, along with observations and interviews among farmers, showed that there are elements of an older resource-based economy in the area, focused mainly on timber, grain, and now grass seed production. Evidence of an ongoing development industry geared toward increasing economic growth opportunities and expanding communities was plentiful in both the literature and discussions among farmers. There were also examples of an amenity-based economy described by several newer smallholder farmers in the area. It is clear that there are multiple perspectives on development, sustainability, and the place of agriculture in the region. Throughout this study I worked to create a pathway through the research based on examining and interpreting the place of farmers and their relationships among stakeholders in the Marys River region and within the context of the globalized system of agriculture.

Perspectives on the Space and Place of Farmers in the Region

While interviewing farmers to determine definitions of place and identity it became clear that, regardless of farm size, farming style, or market base, everyone described farmers and agriculture as having an integral place within the Marys River region. Farmers often interpreted the term ‘place’ in the context of economic impacts of the individual farm within the perimeter of their market base, expanding outward from the very local region. Farmers, like all individuals, are not exempt from the influences of globalization. However, whether they were describing their place in the local community, the larger ecoregion, or within the context of the globalized food supply chain, farmers spoke from the viewpoint of the ‘space’ of their individual farms and in terms of the importance of agricultural lands within the Marys River region. The point of clarifying the differences between space and place is that, although it has become quite common to suggest that we humans are all part of the global village, the reality is that we as individuals can occupy only a very small space on the planet at any one point in time (Escobar 1999; Thompson 2010). While discourse is essential in describing and understanding the farmer’s sense of place, the physical aspects of the farm itself also makes a statement and helps to represent the place of the farmer in the local community. The way that the physical space of the individual farm is kept, in relation to the surrounding area, says a great deal about the place of the farm owner and how that person wants to be seen within the community. In other words, the place of the farmer cannot be separated from the space of the farm.

There is a great deal of information on the ideas of space and place. The dualism that is a dominant component of the mechanistic worldview, based on

Cartesian philosophy, has led to differing notions of what determines space and what is place. For many the idea of space is considered to be objective while the concept of place is subjective (Thompson 2010). Constructivist applications for creating an intersubjective construction of reality require an understanding of the geographic area as a setting for social interactions (Moore 2001). According to Thompson;

Space—the underlying reality—is represented as place by subjects who experience a given spatial locale in association with certain cognitive or emotional affects, on the one hand, or through the interpretive filter of certain discourse practices on the other. Place is thus dependent on the cognitive process of subjects. [2010:131]

Space, the physical reality of a particular location, is represented by, and is a product of the various discourses among specific parties with varying interests in describing how those rural spaces are defined, resulting in a social construction of place. “Place exists only in the mind, and the experiences and practices of perceiving or discoursing subjects. It is a secondhand copy of actual spatial locations mediated by cognitive or linguistic processes” (Thompson 2010:132). While the meaning of the term place among farmers in the Marys River region was based on the physical space of the farm itself, identity was also closely associated with the relationships between customers, institutions, and other farmers. The first priority for farmers was being able to continue farming within the physical boundaries of the farm in which they live. Second was the ongoing relationships those farmers had with their neighbors and the communities where they were doing business. What is perhaps most important to understanding farmer identity is that, while many described themselves as particular types of farmers, individual practices were not set in stone and so the real priority was a continued ability to farm the land in some capacity.

Opportunity plays a significant role in determining farming practices which in turn help to determine the farmers place in the region. A number of different strategies have been implemented by farmers trying to fill a niche within the sustainable agriculture market or change from the structure of industrial agriculture to more traditional agroecosystems. For some, sustainable farming practices involve a return to older methods of agricultural production. Smaller-scale tractors and farming implements that are no longer adequate for the increasing scale of many farms are being rebuilt and redesigned to accommodate the needs of farmers using more traditional practices. In many cases farming methods that have been lost or forgotten need to be relearned by newer generations of farmers (Bell 2004). Newer technologies have also been incorporated into sustainable farming systems. As Bell states;

Advocates of sustainable agriculture have been particularly excited by new farming techniques like ridge tilling, rotational intensive grazing, deep-bedded hoop houses for hogs, and holistic management, as well as older techniques like crop rotation, flame cultivation, pasture-farrowing, and direct marketing—jargon to those outside what must now be recognized as the *sustainable agriculture movement* but a social, economic, and environmental lifeline for those inside it. [2004:5]

It is important to remember that the idea of a widespread return to the Jeffersonian ideal of the small-scale family farm is unrealistic because it ignores the massive political power of agribusiness corporations. Instead of a return to an older system of agriculture, with its often repressive race and gender roles, a transition from the dominant industrialized agricultural system to a more sustainable systems-based approach must focus on resolving the broader political issues which emerge from struggles between groups with opposing worldviews. Those struggles are often the result of conflicts between agribusiness corporations and those doing the actual work

on the farm. Many of the predicaments faced by farmers at the local level are due to a forced induction of the essentially space and place-based nature of agriculture into a vertically integrated global market economy which severely limits the ability of farmers to regulate prices and diversify production (Thompson 2010). According to Altieri;

Change toward a more socially just, economically viable, and environmentally sound agriculture should be the results of social conflicts and social movements in the rural sector, rather than the diffusion of technological innovations, which lack the power to bring about more equitable social arrangements. [1991:131]

In order for farmers to expand local knowledge and awareness of place, practicing sustainability must go beyond the confines of the individual farm to include communities and the local region. Although farming is a space and place oriented occupation, it is necessary to remember that farmers are also part of a much larger agricultural system and sustainability depends on interactions between human and non-human elements at all levels (Gliessman 2005; Pretty 2002).

According to Escobar (2001), researchers often make the distinction between global and local processes, and have approached the global realm as being without culture rather than seeking to understand the changes in cultures caused by globalization. Escobar (1999) argues that achieving sustainability depends on the incorporation of different views of nature into new forms or hybrid natures that will allow local communities to negotiate with external forces and adopt useful changes while maintaining a basic autonomy and local cohesion. Ecological considerations should be understood in biological terms that embrace the complex relationships between environmental, social, and economic practices within regions. Achieving sustainability is a problem of management that should be controlled by local

communities rather than the self proclaimed experts who hold to the dominant mechanistic worldview. The argument presented by Escobar (1999) is similar to Foster's (2004) critique of those suggesting that we try to 'Green' neoliberal organizations like the World Bank and the World Trade Organization that are so influential in promoting the globalized food supply chain. According to Foster, there is a problem among many environmentalists of adopting a single-issue approach to sustainability issues rather than developing alliances among regional participants. Presenting people with the choice between protecting the environment and protecting livelihoods is just another way of separating humans from nature (Foster 2004). What is most important to promoting sustainability in the Marys River region is not any one perspective but an ongoing dialogue between those with differing viewpoints and an ability to accept changes that will promote equality and longevity for humans and the environment.

