

**The Role of Regulations in Decisions Regarding the Transition to
Organic, Biodynamic, and Sustainable Agricultural Productions:
The Case of Niagara Vineyards**

by
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Abstract

There is a myriad of motivations and barriers that influence agricultural producers to adopt ecologically-sound management practices. Therefore, this research aims to explore vintners' motivations to adopt organic, biodynamic, and sustainable practices in the Niagara region. This research also investigates what the challenges are in the transition process, and whether the regulations facilitate or hinder producers from completing the transition. This research employs a survey of regulations, semi-structured interviews, and online questionnaires to acquire data on vintners' experiences. The results conclude that Niagara's wineries are motivated to adopt ecologically-sound management practices due to environmental, social, and economic reasons. The results also indicate that there is a paradox of sustainability among organic, biodynamic, and sustainable producers on which practice is considered environmentally friendly. Lastly, the findings reveal that the wineries did not encounter severe challenges during transition, however, they note that the regulatory requirements and certification process need to improve.

Dedication

This thesis is dedicated to my mother, Dr. Cara MacMillan for her constant love, faith, support, and guidance. You are the reason why I am where I am today. Thank you for instilling into me your drive, work ethic, and love of learning.

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Chapter 1: Introduction

Scholars have found that there is a range of motivations and barriers that encourage and hinder farmers from transitioning to more ecological forms of agriculture. However, there is little research on the influence of formal regulations on the transition process. The purpose of this research is to examine the influence of official regulations in decisions concerning the transitioning from modernist, industrial modes of agricultural production to ecological modes using Niagara vintners as a case study.

This chapter begins by presenting the research questions and objectives. It then briefly explains why this research is important, as well as highlights the benefits and challenges in transitioning to a more ecological form of agriculture. The chapter next provides background information on the Niagara region, describing why it was a suitable case study for this research. Finally, this chapter ends with a structural outline of this thesis.

1.1 Research Questions

This research considers three questions. First, what were the reasons and motivations of Niagara vintners for transitioning to organic, biodynamic, and/or sustainable modes for vineyard management and wine production? Second, what barriers and/or challenges did they have to address in this transitioning process? Finally, what role did regulations play in the decision to transition? The study also examined several secondary research questions. First, what motivated vintners to choose the organic, biodynamic, or sustainable modes of productions they did? Second, how did vintners interpret the relevant regulations, and to what degree did the rules outlined within these regulations influence their decisions?

1.2 Research Rationale

Increasing numbers of farmers, both in Canada and globally, have shifted or are considering shifting to more ecological modes of production. Investigating the reasons and challenges associated with transitioning to such modes of production is therefore important to understand the decision-making associated with it. Although this work focuses on the role that formal regulations and certification play in decisions regarding the adoption of ecological modes of production, such decisions depend upon a range of factors. As will be presented in greater detail in Chapter 2, these factors include ideology; on-farm production practices, productivity and costs; and market factors as both reasons for and barriers to transitioning to ecological modes of production. However, the role of regulations, and certification specifically, have received less attention in this literature, representing an important gap in understanding the dynamics of such transitioning decisions.

This research focuses on three ecological modes of agricultural production: organic, biodynamic, and sustainable practices. Although these modes of production share similarities in terms of values and practices, they differ in how they are understood discursively and defined in regulations. Collectively, organic, biodynamic, and sustainable agriculture are alternatives to conventional, or industrial, agriculture. They are more holistic farming systems that aim to preserve biodiversity, respect biological cycles, and enhance soil fertility. Specific regulations exist for each of these ecological modes of production in Ontario.

1.3 Case Study of Wineries in the Niagara Region

This research uses the Niagara Region as a case study, and more specifically, focuses on vintners in the Niagara Region who have shifted to organic, biodynamic, and/or sustainable modes of

production in their vineyards and the production of their wines. The Niagara region is in Southern Ontario, Canada, situated between North 41 to 44 degrees in latitude. Lake Ontario frames it on the northern side and Lake Erie on the southern side, the Niagara River as its eastern boundary and the Niagara Escarpment, its western boundary (see Figures 1 and 2).

The region’s climate is moderated both by the maritime influence of Lake Ontario and the protection provided by the Niagara Escarpment. This has resulted in optimum growing conditions for mild-climate crops including grapes. The division of the region’s wine industry is ten sub-appellations according to its unique agronomic traits: Beamsville Bench, Creek Shore, Four Mile Creek, Lincoln Lakeshore, Niagara Lakeshore, Niagara River, Short Hills Bench, St. David's Bench, Twenty Mile Bench, and Vinemount Ridge (VQA, 2019). Table 1 provides an overview of the difference between each sub-appellation in terms of their topography and agronomic traits.



Figure 1. Locating the Niagara Region (Wine Country of Ontario, 2011).



Figure 2. Map of the Niagara Peninsula (colour polygons represented each of the ten sub-appellations in Niagara.) Source: (Gray, 2014).

| Sub-Appellations | Topography and Climate Factors |
|-------------------------|---|
| Beamsville Bench | <ul style="list-style-type: none"> • Close to the lake • Sloping Benchlands • Limestone rich soils |
| Creek Shore | <ul style="list-style-type: none"> • Close to the lake • Flat Topography • Creeks and streams nearby • Fertile soils |
| Four Mile Creek | <ul style="list-style-type: none"> • Large vineyards • Lots of sunlight • Warm temperatures for growing grapes • Distance to lake vary depending on location |
| Lincoln Lakeshore | <ul style="list-style-type: none"> • Close to Lake Ontario • Long growing season • Seasonal streams |
| Niagara Lakeshore | <ul style="list-style-type: none"> • Close to Lake Ontario • Long growing season |
| Niagara River | <ul style="list-style-type: none"> • East facing • Gentle slopes • Long growing season with temperatures moderated by the Niagara River |
| Short Hills Bench | <ul style="list-style-type: none"> • Warm temperatures with direct sunlight and cool night temperatures • Complex soil • Far from the lake |
| St. David's Bench | <ul style="list-style-type: none"> • Warm spring weather • Gently slope • Far from the lake |
| Twenty Mile Bench | <ul style="list-style-type: none"> • Complex topography • Double benches • Deep soils • Far from the lake |
| Vinemount Ridge | <ul style="list-style-type: none"> • On top of the escarpment • South and East-facing • Far from the lake • Warm spring weather • Hot summers and cold winters |

Table 1. Topography and climate factors differed between each sub-appellation in the Niagara Peninsula Source: (Wine Country of Ontario, 2011).

In the last 200,000 years, several glacial events occurred in the Niagara Peninsula that changed the layers of the sedimentary rock that led to unique soil composition consisting of thick layers of clay throughout the Niagara Escarpment and Lake Ontario (VQA Ontario, 2019). The soils range from sand to clay to rock and contain a high concentration of limestone from the glacial activities (Wine Council of Ontario, 2011). The variation of soils along the Niagara Peninsula allowed for different varieties of grapes to grow and thrive, depending on their location, which, in turn, created different flavors of wine in different sub-appellations. The climate in the Niagara region consisted of great shifts in day and night temperatures with limited sunshine during the growing season. As mentioned above, the Niagara Peninsula sits between the Great Lakes, which means that the cold winter temperatures in the lakes cool the vineyards during the summer months. The shifting temperatures in the growing season created a balance between acidity, alcohol, and fruit expression (Wine Country of Ontario, 2011). The temperatures in Niagara led to unique and intense flavours of ripened grapes that warmer climates could not provide (VQA Ontario, 2019).

The Niagara Peninsula is Canada's largest wine-producing region, both in terms of area planted to grapes, totalling 13,600 acres, and in terms of estates, totalling 101 wineries (VQA Ontario, 2019)¹. Niagara's wineries plant several varieties, such as Riesling, Chardonnay, Cabernet, and Pinot Noir. The Niagara region produces dry wines, ice wines, and sparkling wines. Dry wines are the most common wine that Niagara wineries produce due to the unique character of the grapes grown in a colder climate. The colder climate produces expressive grapes

¹ The Niagara Peninsula is considered the largest planted area in Canada with 13,600 acres of planted grapes with different varieties. Prince Edward County has a total of 30 wineries and Lake Erie North Shore has 15 wineries (VQA Ontario, 2019). British Columbia is the other major Canadian wine growing province with 10,260 acres of planted grapes as of 2014 (Bremmer, 2014).

(combines, origin, variety, and style) and creates a strong balance between acidity and minerality in a way that warmer climates cannot achieve. The assembly of dry wines is from more than forty varieties of grapes, where production splits the varieties - sixty percent of the production goes towards dry white wine and forty percent goes towards dry red wine.

The most common produced wines are from Chardonnay, Riesling, Merlot, Pinot Noir, and Cabernet Franc. White grape varieties can also include Sauvignon Blanc, Pinot Gris, Gewurztraminer, and Vidal Blanc (VQA, 2019). Table 2 provides the list of white grape varieties and explains the aromas in the wine. Red grape varieties include Cabernet Sauvignon, Gamay Noir, Shiraz, and Baco Noir (ibid, 2019). Table 3 provides the list of red grape varieties and explains the aromas in the wine.

Interestingly, Baco Noir and Vidal Blanc are the only two allowable hybridized (the crossing between two or more *Vitis* species) varieties in Ontario and are commonly used to produce ice wine (ibid, 2019). Ontario is also a known and only leader in the production of ice wine since the winters are just cold enough, but not too cold with warm summers to ripen the grapes for ice wine. The production of ice wine occurs from frozen grapes, which provides a very sweet flavour (Wine Council of Ontario, 2011). Additionally, Ontario produces dry sparkling wines since the cold climate creates unique grapes that are not too ripe, especially from Chardonnay and Pinot Noir (ibid, 2019).

The Vintners Quality Alliance (VQA) has standards for Niagara wineries to meet. First, wines must be from Ontario-grown grapes with no concentrates. The grapes are required to meet the quality standard in terms of natural sugar content for each variety. Second, water cannot be added to the winemaking process. Third, labels on the wine bottles must accurately represent the wine. Fourth, all wines must be vintage-dated and meet vintage requirements, except for dry,

sparkling, and fortified wines. Fifth, finished wines must be tested by a taste panel and undergo a laboratory analysis (VQA, 2019).

| White Grape Varieties | Aromas |
|------------------------------|--|
| Riesling | <ul style="list-style-type: none"> • Contains citrus, peach or floral aroma |
| Chardonnay | <ul style="list-style-type: none"> • Contains peach, pear, apple or tropical fruit aroma • Mineral notes • Buttery • Caramel flavours (only if aged in a barrel) |
| Vidal Blanc | <ul style="list-style-type: none"> • For dry wines, light, and fruity. • For icewine, sweet, rich and strong acidity |
| Pinot Gris | <ul style="list-style-type: none"> • Contains honeydew melons, apples, and spring flowers |
| Sauvignon Blanc | <ul style="list-style-type: none"> • Contains grassy, green, gooseberry fruit and asparagus characters |
| Gewurztraminer | <ul style="list-style-type: none"> • It contains lychee fruit, rose petals, and spicy floral notes. |

Table 2. White grape varieties and its associated aromas in Niagara’s wines.

| Red Grape Varieties | Aromas |
|----------------------------|---|
| Cabernet Franc | <ul style="list-style-type: none"> • Contains plum, bell pepper, and herbal characters |
| Baco Noir | <ul style="list-style-type: none"> • Contains spicy and feathery flavors |
| Cabernet Sauvignon | <ul style="list-style-type: none"> • Contains currants, prunes, and herbal flavors |
| Merlot | <ul style="list-style-type: none"> • Contains blackberry, blueberry, and dark fruit flavours |
| Pinot Noir | <ul style="list-style-type: none"> • Contains strawberry and cherry fruit flavors. |
| Gamay Noir | <ul style="list-style-type: none"> • Rich flavors that are aged in oak |

Table 3. Red grape varieties and its associated aromas in Niagara’s wines.

In 2016, 36 wineries participated in the sustainable self-assessment program (Wines in Niagara, 2016). However, an updated 2019 list revealed that this number has dropped markedly to 12 certified sustainable wineries in Ontario (Ontario Craft Wineries, n.d.). The figures show a requirement to shift the research and to add wineries who opted out of the sustainable certification to understand better why they decided to opt-out. There were a small number of

certified organic and biodynamic wineries in the Niagara region and, therefore, the names of the wineries remained confidential to respect their anonymity.

1.4 Organization for Remainder of Study

This thesis consists of six chapters including this introductory chapter. Chapter 2 provides the academic foundation for the study. It includes an overview of the theoretical frameworks of political ecology and regulation theory and how political ecology frames organic, biodynamic, and sustainable modes of productions. It then presents the existing literature dealing with how vintners globally approach transitioning to more ecological modes of production and processing. Chapter 3 presents the methodology which defined the research approach and the specific methods used to obtain primary data, including the role of the case study, a survey of the regulations, semi-structured interviews, online questionnaires. It also describes the analysis of the data, including coding and discourse analysis. Chapter 4 presents the key results of the study, presenting the motivations to adopt a certain mode of production and the experiences in the transition process of obtaining the certification, as well as the role the regulations and its effect on agricultural practices as identified by participating Niagara vintners. Chapter 5 research results are discussed through the lens of political ecology and regulation theory. Finally, Chapter 6 concludes by providing closing remarks and summarizing the basis of the research and the findings. The chapter also commented on opportunities for future research regarding organic, biodynamic, and sustainable practices in the Niagara region.

Chapter 2: Theoretical Frameworks

What motivates vintners to shift from conventional modes of production and vine management strategies to more ecological ones? Are they driven principally by beliefs or by economics, or some combination of both? To undertake such a transition can be costly and complex. Therefore, the motivations as to why these individuals are choosing to do so are important.

Two separate bodies of literature have explored these questions. These literatures provide this research with its framing and its theoretical dimensions. This chapter begins by examining the research question from a political ecology perspective. This includes defining political ecology and then examining how this theoretical framework defines organic, biodynamic, and sustainable production. The chapter then turns to the role of regulations designed to formalize organic, biodynamic, and sustainable modes of viticultural production. This includes defining regulation theory and then provides an overview of the regulations of these three ecological modes of production as they exist in Ontario. The chapter will then shift to an examination of the current literature on the motivations of vintners when deciding whether to transition and the barriers or challenges they identified in undertaking such a transition.

2.1 Defining Political Ecology and the Meaning of Ecological Agriculture

2.1.1 Political Ecology

There is no single definition of political ecology. Robbins, in his 2012 work *Political Ecology: A Critical Introduction*, provides a comprehensive overview of the spectrum of definitions that ranges from political ecology being an extension of political economy to diverging definitions focusing on formal institutions and environmental change. Not surprisingly, included in this review is that of Blaikie and Brookfield (cited in Robbins, 2012, p. 15) who defined political

ecology as combining “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.” Peet and Watts (1996, p.6) draw similar connections, more eloquently and simply, defining political ecology as “a confluence between ecologically rooted social science and the principles of political economy.”

Consistent to all the definitions is the ‘political’ nature of political ecology which Robbins (2012, p.13) sets in contrast to an apolitical ecology in writing: “This is the difference between identifying broader systems rather than blaming proximate and local forces; between viewing ecological systems as power-laden rather than politically inert; and between taking an explicitly normative approach rather than one that claims the objectivity of disinterest.” Political ecologists seek a more methodological commitment to focusing on practical engagements with the environment by various stakeholders and a focus on finding solutions to socio-environmental issues that further our understanding of how economic and political systems affect the environment and how its discursive and cultural uses construct the environment. It is, therefore, a mode of theorizing the politics of environmental relations and environmental issues. Forsyth (2003) writes that political ecology focuses on the relationship between state actors, non-state actors, and the environment.

Political ecologists argue that the origins of environmental issues are social. Significantly, the introduction of the “political” into environmental questions leads to multiple perspectives and understandings of the environment and the nature of human-environmental interactions. As Ballamingie (2006) observes, social actors construct their view of the environment in different ways. The outcome of this is that different narratives regarding the environment and human-environment interactions co-exist within society at any given time.

Political ecology provides us with the framing for understanding how discursive practices shape policies and actions (Paulson, Gezon, & Watts, 2005).

| Thesis | What is explained | Relevance |
|--------------------------------------|---|--|
| Degradation and marginalization | Environmental conditions (especially degradation) and the reasons for their change | Environmental degradation, long blamed on marginal people, is shown in its larger political and economic contexts |
| Conservation and control | Conservation outcomes (especially failures) | Usually viewed as benign, efforts at environmental conservation are shown to have pernicious effects, and sometimes fail as a result |
| Environmental conflict and exclusion | Access to the environment and conflicts over exclusion from it (especially natural resources) | Environmental conflicts are shown to be part of larger gender, classed and raced struggles and vice versa |
| Environmental subjects and identity | Identities of people and social groups (especially new or emerging ones) | Political identities and social struggles are shown to be linked to basic issues of livelihood and environmental activity |
| Political objects and actors | Socio-political conditions (especially deeply structured ones) | Political and economic systems are shown to be underpinned and affect by the non-human actors with which they are intertwined |

Table 4. Five theses of political ecology and what they attempt to explain (Robbins, 2012, p.22).

Robbins (2012) summarises five theses of political ecology, presented in Table 4. This research follows Blaikie and Brookfield (cited in Robbins, 2012) in defining political ecology as a combination of environmental concerns and a broadly defined political economy where a dichotomy between society and natural resources exist. This research is then situated at the intersection between the fourth and fifth theses, those of environmental subjects and identity and political objects and actors. It examines the articulation and emergence of more ecological sets of relations with specific attention paid to agriculture and the associated formalization of such relations in regulations. It thus focuses on the (re-)emergence of the ecological agriculturalist as individuals and a social group, and the articulation of ecological agriculture in formal

regulations. However, this research does not posit eco-agriculturalists as conflicting with others in society nor assert the re-emergence of ecological forms of agriculture as a focal point of some struggle. Rather, this work sees the emergence of ecological agriculturalists as an alternative social group within society and eco-agriculturalism as an alternative mode of production.