Given the notion that the real driving force behind farmers' perspectives is the ability to continue farming, the goal of developing a more sustainable agricultural system within the Marys River region seems more in reach. According to background research including the agricultural history of the area and information gathered from farmers I spoke with, there is some potential for making the necessary changes in the agricultural infrastructure that will allow farmers and consumers to work together in developing a regionally based market that will strengthen all three components of sustainability in the region.

The Possibilities for a Future Paradigm Shift in the Region

Since the dominant system of industrialized agriculture in place today has been socially constructed, it can also be deconstructed and replaced with a new system where values are based on considerations other than economic growth and conspicuous consumption. Many have suggested, including several farmers in the Marys River region, that long-term sustainability requires a restructuring of markets toward a focus on regional community relationships that will allow more control of production and distribution by local populations and thus increase farm income, reduce out-migration of rural people, and decrease environmental degradation caused by the industrialized agricultural system. Individuals within societies must know how their food is produced and where their vulnerabilities to hunger lie in order to understand and improve their conditions of sustainability (Bell 2004; Bell 2009; Norberg-Hodge et al. 2001).

For the sustainable development of a regionally centered agricultural system to occur, it is necessary to recognize the importance of analyzing and understanding the perspectives of those living in an area being studied to determine how populations and ecosystems will be altered by those development projects. Culture is constructed through shared dialogue between members of societies and the central issue in the debate on social selection is who decides which narrative or reality will be followed in the construction process (Bell 2009; Pretty 2005; Thompson 2010). People are often willing to change the way they do things, but it is difficult to give up their sense of identity and place. The loss of identity most often comes from a loss of control, or at least a feeling of control, over resources like land and water. The degree to which a

group loses control over their livelihoods and resources is the degree to which impacts can be measured when social changes occur.

In recent years the ideas of healthy, organic, and ethically raised and traded foods have been incorporated into the dominant industrialized agricultural system. While large agribusiness corporations see sustainability as sustained profits within a vertically and horizontally integrated global food supply chain, sustainability for farmers most often means being able to continue farming on their own land and passing on the farm to future generations. When considering issues of social sustainability, Goldschmidt (1947) discovered that communities surrounded by smaller and more diversified farms are more sustainable than those communities surrounded by large monoculture operations. Large industrial agricultural operations tend to take capital away from communities rather than building up those essential elements of the infrastructure like schools, public health, and important municipal services. There is more to agricultural sustainability than simply sustaining society through increased production of agricultural products. Sustainable agriculture also requires more than just adopting organic farming practices. "Asking whether something is sustainable always implies that a number of elements are interacting in a regular, continuous, or ongoing manner" (Thompson 2010:216). It means embracing the ideals of stewardship, community building, and the sense of place necessary for developing a truly sustainable regionally focused agricultural system.

Thompson (2010) argues for the importance of viewing sustainability in the context of a relative equilibrium between natural and social subsystems rather than from the perspective of optimization of resources. Optimization of resources, whether

social or natural, requires a single perspective that is often geared toward production. The idea of equilibrium allows for changing influences, understandings, and perspectives to maintain stability within a system or region. Maintaining equilibrium within a system or subsystem requires balancing human well-being with the capacity of those natural subsystems to renew and regenerate themselves. Therefore, when addressing sustainability issues, it is better to consider those methods and activities that are least harmful to natural resources and most beneficial to social communities at any particular point in time rather than developing models based on those activities that will limit our actions in the future due to preconceived parameters of stability (Altieri 1991; Gliessman 2005). According to Robinson (2004), a more integrative approach is needed while acknowledging the essentially normative and political nature of sustainability, and the recognition that achieving sustainability is a process rather than an end result. Robbins (2004) argues that political ecologists should focus on networks of interactions between stakeholders and has developed what he calls a hybridity thesis that “suggests certain tendencies and trends in the collision of human and non-human nature and paves the way for new research” (2004:213). In order to keep any agroecosystem balanced, it must be understood that land managers must be able to make a continued living from that land over an extended period. According to Rhoades, because the farmer is held accountable for decisions made on the farm, “Research must come full circle from proper problem identification to farmer acceptance or rejection” (1984:33).

A Paradigm Shift to a New System

Farmers in the Marys River region that were part of this study made it clear that agricultural land was under used and the key to increasing sustainability was to utilize that land more intensively and efficiently. An important question to consider in the dialogue among stakeholders is; what exactly do farmers mean by intensification and increasing use of agricultural lands? The perspectives of farmers in the Marys River region should not be confused with political and policy driven notions of intensification which follow the previously mentioned Earl Butz model of plowing fields fencerow to fencerow to supply the global commodities market, or the challenge of 'get big or get out' (Manning 2004). For the farmers that I talked with, ideas of agricultural intensification were aimed toward growing and producing more food products that will feed more people within the region and thus increase sustainability by reducing external inputs. It was interesting to note that more than 125 years after Fagan (1885) said the region needed to be more self-supporting farmers are still saying that we are not producing and consuming enough of our own agricultural products in the Marys River region. To make the necessary changes toward a more independent and self-supporting bioregion requires a paradigm shift away from the globalized industrial agricultural system that runs on the treadmills of production and consumption. But, for the paradigm shift to occur, farmers cannot be the only ones who are taking the risks inherent to changing production models. Continued dialogue between producers and consumers is vital to building and understanding relationships between stakeholders in the region that will promote equitable changes in agricultural production.

Farmers are constantly making changes to improve efficiency and increase production on the farm. The history of the Marys River region shows that farmers are willing to change their farming practices if the risks are reasonably low and there is a market for their products. The change from being a predominantly wheat growing region to an area that is dominated by growing grass seed and Christmas trees shows this to be true. However, those changes were made possible by subsidies and a strong market for those products. Therefore, the main difficulty in actualizing a paradigm shift is in the amount of perceived risk among farmers involved in making changes. If the risk is high, dramatic changes are unlikely to occur. One of the big problems, according to farmers, is that they have very little control over the market for their products. The present market situation is a good example of that lack of control: While both grass seed and Christmas trees were at one time very valuable agricultural products for this region, they are no longer as profitable as they once were. Several farmers suggested that the time may be right to make another change or to diversify into new types of farm production but, there is also a great deal of risk involved in making those changes on a large-scale. According to farmers, increasing diversity makes sustainability possible but, there has to be an active market for changes to occur on a level that would allow for a serious paradigm shift in the region. Because large-scale changes require large investments, farmers often start by diversifying on a smaller scale to see how production goes. If there is a market for their new products that is cost effective, they tend to continue increasing production of those goods.

Some large-scale farmers in the Marys River region are transitioning from grass seed production to different crops like wheat and beans but one of the primary

questions among those farmers is; how much increase in production of those crops will the regional market be able to manage? If increased production leads to more agricultural products being shipped out of the region and onto the global commodities market, then that change is not necessarily beneficial to the sustainability of the region. One of the fundamental issues among farmers trying increase regional production of wheat and other crops, particularly certified organic products, was the difficulty of finding storage and warehouse space close to their farming operations. There were also many smaller scale farmers who were having difficulties in finding or affording adequate storage space; particularly cold storage that would extend the market life of produce. I have mentioned the importance of canneries in the region and the significant role that they played in agricultural production and processing in the past. However, widespread reintroduction of large-scale canneries and processing plants run by multinational corporations would mean simply shifting the regional focus of the ongoing treadmill of production within the globalized food supply chain and do nothing to increase bioregional stability. So, while there are farmers who are making the transition to growing new crops, without an adequate regionally based infrastructure in place for the storage, processing, and marketing of those goods, any large-scale transition is unlikely to occur in the near future.

One of the most difficult aspects of actualizing a paradigm shift toward a more sustainable region is that the industrialized agricultural system, which is based on constant economic growth and runs on the treadmills of production and consumption, is firmly entrenched within the region and the nation. That system is increasingly controlled by multi-national corporations and based on the distribution of products on

the global market rather than increasing the sustainability of particular regions.

Farmers at every scale in the region are forced to compete within a system where prices are determined by a global market rather than the actual price of growing those products. The ‘farmer’s problem’ as described by Bell (2004) is particularly relevant in explaining the treadmill of production imposed on many farmers in the region. If everything goes well on the farm during a particular season, inputs tend to stay relatively low and production is high. However, when things go well for one farmer, they tend to go well for everyone in the area. When prices are controlled by the global market, the result is that increased agricultural production will be reflected in lower prices for those commodities that were grown. In bad years, prices for limited commodities will be high but, production will be low so the farmer loses again. To be financially successful in a situation controlled by the global market, competing farmers must expand production and buy or rent more land in order to knock other farmers in the area off the treadmill and out of business. Small-scale farmers using direct marketing strategies must compete with the price of products in supermarkets owned by multinational corporations. One alternative to working within that system is development of a regionally based agricultural infrastructure focused on providing for the region first and then selling the surplus in an expanding perimeter to include larger ecoregions and national markets. Such a system would allow farmers at every scale to be more diversified, resulting in more overall acreage in livestock and food crop production that could be processed and consumed in the region. However, in order for that system to be sustainable, the infrastructure must be dedicated to providing for the region first to avoid undue risk for farmers caused by situations, as has happened in

the past, which allow industries to shut down and move out of the region leaving farmers holding the bag. Consumers would need to play a far more active role in supporting regional production by eating locally grown products and promoting sustainable agricultural development.

A Paradigm Shift within the Present System

Another possibility mentioned by some farmers for increasing sustainability in the region, but working more within the present system, also called for increased production. The idea was that, while grass seed is not very useful as a food product, a vertically integrated system of production is already in place to produce and market mass quantities of grass seed. From the level of the individual grass seed farm, with the planting and harvesting equipment necessary to do the job, to the trucks and transportation systems necessary to ship the product out of the region and onto the global market, grass seed dominates the agricultural market in the region. According to farmers, it is because there are a lot of producers growing grass seed in the area that such a dominant and widespread production model is successful. Therefore, it is necessary to increase production of other agricultural crops in the region to develop the same types of widespread production models and so make those increases worthwhile, profitable, and sustainable for farmers. Farmers argue that in order to increase sustainability within the region, prices and production must be controlled to a greater extent by farmers rather than multinational corporations that are focused on profits gained from working within the present globalized agricultural system. One of the biggest problems for farmers who are part of the globalized food supply chain is that multinational food corporations are able to shift food products between countries

to take advantage of optimum prices and government subsidies while farmers are left with ever smaller profits for the commodities they produce (Norberg-Hodge et al. 2001). Increased consolidation within the agribusiness industry tends to give multinational corporations more power to influence federal agricultural policy decisions as well as the ability to set prices in the global market. The growth of industrial agriculture has caused a dramatic reduction in the number of farmers and the loss of many agricultural networks that were adapted to local communities and ecosystems. So, the problem with the second solution for developing a paradigm shift is that many think it is futile for farmers to work within the present globalized system and expect different and more sustainable results.

Small Changes, Big Concerns

For those farmers in the region who depended primarily on direct marketing strategies, land-use intensification through diversification and increased agricultural production was also a significant part of improving sustainability. The direct marketing designs used by farmers to sell their farm goods are often very effective on the smaller scale and for the most part those products tend to stay within the Pacific Northwest ecoregion. Because the marketing focus for many of the smaller farms is already regional, their issues and suggestions for improving sustainability were most often directed toward changes in regulations that would improve local market conditions.

Many of the issues with food safety and land-use regulations that farmers spoke of revolved around the problem of those regulations being geared toward large-scale farmers using industrialized and often more specialized farming practices. The

treadmill of production is geared toward volume and therefore the industrialized agricultural model makes it difficult for smaller scale farmers to provide the volume in agricultural products necessary to operate within that system. While many smaller scale farmers discussed the problems that they had with conforming to the rules and regulations for things like slaughtering animals and value added food processing methods, their goal was not necessarily to reduce or get rid of regulations but rather to change the rules so that they would also be applicable to smaller operations. For farmers, one of the recommendations for achieving the goal of a regionally focused agricultural infrastructure would be to focus more on making available appropriate scale production, marketing, storage, and processing facilities for both large-scale and small-scale farmers. Some steps have been taken to improve access to facilities designed to improve value-added production but, the process has been slow and often sporadic due to the costs of those investments.