Given this, cultural ecology further informs this research. Cultural ecology combines two themes: cultural evolution and cultural materialism. Cultural ecology requires a researcher to look beyond historical change to underlying patterns of resource use and how humans adapt to different environments in different ways (Peet & Watts, 2004). Cultural ecology focuses on the

[...] value of holistic interpretations of unique human and environmental situations versus the value of comparative universal frameworks, on the importance of materialist versus culturalist explanations, and on the type of field and analytical methods needed to understand a topic of study that is always biophysical and culturally meaningful (Paulson et al., 2005, p.18).

Paulson et al., (2005) state that cultural ecology problematizes nature versus culture dichotomy. This means seeing how the material reality influences culture, which means that cultural beliefs and practices heavily influence the environment and humans' perceptions of it. The main objective of cultural ecology is to determine and explain cultural similarities in similar environments and explain how economic factors arrange cultural, social, and political factors. The goal is to find patterns in humans' mode of behaviours concerning their environment.

However, once again, no society is characterized by a homogeneous culture. Multiple variations of culture co-exist within societies at any given time although one or a set of cultural norms are dominant in a society at a given time. A dominant conceptualization of social structures is based on Kar Marx. According to Marx, social and cultural systems are based on historical and material conditions (historical materialism). Historical materialists argue that humans' relationship to nature provides a basis for society and politics to arise and govern

production and relations of productions when society's relationship with nature changes. In capitalism, production is based on workers' labour, who are doing the work for the benefit of the owner. Nature operates in the same way that workers do; when we degrade nature and underinvest in maintaining its quality, only the companies and owners derive benefits from nature through money. For example, in crop production, farmers are "robbing the soil" when they are ruining the fertility of the soil (Robbins, 2012, p.58). By including Karl Marx's work, we can find the potential connections between cultural ecology and political economy (Peet and Watts, 2004). Behavioural cultural ecology remains attentive to the rationale behind the decision-making for production practices and how it is influenced by political and economic factors (Robbins, 2012).

Political ecologists draw upon post-structural methods to explore the relationships that give rise to social structures. Michel Foucault's approach to discourse analysis is particularly noteworthy. To Foucault, truth is formed through language that is used to administer social order. To understand society, we need to reveal how society defines taken-for-granted concepts and how the social, which includes political and economic systems, make these concepts the 'single truth' in this world. Foucault best summarizes why discourse is important for truth in writing that "Truth is a thing of this world: it is produced only by multiple forms of constraint. And it induces regular effects of power. Each society has its regime of truth, its general politics of truth: that is, the types of discourse that it accepts and makes function as true" (cited in Robbins, 2012, p70). Political ecologists apply Foucault's method to dismantle the truth by determining the hidden meaning behind how a concept is formed and the history behind it. Critical political ecology allows researchers to uncover multiple ways of knowing and constructing the environment.

Social nature is about the relationship between society and nature, and political ecologists use this idea to better understand the nature/society dichotomy (Ballamingie, 2006). According to Braun and Castree, researchers working in the field of social nature ask, “who constructs what kinds of natures(s) to what ends and with what social and ecological effects?” (cited in Ballamingie, 2006, p.46). Braun and Castree assert that geographers view social nature in three ways: knowing, engaging, and remaking nature. They state that knowers’ knowledge of nature is often biased. This means, first, that certain discourses dominate others within a society, which ultimately leads to knowledge of nature as an expression of power within that society. Second, engaging relates to the materiality of nature and how it provides both opportunities and constraints based on technical, cultural, and economic rationalities. As such, engaging is about understanding how people choose to engage with nature through technical, cultural, and economic factors. Third, they assert that societies re-make nature. Nature is not just social, but also political. Politics and power are interconnected, and if nature is political, then knowing, engaging, and remaking nature is about power (Ballamingie, 2006). As Ballamingie (2006, p.47) writes, this leads to several questions:

Who is currently empowered to define what counts as “nature” – discursively and materially – and what implications do accepted hegemonic definitions have? In turn, asking such a pointed question leads to another: namely, what counter-hegemonic definitions are currently available to us (in geography and beyond) and what kind of world – socially, economically, politically, and culturally – do they allow us to envisage?

2.1.2 The Framing of Ecological Agriculture

The ideas presented in the preceding section have important ramifications when researching agricultural principles and practices. Powerful social structures, based on specific narratives and ‘truths,’ create the conditions under which specific ways of farming are seen by farmers as being

the ‘right way to farm.’ Political ecologists aim to understand how social and environmental conditions change in time and space, and how the social and environmental conditions can be changed or are no longer accepted as a norm. It is also about understanding how powerful institutions, which include the government, economic actors, and media companies, control how the public perceives social and environmental conditions. Political ecologists that engage with discourse analysis are questioning the “truth” and dismantling it to produce multiple ways of seeing the truth (Robbins, 2012). Forsyth (2003) states that ecological discourses are important for environmental politics because they allow us to see the structure of opposition between state, non-state-actors, and the environment.

Organic, biodynamic, and sustainable agriculture all have a shared understanding of agricultural practices based on a holistic system that embodies the principles of preserving biodiversity, biological cycles, and soil fertility. However, they do differ subtly in terms of the narratives upon which they are grounded.

2.1.2.1 Defining Organic, Biodynamic and Sustainable Agriculture

Organic agriculture pre-dates industrial agriculture by millennia. Interest in organic agriculture arose as a movement for an alternative system to conventional agriculture that did not condone the use of chemicals. This idea can be traced to the 1920s and the works of several scholars, including Howard McCarrison and Rudolf Steiner. McCarrison found that Indian men did not contract diseases as easily as the people in the West did, which was due to their diet consisting of wholesome food (Kristiansen & Merfeld, 2006). Rudolf Steiner founded biodynamic agriculture, a branch of organics that was based on the theory of anthroposophy (ibid, 2006). The second wave of the modern organic movement began as institutions, such as the Rodale Institute, began to champion the benefits of organic production and ultimately published their results. During the

1960s, the organic movement gained increasing visibility as activists publicized the harmful effects of chemicals and the health benefits of organic. It was during this period that counter-culture connections were also made between organic agriculture and the ‘Back to the Land’ movement (ibid, 2006).

Formalization of its modern definition occurred during the 1970s led by the International Federation Organic Agricultural Movement (IFOAM), an organization that was founded in the early 1970s to create basic standards for a united co-operation of organic agriculture (Arkenbout, 2016). IFOAM defined organic agriculture as

[...] a production system that sustains the health of soils, ecosystems, and people. It relies on ecological processes, biodiversity, and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic agriculture combines tradition, innovation, and science to benefit the shared environment and promote fair relationships and good quality of life for all involved (IFOAM, n.d.).

This definition provides the foundation to most of the definitions of organic agriculture globally, including that of the Canadian Organic Growers (COG) which defines organic agriculture as

[...] a holistic system designed to optimize the productivity and fitness of diverse communities within the agro-ecosystem, including soil organisms, plants, livestock, and people. The principal goal of organic production is to develop operations that are sustainable and harmonious with the environment (Government of Canada, 2018, p.ii).

There are four principles of organic agriculture as formulated by IFOAM and COG: the principles of health, ecology, fairness, and care in the formulation of their regulations. The principle of health emphasizes protecting and enlivening the health of the soil, plant, animals, and humans. The principle of ecology emphasizes preserving biological cycles and enhancing biodiversity. The principle of fairness states that organic farmers should respect all living things on the planet, including their employees and processors in order to contribute to creating an adequate quality of life for all involved. Another aspect of the fairness principle is to respect the

environment and to preserve it for future generations. Finally, the principle of care emphasizes enhancing productivity and efficiency in organic agriculture without compromising one's well-being and preserving it for future generations (IFOAM, n.d.). This conceptualization of organic connects natural systems to social principles.

Biodynamic agriculture extends the definition of organic agriculture to include a spiritual dimension. Rudolf Steiner, originator of the concept of biodynamic agriculture in 1924, writes that biodynamics is based on the theory of anthroposophy, where human beings work to connect the spiritual and natural worlds. Anthroposophy asserts that all the cosmic and natural elements, including humans, soil, plants are interconnected and must be balanced (Castellini, Mauracher, & Troiano, 2017). This agricultural system thus respects the “spiritual dimensions” of all living creatures (Leiber, Fuchs, & Spieß, 2006). Turinek, Grobelnik-Mlakar, Bavec, and Bavec, (2009, p.146) write that anthroposophy

[...] encompasses practices of composting, mixed farming systems with the use of animal manures, crop rotations, care for animal welfare, looking at the farm as an organism/ living entity and local distribution system, all of which contribute toward the protection of the environment, safeguard biodiversity and improve livelihoods of farmers (Turinek et al. 2009, p. 146).

Under biodynamics, a farm is considered a living entity and different farms have their own unique characteristics, such as the biological characteristics of the soil and the different dynamic effects of natural forces (Arkenbout, 2016). Biodynamic farming is a holistic system where farming and planting follows the *Stella Natura* Calendar, and farmers spread biodynamic preparations onto their land to draw in ‘life forces from the cosmos’ (McMahon, 2005).

According to Demeter Canada, the certification body for biodynamic farmers, biodynamic agriculture focuses on:

[...] enhancing the life processes of nature. We work to create self-contained farm individualities. Each BD farm develops its own identity based on the relationships between the animals that provide fertility for the soil, the fields that provide food for animals and people, the plant life, the meadows, the orchards, the forests and the wetlands giving space for birds, insects and other wildlife. These interrelations support a healthy farm capable of producing quality, health-giving products (Demeter Canada, 2019).

Sustainable agriculture differs from both organic and biodynamic agriculture by incorporating greater flexibility and interpretation into its narratives of ecological agriculture. As such, it is a broad but contested term. For the purpose of this research, sustainable agriculture is defined as:

[...] a model of social and economic organization based on an equitable and participatory vision of development which recognizes the environment and natural resources as the foundation of economic activity. Agriculture is sustainable when it is ecologically sound, economically viable, socially just, culturally appropriate, and based on a holistic scientific approach (Horrigan, Lawrence, & Walker, 2002, p. 452).

Sustainable agriculture embraces the three pillars of sustainability: environmental stewardship, profitability, and social and economic equity. Achieving sustainable agriculture practices is about making progress, which means setting small, obtainable goals towards achieving a truly sustainable practice (Zucca, Smith, & Mitry, 2009).

2.1.2.2 The Political Ecology of Ecological Modes of Agricultural Production

Broadly, political ecology links social and physical sciences together to address environmental issues. It also recognizes that a society possesses multiple discursive practices and associated structural arrangements. Specific to this study, ecological modes of agricultural production exist alongside commercial or industrial modes of agricultural production. The current revival of ecological agriculture is the result of growing awareness within society of the environmental and health impacts of industrial agriculture.

Exactly which ecological mode of production an individual farmer chooses depends upon the narratives that individual embraces, which is what this study aims to determine for the Niagara region. As described in the preceding section, the discursive practices and conceptualization of organic connect natural systems to social principles. Those associated with biodynamics extend these connections to the spiritual. Those associated with sustainability are less restrictive than either organic and biodynamic providing for greater leeway in both understanding and application. Political ecology provides the theoretical framing for exploring the discursive practices that provide the foundation for each of the ecological modes of agriculture.

2.2 Regulation Theory and the Formalization of Ecological Agriculture

Regulations are a means of formalizing and exercising control over activities that a community engages in. The concept of *regulation* is used in a variety of ways. Regulations are used as ‘a specific set of commands,’ which means that regulations are formal rules bounded by the state. Regulations are also used as a ‘deliberative state influence,’ which means that the regulations are enacted for all state actions to influence economic and social behaviour (Baldwin, Cave, & Lodge, 2012). Regulations are also used as ‘all forms of social and economic influence,’ which means that any mechanisms used to influence behaviour are considered regulatory. Regulations are known to be binding rules that restrict or enable behaviour to prevent unpleasant activities or promote good activities (ibid, 2012).

2.1.2 The Nature of Regulations and Their Purpose

The study of regulations gained prominence during the 1970s with the work of the Regulation School. This School draws upon the political economy and the Marxist structuralist tradition. To

regulation theorists, economic activity is understood as taking place in the context of social, cultural, and political systems, and not in isolation or separate from these other social systems. As such, economic activity is seen through the lens of political economy. To this, these scholars incorporated Karl Polanyi's (1944) substantive approach into their work. In this approach, he argues that the term 'economics' has two meanings, the first being the formal definition used in neo-classical economics and the assumption of rationalism in decision-making and action, and a second that describes how livelihoods form and how humans make a living interacting within their social and natural environments. It is this second definition that regulation theorists apply.

The regulation approach emerged from French academic debates concerning the nature of capitalism and the economic and social changes of the 1970s. The early 1970s was a period of dramatic economic structural change resulting in stagflation, a condition combining high inflation, slowing economic growth, and high unemployment. Michel Aglietta, Robert Boyer, and Alain Lipietz (and later, the British scholar Bob Jessop) proposed that this structural change represented a fundamental change in society, its structures, and organization.

Regulation theorists argued that capitalism consists of a series of different periods (Boyer 1990, Boyer & Saillard 1995, Jessop 1997). Each of these periods is organized around a dominant, specific *model of development*. A model of development consists of three reinforcing parts. First, each period had its own distinct 'industrial paradigm' that organizes technical and social divisions of labour and set labour relations. Second, each period had its own 'accumulation regime,' a complementary pattern of production and consumption that stabilizes society and its industrial paradigm over long periods of time. Finally, each period has its own 'mode of regulation.' This mode of regulation consisted of "an emergent ensemble of rules,

norms, and conventions, patterns of conduct, social networks, organizational forms and institutions which can stabilize an accumulation regime” (Boyer, 1990). Here, regulation does not just mean formal and informal rules and regulations; it refers to the self-regulation mechanisms of a system.

Asquer (2018) suggests that today’s model of development can be described as regulatory capitalism characterized by the emergence of extensive regulatory governance. Understood as the mode of regulation associated with the current model of development, that of neoliberalism, it consists of a range of public and private actors engaged in regulatory activities within the state, between the state and the private sector, as well as within the private sector.

Formal regulations reflect the existing mode of regulation. The impetus for formal regulations can come from informal practices within a society, from technological needs and from societal narratives and discourses. In general, regulations are designed to address economic and social rationales (Asquer, 2018). Specific to economic activities, regulations are needed to control the market so that the marketplace cannot yield behaviour or results that are not in the public’s interest. Examples include regulating monopolies to ensure competition so that prices are not charged above the marginal average and preventing information inadequacies where consumers are given inadequate information to evaluate between different competitors’ products or services and are not aware of the risks associated with a product (Baldwin et al. 2012). Social rationales, on the other hand, are regulations that create fairness, accountability, access, and equity for society (Asquer, 2018) or that address other social goals. Regulations also exist to protect human rights and enhance social solidarity. Regulations, therefore, do not exist just to regulate the market, but also to provide frameworks to ensure that rights are protected to help the market work. Examples include advancing citizenship and preventing discrimination.

The translation of discourses, narratives, and ideals into regulations is a process imbued with politics. What is to be included in regulations, what thresholds are to be enforced, what is even practical or realistic, and what practices are to be approved are all established through negotiations between a diversity of actors within a society.

2.2.2 Certification and Ecological Modes of Agricultural Production

Formalization of ecological modes of agriculture is achieved through regulations enacted by a government and subsequent enforcement of standards set out in these regulations through certification of agricultural operations. This regulatory complex involves both government and non-government actors. A certification is a specific form of regulation. This section will provide an overview of the certification process and the regulations that the vintners must adhere to obtain organic, biodynamic, and sustainable certification.

2.2.2.1 Organic Regulations

In Canada, the Canadian Organic Standards are enacted through Agriculture and Agri-Food Canada and regulated and enforced by the Canadian Food Inspection Agency (CFIA). There are seven certifying bodies in Ontario accredited by CFIA: the Centre for Systems Integrations, Ecocert Canada, Organic Crop Improvement Association Canada, Pro-Cert Organic Systems Ltd, Quality Assurance International, TransCanada Organic Certification Services, and Quebec Vrai (Organic Council of Ontario, 2016). The two most common organic certifying bodies of Niagara wineries are Ecocert and Pro-Cert; therefore, this research will only focus on the certification processes for these two bodies. Both involve a process of application, initial on-farm evaluation, development of a farm plan against the standards outlined in the certification documentation, and inspection by an accredited inspector to verify that an operation meets all of the requirements set out under the certification. Ongoing inspections can be required to ensure

that an operation continues to operate in accordance with the rules set out under the certification authority. Certification allows an operation to market its product using the certification body's logo.

There are four national organic organizations in Canada: the Canadian Organic Growers, the Organic Federation of Canada, the Organic Agriculture Centre of Canada, and the Canada Organic Trade Association. The Canadian Organic Growers is a farmer and consumer association with a focus on organic education, policy work, and sectoral development. The Organic Federation of Canada is a national organization that represents the organic sector on matters of regulation. Based at Dalhousie University, the Organic Agriculture Centre of Canada is the national research organization serving the organic sector. Finally, the Canada Organic Trade Association is a national organization focusing on the domestic and export marketing of organic products. These organizations also maintain connections with other non-government organizations in the field of sustainable agriculture under the Canadian Agri-Food Sustainability Initiative that includes many of the major farm organizations across Canada (COG, 2020).

In addition, there are nine provincial/territorial organic organizations including the Organic Council of Ontario. This Council is "a membership-based non-profit association that supports Ontario's organic sector through advocacy, government and policy work, organic standards review, and provision of educational resources and services" (COG, 2020). The Council also promotes partnerships with other provincial organizations sharing common principles and goals including, of note, the Ecological Farmers Association of Ontario.



Figure 3. Map of organic organizations in Canada (Dalhousie University, n.d.)

The Canadian Organic Growers provides farmers with two essential documents to follow: *General Principles and Management Standards* and the *Permitted Substances List* (GOC, 2018). The requirements for the transition period, as outlined in the *General Principles and Management Standards* state that the land must be organic for three years before the first organic harvest and that any accredited organic certifying body in Canada must verify and approve that the land is indeed organic. A farm must also maintain buffer zones, which include physical barriers, of eight metres wide to separate organic and non-organic land. Production must remain organic at all times (Martin, 2019). All the organic inputs, such as fertilizers and processing additives used in production, must comply with the regulations (GOC, 2018).

The Government of Canada also provides a production and management practices document. The standards outline the land requirements for organic crop production. The standards state that organic production must comply with the standards for at least 12 months before the first harvest and must prohibit the use of banned substances for at least 36 months. According to the regulations, there are environmental factors to implement, which consist of having a buffer zone of eight metres between organic crops and non-organic crops or other physical barriers that are permitted, such as hedgerows, windbreaks, and roadblocks, to protect from accidental contact between organic and non-organic products. Only organic certified seeds and planting stock are permitted unless there are no known suppliers that supply such seeds or planting stock (GOC, 2018). Soil fertility and crop nutrients management consists of practices that increase soil fertility, provide nutrients to the soil, and maintain biological activity in the soil, which can be done through crop rotations, such as deep-rooting, legumes, and cash crops, or through composted animal or plant matter.

Tillage and cultivations practices must maintain soil fertility and reduce soil erosion. Plant materials must be used to enhance the soil and organic soil matter without compromising the soil, water, crops, or the air. Burning crop residue is prohibited; however, burning for weeds, pests, and disease problems are allowed. Crop, pest and weed management is about enhancing the overall health of a crop and reducing losses due to disease, weeds, and pest through cultural practices, such as crop rotations, mechanical practices, such as muscles and traps, physical practices, such as using heat against diseases (GOC, 2018). For manure management, soil amendments, such as liquid manure, solid manure, compost, or substances is allowable if it meets the requirements listed for nutrient management. The rate and method of the manure practice must not contaminate crops and groundwater or cause water run-off (GOC, 2018).

Another important section in the document ensures integrity during cleaning, preparation, and transportation of produce throughout the system. This section applies to all operations to maintain the integrity of organics from production to processing through to sale to the consumer. Preparation and production materials, such as counters and storage, must be cleaned if they are in contact with food or wine with high-grade food cleaners or disinfectants. Cleaners, disinfectants, and hand sanitizers are allowed if they are on the permitted substances list outlined in the document. Mechanical, biological, or physical processes, such as fermentation (commonly used in winemaking) is allowed. Organic products must be kept separately from non-organic products. Mixing organic products with non-organic products at any stage of production is prohibited. Packaging must also maintain the integrity of organic as well and packing organic products must be done in a way that causes minimal harm to the environment (GOC, 2018). Facility pest management and post-harvest management is about preventing pest from intruding production by removing their habitats and using preventative measures, such as traps and repellents to ensure that they are not in the facility. Transportation is about ensuring that organic products or ingredients are not compromised, especially if in transport with non-organic products. Measures must be undertaken to prevent contamination by providing the following information: name and address of operation, name of the product, organic status, and traceability information (GOC, 2018).

A final important document is the *Prohibited Substances List*. The Government of Canada provides a list of prohibited and permitted substances for organic agriculture. Organic agriculture prohibits the use of substances that do not respect the principles of organic agriculture although genetically engineered pesticides are permitted if they are not on the *Prohibited Substances List* (GOC, 2018). Prohibited synthetic inputs include food additives and processing

aids, such as sulphates, nitrates, and nitrites, used in food processing. The prohibition list also includes any equipment and packaging that contain synthetic fungicides, preservatives, fumigants, and pesticides (GOC, 2018). Permitted substances include tannic acid for filtration aid for wine, soil amendments to improve soil fertility, and vintners can only grow pomaces organically (GOC, 2018).

From a political ecology perspective, organic regulations arose in response to discourses and narratives associated with organic practices. The organic regulations address the associated environmental and health discourses by prohibiting the use of inorganic or synthetic chemicals through the establishment of the *Prohibited Substances List* and by enacting regulatory requirements that ensure that the land and the product will not be contaminated with non-organic ingredients. The organic regulations also aim to preserve the environment by outlining appropriate practices aimed at improving soil fertility and protecting biodiversity.

2.2.2.2 Biodynamic Regulations

Biodynamic regulation is a private sector initiative that is recognized by the government. Demeter Canada is the accrediting entity for biodynamic certification in Canada. Demeter Canada also sets the regulatory guidelines for biodynamic production and certification. This section does not address the spiritual aspects of biodynamic production.

The Demeter standards for the hop and other perennial productions including for seed and propagation materials, manure management, plant care, weed control, productions in glass and plastic, and harvest and sales preparations. For seed and propagation materials, the seed used in productions must come from biodynamic agriculture, but if biodynamic seeds are not available, organic seeds are acceptable. Seeds cannot contain any synthetic chemical seed treatment agents. Propagation materials must also come from biodynamic farms, or organic

farms if biodynamic materials are not available (Demeter, 2018). For manure management, farmers are required to produce soil mixes consisting of on-farm materials where 25% of the materials must be compost made from plant manure. Fertilizers and crop rotation must use techniques that manage nutrient leaching into groundwater. All fertilizers must be permitted substances under the Demeter standards (explained more fully below). Peat is allowable for propagation beds but cannot exceed a limit of 75% (Demeter, 2018). Soil-less and thin soil layers are not allowed with certain exceptions, such as cress. For plant care, any synthetic chemical substances to control pests or fungal attacks and to speed up the growth of crops are prohibited (Demeter, 2018).

For weed control, it is preferable to use mechanical measures over thermal measures. Steaming the soil is prohibited. Biodynamic farmers can use industrial mulching materials if the weeds are extensive due to the environmental effects of weeds suppressions. It is also permitted to grow crops under glass and plastic provided the energy usage for heating crops is low. In glasshouses, soil steam or heat treatments are prohibited, but the national certification organization can grant exemptions in times of emergency. For harvest and preparations for sale, operations must maintain careful harvest and storage techniques to sell quality biodynamic products (Demeter, 2018).

Demeter also provides an *Input List* that lists the allowable inputs in biodynamic productions. The *Input List* is a 237-page guideline that outlines all the permitted inputs, which company to get the inputs from, the nutrient content and the composition of the inputs. The list provides sections on allowable fertilizers (phosphorus-rich fertilizers, such as Humigras), products used for plant protection (allowable insecticides, fungicides, etc.), products used to strengthen plants, products for cleaning, products to control parasites, and animal products.

There is also another section on allowable inputs for processing for a variety of industries, such as the dairy industry, the meat industry, and the wine industry. The Demeter International Standards provides a list of allowable cleaning inputs for juice and wine processing. Such examples include Weinsteinlöser P extra stark, which is used to remove potassium bitartrate in the tank plants, Füllersteril PPP, which is used to disinfect alcohol, and Sodasan Händedesinfektionsmittel, which is a liquid disinfection hand soap (Demeter International, 2019). These examples exemplify the outlook of the standards regarding the use of inputs.

Biodynamic agriculture is a branch of organic agriculture, which is also an alternative to conventional agriculture. Biodynamic agriculture does not prohibit the use of chemicals as organic does; however, the biodynamic regulations provide a list of preparations that vintners must use. The biodynamic *Input List* provides a list of what producers can use that will be good for the soil; meanwhile organic provides a list of what you cannot use. The biodynamic standards also provide a list of practices that are acceptable for the management of a biodynamic farm and vineyard that will protect the soil and all living beings.

2.2.2.3 Sustainable Regulations

As already stated, sustainable modes of production are less rigid and therefore standards for sustainable production are less specific. The Ontario Craft's Wineries (OCW), formerly known as the Wine Council of Ontario, is the accrediting body for sustainable viticulture and for the standards applied to sustainable viniculture. It developed a voluntary self-assessment tool for wineries in 2007.

Sustainable agriculture is another alternative to conventional agriculture; however, it is a broad term encompassing different practices, including, as examples, no-till agriculture, and conservation agriculture. The sustainability mode of production focuses more on on-going efforts

to adopt more ecologically harmonious practices over time. The sustainable regulations focus on measuring and tracking a vintner's practices that affect the environment, which ultimately leads to costs reductions and less environmental impacts. The regulations do not prohibit vintners from using chemicals or from using a certain practice; however, they ensure that vintners are keeping track of their practices that harm the environment. For instance, vintners are required to keep track of energy and water usage. The relationship between the regulators and the regulated body consists of the process where auditors inspect the farm every three years, but they must submit the paperwork every year to ensure that wineries are improving their sustainable practices. The sustainable certification is a broadly defined economy because it focuses on encouraging wineries to reduce their carbon footprint to obtain the marketing label, which is the Green Leaf logo. It is not as strict as the organic and biodynamic regulations, but still yields interesting perspectives on how it affects vintners' productive activities. The sustainable regulations for this research focus on linking profitability, environmental stewardship, and social justice together in a vineyard's operations.

2.2.3 The Significance of Certification

Certification provides formal recognition that a producer of a specific product meets the rules and standards set out under a certification program. As such, certification is designed to be a marketing tool. Certification as an organic, biodynamic, or sustainable vintner informs a prospective consumer that the vintner applies certain practices in the creation of his/her wines. This, in turn, allows consumers to make informed choices with confidence. If a consumer wishes to purchase only organic, biodynamic, and/or sustainably produced wines, certification makes this possible as only those vintners who meet the standards as set out under the specific regulations are so certified.

Certification as organic, biodynamic, and/or sustainable requires that a vintner apply for certification and is then inspected by an independent (third-party) inspector who validates that the vintner meets all the standards under the specific regulations. Under most certification programs, a vintner is inspected on an annual basis in order to retain the certification. The certification process varies in terms of steps and demands. For example, to apply for the Demeter certification, a winery must not only ensure that its operations comply with the Demeter production standards but that the farm has operated under these standards for at least 12 months if it is an organic operation transitioning to the Demeter biodynamic mode of production, or 36 months if it is a conventional farm converting to biodynamic production before being granted certification status (Demeter, n.d.).

Certification as a sustainable operation is more problematic than for organic or biodynamic certification. Several organic certification approaches exist, two of note being Ecocert and Pro-Cert. The steps in each of these are summarised in Table 5.

There was no motivation from Ontario wineries to adopt the sustainable certification in 2007; therefore, the self-assessment program “sat on the shelf.” However, in 2017, the Grape Growers of Ontario decided to apply for government funding to revive the program. The purpose of sustainable certification is to help wineries get recognized for their work in protecting the environment, remaining profitable, and being socially responsible (Grape Growers of Ontario, 2010). The overall goals of the program are to improve wineries' environmental performance, to provide transparency for consumers, and increase the value of the wine industry in the Niagara region.

Ecocert

There are six steps to getting the organic certification under Ecocert. The first step involved registering for organic certification, and then Ecocert sent the application documents that included the information guide, organic standards, certification fees, and registration form. The second step was Ecocert must verify that they have received and reviewed your application to ensure the following the criteria, then they would send the vintner an invoice. The third step involved payment and the signing of a contract. The fourth step was an inspection, where the inspector visited your farm for a minimum of 3 hours, and then the inspector gave you a preliminary document of their findings. The paper arrived within six weeks. The fifth step was for Ecocert to review the report made by the inspector. The final step was when the vintner achieved approval for an organic certificate and could use the Ecocert logo on products. It took one year of pre-certification to attain full certification (Ecocert, n.d.).

Pro-Cert

For Pro-Cert, there were five steps to complete the certification. The first step was the application and preliminary evaluation. The second step was an inspection, but for initial applicants, the inspector visited and reviewed the farm before the reviewing of organic products. The inspector's job ensured that the farm was operating following the *System Plan* from the application and evaluating whether the farm complied with the regulations. The third step was evaluation and resolution, where the Pro-Cert committee evaluated operations and product usage against the standards. The committee informed the vintner of any practices that were against the regulations and allowed 30 days to provide proof that you corrected your mistakes. The fourth step is certification, which means the committee informs you if you are certified, or worse, denial of certification, suspension of certification, or revocation of certification. The fifth step is surveillance and enforcement, where Pro-Cert will monitor your operations by visiting your farm without warning to review your mistakes and reviewing your advertising and labelling of organic (Pro-Cert, 2019).

The steps to getting the certification for both Ecocert and Pro-Cert were similar in application, inspection, and certification process; however, they differed in how they used their method.

Table 5. Steps in Ecocert and Pro-Cert Certification.

The certification program for sustainable certification itself continues to be a self-assessment program where wineries answer a questionnaire that covers a wide range of topics including energy, water and wastewater, solid waste management, hazardous waste, and materials handling, integrated pest management, industry standards awareness, and expansion and renovation of an existing winery. The questions are broad in scope but examples include asking how much water a winery uses and whether they have installed metres to track water

usage, and there are questions about monitoring how much energy a winery consumes (Martin, 2007). The structure of the self-assessment tool is for wineries to indicate “yes” or “no” to each question in their self-assessment document. Wineries are given a score from -20 to +20 for each answer. Table 6 explains the rationale behind the scoring. Vintners can write “not applicable” for any question that is irrelevant to their vineyard (Martin, 2007).

| | |
|----------------------|--|
| -20 Unsustainable | It contains a negative environmental impact, and actions need to be undertaken to address the impact. |
| -10 | It possibly has negative environmental and economic impacts. |
| 0 | If written “no,” then the wineries will likely implement the practice, but in the meantime, it has no severe negative impacts. |
| +10 | Indicates a positive environmental impact. |
| +20 | Excellent leadership with no impact on the environment. |

Table 6. The rationale behind the scoring for each answer in the sustainable self-assessment tool (Martin, 2007).

The purpose of the scoring is to help wineries understand their current ranking in terms of their environmental performance and to set goals to improve their score every year by focusing efforts on those components where they scored less than zero. Wineries can add up their answers to determine their overall score (Martin, 2007). Once the questionnaire is filled out, the wineries must send it into the OCW. Then an auditor will conduct an on-site evaluation. The difference between organic and sustainable is that the auditors come in every year for organics, whereas, for the sustainable certification, the auditors come in once every three years although the vintner is expected to maintain records and draft an updated plan annually. Because of proprietary information held by the Grape Growers of Ontario, the regulatory requirements in the self-assessment tool cannot be presented in this thesis. What is important is that, unlike organic and biodynamic certification, which have set standards and practices a producer must follow, sustainable certification focuses on an ongoing effort to become increasingly ecological in their practices thereby reducing negative impacts on the environment.

2.3 Existing Literature on the Transition Process and its Challenges

There are always two sides to a story. When considering a decision to switch to a more ecological mode of agricultural production, there are motivations for transitioning and barriers or challenges to transitioning. This thesis considers the opportunities, challenges, and barriers to transitioning from conventional modes of production to more ecological modes of production by vintners in the Niagara Region of Ontario as identified by those vintners. It does not propose to conduct a critique of the regulations or certification process associated with this transitioning.

According to McCarthy and Schurmann (2018), transitioning to organic farming, or ecological modes of production more generally, can involve completely changing one's production practices, and, given that, producers considered it a risky and bold move.

Transitioning to new ecological modes of production is a learning process and uncertainties can arise in the transition process, which includes uncertainties about labour requirements; disease, weed, and pest control; market factors, governmental policies, and production levels. Farmers must weigh the transition against the risk associated with it. Nevertheless, it is important to understand the motivations and barriers in the adoption of organic agriculture because it helps us understand farmers' rationales to design or change policies that can encourage farmers to convert to a more ecological form of agriculture, including organic agriculture. It is crucial because organic agriculture requires that farmers change the process and productions of their farm, which can be a complex task to undertake (Koelsing, 2006).

2.3.1 Motivations to Transition

Motivations to adopt organic practices vary among farmers. Several studies reveal that the motivations to adopt organic agriculture include preserving the environment, improving human health, farm location, personal ideology, higher quality of wine/food, validation through

certification, additional profitability, and governmental support. McEachern and Willock (2004), for example, found that the overall motivations to convert to organic for livestock producers in the UK are based on environmental (56% of those interviewed), ethical (42%), and social (32%) reasons.

Environmental reasons proved the most commonly cited reasons for transitioning. Siepmann and Nicholas (2018) found that organic winegrowers in Germany were motivated to adopt organic practices to bolster on-farm resilience to climate change. Organic agriculture was also seen by respondents as protecting the soil from erosion, resulting in healthier soils for future generations as well (Siepmann and Nicholas, 2018). Devitt (2006) found that farmers in Ireland were motivated to adopt organic agriculture because it is their responsibility to farm ethically and to be environmentally friendly. Koesling (2008) similarly found that organic farmers in Norway adopt organic practices to protect the environment both at the farm level and global scale, citing that organic practices will nurture healthier soils and emit less greenhouse gas emissions. Tress (2001) states that Danish farmers were motivated to preserve the environment.

Ideology is another primary motivating factor to transitioning to more ecological modes of agricultural production. Siepmann and Nicholas (2018) found that farmers who transitioned to organic production did so for ethical reasons. Devitt (2006) found that farmers did so because they believed that it was “the right thing to do.” Soltani, Azadi, Mahmoudi, and Witlox (2013) found that farmers in Iran similarly strongly believe in the values of organic farming as a practice that is environmentally friendly and healthier. Finally, Tress (2001) also discovered that Danish farmers firmly believe that organic agriculture is the future.