Many farmers using direct marketing strategies were concerned about the uncertain future of the agricultural market. The terms boutique, cache, and fad were often used in describing the organic and sustainable agricultural products market. While some farmers rely on organic or other certification organization to make a statement about growing practices or to improve sales, others argue that certification is only a place to begin improving sustainability. Several farmers were concerned about the investments required for certification and whether the market would allow those investments to pay off in the future. Another of the worries that many smallholder farmers had was in making large investments toward expansion of their farming operations. Several farmers discussed the difficulties of intensification and

transitioning from small to larger scale farming operations. For those who wished to intensify production on small acreages, the problems were usually associated with investing in greenhouses which led to increased inputs and use of petrochemical based products like plastic. There were several smallholder farmers who were torn between maintaining the more ecologically friendly practices of using cover crops, fallow periods for fields, and planting seasonally appropriate crops, or investing in greenhouses to extend their growing season and thus increasing production. Some farmers said they had to rely on greenhouses for more intensive land-use because there was no available land nearby at affordable prices that could be used for expansion of their farming operations. Also, farmers said that expansion rather than intensification of land-use required more labor and therefore more labor costs, making the transition to larger operations more difficult.

Several labor issues were discussed among farmers I spoke with but the most prevalent were availability of good help and the uncertainties related to the future of immigration laws for the region. One of the problems with increasing food production and intensification of land-use in the region, for both small and large-scale farmers, is the necessity for more labor and therefore the availability of human resources. As several farmers suggested, an important issue to consider with increasing sustainability is developing ways to have more farm laborers in the region who are from the region. A significant aspect of the farm labor issue that should be considered is that farming is seasonal and so, while increased production in the region would require more farm labor, the increased levels of help would only be necessary during the busiest parts of each year. Therefore, diversification would necessarily extend to the human labor

force, allowing for possible scenarios like workers practicing different jobs throughout the year or a more efficient system allowing for a larger seasonal labor force. For a paradigm shift to take place in the region, the complex issues of labor and housing must be addressed, requiring more stakeholders in the region to take an active role in determining how their food is produced to improve the sustainability of the area.

According to farmers, an important element of agricultural intensification in the region was increasing production of the right types of agricultural products. The focus of the paradigm shift must be to increase the amount of edible food that is produced and therefore consumed within the same region. By intensifying production of food crops and livestock in the region, farmers could help to build soils by producing and using organic fertilizers. Livestock farmers said that raising grass-fed animals would reduce the amounts of inputs and pastures composed of perennial grasses can be an excellent means of long-term carbon sequestration. Farmers argued that by intensifying production they could actually cut down on the environmental impact of agriculture by decreasing transportation costs of shipping foods from outside the region to feed consumers. Again, such a paradigm shift toward more sustainable practices focuses on the importance of asking the farmer what works best on the individual farm. The farmer is the one with the most intimate relationship to the land and who is responsible for the outcome of what is done on the farm. Therefore, farmers should be active in producing as well as being the recipients of useful farming information.

While it is important to acknowledge the contextual character of farming and the importance of feeling rooted in place, it is also important to understand and work

within the official knowledge systems which are part of the broad domain of industrial agriculture and are used by experts to secure employment, control farming resources, and influence practices (Altieri 1991; Robbins 2004). As Gibbon et al. state;

Only by developing an understanding of individual situations, by allowing local knowledge to flourish, by understanding local cultures, values and institutions, and by combining these with scientific insights and more conventional ideas and practices, along with appropriate methods of experimentation and discovery—will sustainable agriculture systems be developed. [1995:39]

Scientific definitions of sustainability very often continue to be limited by assumptions of a value free science. According to Gibbon et al., “We continue to train natural scientists without a good understanding of the social and political context in which they work and the role they themselves play in determining outcomes” (1995:47). The establishment of a more sustainable system of agricultural production must be based on closer ties in the relationships among those affiliated with agricultural institutions and farmers with local experiences in the region.

Oregon State University is in a position to play a significant role in the paradigm shift toward a more sustainable region. As noted earlier there is, overall, a positive attitude among farmers toward the University and the Extension Agency but, more could be done to ensure continuing transition to a more sustainable system of agriculture in the region. Many smaller scale farmers have a positive attitude toward the University and I agree that the Extension Agency has been especially helpful for smaller farms in the area. However, many farmers I spoke with were also very concerned about the University’s focus on biotechnology and the spread of genetically engineered crops in the region. According to Thompson, “Any political philosophy that accepts the legitimacy of technical efficiency in absolute terms will ultimately

find a way to rationalize the technological treadmill..." (2010:54). Maintaining dialogue among stakeholders in the development and use of biotechnology will help build more successful relationships and define the role of the University in the region. The background research for this project and interactions with farmers in the region emphasize the importance of integrating local knowledge and place-based science to create a deeper understanding of agricultural systems.

Goldstein (1999) suggests that scientific knowledge and place-based knowledge can be combined into a working process of bioregionalism following a constructivist perspective which argues that science is embedded in culture. According to Goldstein, "A 'constructivist' perspective on the sciences can help bioregionalists embrace what is irreplaceable in science, while sustaining a commitment to place based knowledge" (1999:157). Individuals construct a sense of place, based on unique perceptions that are influenced by factors such as their ethnicity, social class, and personal and family history. When those living in particular regions rely only on scientific expertise and technical explanations, power is concentrated among only a few individuals with scientific and technical credentials. Communities therefore tend to be managed by those few individuals with power rather than by a more equally distributed power structure of individuals working within multiple social institutions. If scientists don't share the same values and ideals with farmers, or they don't understand the nuances of different farm agroecosystems within a region, then those scientists tend to ask the wrong questions or leave out important questions, resulting in information that is often less useful or incomplete. Goldstein (1999) argues that the solution to the problem of separation between place-based knowledge and scientific

knowledge is the development of place-based science that facilitates an open dialogue between scientists and those with local knowledge. "A scientist needs to remain a dependable witness to the creation of new scientific knowledge while being attentive to the coalition of science and society, as well as the particular interaction between knowledge making and place making" (1999:165). Local knowledge is a social construction that is based on actual farming practices within the physical environment of the farm, but also builds on discursive interactions among stakeholders, creating a sense of place in the region. Ideas of place can be tied to bioregionalism through an understanding that a more complete awareness of experiences within the space of the individual farm creates a stronger sense of place for farmers in local communities and regions. By adding the place-based knowledge of local farmers in the region to the information developed by scientific institutions, it is possible to create new perspectives on a place-based science directed toward building stronger communities and increasing sustainability within the Marys River region.