Health is yet another commonly cited motivator. Vintners in Siepmann and Nicholas’s (2018) study acknowledged the damage potentially being caused by their inorganic sprays and

saw conversion to organic as minimizing any health risks to themselves and their farm as well as to consumers in general. Kallas, Serra, and Gil (2010) study of farmers in Catalonia, Spain found that farmers who have a positive view of organic agriculture believed in prohibiting the use of chemical inputs. Several studies connected human health reasons with a higher quality of food and wine products. Kallas et al. (2010) determined that those farmers more likely to adopt organic practices believed that organic agriculture produces higher quality food. Koesling (2008) found that farmers in Norway ranked higher quality of food as the main driver to adopt organic practices. Siepmann and Nicholas (2018) found that organic farmers believe that organic practices result in a higher quality of wine since the root of the wines is deeper due to the lack of the use of systematic fertilizers.

Less commonly cited, yet important nonetheless, was profitability and government support. First, concerning profitability, Koesling (2008) found that farmers who were planning to transition to organic were motivated by profitability and by the pay-outs from organics. Devitt (2006) revealed that organic farmers found that the demand for organic produce is increasing and that this is seen as a market incentive for adopting organic practices. Siepmann and Nicholas (2018), on the other hand, found that winegrowers in Germany were not motivated to adopt organic for financial gains.

Finally, governmental support is seen as providing assistance for farmers looking to transition to more ecological modes of agricultural production. Soltani et al. (2013) found that governmental support is extremely important in encouraging conversion to organic practice because the government can reinforce positive attitudes towards organics by providing marketing for organics, research on organics, and changing consumers' perceptions. Devitt (2006) determined that financial support from the Rural Environmental Protection Scheme and available

grants for converting to organics helped facilitate such transitioning (Devitt, 2006). Siepmann and Nicholas (2018) found that supportive social networks are important as organizations can help support farmers through the certification process. Even certification can be a motivator because the certification means that organic farmers are truly organic since a third-party member has validated their work (Siepmann and Nicholas, 2018).

2.3.2 Challenges and Barriers to Transition

A desire to transition to more ecological modes of agricultural production is not always a sufficient reason to do so. There exist a range of challenges and barriers to the adoption of ecological agriculture farmer must address, such as on-farm issues, cost and profitability, ideology, lack of governmental support, and certification.

There are several on-farm production issues when practicing organics that serve as a barrier to convert. Siepmann and Nicholas (2018), Tress (2001), and Wheeler (2007) found that concerns over pest and disease management were barriers to the adoption of organic practices. Furthermore, the frequent spraying on the vines and the use of copper as a spray were barriers for vintners in Germany (Siepmann & Nicholas, 2018). Soltani et al. (2013) found that organic production is more expensive because organics require more facilities for transport, handling, and storage of both inputs and product, which increases the costs of farming organically thus raising resistance to transition. Finally, a third important category of on-farm barriers to transitioning were the associated paperwork demands which farmers in studies cited as being burdensome. In addition, under most certification programs, the farm must be inspected annually, which can be burdensome for farmers.

Reduced productivity was seen as a major concern. Pechrova's (2014) study of farmers' decisions to transition to organic and biodynamic revealed that biodynamic practices resulted in

reduced yields of as much as 54.42%, while reduced yields on organic farms of up to 26.27% when compared to conventional modes of production. This research did suggest that farmers are more likely to convert if there are no significant adverse impacts on yields and productivity. This research also noted that farmers saw subsidies as offsetting these losses in productivity. The higher the subsidies are, the more likely a farmer will convert because farmers see subsidies as a boost in their income. Farm size mattered in this decision-making as well. Small farm owners (in terms of the number of employees), were more likely to convert to organic whereas large farm owners were less inclined because they believed that the conversion would adversely impact on yields and therefore farm income. Tress (2001) found that organic farmers strove to achieve a higher quality product, respect animal welfare, and garner higher profits.

Beyond the farmgate, the perception of the market for organic products, and a farmer's return on investment, represents another major barrier to transitioning. The market for organic is still small in many countries and, although consumers are often willing to pay a premium for organic foods, this is not always possible. In their study of Iran, Soltani et al. (2013) observed that most Iranians cannot afford to purchase organic products and therefore, there is no opening in the market for organics. In their study of Danish dairy farmers, Smit, Driessen, and Glasbergen (2009) found that the transition process to obtain the certification is lengthy and that the farmers do not get price premiums for their milk until after they receive the certification and even then, the price premiums they receive for adopting organic practices do not offset the higher production costs. Wheeler (2008) found that the market in Australia is the major barrier to the adoption of organic practices.

More generally, existing research suggests that there are significant financial risks that farmers must think of before deciding to convert to organic agriculture, and these include

increased production costs, the possibility of reduced yields, and markets returns. It costs more to farm organically and often price premiums and subsidies are not enough to offset these costs. Siepmann and Nicholas (2018) found, for example, that decreasing profits is a barrier in Germany because only cheap wine can use the price premium for being certified organic wine whereas premium wines do not get the organic price premium. The subsidies are also too low to consider transitioning to organic agriculture.

It is interesting to note that ideology is another identified barrier to the adoption of organic agriculture. Siepmann and Nicholas (2018) found that some farmers are against the ideology behind organic farming because they do not see it as being sustainable. Issues such as the types of fertilizers used are not seen as the main problem in destroying the environment; greenhouse gas emissions are, and to these farmers, going organic agriculture is not going to address the issue of greenhouse gas emissions. Smit et al. (2019) noted that Danish dairy farmers' practices have a reputation of sustainability that is almost as good as organics; hence why the dairy farmers did not convert to organics. McEachern and Willock (2004) found that 50% of their participants believe that organic farming will lose its ethical stance in the future.

Lack of governmental support was raised in several studies as a barrier to the conversion to organic agriculture. This lack of support included both financial support and technical support. In general, organic farmers cited this lack of governmental support, meaning that organic farmers learn by trial and error, which could be expensive and risky. Wheeler (2007) found that farmers perceived a lack of governmental support as a major barrier to converting and that farmers would consider transitioning if there is support from the government in terms of having specialists around to help provide information, go through the transition process with them, and having policy support in their transition. Lack of knowledge is also one of the barriers to the conversion

to organic agriculture. Soltani et al. (2013) have noted that farmers in Iran do not know where the market for organic products is because the majority of Iranians cannot afford to purchase organic products; therefore, the government should provide support by establishing sites for Iranian farmers to sell their organic products. Seufert, Ramankutty, and Mayerhofer (2017) support the notion that lack of knowledge is a barrier, but also notes that a lack of technical support is a barrier as well. Siepmann and Nicholas (2018) revealed that the barriers to adoption for winegrowers is that the regulations are tight and restrictive because the regulations tells you how much you can spray or how much sulphites you can use in your wine that will help it last longer, which shows us that the organic regulations are too harsh to encourage transition.

The certification itself was raised as a barrier to the adoption of organic practices, first and foremost because certification is expensive to acquire. Soltani et al. (2013), for example, found that there are no national organic certifying bodies in Iran, so farmers must acquire certification through international certifying bodies. While these researchers found that high-income farms are more likely to adopt organic since they can afford the certification and the technology to take on the financial risks of adopting organics, the majority of Iranian farmers are small-scale farmers, and certification is too expensive for them to secure. Tress (2001) found that the lack of financial gains during the transition process proved to be a barrier. Siepmann and Nicolas (2018) found that conventional farmers who used sustainable practices do not see the need for organic certification.

The literature on the motivations and barriers for adopting sustainable agriculture varied as sustainable practices can include, but are not limited to conservation agriculture, no-tillage agriculture, integrated pest management, and other practices, which means that sustainability is a broad term. Trujillo-Barrera, Pennings, and Hofenk (2015) explored sustainable producers'

motivations to adopt sustainable practices based on expected economic, social, and personal rewards, as well as the financial risk perceptions and risk tolerance for Dutch hog farmers in the Netherland. A potential barrier to the adoption of sustainable practices identified the uncertainty of the returns on investments. Trujillo-Barrera et al. (2015) findings reveal that the main motivations in the adoption of sustainable practices are economic rewards. Hog farmers want to invest in sustainable technologies that will increase their yields and efficiency. The tax benefits from the government is also a motivation for farmers to adopt. Interestingly, they found that social and personal rewards do not influence farmers' decisions to adopt sustainable practices. They also found that risk tolerance does not influence the adoption of sustainable practices as well.

Dodds, Graci, Ko, and Walker (2013) studied the motivations of New Zealand vintners to pursue sustainability. Quite similar to the sustainable certification for the wineries in Niagara, New Zealand's wineries follow an environmental audit that asks questions about the practices regarding water, and waste management; risk management; supply chain management; employee training and involvement; and community relationships. The results revealed that social responsibility and preservation of the environment are the most important motivators to the adoption of sustainable practices for the wineries of New Zealand. Marketing and saving money from sustainable practices were found unimportant to motivate wineries to partake in the Sustainable Wine Growing New Zealand (SWNZ). Another major motivator is that the wineries knew that they had to be organic or sustainable to export their wine as per the government request. Interestingly, the results also revealed that certified organic and biodynamic wineries are motivated by social responsibility and protection of the land as well. For non-certified organic and biodynamic wineries, the environment was the main motivator, and the regulatory

requirements on wine exporting is another motivator to become certified. However, barriers do indeed exist for the wineries, such as lack of information and high capital costs to be part of the SWNZ (Dodds et al. 2013).

Leite, De Castro, Chiappetta Jabbour, Batalha, and Govindan (2014) study of grain farmers in the Sao Paulo state of Brazil included several interpretations of sustainable agriculture including conservation agriculture, precision agriculture, integrated pest management systems, and organic agriculture. This study found that 75% of grain farmers were motivated by the cost reduction of sustainable practices, 98% were motivated by the increase in productivity, and 88% of farmers were motivated by improving soil fertility. Of the participating farmers, 53% believed that sustainable practices will yield lower farm incomes. 56% of participating farmers cited the lack of information available is a barrier according, 61% of farmers said that the lack of agricultural policy and finally 40% said that the lack of technical support is a barrier in the adoption of sustainable practices. It is also interesting to note that the adoption of sustainable practices was greater among farmers connected to associations or cooperatives as they get better access to information (Leite et al., 2014). Mishra et al's (2018) study of farmers in Kentucky, USA found that older farmers were less likely to adopt sustainable agriculture practices, preferring to continue more traditional forms of agriculture while young farmers were more receptive to transitioning.

Literature also revealed a need to provide education and extension programs to increase the adoption of SAPs because some farmers have difficulty understanding the SAPs technologies or difficulty in implementing the practices. Mariani and Vastola (2015) state that the strategic drivers to the adoption of sustainable practices are managerial attitudes, preservation of the environment, employee safety, and corporate social responsibility. Another important driver is

compliance with the regulations, especially concerning trade regulations for exporting, and to participate in the supply chain. Mariani and Vastola (2015) also note that the potential barriers to the adoption of sustainable practices are high costs, more administrative labour for the certification process, and lack of knowledge. For the winegrowers, the lack of knowledge is attributed to questioning the effectiveness of sustainable practices leading to environmental benefits (ibid, 2015). Table 7 summarizes all the motivations and barriers to the adoption of each mode of productions based on the literature.

| | Motivations | Barriers |
|--------------------|--|---|
| Organic | <ul style="list-style-type: none"> • Preserve the environment • Increase soil fertility and lower GHG • Farm location • Positive view of organic agriculture • Higher quality • Profitability • Market demand • Governmental support • Social networks • Validation through certification • Protection of farmers' health | <ul style="list-style-type: none"> • Expensive certification • Financial risks • Higher production costs • Certification process • Low market demand • Pest and disease management • Frequent use of organic substances • Lack of governmental support • Lack of information • Harsh regulations • More labour • Negative view of organic agriculture |
| Biodynamic | <ul style="list-style-type: none"> • Protection of farmers' health • Preserves the environment | <ul style="list-style-type: none"> • Harmful to the environment • Lack of knowledge • Lack of innovation • Financial risks • Lower yields • Certification • Small market • Inefficiency • Transition process |
| Sustainable | <ul style="list-style-type: none"> • Preserves the environment • Governmental support • Social responsibility • Efficient costs reductions • Increased productivity • Regulatory requirements | <ul style="list-style-type: none"> • Lack of information • High capital costs • Low profitability • No agricultural policy • No technical support • More labour due to certification |

Table 7. Motivations and barriers to the adoption of organic, biodynamic, and sustainable agriculture based on a review of the literature.

2.4 Cultural Ecology and the Literature Related to Motivations and Barriers

Cultural ecology is about how individuals' perceptions of nature are influenced by their cultural values and beliefs. The goal of cultural ecology is to determine the rationale behind individuals' decision-making of their production practices and whether their decisions are influenced by political and economic factors. Simply put, the goal is to determine similarities in individuals' modes of behaviours. The purpose of using cultural ecology in this research is to determine the rationale behind vintner's decision to adopt organic, biodynamic, and sustainable viticultural practices. Research shows that the motivations and barriers to adopting organic practices are based on environmental, social, economic, and political factors.

The motivations to adopt organic practices are influenced by environmental stewardship, health, farm location, ideology, quality, validation from certification, high profitability, and strong governmental support. The barriers to the adoption of organic practices are certifications, financial risks, increase workload and costs, lack of knowledge, on-farm issues, lack of governmental support, strict regulations, and ideology. The literature mentioned above aimed to understand farmers' rationales adopting ecologically-sound management practices and whether these political and economic factors influence their decisions. The literature showed that the motivations to adopt organic, biodynamic, or sustainable are based on environmental and health reasons, as well as the farmers' ideology of their practice. The literature also revealed that decisions are made based on economic and political factors, such as profitability and governmental support can be understood through the lens of cultural ecology. The challenges and barriers to the adoption of organic agriculture were on-farm issues, ideology, and lack of knowledge, workload and costs, financial risks, certifications, lack of government

support. On-farm issues included pest and disease issues (Wheeler, 2007; Siepmann & Nicholas, 2018). The ideology of organics versus the reality of its lack of sustainability decreased farmer acceptance of organic practice (Smit et al., 2019; Wheeler, 2007). Organic farming required increased manual labour thus increasing workload and costs (Soltani et al., 2013). The literature showcases that there are a variety of barriers; however, they are based on environmental, social, economic factors, which can be understood through cultural ecology as well.

There is a wide variety of motivations and barriers to adopting organic farming worldwide; therefore, cultural ecology allows us to determine the rationales and find the similarities in those rationales in the Niagara Region depending on the certification. This leads to finding the chain of explanation, which means that there is a plural approach to political ecology that reveals different rationalities due to the lack of environmental data. Why one winery chose to adopt organic practices, but not biodynamic, nor sustainable had a different rationale compared to a winery that chose to adopt sustainable, but not organic, nor biodynamic.

Organic, biodynamic, and sustainable means different things to different farmers. Some farmers, for example, view biodynamics almost like a religion in the sense that it is a philosophy or a spirituality whereas others see it as rather eclectic. Some farmers see organic as too restrictive or unrealistic whereas others see it as the only approach for minimizing impacts on the natural environment. Some farmers see sustainable approaches as the best option in terms of improving environmental performance, whereas others see the definition of sustainable as too broad and ‘wishy-washy.’ Nevertheless, all are seen as sharing a common concern for the natural environment.

Turning specifically to regulations, the principles of organic agriculture, as by the International Federation of Organic Agricultural Movement, helps create a cohesive definition

and principles for all countries to follow (Arkenbout, 2016). However, there are problems with the organic regulations that sometimes prohibit farmers and winegrowers from adopting it. Arkenbout (2016) states that corporate value-chains do not necessarily respect the IFOAM principles of care, health, fairness, and ecology in their production practices; however, the alternative value-chain respects the IFOAM principles of organic agriculture. Although regulations augment consumer trust by ensuring fairness in certification and profitability, each state controls how organic is formally defined and regulated in its own jurisdiction. Formal regulation also runs the risk of organic farming becoming conventionalized (De Wit & Verhoog, 2007; Guthman, 2004).

Chapter 3: Methodology

Chapter 3 outlines the methods used to conduct this research. This research employed a case study, a survey of the regulations, semi-structured interviews, and an online questionnaire to obtain information from vintners on their experience of the transition process. The research also used discourse analysis to frame the results. First, this chapter investigates how this research is grounded in a case study. Subsequently, this chapter highlights how surveying the regulations helped with this research, as did the method of interviewing and the online questionnaire. This chapter also explains the use of discourse analysis. Finally, this chapter concludes with an explanation of the limitations of the research approach.

3.1 Research Methods

3.1.1 Case Study

The definition of a case study was “an intensive study of a single unit to understand the larger class of (similar) units” (Baxter, 2016, p.130). Yin (2014) stated that “[t]he essence of a case study, the central tendency among all types of case study, was that it tried to illuminate a decision or set of decisions: why they decided, how they implemented, and with what result” (15). This research focused on certified organic, biodynamic, and sustainable wineries in the Niagara region as a case study.

A case study is an empirical study that comprehensively examines a small case to determine the real-world context (Yin, 2014), which means understanding how the results of a case study could replicate among multiple case studies. Studying the motivations to adopt organic, biodynamic, or sustainable practices and the challenges in the transition process in the Niagara region alone helped to determine how the application of the findings could be applied or

replicated by other provinces or countries. This research adopted a comparative case study approach. A comparative case study was a case with multiple phenomenons and could be space specific. Specifically, the comparative case study analyzed and compared two or more phenomenas (Baxter, 2016). As mentioned in Chapters 1 and 2, organic, biodynamic, and sustainable practices all offered a holistic alternative to conventional agriculture that aimed to improve soil fertility and biodiversity; however, they differed in how they are defined, regulated, and practiced. Therefore, organic, biodynamic, and sustainable contained three comparable phenomena, and the Niagara region was place specific. Comparing enables the researcher to communicate the motivations to adopt and the transition process for organic, biodynamic, and sustainable practices enabled the wine industry and the wider society to understand the rationales behind the decision-making process in the pursuit of the adoption of environmentally friendly management practices. Thus, this leads to a better understanding of the process to close the knowledge gap of the challenges in the transition process and to shed light on the decision-making process, thereby, hopefully leading to changes in policy that can facilitate a smoother transition process for wineries in the Niagara region.

A case study also helps to test or expand a theory, which means that case studies help to understand a single case in greater detail. The understanding leads to both creative solutions for problematic areas of the case and to refine theorizing about the phenomenon (Baxter, 2016). In a case study, a theory helps analyze the data against the theory. The theory helps to ground the sub-theories into ideas that represented the key issues (Yin, 2014). As mentioned in Chapter 2, the theoretical frameworks of political ecology and regulation theory grounded this research. The purpose of grounding this research within political ecology was to understand how political and social factors contributed to environmental degradation (Forsyth, 2003) as well as how political

economies affected productive activities concerning the environment (Paulson et al., 2005). For instance, political ecology helped in understanding vintners' rationale for adopting a certain mode of production and whether the regulators played a role in the management of their practice. Specifically, political ecology helped to determine the discursive practice of each method of production and the material reality of the regulations. It was about understanding how vintners constructed their understanding of their mode of production and how they constructed the rules that facilitated their practices. A second grounding theory was regulation theory. Regulation theory outlined the regulatory nature for each mode of production. It clarified the regulated industry and regulator relationship. The theory explained how vintners perceive regulations impact on their operations. Both theoretical frameworks enabled the understanding of the relationship between vintners, regulators, and the environment, as they managed their practices in the Niagara region.

3.1.2 Survey of Regulations

A survey of the regulations resulted in a thorough review of the regulatory requirements to which certified wineries must adhere. The researcher reviewed the regulatory requirements and certification process for organic, biodynamic, and sustainable certification. By surveying the regulations and the certification process, the researcher gain an understanding of the steps wineries undertook to obtain the certification. A great deal of research showed that the barriers to the adoption of organic farming were harsh regulations and certification. This begs the question as to whether the literature on the barriers to adoption is the reality for farmers who have already obtained the certification. Investigating three certifications and the regulatory requirements represents an opportunity to determine the rationales for vintners' decision-making processes. It questioned the implied difficulty of audited certification.

The researcher examined the organic regulations, which consisted of the *General Principles and Management Standards* and the *Prohibited Substances List*. The next step was to review the regulatory requirements for crop farmers and the list of the disallowed farm inputs. The subsequent procedural item examined the certification process for both Pro-Cert and Ecocert because these were the two most common certifying bodies followed by wineries in the Niagara Peninsula. The next step was to inspect the Demeter standards as they were the certifying body for biodynamic agriculture. The rules consisted of documents outlining their *Production Standards* and their *Input List*. The final step was to review sustainable certification. The sustainable certification began with the Ontario Craft Wineries' provision of a self-assessment tool that contained questions for wineries to answer on energy and water use, wastewater, solid waste management, hazardous waste, and materials handling, integrated pest management, industry standards awareness, and expansion and renovation of an existing winery. The researcher thoroughly reviewed all questions on the self-assessment tool. The Grape Growers of Ontario stated that the items on the self-assessment tool could not be published in this research.

3.1.3 Semi-Structured Interviews

The definition of interviewing is a face to face interaction with another person to gather information or their opinions on a subject. The type of interview conducted was semi-structured interviews, which meant that the discussion consisted of prepared questions, with flexibility for the informants to speak at a greater length (or go off on a tangent). There are four strengths to interviewing, which was to fill a gap in knowledge; to inquire into individual's modes of behaviours; to gather knowledge of a diversity of perspectives, and to treat the participants' experience as valuable (Dunn, 2016). Interviewing was a suitable method for this research because it facilitated an understanding of the motivations and behaviour which drove the

decisions to pursue organic, biodynamic, or sustainable certification. An analysis of the three different certifications showed different perspectives as to why vintners chose to adopt a specific mode of production and how they perceived their current certification and the regulatory requirements. Most research focused on why people decided to convert or to not convert to organic practices as mentioned in Chapter 2. The gap in the research revealed an opportunity to understand the transition process for those who have already transitioned and a better understanding of what potential transitional barriers existed. By focusing on vintners' experiences and opinions, an understanding of current certification, certification awareness, and policy influence capabilities developed. It is a successful way to gather information from a variety of different opinions and to counteract claims that caused the public to view something in a certain way (Dunn, 2016). The interviews facilitated a focus on the vintners' perspectives and experiences of the transition process. It also helps to counteract how farmers viewed the transition process, as well as how the public saw organic, biodynamic, and sustainable production practices.

Semi-structured interviews are interviews in which the interviewer asked questions that are relevant to their research; however, the interviewer was not following the interview script as a strict regime. Semi-structured interviews allowed for more flexibility for the participants to speak; however, the researcher's role was to ensure that the participants did not stray off-topic of the research (Dunn, 2016). Semi-structured interviews allowed the participants to speak freely and to provide valuable information related to the research. The questions within the script collaborated with one another, which meant that the participants often answered questions without verbal cues. A comfortable and trusting atmosphere for participants encouraged information sharing.

A recruitment email invited vintners to the interview. The internet provided a variety of sources that revealed which wineries were certified organic, biodynamic, and sustainable. Random sampling selected the wineries to interview and to limit bias in the research. A source that revealed that thirty-six wineries participate in the voluntary sustainable certification back in 2016, which proved to be outdated. The Ontario Craft Wineries provided an updated 2019 list, which revealed that twelve wineries participate in the certification. The revelation that twenty-four wineries opted out of the certification proved interesting. This research proposed the inclusion of the wineries who opted out of the certification. As a result, the researcher scheduled nineteen interviews. The number of certified organic, biodynamic, sustainable, and opted out of sustainable accreditation was not shared to protect participants' privacy. It was important to note that some wineries have adopted more than one certification, which yielded new data that is explained in greater detail in Chapter 4.

The researcher conducted sixty to ninety minutes interviews to gain insights into what motivated the participants to adopt a particular mode of production and their experience of the transition process to said mode of production. The interviews took place at the participants' wineries in a meeting room or office that allowed for privacy for the participants to share information. Recording and transcribing were essential aspects of this research. According to Dunn (2016), digitally recording an interview was important because it allowed the conversation to flow appropriately as notetaking tended to interrupt a participant's flow of thought. The researcher was deaf, who relies on lip-reading. To look away from a participant's lips and take notes resulted in 'interrupting the participants' flow of thought.' The researcher needed to focus on the participant to be able to read their lips. Recording the interviews allowed the researcher to focus on the participant's words. Transcribing the meetings was a time-consuming task that

involved listening to the recordings and turning them into a written script. Contracted research assistants completed the transcription of the interviews. As per strict ethical compliance, the contracted transcribers signed confidentiality and no disclosure agreements.

3.1.4 Online Questionnaire

Questionnaires were standardized questions given to a group of participants. Questionnaires were a useful tool to gather information about people, perspectives, experiences, behaviours, and social interactions. Questionnaires could be helpful in three ways. First, questionnaires helped to determine values, attitudes, beliefs, and social trends (McGuirk & O'Neill, 2016). This research centered around learning vintners' perspectives and experiences on the transition process; therefore, online questionnaires were a perfect tool in gathering the data to address the research question. Secondly, questionnaires were cost-effective tools that allowed the research to extend to a large population (McGuirk & O'Neill, 2016). For this research, the questionnaires permitted the researcher to ask additional questions following the interviews without taking up too much of the participants' time and money. Thirdly, questionnaires were a flexible tool as they combined with other forms of qualitative research methods, including interviews and focus groups, on getting more in-depth information regarding the social process (McGuirk & O'Neill, 2016). The questionnaires were follow up communication with participants emailed to them after completion of the interview transcripts. This step in the process facilitated the gathering of more information or supplemental data. The follow-up questionnaire expanded participants' responses to address the research question adequately.

Open questions helped to gather in-depth responses related to the research question. The purpose of open questions was to gain insights into the meaning behind a process or practice from the participants' standpoint. Open questions were not structured but rather allowed

participants to explain their values, attitudes, and experiences in any way they pleased. Open questions allowed participants to trail off in a tangent. Open questions yielded unique responses that enabled researchers and the wider society to understand similar or different contexts of everyday life. Open questions helped researchers determine individuals' perceptions and experiences of a certain place or event, and how the social structures are perceived, constructed, maintained, or resisted (McGuirk & O'Neill, 2016).

For this research, the questionnaire followed the structure of open questions because it allowed the researcher to gain insights into the participants' experiences and their perceptions of a social process in more significant details. The following of a strict questionnaire regime where the questions were too controlled, tended to elicit specific responses. Open questions gave the participants flexibility in the same way that semi-structured interviews did, which was to provide as much information as they believed was valuable for the research. The motivations to adopt a certain mode of production were similar or different depending on the vintner, and the transition process differs among vintners as their practices changed. Open questions help in determining how vintners perceived and constructed the regulations to which they adhered. Open questions showed the uniqueness of each participants' responses. The open questions were distributed in a myriad of ways, including by mail or through online portals (McGuirk & O'Neill, 2016). The questionnaires were sent out via email after the transcription of the interview because it allowed for further explanation or detail.

3.2 Coding

The software program that allowed data coding was NVivo. Coding is heuristic, which is a Greek term that means "to discover." There was no formula to follow when coding. The coding

technique facilitated exploration until the discovery of a solution. Coding is the first step on the path to a more meticulous process of analyzing and interpreting data. Coding links data together. Simply put, coding leads from data to an idea, by putting together the data that relates to that idea (Saldana, 2009). Coding is a tool used by qualitative researchers to help analyze their data. Researchers analyze their data by forming a code, which links a word that symbolizes its meaning in a shorter term. There are two cycles of coding: first cycle and second cycle. The first cycle of coding portions the data from single words to long sentences. The second cycle of coding portions data into similar units or the same units (Saldana, 2009). The next two sections explain the method used for the first and second cycles of coding for this research and how it aided in the analysis and interpretation of data.

3.2.1 Value Coding

Values coding referred to forming codes that reflected the participants' values, attitudes, and beliefs. Value coding brought all the values, attitudes, and beliefs together to give it a specific code. Values were the things, ideas, or persons that we prioritized as great importance. Attitudes were about how we felt about things, ideas, or persons. Our attitudes affect how we behave, hence why it was essential to evaluate attitudes. Beliefs were about values, attitudes, and knowledge that became systematic as we attached value to it (Saldana, 2009). Values coding aligned with qualitative studies that examined cultural values, intrapersonal and interpersonal experiences, and actions in case studies. It was important to note that there was an interplay between values, attitudes, and beliefs that translates into how one felt, thought, and acted. Value coding helped with research related to participants' motivations, agency, and ideology towards a certain thing (ibid, 2009).

Since this research centered around motivations and barriers in the adoption of organic, biodynamic, and sustainable practices, as well as vintners' perspectives of the certification process and regulatory requirements, it was deemed fitting to use value coding for the first cycle of coding. The vintners' beliefs and views separated into its node based on the categories of social, economic, political, and environmental factors. For instance, motivations to adopt a practice could be to preserve soil fertility, which categorized into environmental factors. Profitability, on the other hand, belonged in the category of economics. By separating the values, beliefs, and attitudes into categories, it broke down different rationales into its theme. Some sub-nodes can contain different values, attitudes, beliefs into one node. One category had several sub-themes. For instance, health reasons and community protected involved different rationales for adopting organic; however, they both belonged in the category of social factors. The coding of each question from interviews and the vintners' responses to their respective categories aligned with nodes. Motivations divided along with social, political, economic, and environmental rationales, as seen in Chapter 2.

Chapter 4: Vintners' Rationales Regarding Certifications and Regulations

Chapter 4 presents the findings from the semi-structured interviews with the Niagara region's certified organic, biodynamic, and sustainable wineries. The results also included interviews with the wineries that chose not to adopt a sustainable certification. This chapter first provides an overview of the organic, biodynamic, and sustainable practices based on what the vintners discussed. Following the overview, this chapter presents the motivations behind the wineries' decisions to transition to organic, biodynamic, or sustainable practices. This chapter then explains the wineries' experiences with the transition process and the challenges they encountered. Chapter 4 describes the nature and effectiveness of the regulations for each mode of production and then critiques the regulations from the perspectives of the vintners. Chapter 4 also reveals why some wineries opted out of sustainable certification. This chapter ends with an explanation of the limitations of the research approach.

4.1 Overview of Current Practices

A total of 19 interviews of certified organic, biodynamic, and sustainable vineyard managers, and/ or winemakers were conducted during June, July, and August 2019. Another 5 wineries have chosen to opt-out of the sustainable certification were interviewed. To protect wineries' privacy, I will not reveal how many interviews I have done for each mode of production, as the sample size for each is small enough that anonymity becomes hard to guarantee.

For each mode of production, I asked the wineries how long they followed their current mode of production. The answers varied based on how long they practiced their current production and how long they have had the certification. Nearly 84 percent of the participating organic wineries have been certified organics for more than ten years, while the remaining 16

percent have been certified organic for less than ten years. All the participating certified biodynamic wineries have been so certified for more than ten years. Thirty percent of wineries certified as sustainable have been certified for four years and another 30 percent have been certified for three years. Ten percent of sustainable wineries have been certified as sustainable for the past two years. Interestingly, one winery has used sustainable practices for twenty years, but it did not reveal when it received formal certification. Twenty percent of the wineries surveyed followed the sustainable accreditation, but they failed to divulge when they first received the certification. It is important to note here that sustainable certification originally began in 2007 as a voluntary program but sat on the shelf for ten years before the Ontario Craft Wineries brought it back in 2017 as an accredited certification. This accounts for the years certified of sustainable wineries being so much shorter than for those certified organic and biodynamic.

Organic, biodynamic, and sustainable practices have similar or different environmental impacts associated with their practices. Winery participants were asked how they understood the ecological impacts of their production and operations. For the organic wineries, the responses varied. One winery representative said that they did not have any environmental impacts; whereas, other organic producers noted that farming was not natural and that there will always be environmental impacts, regardless of whether you were organic, biodynamic, or conventional. Several of the participating wineries focused on the use of sprays. One winery said that the problem with organic sprays was that they washed off every time it rained, whereas conventional sprays adhered to crops (thus last longer). When the organic sprays washed off, they must take the tractor out again and re-spray the vines. Therefore, from a fossil fuel standpoint, organic sprays had a detrimental impact on the environment, although, from a soil standpoint, the organic

sprays were less toxic and increased soil fertility. Another winery said that the copper sprays (a metal spray commonly used for organic practices) was harmful to the environment and that the wine industry employed a lot of sprays and used a lot of fuel from the tractors; therefore, they were not environmentally friendly. On the other hand, another winery said the copper sprays were better than the regular sprays that conventional farms used.

Most sustainable winery representatives acknowledged that farming did have environmental impacts, notably as measured by fossil fuel use for tractors, water run-off, and energy consumption. The purpose of sustainable certification was to motivate vintners to decrease their environmental impacts and set goals to lessen those impacts. As one winery participant stated, “Sustainability is a mindset; it’s a set of personal goals or beliefs that you have. That you should be a better citizen, I think that is what sustainability should be about, truly.”

4.2 Motivations to Transition

The participating vintners provided a range of shared rationales for adopting more ecological modes of production connecting environmental, social, political, and economic factors.

Organic producers cited motivations to transition related to environmental, political, social, and economic reasons. However, the principal reasons for transitioning were environmental. Two wineries stated that their motives were due primarily to environmental concern and specifically the use of chemicals sprayed on the vines. The same two vintners also cited the negative impact of their operations on air quality. These organic producers did not want to contribute to what they saw as worsening local air quality, especially since these wineries in

Niagara live North of Hamilton, a city with a significant industrial based that emitted more than their fair share of greenhouse gases.

Another winery representative expressed a belief in regenerative agriculture, which the participant described as “bringing more carbon into the soil than any of the products released during the annual cycle.” This participant cited research focusing on how appropriate cover crops sequestered carbon and helped wineries to ensure that their soils were healthy. For this winery, the participant explained that they wanted their practices to be about reducing their impacts in the face of climate change.

Several organic-certified wineries merged these environmental reasons with ethical principles. One organic winery portrayed themselves as stewards of the land, hence why they adopted organic practices. More specifically, the winery participant said, “We look at ourselves as stewards of the land. It is the right decision for the environment, and the soil, and the vineyards, to leave things just as well if not better than when we took them over.” A second organic vintner stated that transitioning to an organic mode of production was due to a general desire to “farm more responsibly.” This commitment combined responsibility for the well-being of their employees, their land, and the region more generally.

Several interviewees cited social factors motivating transition to organic primarily related to health. Two wineries stated that it is not healthy for humans or the environment to handle pesticides. One of the wineries noted that the Niagara region has one of the highest cancer rates in Canada, which was due to the chemicals and air pollution from Hamilton. Another organic vintner decided to farm organically to protect the health of their neighbours and to give their neighbours the freedom to go in their backyards without fear of spray drift. As the winery representative said

[...] when you look out the window there? You'll see all the houses along the front of the property... So if you use, uh, conventional materials for spraying, sometimes you're not allowed to re-enter the vineyard for up to 3 weeks after you've sprayed that material, and which means if you look at ... all the houses? They ... wouldn't be able to go in their backyards ... for three weeks.