I have examined a number of different aspects of agricultural production in discussing definitions of sustainability and the perspectives of farmers in the Marys River region. The theoretical model of regional political ecology integrating the concepts of bioregionalism and political ecology helped me to develop a foundation for addressing some of the relevant issues among stakeholders in the region. The idea of relationships, as described by Merchant's (2005) partnership ethic, provides a useful context for understanding the ongoing dialectic between the mechanistic and ecological worldviews. In the end, what I discovered in my observations and interactions among farmers in the region was that all farmers, regardless of individual

worldview, farming scale or farming practices, all define sustainability foremost as the ability to continue farming into the extended future. I also came to realize that, while worldviews and farming practices may influence the 'place' of an individual farmer, all are inherently tied to the 'space' of the farm. The solutions to problems of improving sustainability lie in all of the issues surrounding the actual practice of farming. Therefore, rather than focusing on questions of why some farmers are less sustainable than others, or why some farmers are more attached to the land than others, the real question is; how can we work to reconnect farmers and consumers so that the reality of farming more closely coincides with the symbolic views and meanings of agriculture within bioregions and in the United States. While the Marys River region does not exist in isolation, it is clear that resolving sustainability issues can be addressed most positively within the context of specific regions where unique social, environmental, and economic constraints may be viewed from a local perspective. Because of the difficulties in undertaking the many complex issues of sustainability within a region, it is vital to develop an ongoing dialogue between stakeholders to ensure active participation in the process of preserving land and livelihoods and strengthening communities and bioregions.

Chapter Seven: Conclusion

Defining sustainability, whether in a global context or within a particular region is difficult and complex because each term describing sustainability is a social construct interpreted differently by various stakeholders. Definitions of sustainability are determined to a great extent by peoples' perspectives and beliefs. If a person believes that the methods practiced within the industrialized agricultural system are valid they are likely to include them in conceptualizations of sustainability and to view those methods as appropriate for solving issues of hunger and environmental degradation on a global scale. However, if a person does not agree with the methods of the industrialized agricultural system, they will often consider those practices to be unsustainable and seek out alternative methods to solve agricultural issues (West 2007; Robinson 2004; Paulson et. al 2003). Differing perspectives of sustainability practices and issues based on opposing worldviews have caused an ongoing dispute and power struggle for dominance and made dialogue among stakeholders increasingly difficult and controversial. However, because of the multiple definitions of sustainability held by diverse interest groups, it is vital to maintain an ongoing dialogue between stakeholders so that equitable measures can be taken that will ensure the long-term preservation of both lands and livelihoods. One of the most significant results of this study indicates that the farmer's definition of sustainability can provide a common ground for dialogue among stakeholders with differing worldviews.

For farmers in the Marys River region, the central focus of sustainability is to preserve and maintain individual farms so that they will be able to grow food well into the future. Farmers choose practices they feel will work best for them based on the geographical attributes of the farm, marketability of agricultural products, and the

information they have inherited or accumulated through the experience of living within a region. The history of agriculture in the Marys River region shows that farmers are willing to change, and indeed must alter farming practices when necessary to stay in business. That willingness to change in order to meet the needs of the market provides a common ground from which to proceed in the ongoing dialogue among stakeholders with opposing worldviews. Therefore, ensuring a closer alignment of the farmer's definition of sustainability with those of other stakeholders requires the help of consumers in the creation of a stable regional market that will conform to the ecological limitations of the bioregion while allowing growers to continue making a living into the extended future.

Another significant finding of this study shows that because farming must occur in a particular location, a more complete understanding of farmers' definitions of sustainability must begin with considering the 'space' of the individual farm. The farmer is inherently tied to the space of the farm and therefore her first concern must be the management of that land. That is her focal point. The size of the farm, or type of farm, and how that affects the farmer's identity is important but secondary. It is too easy when considering the ideas of reinhabitation to suggest that farmers practicing industrialized methods do not care about or even think about the land while traditional farmers do. It is not whether they think about the land; it is how they think about it. Although the location of the farm stays the same, farmers make changes in their practices over time to better manage the land and stay in production. Those changes are influenced by decisions that occur outside the space of the farm and play a powerful role in determining the place of the farmer in the region. Concepts of place

and identity are built on the perceptions and discursive practices of stakeholders describing their experiences within a particular region. Although those experiences are not outside the scope and influences of globalization, the acceptance or denial of those external influences is determined by relationships among stakeholders within a particular geographic area.

Farmers use many different techniques to achieve their goals based on individual philosophies and opportunities to develop useful farm management and planning strategies geared toward providing a balance between inputs and outputs on the farm. For farmers in the Marys River region, going back in time to a romanticized version of a simpler and happier farming era is not the idea behind traditional farming practices. Before the twentieth century, farmers and scientists did not understand the complexities of agroecosystems in the same way they do today. In many ways we have a more complete understanding of cause and effect for describing why things happen on the farm and how they are interconnected than we did in the past. Unfortunately, many farmers and scientists, particularly those working within the industrialized system of agriculture have simplified that knowledge to focus only on profits to be extracted from agroecosystems rather than the health of those systems. Traditional farming before the advent of synthetic chemicals and fossil fuel-based mechanization focused on understanding the complex interrelationships of natural events to enhance production. Sustainable agriculture should be a matter of using that traditional systems-based approach as a foundation and applying new understandings and technologies to enhance the health of agroecosystems and bioregions rather than relying on the simplified profits-based system of industrialized agriculture.

Many of the farmers I have spoken with agreed that a paradigm shift is necessary to wrest power from those multinational corporations who are in control of buying, selling, and price-setting to enable farmers, as the producers of food, to gain more control over the future of agriculture. The need for change was based on concerns over the uncertain future of agriculture and the financial stability required for continuing farming. For farmers in the Marys River region, the move toward embracing a postindustrial paradigm focused on building communities is necessary for the development and adoption of a more sustainable regional agricultural system.