This winery representative further explained that if a vineyard sprayed organic products, then their neighbour could be in their backyards again after six to twelve hours post-spraying.

However, if the winery used a conventional chemical spray, neighbours could not go out in their yard safely for up to three weeks. This fact itself motivated the winery to adopt organic practices because it meant being a good citizen and respecting their neighbours.

Several organic vintners highlighted economic reasons for transitioning to organic practices although these centred on one basic goal: to make higher quality wine. Two wineries stated that they transitioned to organic production to “make great wine.” Another winery’s secondary motivation (to that of the health of neighbours) was to make “expressive wines.” This goal merges with marketing benefits as it allows them to make better wines. One winery representative stated that the Liquor Board Council of Ontario (LCBO) requires organic producers to be certified organic in order to sell their wines as organic in the LCBO stores. Market requirements, therefore, triggered the need to certify. The same winery representative stated that they would not have gone through the certification process had the LCBO not required it.

Only a small number of biodynamic producers operate in the Niagara region. Several of these have both organic and biodynamic certifications, and therefore, their reasons to adopt biodynamics were often grounded on organic principles. These representatives generally saw biodynamic as an extension of organic. One winery representative identified their decision to pursue biodynamic practices primarily because the owner thought it would be an interesting

addition to the vineyard and winemaking practice. Like organic producers, biodynamic producers' motivations to transition were twofold: to create high-quality wines and to achieve greater farm responsibly.

Sustainable producers similarly cite environmental and economic factors principally as reasons for transitioning to sustainable practices. However, several wineries also cited social and political considerations influenced their decision to practice more sustainably. Two wineries cited the desire to be "friendly" to the environment. Specifically, one winery representative elaborated on the importance of being sustainable:

[...] sustainability for me is not just the idea of being green for the sake of being green, but I see it as a way for generational progression. We can have good land and good vines, and good fruit, a good ecosystem, good plants, good vegetation, good insects, good animals, good people for generations to come. That's to me what sustainability is about; it is not just about being a buzzword of green.

Several representatives of sustainable-certified wineries stated that such certification allows vintners to "speak" to society about their sustainable operations, especially when they have already done the work to be sustainable for the sake of being sustainable. One winery representative chose sustainability because it believed that good business was a sustainable one. This winery representative explained

[...] I think it did come down to marketing, environment, sales, being sustainable. It's a neat little term that I think if you're a good business and a smart business, you're probably already sustainable. You're probably already doing most of the right things... so why wouldn't you brag about it?

For one of the sustainable producers, the process associated with sustainable certification allows a winery operation to understand how to improve their practices. This winery participant explained this idea:

[...] I mean, when they introduced the project, it was almost like a check for us to do it, to make sure we were not missing something. And maybe being when it goes through

your water resources and monitoring your water, and how much water you use, so it was just kind of a check for us to go through it, to make sure we were doing as good a job as we thought we were, and where we could improve.

Another winery representative extended this idea to the scale of the industry. This representative stated that they pursued the sustainable certification to support the industry and to show other wineries how they can improve their sustainable practices, supporting the relevancy of social motivation as a reason for transitioning. This winery representative further noted that if other wineries saw some wineries scoring 90 percent and they were scoring only 65 to 70 percent, these under-performing wineries could be motivated to adopt practices used by these high-scoring wineries in order to improve their scores. As such, the sustainability model provides for an ongoing, dynamic learning environment.

As was the case for the organic and biodynamic wineries, the principal economic reasons for adopting sustainable certification cited by sustainable-certified winery participants were marketing reasons and the desire to create higher quality wines. One winery obtained sustainable certification because it believed that such certification provided credibility in the marketplace, which helped with marketing. Another winery believed in the importance of creating a brand for Ontario's wines as sustainable, hence why they took advantage of the opportunity to build on the brand for marketing purposes. Yet another winery decided to go with sustainable certification because they have always been sustainable, and that certification helped them to be more vocal about what they do in terms of protecting the environment. This representative went on to note that this certification is important in dealings with customers as they have dealt with questions as to why they were not organic in the restaurant supply chain. Similarly, another participant pointed to the importance of this certification to the consumers. This representative stated that

consumers who buy their wines take comfort in knowing that these wines are sustainable. Thus, marketing benefits represented an essential reason to adopt sustainable certification.

4.3 Challenges Associated with the Transition

The experience of vintners in the transition process from conventional to ecological modes of production varied. For the organic producers in Niagara, there were mixed responses. One winery representative said that the transition process and the certification process did not prove to be a difficult task. However, several participating wineries noted that it was not a smooth transition process for them because the transition was equally a learning process of best practices for your crop. Several wineries noted this learning process was why they encountered issues such as crop failure.

Interestingly, the smoothness of a transition process depended on the farming practices and techniques used on the farm at the time of transitioning. For one vintner with multiple satellite vineyards, the process of converting a conventionally managed farm to organics did not prove easy due to vinicultural problems they encountered. On the other hand, two other wineries said the transition proved easy for them because they began the process when planting the grapes on fallow land. One of those wineries explained this in simple terms: “The history of the soil here that was very low impact agriculture, like it was basically fallow before the vines were planted. It was a really good site to convert to organic production, so we do not have any particular roadblocks.”

For sustainable producers, all the wineries stated that it was easy to transition to sustainable certification. Several acknowledged that they have been using sustainable practices before obtaining the certification. One winery representative explained:

I thought it was relatively easy for us to obtain it. Yes, we already had many of our sustainable practices. We already had been doing many of them that they were seeking or advising on. So, for us, the change wasn't very difficult or any different really, it was kind of what we had already been doing as our standard practice was what they were requiring or needing. So, it was a very simple conversation, and I had to do some number crunching, but that was really it.

Several wineries also said that the questionnaire and the audit process was easy. It was just a process of filling out the questionnaire. For example, the survey would ask how many litres of water you used to clean a barrel, so according to several representatives, it was just a matter of doing some number crunching to answer the question. There were only three challenges that three wineries encountered. The first was getting the questionnaire done during the busiest time of the year for wineries. The second was incorporating some of the requirements in an old winery because it was too expensive to add all the sustainable practices in at once and therefore, the winery added more sustainable practices over time, such as LED lighting. The third was that the questionnaire was ambiguous in the sense that the winery representative had to figure out what was applicable or not applicable to their vineyard although the respondents also mentioned that it was accessible at the same time.

Most organic producers interviewed said that they did not face any difficulties understanding or interpreting the regulations. Two wineries noted that there were no challenges, but that wineries needed to be motivated to learn the process and to change their mindset about organic practices. One winery participant did note that learning how to convert to organic was confusing the first time, but it became more manageable once you learned the process. Two wineries said it was not a difficult task although one of these wineries noted the challenge for small wineries who did not have a lot of "hands-on-deck," given how time-intensive the certification process was. These smaller wineries had to dedicate extra hours in the evenings to

do the paperwork, meaning that the winemaker needed to spend more time in the office than in the vineyard. For larger wineries, it was easier to have people who were assigned to do the paperwork, and therefore, they did not lose time in the vineyard. One winery representative did say the regulations could be simplified or streamlined because of the combined demands of all the regulations a winery needs to address. This winery representative noted that wineries have a lot of other regulations, which included LCBO, Alcohol and Gaming, manufacturing license, and probably more. Streamlining rules would make things easier on the administrative side by, at the very least, eliminating duplication.

In-vineyard regulations did present some challenges during transitioning, particularly regarding the details demanded of the process. According to one representative, you needed to be able to verify that you implemented all the necessary steps as set out under the specific regulations, whether you were seeking certification as sustainable, organic, or biodynamic. For example, organic producers must not merely have grass in between rows, they must also use certified organic grass seed. If a vintner wanted to mix clover, fescue, and wheat for their rows, these must be similarly certified organic. If this was not possible, they had to prove that organic seed was not available in Ontario or that they could not import such seed from elsewhere.

Transitioning to biodynamic production is more demanding, although this is due to the particularities that make up biodynamic agriculture. One biodynamic producer noted that it was difficult to transition to biodynamic as this involves extensive research to understand the approaches of biodynamic management practices and then how to apply these to your management program. This winery representative explained:

That was really difficult, and not necessarily farming reasons, because of biodynamics is philosophical, and so it's, it's like you were given seven different bibles, and then a couple of Korans and something else. They all say the same thing, which one do you

want to pick, so, and all of them are in different languages as well, so it's really, even though there were only seven lectures given by Rudolf Steiner, there are some much literature and so many different things people imagine biodynamics to be.

Most of the sustainable producers interviewed did not encounter any serious challenges in the transition process. Several producers did experience some problems, as mentioned in the preceding section. It was easier to get the certification when the wineries already were applying sustainable practices before pursuing the certification. One winery representative said that the information to be sustainable was already available for you; however, a challenge was making sure that you did the paperwork right and gave them the information they needed. Another winery representative said that an associated problem concerned how a winery could improve its practices annually, even when they were already "doing it right." This challenge was especially real for wineries with old buildings. As one winery participant said:

[...] when you work in an older building, it is hard to change how it has been ... made. The lights are my lights. Tomorrow, I can't decide 'Well, I want the certification so tomorrow I want all the lights LED.' It costs too much money. So a lot of things need a lot of time to happen. ... the way the cellar was designed, it can't always work green. So, people who are building wineries today, they should have 100 percent everywhere. They should follow all the guidelines. For an older building, it's hard to change, so we do little by little.

A final associated challenge with transitioning was how to incorporate requirements that seemed ideal but not practical. For example, the sustainability auditor told one winery that ideally, they should meter every line for when they wash a tank to know how many litres of water they are using. Despite these challenges, the winery representative stated they did not encounter any obstacles that were not worth overcoming to secure certification.

Finally, the role of inspectors in the transition process led to significant discussions and diverging opinions. Organically certified wineries provided mixed assessments of the part of inspectors. According to one winery representative, the inspectors sent letters to the producers

with minor infractions that the vintners see as threatening resulting in the inspectors gaining a bad or negative reputation. While recognizing the role of inspectors and acknowledging that the letters were part of the protocol, the winery representative felt that these letters could be more supportive and written in a non-threatening manner. One vintner described their reaction as follows:

[...] every non-compliance that we get – so let's say they say 'Hey, you're not quite doing this right.' Every single non-compliance that they get, and really what they're trying to do, is coach you into just being better, okay? But they have to put this saying at the bottom of every letter they write, which is, 'If you are unable to respond to this notice by the date, you will lose your certification.' And they say that on every letter. So it's very, it's very abrupt and it, it doesn't feel good if that makes any sense. So, from a, from someone who is trying to do the right thing, you're trying to be good, and every time you fall off the track, not even a little bit or unknowingly, you might not be perfect, they basically say 'Fix it or else.'

However, another vintner expressed a different view of the inspection process. This winery representative said that the inspectors inform you that you have an infraction through a written citation and give you a timeline as to how to correct the issue. From there, they would decide whether it was compliant or non-compliant, as well as whether you would lose your certification. Another winery representative stated that they have grown accustomed to the regulations and because of this, they have learned how to find solutions to their infractions when the inspectors did not provide answers, which they said was originally problematic.

Several interviewed representatives spoke of the positive relationship they had with inspectors. For one winery representative, the certifying bodies acted more like advisors rather than third-party auditors. The farm was the customer who was paying the auditors for their service. Two other wineries raised the issue of the potential advantages of educated inspectors. For these representatives, inspectors who knew about grape-growing could effectively advise rather than simply inspect your operations to ensure compliance. Similarly, another winery

representative noted that you would not get an infraction if you knew what you are doing. There were guidelines in place that informed you of how to be organic. Minor violations usually occurred if you forgot to document something, and the certifying bodies gave you a “slap on the wrist” and a timeline to address the issue.

All sustainable producers, except for one, felt that the inspectors were helpful and did provide advice to improve. The wineries agreed that the inspectors were there to help them and were not there simply to give out infractions. The preferred course of action was to provide solutions to the wineries. As one vintner stated about a regularly visiting inspector, “He is very helpful. His objective is to make sure that people can improve what they’re doing or can demonstrate what they’re doing meet sustainability criteria and so he’s trying to get people to do a better job so they can pass. He’s a very encouraging guy.”

Interestingly, as was true for one of the organic winery representatives, one sustainable winery representative said that inspectors were not inspectors per se, but rather they should be defined as third-party auditors because they come to your vineyard to review your operations. With that said, the winery did not encounter any problems with the “third-party auditors.” The winery representative also mentioned that it was not the inspector’s job to guide the winery on how to incorporate sustainable practices into its vineyard; it was up to the winery to go through the guidelines for the sustainable certification and learn how and where to make improvements because then the winery could incorporate the sustainable practices that would best suit their operations. As this vintner explained, “Because, don’t forget, the land that you farm, or your business and how you operate, no one should know better than the business operator and the people working there. The inspector can make a recommendation, sure, but it is up to the business really to make the best decisions for themselves.”

Although the relationship with the inspectors is generally seen as positive and constructive, one winery representative did say that they wished that inspectors would offer more solutions. At the same time, however, this representative did speculate that the problem was that sustainable certification was relatively new, and therefore, the inspectors did not have a vast portfolio of solutions to offer yet. The winery also posited that after a few years, the inspectors might begin to have more answers to the problems that the wineries face once there were more certified wineries. The auditors would learn from other wineries to understand which practices worked and which ones did not. Associated with this need to create a pool of knowledge and expertise, another winery representative mentioned that the Wine Council of Ontario did not provide seminars to help you improve your sustainable practices; therefore, they said that the inspectors were the only source of help.

4.4 Nature and Effectiveness of the Regulations

Wineries adopting different ecological modes of production have their differing perspectives on regulations as well as on the practices and regulations of opposing modes of productions. Many organic producers perceived sustainability as a broad and vague term. When asked about sustainability, the majority responded by asking, “what does sustainable mean?” One winery representative said that sustainability had a different definition for different people. Another said that sustainability had many emphases, which included being environmentally, socially, and economically sustainable.

One participating organic winery said that “sustainable” was not a regulated term. Similarly, to another vintner, sustainable was a “wishy-washy” term and that consumers did not hold sustainable in the same regard as they held organic. Yet another vintner said that sustainable

certifications were “watered down” to the point where it did not mean anything, and that any vineyard could get certified as being sustainable simply by following a set of “good practices.” Interestingly, one winery representative stated that sustainable was about being economically viable, whereas organic and biodynamic focused more on ecological farm practices and products rather than focusing on economics.

Non-biodynamic certified winery representatives were more ambivalent about biodynamic practices and certification. One organic producer perceived biodynamic practices as outdated. Another said that they would never consider biodynamic practices as these did not align with “who they were as vintners” because it was simply too spiritual. One producer was not interested in obtaining the biodynamic certification, although this representative did believe that biodynamic practices would yield a higher quality of the wine.

Most wineries that opted for sustainable certification did so because they found organic regulations and certification too strict. Various sustainable winery representatives also stated that it was difficult to be organic because of the climate. According to several wineries, to be organic was not necessarily sustainable, especially in Niagara, due to the use of copper spraying in the vineyard. One winery representative stated that copper sulfate, although an allowable organic spray, was harmful to the soil because it contributed to soil compaction and ultimately made the soil more infertile. This vintner also saw copper sulfate as being bad for the vines, as well as bad for runoffs and streams.

A second vineyard problem in Niagara was that there was a lot of disease pressure, notably downy mildew and powdery mildew, which made it difficult to farm organically. The disease pressure was due to the greater amounts of rainfall Niagara received. For example, although Niagara has the same amount of heat as Tuscany, Italy, the Niagara region receives four

to five times more rainfall than Tuscany and this combination of rain and warmer temperatures contributes to increased risk of mildew and other diseases. Furthermore, the volume of rain washed off the metal sprays results in the need to spray more often, sometimes four to eight times a season. The increased use of sprays resulted in infertile soils and higher energy costs associated with tractor use. Some wineries wanted to reduce the number of sprayings and choosing to be certified as sustainable instead of organic allowed them to use different products and to spray less. For one winery representative, they were able to spray only twice a year using other approved products. As one of these winery representatives explained:

So, we have a lot of pressure due to our sour rots, black rots are mildews, powdery and downy, and that causes huge amounts of pressure on organic practices. That is what I was saying before that organic vineyards will spray four to five times if not more of heavy metals onto the soils, and over time those soils become infertile. So, you gotta ask yourself, if you choose to go organic is it really sustainable?

Another common reason why some sustainable producers chose not to be organic was that they simply were afraid of losing their crops. One winery representative said if they had a challenging year due to the climate, then they could lose their crops – a significant economic risk. Another winery representative said that being organic was not economically sustainable if they lost 30 percent of their crops as a direct result of management practices and the organic regulation requirements.

According to several of the sustainable-certified representatives, it is more expensive to farm organically due to all the problems mentioned above. Two sustainable wineries said that organic was a well-marketed word in the sense that it promoted the disallowance of the use of chemicals. Still, they said this was not the case. Nevertheless, society believed that organic was better than sustainable because the people believed organic producers did not treat the vines

which is far from the truth since organic producers did, in reality, treat the vines and did use chemicals on the vines even if they are classified as “organic chemicals.”

A final reason raised by several sustainable-certified winery participants for not adopting organic practices was due to the land-use regulations that they said were too restrictive given the Niagara climate. As one winery representative stated, the organic regulations require a vineyard have an eight-metre buffer between their organic vines and surrounding non-organic land, which they felt was unreasonable given the loss of prime farmland resulting from such a practice.

How sustainable producers viewed the biodynamic system varies. One winery representative said that biodynamic was “almost like a religion” and although they tried biodynamic practices, they did not have “faith” in the system, and therefore, they abandoned it. Another producer said that the invention of biodynamic came in the 1920s, but there was no science behind it. As a scientist, this representative felt that it was difficult to believe how the moon influences agronomic practices, or the belief that properly timing when you cut your grass or tree or vine, the moon would ensure that there are no problems.

4.5 Attitudes towards Regulations and Certification

Not surprisingly, different wineries hold different opinions concerning regulations and certification based primarily upon their experiences with the rules and processes. As noted above, the industry is generally supportive of the regulations. However, organic, biodynamic, and sustainable producers in the Niagara region do share certain clear opinions on how the regulations and certifications of their respective mode of production could be improved upon. They also have shared ideas on how the government could better support the transition process. This section will examine both opinions concerning the regulations and certification, and then

how they see these can be improved upon in order to present participating winery attitudes towards the regulations formalize an understanding of organic, biodynamic and sustainable modes of agricultural production.

Organic producers generally viewed the regulations as cumbersome and argued that there are problems with the regulations, but at the same time, they accepted them and “worked within the system” as one winery representative said. These winery representatives raised two issues. First, there is a lot of paperwork involved, which was time-consuming, especially given that the wine industry had a lot of administrative paperwork to do already like any other food business. Second, there is a problem with product availability. Two wineries pointed out that the regulations allowed the use of copper as a spray, which was very toxic to the environment. These wineries wanted access to other products that were better for the environment.

Sustainable producers were generally more positive in how they viewed their regulations. Most sustainable producers described the sustainable certification as an adequate and flexible program that helped encourage wineries to be mindful of their practices and improve on their sustainability score. One winery representative said that sustainable regulations were not a binding regulation where you needed to be sustainable immediately, but instead helped you transition into sustainability and improve over time. Another winery representative said that sustainable certifications helped give credibility to what wineries were doing to achieve sustainability and this, in turn, created consumer trust. However, two problems were raised by several of the wineries. First was the fact that these were not legally binding. Second, the regulations were not seen as evolving. One of these wineries explained that because there were “no teeth” to sustainable regulations, and there are no punishments for not following through with the regulations, there was no reason for wineries to follow through. As for the latter

problem, three wineries said that the sustainable regulations need to be updated and fine-tuned regularly, especially with new technology and new pesticides constantly becoming available, in order to ensure that they were up to date and reflected the most current best management practices. One vintner specifically said that the province's sustainable regulations should be tweaked to reflect what works best for the Niagara region, rather than copying what works in New Zealand or Oregon, USA. The climate was different in each area.

Wineries were then asked what they would change or fix in current regulations. Responses from organic producers ranged from concerns over the appropriateness of the regulations to the agronomic conditions found in the Niagara region, to specific practices associated with the regulations. One of the organic producers specifically addressed the issue of appropriateness in citing the origin of the Canadian rules was the United States and specifically California. According to the respondent, and as already noted above, the American regulations did not reflect Niagara's climate or related disease issues, and it was a slow process to change the regulations to reflect the Niagara region. This winery representative felt that Ontario's regulations should be modelled after the European regulations because they had better standards and better products available that more closely indicated what organic represented.

Excessive bureaucratic requirements were another issue raised by organic winery participants. One organic producer stated that the paperwork involved for certification was too extensive and that it would be easier to have forms geared specifically towards winemaking. One winery representative stated that the organic regulations had requirements for you that had nothing to do with being organic. For example, the paperwork included a section on *Health and Safety*, which had nothing to do with being organic. The organic regulations also required you to fill out a sheet that a producer had laid out mouse traps at every door and checked them every

day, but this really had nothing to do with organic winemaking because mice cannot chew through tanks, barrels or bottles. This winery representative said that this requirement was really geared towards grain farms. In this representative's opinion, the organic wine producers should have the option of putting "not applicable" onto the form. Another winery representative said that the paperwork was time-consuming, which was difficult at times.

The lack of subsidies to transition was raised as a barrier to adoption by several organic participants. Other countries had programs to encourage farms to convert to organic practices. Canada did not have a program that helped to pay for certification, nor to educate farmers on the transition process, nor compensate them for any risk they encountered in the transition. Several winery representatives felt that there also needed to be a local expert in the Niagara region that producers could call for advice on organic practices and on how to transition successfully. Specifically, regarding vineyard management, two winery representatives spoke of the difficulty of getting organic products approved in Canada. Organics represent three percent of producers in Canada, a very small segment of the overall agricultural market, which is why spray companies did not have any interest in getting products approved in Canada. A winery representative explained:

[...] at the end of the day, the cost associated with getting new products listed as organic, falls on the responsibility of the producer. The companies that produce this stuff, it is kind of like you said, in that, they are saying well, there is a small market here. There is not a huge population of growers that are going to go out to buy this, to make it worthwhile for our company to spend the millions of dollars that it would take to get it certified organic.

A winery representative extended this concern, linking it to environmental principles in stating that Canada had minimal products available to use, and one of them was copper, which helped counteract powdery and downy mildew, but it was harmful to the environment.

According to this interviewee, OMRI Canada should be looking for products that are more sustainable and can counteract the disease pressure. While a conventional farm has a choice of sprays to use, an organic producer in Niagara only has three options to fight insects, molds, or the mildew. Several wineries expressed a desire for more organic products available on their shelves besides copper. As another organic representative explained:

What would be amazing if- let's pretend that a product is approved in the United States of America and approved in Europe, that it automatically gets granted into Canada, we would have way more products. But when the company who got approved in Europe, and the company that got proved in the United States, when that makes up 95 percent of their business, they're not gonna go to the effort to get Canada for 5 more percent. They just don't care. And so, when we look at the products on the organic level that what they have in the States, and what we can use in Canada, it's very, very different.

Biodynamic producers did not express anything that they would like to change about the biodynamic regulations. Quite the opposite was true. They liked how flexible the biodynamic regulations were and that they did not rely on products as much as organic producers did.

The responses from sustainable producers varied. One of the wineries believed that there should be more ongoing tracking, an online portion that wineries could access and use every two months rather than doing an audit once a year. Two wineries found that some of the questions in the questionnaire were vague. One of these wineries provided the following example:

'Do you regularly test the quality of water,' Yes. That's a great question. Do you do it? Yes we do. Kay, great, that's a sustainability thing that would lead to better water quality, you know, proper treatment in your facility. That could stay 'cause that's a to-the-point question, it's a yes or no question. But 'are you aware of changing requirements' is not... it's a very vague question. It doesn't have an end result in the winery that would lead to sustainability kinda thing.

Audit questions that involved asking you if you were aware of something did not necessarily mean that you were taking actions to prevent environmental impacts were considered vague and ineffectual. The questions needed to be more streamlined, for example, the inclusion

of a rating system. The “Yes and No” items needed to have more details in them. Several representatives stated that the questionnaire must be updated because the 2019 Winery Sustainability Survey had the same questions from the 2017 Winery Sustainability Survey.

Compounding this issue was a belief that there were also questions in the questionnaire that wineries simply cannot answer. As one representative cited, the questionnaire had a section on expanding your winery, but these questions were not relevant to an established winery. One winery representative wondered if wineries would lose marks if they cannot answer the questions in the questionnaire? Here again, the representatives pointed to the need to be able to answer “not applicable” to questions. Another winery representative spoke of the need for greater clarity was also raised in what information the Ontario Wine Council was seeking and how they interpreted the answers so that wineries could understand where they were losing marks.

To several respondents, the Ontario Wine Council needed to go even further, educating the wineries on how to do the questionnaire because every winery operated differently. Each winery was in different rural areas, so the questions should reflect the variance of each winery’s operations. For example, as one representative said, some wineries have septic systems while others are on municipal sewage so the questions needed to be fair and context-specific rather than having wineries lose marks because they did not answer a question “correctly.” One winery representative clarified this point by explaining:

Like for example ““did you contact a minister of Natural Resources for advice before maintaining on your own drain?” That’s not relevant to us because we don’t have a municipal drain so when we say not applicable that’s an example of what happens to that question?” We don’t know.

Three wineries agreed that sustainable guidelines needed to “level up” in terms of best management practices. One spoke of the need for the Wine Council to review the sustainable

guidelines regularly to evolve and adapt to new sustainable practices. This winery representative stated that the regulations needed to be more concrete rather than idealistic. The regulations and the transition process needed to be more precise. A way to do this was to give wineries five years to transition to sustainable, which means that they had five years to implement sustainable practices such as converting all light bulbs to LED. If a winery did not complete the transition in five years, they would lose their certification. Another winery representative said that the regulations needed to tighten up. The policy would pave the way forward towards a sustainable wine production in both the vineyard and the winery. A third winery representative said that the industry needed to be more involved if we were going to see significant support for sustainable wine production.

One winery representative said that the Wine Council needed to be more active in assisting wineries to seek solutions for infractions. For example, one winery had to install meters to monitor their water usage, but no one at the Wine Council provided advice or directions as to where to get the meters. There needed to be resources available to help resolve issues, rather than expecting vintners to figure it out all in isolation.

All certified sustainable wineries obtain the Green Leaf when they achieve certification. One vintner said that while the logo sent the right message, there needed to be a website that provided sufficient information to explain the meaning of sustainable certification. The wineries could use the logo on their website, and if you clicked on the logo, it should direct you to a site that explained its meaning (personal communication, 2019).

Interestingly, one winery representative said that they would not want to change anything about the sustainable guidelines or the certification process. Currently, there are fewer than 20

wineries certified, so if the regulations changed, then the numbers of wineries could potentially decrease.

When asked whether certification helped increase sales and profits, many organic producers said that being organic did not make them more profitable because it cost more to farm organically. Expenses, coupled with lower yields compared to conventional growers, was seen as a challenge by the majority of organic wineries interviewed. One organic vintner said that they spent less on herbicides compared to a traditional grower, but they paid more in terms of labour costs. Several organic wineries did include price premiums that organics earned when they sold their wines, but they did not see an increase in profits. However, one vintner stated that they received a higher price per bottle sold due to the price premiums, which was why they saw the benefits of being organic from a financial standpoint. Two other wineries replied that they gained a good reputation with consumers as organic producers and as a winery that respected the environment, which helped with marketing.

Only one interviewed vintner adopted biodynamic practices to make a higher quality of the wine, rather than for marketing purposes.

Sustainable producers cited a variety of different responses as to whether sustainable certification leads to greater profitability. Three wineries said that sustainable certification does help increase profitability because the wineries save money when they decrease their energy and water usage. As one winery representative explains:

Principally, that would be through energy efficiency and water efficiency. Those are two big consumables so anytime you reduce your demand there that saves you dollars. And if being sustainably certified encourages people to come and do business with us selling more wine improves your profitability.

While some wineries lacked the numbers to prove that being sustainable increased profitability, they believed it did in terms of being more efficient with water and energy usage. One winery

representative said that being sustainable helped them improve their yields because it helped increase the health of the vines.

Sustainability certification was seen by a majority of interviewed winery representatives as being of value in the marketing of their wines. Two wineries noted that it could help to increase profitability because consumers wanted to purchase products that they know are certified sustainable, especially in an era of climate change. Another winery representative said that being certified sustainable did not yield any benefits, such as profitability. Instead, it was an indirect economic benefit in terms of consumers willing to pay for sustainable wine; however, it did cost a lot to be sustainable because the wine industry was an already expensive business. Interestingly, one winery chose not to use the sustainable logo on their bottles because they did not believe in using it as a marketing tool. However, they discreetly tell visiting consumers about their commitment to sustainability.

Lastly, I asked the wineries if the governments provided adequate support in their transition to their chosen mode of production and how governments could do better in that regard. The organic producers all said that there was no governmental support for transitioning to organic. Three wineries noted there were agricultural programs and grants available to improve their practices in terms of purchasing new equipment, such as LED lights or new trellising, but that these grants and programs were available for all producers, whether organic or not. One winery representative stated that the government could provide support by implementing regulations and providing transition grants. For example, the government could implement regulations or restrictions on the use of neonic insecticides that were harmful to the bees. Another winery representative returned to the subject of availability of organic products noting

that the government could be supportive through regulations by bringing in more allowable products to give organic vintners more tools to combat the problems in the environment. This same winery also argued that the government should also provide transition grants that could help with the costs of transitioning to organic, especially transitioning from conventional.

One winery representative wants the government to provide a scale for how much a person could pay for certified organic fruit because they had a pay structure for grapes, but not organic grapes. As this winery representative explained:

[...] so they pay us on sugar. So, if my grapes have 20 units of sugar, I get paid two thousand dollars. If they have 30 units of sugar, I get paid twenty-five thousand dollars. Kay? So, it's a scale based on how ripe, or how sweet the grapes are. And I want them to pay me more because I do organics as well. Because it costs more. And it's the better environmental play.

This interviewee also wanted subsidies for being organic during the three-year transition period where they did not receive the price premiums until they were certified.

Several of the sustainable producers explained that the government indirectly provided support, primarily through grants. However, as was noted by several organic participants, this support is available for all producers, regardless of whether you were sustainable or not. As one winery representative explained:

For example, we've taken advantage of some of the government support programs for changing lighting, so for some of our changes, we got some rebates back. So in that sense, they've supported us; they probably weren't intending to support sustainability to that program; they were trying to support energy conservation, which is sustainable, so yes, we have. But in terms of them directly supporting the program in some fashion, I don't know of that.

Similarly, another winery representative offered this critique:

We did not get any support in this regard. The government does, however, offer up grants from time to time for producers to offset the costs of new equipment and drive innovation in the vineyard and winery. It would be nice to see them set something up to support certified wineries exclusively so that we can better improve our operations. The grants

that become available currently are open to all farmers, and often the programs are abused, and funds are not fairly distributed.

The government supports innovation and wineries was more likely to get support if they were doing something geared towards environmental protection. There were farm and industry support programs operated by the provincial government, and there were federal-provincial programs that supported agribusiness development. For example, one winery representative said that there were grants available to help fund more energy-efficient equipment, such as a better grape presser or line bottling. This representative offered this example:

For example we said we need to add production space and we need to put in more modern efficient pressing grapes equipment or more efficient bottling line something like that and one of their criteria is innovative technology (and lots of innovative technology is going to be low on energy and emphasize efficiency energy), so some of those programs will also be supported technology and those programs are bigger dollars, and usually you provide a pot full of money and the government provides a pot full of money. So say you have to provide half a million dollars and the government gives you \$150,000 of that five hundred thousand because it's going to meet these objectives of new technology that move the whole industry forward or make you particularly more competitive well they'll support sustainability too. So yes, there are programs, but it's one step away from being direct.

However, several sustainable producers stated that the government could be more supportive by providing more direct grants for sustainability. For example, the government could help with the transition by providing funding to implement sustainable practices. One winery representative said that the government could provide support by offering retrofits to make changes to the winery to make it more sustainable, like retrofits for LED lights. Another winery representative said that the government could reduce taxes for businesses if they followed a particular sustainable practice, such as meeting a certain level of water and energy consumption. The result could lead to more wineries adopting sustainable practices if it led to tax reductions.

Interestingly, one winery representative said that the government supported the creation of this program and provided incentives through the Green Leaf logo that wineries could use as a marketing tool to signal that they were certified sustainable. Another winery representative said that they thought that governments could be supportive by subsidizing the auditors because then the wineries did not have to pay for the audits.

4.6 Interviews with Growers who Opted Out of Sustainable Certification

The opportunity presented itself to interview 24 wineries which have opted out of the sustainable certification since it became an accredited certification. Exploring why they chose to opt out provides additional insight into the nature of the regulations and certification process. All 24 were originally certified as sustainable.

All the 'opted-out' vintners shared the same motivations as those wineries currently certified as sustainable as presented in the preceding sections. These motivations centred around making the right and conscious choice to help the business sustain itself. One winery believed in operating naturally and being efficient at the same time without relying on chemicals that affect the environment. A second winery representative explained that they like what sustainability entailed, especially the push towards thinking about the environment, society, and economics in an integrated way. Another winery identified a big push to be environmentally friendly, but also acknowledged that being sustainable helped you reduce costs and expenses in production and thus become more profitable.

Despite the motivations or desire, to be sustainable, these vintners cited both economic and political factors that led them to opt-out of the sustainable certification. From an economic perspective, some wanted to pursue sustainable certification but got held back by time and

money. These wineries tended to be smaller, with very small management teams, which made it extremely difficult to focus on obtaining the certification while running the vineyard and making the wines – both time-consuming tasks. Two winery representatives elaborated on how time and money interfered in the task of getting the certification. One stated:

[...] we were actually going to pursue the certification last year, but it was economically a very bad year for us, and there is a consultant fee involved right up front with the certification. Plus, whatever additional costs we are going to have to incur to get certified, so at that, we just decided to push it to the following year. So, it is still our intent to pursue it, but it was not just last year because of the money.

The second vintner explained:

But I think we check marked or covered everything that was on the list, but we just didn't have the time to finish it off, there might have been one thing on the list that needed to be completed before the audit, from what I remember it was a while ago. So yes, trying to get that back is definitely our intention to get back on that list.

From a political perspective, the wineries provided varied perspectives on how they perceived sustainable certification. The wineries believed sustainable certification proved to be a great tool as it holds wineries accountable for their actions. Meanwhile, others felt that this was diminished given that the certification itself was not sufficiently rigid in its rules and practices. This winery representative notes that a sustainable certification did not guarantee sustainability. Another winery representative stated that the standards for sustainable certification were very artificial, and it is a form of greenwashing because the association defined the bar as to whether you were sustainable or not sustainable. Similarly, yet another winery representative explained that the winery chose not to pursue certification because of the amount of work it took to get the certification and they simply did not see the benefit of doing it.