Both Jackson (1994) and Berry (1996) agree that the focus of change should be on developing sustainable local communities, which would in turn lead to more sustainable local economies. To become more sustainable, it is necessary for local regions to manage resources by supplying local needs from local sources, including the local workforce, before going to outside sources. The local smaller scale farming operations should in turn be serviced by local smaller scale industries and businesses. It is also important for the local region to supply as much of its own energy as possible. Individuals within local communities should in turn be socially connected with members of nearby communities and cities within the larger region. Berry (1996) argues that by making the local region more self-supportive, a larger portion of the money earned by residents is more likely to stay within that region, thus improving the local economy of the area.

Kloppenborg et al. (1996) have discussed the importance of referring to the bioregion as a foodshed that is embedded in a moral economy focusing more on social standards to reinforce the obligations of reciprocity and equality within regions.

According to Kloppenburg et al., by adopting ecological and moral economy perspectives; “the production and consumption of food could be the basis for the reinvigoration of familial, community, and civic culture” (1996:115). Several authors working within the sustainable agriculture movement suggest that closer attention to, and being held accountable for, the ways humans interact with the surrounding environment should be the central aim in an ecologically oriented society. The goal is to achieve a balance within the system and then leaving well enough alone rather than focusing on more efficient methods of resource extraction and the creation of new technologies without regard for whether practices are good or bad or even needed (Jackson 1994; Berry 1996; Kloppenburg et al. 1996).

For farmers in the region, the goal of a community focused paradigm shift focuses on intensifying food production without depleting soils, water supplies, and biodiversity. Although it is essential to realize the importance of sustainable practices taking place on individual farms, it is also important to remember that agroecosystems are also part of larger ecosystems and communities, and therefore sustainable outcomes depend on interconnections between multiple stakeholders. While farmers suggest that improving sustainability in the region requires more land in agricultural production, land-use laws and conservation oriented stakeholders may provide conflicting views. A study of Willamette Alternative Futures (Baker et al. 2004) suggests three different possibilities for future development in the Willamette Valley. Three different development plans provided alternative scenarios based on the expected outcomes of differing policies and how they may affect the future landscape of the region by the year 2050. The scenario of Plan Trend 2050 represents an

expected landscape if current policies continue. That plan would result in a two percent loss of prime farmland in the Valley. Under the Development 2050 plan, expansion of new development over larger areas of the Valley would result in a twenty-four percent loss of prime farmland. The Conservation 2050 plan would focus on high-density development within current urban growth boundaries resulting in less than two percent loss of farmland to urban development but a fifteen percent loss of farmland due to conversion of existing agricultural lands to natural vegetation. Two individual studies done by Willamette Alternative Futures (Baker et al. 2004) and Ecosystems Northwest (1999) recommend wider riparian buffers along streams and waterways that would decrease the amount of farmland in production. As the population of the Valley continues to grow, the goal of agricultural sustainability, with a focus on providing food for the region is likely to remain a controversial issue. However, because of a deeper understanding of farmer's perspectives, we now have a common ground for dialogue among stakeholders in achieving suitable outcomes for a more sustainable bioregion.

As more individuals and groups become active in developing sustainable communities, they become more influential in transitioning to an environmentally friendly local food economy. While the goal of developing a more sustainable bioregion is a positive step, it is also important to remember achieving that goal depends on viable partnerships between surrounding communities and regions. To improve regional sustainability it is vital that we begin to treat all aspects of the environment, including cities, as being equally important. While many find it easy to set aside a wilderness area to be maintained and cared for, it is equally necessary to

treat each city as a place to be nurtured and cared for in a sustainable manner. Jackson states, "Either all the earth is holy or none is. Either every square foot of it deserves our respect or none does" (1994:67). The development of an ecological worldview, using nature as a reference for considering all aspects of the ecology, both human and nonhuman working together in equilibrium, is vital to encouraging sustainability at the local, regional, and global levels. The sustainability movement is beginning to gain strength as more people become motivated to operationalize sustainable practices and continue to question the priorities of the still dominant globalized system of industrial agriculture. As transportation and distribution costs continue to increase, the costs of agricultural production are also continuing to rise. As water for irrigation becomes scarcer and more expensive, even larger operations are looking for more ecologically friendly methods of production. As more and more people begin to question the motivations behind biotechnology practices within agribusiness industries and the safety of the foods they consume, many are considering the wisdom of developing trustworthy relationships with local growers to help build healthier communities and stronger regions. Perhaps it is time to heed the advice of Jackson who states; "Since our break with nature came with agriculture, it seems fitting that the healing of culture begin with agriculture, fitting that agriculture take the lead" (1994:26).

One of the difficulties we face is in thinking that the globalized agricultural system cannot be changed. However, that system was intentionally put in place and therefore it can intentionally be changed (Robbins 2004). Farming is an inherently risky business and questions of sustainability can be very confusing and complex at times. Each year farmers are faced with the uncertainties of changing growing

conditions and a market that is too often out of their control. Farmers have a right, and a need, to be cautious because livelihoods depend upon making the right decisions based on local knowledge and understanding the demands of individual farming operations. In the end, like most qualitative research, the outcome of this exploratory study was to develop a new research question as the basis for recommending future actions on sustainability issues in the region. The research comes full circle to ask the question; Is it possible to bridge the disconnect between farmers and consumers and in so doing increase farm production, reduce the amounts of products shipped in from and out to the global market, and thus enable a paradigm shift toward a regionally based agricultural system that will be more sustainable by helping to build communities, reduce the environmental impacts of the agribusiness industry, and increase the sovereignty of the Marys River region?

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Appendices

Appendix A: List of Farmers

Farmers	Farm Acres	OC	OM	DM	WM	RC	OC	GC	LS
Ann	< ten		X	X		X			X
Mary	Ten			X	X	X			
Leon	<ten		X	X	X		X		
Debra	< ten		X	X		X			X
Sheryl	Ten		X	X	X	X			X
Denise	<ten		X	X		X			X
Kim	10-50		X	X	X				X
Allison	10-50			X	X				X
Jim	10-50	X		X	X	X			
Alex	10-50		X	X	X	X	X	X	X
Jean	10-50	X		X	X	X			
Henry	10-50		X	X	X		X		
Matt	10-50		X	X		X			X
Larry	10-50	X		X	X	X		X	
Tom	50-100	X		X	X	X			
Roy, Ruby	50-100	X		X	X		X		
John	50-100	X	X	X	X	X	X	X	
Susan	50-100	X	X	X	X	X	X	X	
Terry, Margaret	100-200			X	X			X	X
Ruth, Ben	100-200			X	X		X		
James	> 200			X	X			X	X
Richard	> 200			X	X		X		
Jenna, Bob	> 200	X	X		X	X		X	
Kurt	>200				X	X		X	

(OC = Organic Certified; OM = not certified but uses organic methods; DM = uses direct marketing methods; WM = utilizes wholesale markets; RC = row crops; OC = orchard and tree crops; GC = grain and seed crops; LS = livestock)

Appendix B: Interview Questions

Interview Questions

1. Why do you farm and what kind of farmer would you say you are? Do you farm full time? How long have you been farming?
2. How would you define sustainability?
3. What do you consider sustainable farming methods, and what methods do you use to improve sustainability on your farm?
4. What are your views on land-use practices in the Mary's river region and have those views changed over time?
5. What important changes have you made on your farm in recent years to make it more sustainable and what challenges did you face in making those changes?
6. Why do some farmers change to alternative farming methods while others don't?
7. How do you find information on sustainable farming methods—internet, university extension service, farm neighbors—and how do you know, or trust, that what you are hearing is in your best interest?
8. Do you feel you work pretty independently on your farm or do you consult/interact with other farmers in the area?
9. How do you perceive your place, as a farmer, in the community and within the region, and within a global context, and has that perception changed over time?
10. How did you decide what type of farming you would do and what animals or crops to grow?
11. How do you market the items you produce on your farm?
12. How do you divide up the labor/chores on the farm? Do you depend more on manual labor or do you lean toward mechanical technology to get the work done?
13. What are the most important issues facing farmers today?
14. Are there any questions I should have asked that you would like to discuss?

Appendix C: Benton County Soils

Benton County Soils

A Soil Survey of Benton County was published in 1924 by the Bureau of Soils, U.S.D.A. The following discussion is based upon that soil survey. The information in this appendix is taken directly from Ruttle, Marilyn, Robert O. Coppedge, and Russell C. Youmans, 1974 Benton County Resource Atlas: Natural, Human, Economic, Public. Extension Community Development Project: Oregon State University. All credit for this information goes to those authors with my deepest appreciation.

Melbourne Series. These soils are brown, reddish-brown, or in places light-brown to yellowish-brown in color. The subsoil is yellow to yellowish-brown, and locally mottled with gray or brown and red iron stains. Bedrock is generally encountered at depths varying from 3 to 8 feet. These soils are derived from sandstone or shale rock, and rocks are common in the lower subsoil. The series generally is developed in the lower foothills, and the topography varies from broken to gently rolling. Where the topography allows, cultivation can produce excellent results with proper management.

The remainder of the area supports a forest growth of mainly fir and oak.

Olympic Series. The surface soil, 8 to 12 inches deep, consists of brown to dark-brown friable silty clay loam to heavy, plastic clay. The subsoil is a brown compact silty clay loam, clay loam, or clay, underlain at depths varying from 2 to 6 feet by massive bedrock, mainly basalt. Fragments of the parent rock occur throughout the profile. Rock and outcrops are numerous on the steeper and more broken slopes. Olympic soils are of residual origin, derived from the weathering of basalt and associated igneous rocks. They occur mainly throughout the hill and mountain section of the central part of the county.

Aiken Series. The surface soil consists typically of 10 to 12 inches of red to brownish-red silty clay loam. The subsoil is red in color, slightly heavier than the surface soils and compact. It may contain numerous round, partly cemented brown or rusty-brown iron concretions. In places the soil includes angular fragments of basalt, and the bedrock is found at shallow depths (generally 4 to 6 feet) though it rarely outcrops. The soil is friable and easily worked. The Aiken soil is a residual soil derived from the weather in place of basalt and to some extent from coarser grained igneous rocks. It is prominently developed on the eastern slopes of the Coast Range south of Mary's River where it occupies nearly one-half of the total area of residual soils in that section. Other large areas are located along Soap Creek, Woods Creek, and in the vicinity of Wren and Blodgett.

Chehalis Series. The surface soil consists of a light brown to yellowish-brown friable silty clay loam to fine sandy loam 10 to 18 inches deep. The subsoil is brown to slightly reddish-brown material which is similar to or heavier than the surface soil. The subsoil grades into lighter textured material, which underlies nearly all the Willamette River bottom soils at depths of 2 to 6 feet or more. This soil is developed on the flood plains of nearly all creeks and larger streams of the county. It is derived from recently deposited alluvial material. This soil is very productive and it is extensively farmed.

Amity Series. The surface soil consists of 14 to 18 inches of brown or light grayish-brown silty clay loam, which is plastic when wet and has a tendency to bake upon drying. The subsoil is a light grayish brown compact silty clay loam or clay loam. It is invariably mottled. The surface is gently sloping to nearly flat, and during periods of heavy rainfall, water stands on these soils for several days at a time. Surface drainage is fairly good in places, but under drainage is restricted.

Wapato Series. The surface soil is a faintly mottled brown, dark brown, or dark grayish-brown, smooth, heavy silty clay loam 8 to 12 inches deep. The subsoil, to a depth of 26 inches or more, is a moderately compact drab or brown clay or clay loam mottled with rusty-brown, yellow and gray. The wapato soil is an extensive recent-alluvial soil, occurring in nearly all the smaller stream valleys. The surface is almost level to gently sloping and the drainage is generally poor.

Newberg Series. The surface material is brown to rather dark brown fine sandy loam, loam or silty clay loam, with subsoils generally slightly lighter brown and lighter textured. The subsoil layer is encountered at depths varying from 1 to 3 feet and continues to a depth of several feet. This series closely resembles the Chehalis soils. This soil series consists of recent-alluvial soils, found close to nearly all rivers and creeks. Even though these soils may be subject to overflow, drainage is generally good. Due to its high natural fertility, these soils are very important agriculturally.

Willamette Series. The surface soil consists of 10 to 14 inches of a dull-brown to light-brown, smooth, friable silt loam or silty clay loam. Some areas contain appreciable quantities of rounded and subangular gravel. This soil occurs in a number of areas scattered through the old alluvial deposits of the valley sections. The surface is gently sloping to slightly undulating, broken here and there by the steep banks of drainage ways. Drainage is well developed.

Dayton Series. The surface soil is a gray or light grayish-brown to dull brownish-gray plastic silty clay loam, 12 to 18 inches deep. It is low in

organic matter, and when dry has a characteristics white or gray appearance, which is the reason for the local name of "white land". The upper subsoil, between 6 and 14 inches thick, consists of a heavy drab or dark bluish-gray impervious clay, slightly mottled. The lower subsoil is composed of gray to yellowish-gray friable silty clay loam or silt loam, with numerous mottling stains. The topography is nearly level, and after rains water often stands on the surface for weeks at a time. Both surface and subsoil drainage are very poor.

Sites Series. The surface soil consists of 8 to 20 inches of brownish- red to dull-red moderately friable clay containing appreciable quantities of organic matter and red iron concretions. It is underlain by a compact red clay grading into bedrock at 2 to 4 feet. The topography is generally steep and broken, though the crests of the larger hills are comparatively smooth. The soil is of residual origin being derived from weathering of sandstone and shale. The largest area of this soil occurs between Monroe and Alpine. The soil is productive, but can be improved by application of fertilizers.

Carlton Series. The surface soil is a grayish brown smooth silty clay loam of friable ructure', 8 to 13 inches deep. It is underlain to loam or si].ty clay loam, mottled in the lower and more poorly drained areas. Bedrock is quite deep, occurring at depths of more than 7 feet, even though partly weathered shale fragments are encountered at depths of 4 feet or more. The Canton silty clay loam occurs throughout the foothills areas. The surface is gently rolling or hilly to smoothly sloping. Surface drainage is well-developed, though underdrainage is not good in all places.

Cascade Series. The surface soil typically consists of 12 to 14 inches of brown to light-brown clay loam. The subsoil is a yellow or brownish-yellow clay loam of compact structure. Bedrock is reached at depths of 4 to 6 feet. The Cascade soil is a residual soil derived from the coarser grained basic igneous rocks. It occupies the forests of the flat or plateau-like lower hills or areas of gently sloping and rolling topography. Drainage is generally good. The soil is productive, but can be improved greatly by fertilizing.

Grande Ronde Series. The surface soil, with an average depth of 14 inches, consists of a yellowish-brown to light-brown smooth-textured silty clay loam,, low in organic matter. The subsoil, to a depth of 22 inches, consists of yellowish-brown silty clay, mottled with gray or iron stains. The soil occupies terraces and alluvial slopes and is derived mainly from water-laid deposits having their source in the sandstone or shale rocks of the adjacent hills. The topography is gently sloping to

undulating and surface drainage is usually good, though underdrainage is restricted.

Cove Series. The Cove clay consists of 15 to 20 inches of black, dark gray, or very dark brown clay, underlain by a black waxy clay. The subsoil usually grades into lighter textured, grayish, mottled material at depths ranging from 36 to 60 inches. The type occupies low areas bordering the base of the higher terraces, or areas of outwash from the adjacent hills. Drainage is poorly developed. Cove clay is a productive soil, but poor drainage and clay structure provide some difficulties in working it.

Salem Series. The surface soil has a depth of 10 to 12 inches and consists of a friable brown to reddish-brown clay loam or clay. The subsoil is a reddish-brown to brown heavy clay loam or light-textured clay with a large amount of gravel. Gravel predominates below a depth of 30 to 36 inches. The soil occupies a terrace position from 10 to 30 feet above the flood waters of the streams. The surface is gently sloping to undulating. Surface and internal drainage are good to excessive.

Riverwash. Riverwash is a nonagricultural type of material, consisting of sand, gravel, and cobble, which lies only a few feet above the normal flow of the rivers. In general, this soil type supports no vegetation, though a few alders or willows have found a foothold in some protected areas.

Camas Series. The surface soil consists of 15 to 20 inches of brown to dark-brown friable clay loam. The subsoil is a brown clay loam containing gravel in the upper part, which increases in quantity to a depth of 30 to 40 inches, where a layer of porous sand and gravel is encountered. This soil occupies the deeper former channels of the Willamette River and is rather unimportant agriculturally.

Whiteson Series. The surface soil consists of 8 to 10 inches of light-gray to brownish-gray or grayish-brown plastic silty clay loam. The upper subsoil is a drab clay, very compact, plastic, and impervious. The lower subsoil consists of a slightly less compact drab clay. This soil is found in stream bottoms, and its drainage is poor. Due to the insignificant extent (256 acres), this soil is unimportant agriculturally. [Ruttle et al. 1974]

Appendix D: Treadmills of Productions

An important treadmill example from the animal products side of the industrial food supply chain is the Confined Animal Feeding Operation (CAFO). CAFOs are large-scale operations where hundreds or even thousands of animals are kept in closely confined quarters to increase production for sale on the global market. These ‘factory farms’ were developed as industrialized agriculture became more specialized and demand for animal products increased. As more farmers adopted factory farming methods, smaller operations were less able to compete because the margin of profit becomes so low that the only way to make money is to deal in a large volume of products. Smaller farming operations are also at a disadvantage because large processors and distributors would rather deal with larger contract farmers through a vertically integrated system that controls everything from feed, to breeds of animals, to packaging of the final agricultural products (Bell 2004). While CAFO production methods allow larger farming operations to remain on the treadmill of production, there are many environmental and social issues that are a result of these controversial farming methods. Animals must be fed large quantities of antibiotics and other drugs to stave off illnesses caused by overcrowding and keep them alive until they are ready for slaughter. According to Norberg-Hodge et al., “Over eighty percent of the pigs in the United States have pneumonia, and at least fifty percent suffer from stomach ulcers at the time of slaughter” (2001:27). CAFOs are harmful to soils and cause water and air pollution through discharges of toxic chemicals into local environments. Effluent spills from leaky manure lagoons on hog operations seeping into nearby streams and

lakes “killed 5.7 million fish in 152 incidents in Iowa alone between 1996 and 2002”

(Bell 2009:65). According to Tietz;

In 1995, a woman downwind from a corporate hog farm in Olivia, Minnesota, called a poison control center and described her symptoms. ‘Ma’am,’ the poison control officer told her, ‘the only symptoms of hydrogen sulfide poisoning you’re not experiencing are seizures, convulsions, and death. Leave the area immediately’. [2010;117]

The inequality among farmers and within communities caused by these factory farming systems increases as lobbyists from agribusiness corporations influence governments to loosen regulations against pollution created by CAFOs.

“Consequently, states have often taken away the right of localities to enact anti-CAFO zoning, and banned ‘nuisance lawsuits’ against them” (Bell 2009: 65-6, 72). Because agribusinesses are well funded and well organized, and therefore have more political influence than local communities, they are often better able to maximize profits without investing in local community and environmental enhancements.