The wineries were then asked three questions: what were the primary challenges with the certification, how the certification might be improved, and under what conditions would they

consider getting the certification again? As per the interviews, the wineries stated that the certification could be improved by reducing the workload to obtain the certification. Another area of improvement would be for the government to provide subsidies to be sustainable, since implementing sustainable practices is expensive. Another mechanism of governmental support is providing funds that matched what the wineries were putting in, which would help get more wineries involved in the certification.

The wineries stated that there needed to be an expert involved in the certification that could guide wineries through the process. The social challenges with the certification were that there need to be workshops available that wineries could attend where they could share their knowledge on what worked for their vineyard in their climate. As the winery participant said:

We need more of those workshops. We need to bring a little bit more interest about them, um, and maybe do them in- out on the already certified vineyards out on the wineries that are already participating, to share what they've done and, uh, what can be done better, uh, because it's- everything can be improved in this world. Everything. So even though somebody's already done it, I'm sure they can point out new things that may have arisen as they were going through the process, or maybe something that is applicable to the site-specific, um, place. I mean for us, would be again the proximity of the escarpment, um, to our property, and also limitation of the possibility of expansion.

Additionally, another winery representative said that there needs to be more of a template or a workbook from the industry to help wineries understand the path towards sustainability as opposed to paying an auditor to come in and start the process with you, especially for small and medium-sized wineries. Another area of improvement would be making the sustainable certification more centralized rather than having small businesses working with the auditors. Interestingly, one winery representative stated that there were no primary challenges with the certification because all the information was available to you in a package.

The economic problems associated with the certification were that there were no benefits for receiving the certification other than the feeling that you were doing a good job. As one winery participant explained:

[...] so what is the reward, what is the benefit for getting the certification? So how does it help us as a business, other than having a feeling of yes, we are being socially responsible, what does it do to help our business. And maybe you kind of seeing that, or having some support in that area where if you do this certification maybe we are going to help you by reducing taxes, or were going to help you by blah, blah, blah, right.

Despite the challenges with sustainable certification, the wineries still used sustainable practices in their vineyard. Responses from the wineries range from being conscious of their operations to being sustainable from the beginning of the winery and moving forward into the future. Other responses included adopting integrated pest management to be aware of how much you spray onto your vines. Another winery noted that they were sustainable as per the standards. They specifically said:

[...] yes definitely, yes from the list I believe we are pretty much on par with the requirements to be a sustainable winery, and I think just getting the audit would get us that one step closer. So, just, we always try to do that, do as much as we can to be sustainable, because I think it is the right idea for the environment for the business, to continue on.

4.7 Conclusion

Chapter 4 focused on explaining the results gathered from the interviews and online questionnaires. This chapter explained the overview of each mode of production. The overview explained how long each producer committed to their certain mode of production and the environmental impacts associated with their practices. This chapter also explained the rationales behind vintners' decision to adopt a certain mode of production. The results revealed that organic and sustainable producers' motivations center around environmental and social concerns, as well

as economic gains. This chapter also explained the challenges that vintners encountered in the transition to a certain mode of production and how they perceived the nature and effectiveness of the regulations involved. Organic, biodynamic, and sustainable producers stressed that all challenges encountered in the transition process were worth overcoming. Sustainable producers generally had a more positive view of their regulations compared to organics in terms of how they like the flexibility of the regulations that allow them to improve their practices over time. In contrast, organic producers perceived their regulations as cumbersome.

Chapter 4 also provided a critique of the regulations as per the vintners' responses. The results revealed that organic and sustainable producers want the regulations to improve; whereas, biodynamic producers like their regulations. Finally, Chapter 4 included the results of the wineries' that opted out of the sustainable certification by explaining why they did so. The results revealed that time and money is a major barrier to sticking with the certification and provided recommendations to improve the certification. Chapter 5 will analyze the results, bringing them into conversation with the theoretical frameworks and relevant literature. The next chapter will further our understanding of vintners' rationale for adopting specific forms of certification, and the nature of the regulations that facilitated the adoption of each mode of production.

Chapter 5: Discussion

Chapter 5 provides a discussion of the results with the help of theoretical frameworks and the literature to understand the reality of the transition process and the regulatory requirements surrounding it. This chapter first explains vintners' motivations to adopt a specific mode of production and its relation to political ecology's sub-field: cultural ecology. This chapter investigates how the chain of explanation relates to the Niagara region with supporting evidence from other scholars. This chapter explains the links to the strings of explanation regarding the sustainability and complexity of the regulations. This chapter focuses on regulation theory – regulations and complexity – to examine the relationship between vintners and the certifying organizations concerning how the regulatory requirements affected vintners' practices with supporting evidence from other scholars. This chapter summarizes how the certification process and regulatory requirements improved with examples from other countries. Lastly, this chapter highlights areas of future research.

5.1 Factors Influencing Adoption of Ecological Modes of Productions

Participating Niagara vintners in this study share many of the motivations for transitioning to more ecological modes of production as raised in the literature. These motivations, presented in the literature in Chapter 2, proved multi-faceted but can be categorized into four broad themes: financial gains, environmental concerns, health and safety interests, and philosophy (Cranfeld, Hensen, & Holliday, 2010). Scholars also noted that the relative importance of these themes when making production decisions varies between vintners. As Wijaya, Nurhadi, Utama, and Rahmawaty (2018) write, motivations for adopting more ecological modes of production include philosophy, environmental concerns, marketing opportunities, as well as demographics reasons

including experience, education, and farm size, and it is these demographic variables that often accounted for the variations in the reasons list by participating vintners, most notably, the size of their operations. Vintners' decision to choose between organic, biodynamic, and sustainable modes of production also varies according to their socio-economic perspectives and priorities, often taking on a more business-oriented viewpoint. These decisions combine environmental, social, and economic motivations using different weightings.

For many of the participating vintners, the reasons for transitioning can be characterized as primarily on-farm in nature. This study found that participating vintners share a common concern for the environment, suggesting a shared philosophical belief. All interviewees shared a commitment to adopting farming practices that did not adversely impact air quality or result in soil degradation. All also felt it essential to reduce farm impacts contributing to climate change. Organic producers in the Niagara region often combined a philosophical belief that they should be stewards of the land with care for the environment, particularly with regards to spraying chemicals on the vines. Both motivations affirm the findings of Siepmann and Nicholas (2018), Devitt (2006), and Koesling (2008). The biodynamic-certified producers shared the same concerns as the certified organic vintners, although their philosophical foundation extended to the spiritual. For participating sustainable producers, environmental motivations center also on, perhaps, a simpler desire to be “environmentally friendly” and see being sustainable as an essential component of a good business model.

Farm responsibility for several participating vintners extended beyond the farm gate. Several scholars similarly noted that responsibility beyond the farmgate links to a broader cultural framing focused on a concern for the health and wellbeing of neighbours and consumers. McCarthy and Schurmann (2018), Cranfeld et al. (2010), and Fairweather (1999), for example,

found that organic producers cited the health of others when choosing sprays that minimized harm ultimately, to protect the farm, the air, and the people. Siepmann and Nicholas (2018) found similar concerns and a desire to preserve both the health of the people and the land among German winegrowers. Many of the Niagara vintners in this study acknowledged concern for the health of others and of the environment raising the importance of social responsibility in their decisions to transition. Several spoke of corporate social responsibility (CSR). These findings support the work of Devitt (2006), Koesling (2008), and Siepmann and Nicholas (2018) as well as that of Dodds et al. (2013) and Mariani and Vastola (2015) who found that motivations center around the preservation of the environment and CSR.

Various scholars identified CSR as a desirable business model that enables businesses to focus on sustainability, social justice, and economic viability (Mariani & Vastola, 2015; Dodds et al., 2013; Leite et al., 2014). Under CSR, companies are held accountable for their business practices that impact society and the environment. As a self-regulated tool, companies focus on transparency, finance, and decision making. CSR integrates principles of being environmentally friendly, economically viable, and respectful of social justice. Several of the certified sustainable wineries, as well as producers who opted out of the sustainable certification in the Niagara region, shared the principles expressed in CSR.

Economics cannot be ignored in such decisions although the importance of reduced costs seems to play less of a role in the production decisions of the participating Niagara vintners than in the literature. Although Leite et al. (2014) found that farmers adopted sustainable practices to reduce their costs, in this study, participating vintners often noted that organic, biodynamic, and sustainable practices were not necessarily more economical, but they still opted to transition.

Furthermore, several noted that yields were often reduced but, again, this did not deter them from transitioning.

Economics reasons also merged significantly with marketing strategies. Scholars, including Siepmann and Nicholas (2018), Kallas et al. (2012), Tress (2001), and Koesling (2008), found that organic producers believe that organic practices resulted in a higher quality of food and wine. Koesling (2008) and Devitt (2006) found that organic producers' motivations include the possibility of organic premiums and enhanced profitability. Sustainable producers believe that sustainable certification helps improve their sustainable practices by encouraging them to be constantly looking for better ways of caring for their vines and producing their wines. Sustainable producers in this study did cite the marketing benefits of sustainable certification as a factor for adopting sustainable certification, and some producers believe that sustainability leads to a higher quality of the wine, which is contrary to the literature which did not show how certification and the belief that sustainability led to a higher quality of the wine was a motivating factor. Although Dodds et al. (2012) note that the wineries in New Zealand were motivated to pursue the certification as per the government request and support, the wineries in Niagara did not receive a government mandate to be sustainable.

As mentioned in Chapter 2, cultural ecology aimed to understand how the material reality influenced culture, which meant understanding how cultural beliefs and practices shaped the environment and humans' perceptions of it (Peets & Watts, 2004). The objective of cultural ecology was to determine and explain how cultural similarities expanded in similar environments, as well as to explain how cultural, social, and political factors shaped economic conditions (Paulson et al., 2005). In this study, vintners' perceptions of their vineyard practices developed by the material reality that influenced their cultural beliefs. Cultural practices changed

the vintners' perceptions of the environment. There was a pattern among vintners' motivation to adopt each mode of production, especially concerning being environmentally friendly, making a higher quality of the wine, and protecting both people and nature in the Niagara region. As for the case of the Niagara region, the motivations were similar to Cranfeld et al. (2009) notion of the four broad themes. All the producers in Niagara's motives were cultural, which included health and environmental concerns, marketing advantages, and ideology. However, there was a plural approach to viticulture because each mode of production shared the same goal of preserving the environment. They differed in terms of regulatory requirements and practices, which led to chains of explanation that will be explored more fully in sections 5.2 and 5.3 of this chapter.

5.2 Perceived Benefits of Certification

Certification plays a central role in formalizing “organic” into “Organic,” or from translating a narrative or an ideal form of agricultural production into a definable category of food product. As such, certification is a crucial component of the organic/biodynamic/sustainable food sector – not only in terms of defining products, but also in terms of influencing or directing real-world approaches to production and processing.

The purpose of the chains of explanation is to determine the “a mode of explanation that evaluated the influence of variables acting at several scales, each nested within another, with local decisions influenced by regional policies, which were in turn directed by global politics and economics” (Sayre, 2015, pp. 504). Organic, biodynamic, and sustainable all seek to preserve the environment, but they are defined differently in regulations, which leads to a chain of explanation in how different individuals' construct the environment. Robbins (2012) identified

the role of land managers as the first link, the relationship between land managers and society that affected the management of land as the second, and the state's management of the property as the third. This section highlights the application of the chain of explanation to the Niagara region wine industry.

For the case of the Niagara region, the winery owners/operators represent the land managers. They decide how they manage their land, whether organically, biodynamically, or sustainably. As seen in the previous section on cultural ecology, values and beliefs shape the decisions to adopt organic, biodynamic, and sustainable practices through the preservation of the environment, health, and the method of winemaking. However, as cited in Robbins (2012), Blaikie and Brookfield assert that political and economic factors influenced production practices. This factor constituted a nested link.

The second link concerns the relationship between land managers and society in terms of how they manage their land. As mentioned in Chapter 2, governments and certification organizations enforced the compliance of the organic, biodynamic, and sustainable practices to obtain the certification. For organic methods, the Canadian Food and Inspection Agency (CFIA) regulates and enforces the Canadian Organic Standards (Organic Council of Ontario, 2016). For biodynamic practices, Demeter Canada is the certification organization that governs the practice of biodynamics. For sustainable practices, the Ontario Craft's Wineries is the certifying agency. Each of the certification organizations is involved in the management of the vineyards' practices, which means that the vintners' production practices must shift to meet the regulatory requirements. This means that land managers' decisions are not entirely of their choosing, but rather, economic, social, and political factors shape how land managers manage their land. The second link indicates that vintners have the choice to be organic, biodynamic, or sustainable;

however, the regulatory requirements from certifying agencies define how the vintners must manage their land. This link is evident in organic certification in several important ways including the inclusion of an 8-meter buffer zone to separate organic and non-organic land as well as crop rotation, weed management, and other measures. Sustainable regulations proved more flexible while ensuring that wineries incorporated the practices, such as metered lines.

LCBO requires organic producers to be certified organic to sell their products in their stores. Many scholars (cf, Barry et al., 2012; Bush et al., 2013; Weitzman & Bailey, 2018) have stressed the importance of certification due to its benefits in ensuring compliance, trust, legitimacy, and sustainability. The certification helped assure consumers that the products they purchased were indeed sustainably produced. Lohr (1998) noted that organic certification provided consumer confidence that the products they acquired were organic.

This research suggests that organic and biodynamic producers pursue certification primarily as part of their strategy to increase the quality of their wines, and not necessarily for promotional or marketing reasons. However, sustainable producers use sustainable certification for promotional marketing purposes because it helps give them credibility and assure consumers that they are sustainable. Sustainable producers focused on how consumers perceive their practice whereas organic and biodynamic producers concentrated on how their practices shape the environment and the quality of the wine. Collectively, however, the winery representatives interviewed focused more on improving their winery's vineyard and on-estate production practices than on marketing strategies. Many scholars (Sogari, Mora, & Menozzi, 2016) have stressed that certification had direct benefits, including financial gains, as consumers were willing to pay a premium for certified products. However, organic producers in the Niagara region stated that they did not receive the price premiums for being organic although they also

noted that their reputation as organic helped with marketing. Biodynamic producers used biodynamic practices to create a higher quality of wine and not for marketing benefits.

During the interviews, sustainable producers noted that sustainable certification potentially increased profitability due to a higher willingness to pay (WTP) for sustainable wine. Exactly how much remained unclear. Castellini et al. (2017) found that consumers struggled to understand different marketing schemes and the different meanings behind various “sustainable” practices. Castellini et al. (2017) state that consumers were willing to pay a higher price for sustainable wines. Nevertheless, the scholars noted that the communication of the benefits of sustainable wine and the practices behind the cultivation of grapes to consumers required improvement. There was also confusion among consumers on the definition of organic without consistency on a global scale. There was no central agreement on what sustainable meant in the wine industry, and often, organic and biodynamic practices were seen as interchangeable with sustainable practices. There was also confusion as to what the difference was between organically grown grapes and organic wine². Finally, there was a lack of knowledge on the part of consumers when considering biodynamic wine. Overall, scholars found that there was a lack of knowledge about the difference between organic, biodynamic, and sustainable practices, which decreased their signalling power (Castellini et al., 2017). The vintners interviewed in the Niagara region acknowledged that different certification schemes (organic, biodynamic, and sustainable) have potentially created some confusion amongst consumers, and, given that, they

² Organically grown grapes means that a winery did not use any chemicals in the vineyards; however, the winery did add additives, such as sulfites in the wine during the winemaking process. Organic wine means that the wine is organic from the vineyard to the winery and does not contain any sulphites or other non-organic elements. It is important to note that organic wines do contain sulfites because sulphites happen naturally during fermentation; however, there is no added sulfites (Revel Wine, 2019).

wanted better public information efforts that explained what these modes of production and certification meant.

Several vintners interviewed felt that, moving forward, the wine industry and certification agencies should do promotional campaigns to spread awareness on environmental issues and why it was beneficial to purchase eco-friendly products, specifically for wine (see also Sogari et al., 2016; Tselempis et al., 2015). The wineries who opted out of the sustainable certification also specifically noted that there needed to be more information available to teach producers not only how to be sustainable but also the benefits of the certification. The results of this research suggest that producers' motivations were to manage their land responsibly and ethically, but only some producers took advantage of the marketing opportunities associated with these actions.

Several vintners interviewed highlighted problems with the regulatory requirements, which raises the question as to whether the statutory requirements hindered the adoption of ecologically friendly management practices. Society did not pressure the vintners to be environmentally friendly; the vintners pressured themselves to be, which suggests that the motivations associated with transitioning were more personal than social. The vintners chose to practice a particular mode of production with little influence or pressure originating from the community to do so. The vintners decided as individual producers how they wished to manage their vineyards, which ultimately shifted their production practices and the regulations they needed to abide by. The research results suggest that the vintners were not directly pressured to adopt a more ecological form of viticulture practices by the consumer.

This raises the third link in the chain of explanation, concerning the government's involvement in the management of the land. Is the state involved in the management of organic, biodynamic, and sustainable practices, or is there a lack of state involvement? The participating

winery representatives noted that neither the Canadian nor Ontario governments provide financial support for wineries to transition to a more ecological form of agriculture as other countries, such as New Zealand and Iran, have. In 1995, the Iranian government initiated an *Optimal Utilization of Fertilizers and Pesticides* plan, which was a ten-year plan to reduce the use of chemicals in agricultural products. However, the government did not reach its goal and was still in the process of promoting organic agricultural practices (Soltani et al., 2013). In New Zealand's case, sustainability was tied to export requirements. Specifically, the country made it mandatory for its vineyards to be certified sustainable to export their products on a national scale (including, specifically, to Europe, since the European Union trade agreement demands that all trades must adhere to sustainability) (Dodds et al., 2013). The scholars stressed the importance of governmental support in providing marketing and research, as well as changing consumers' perceptions in encouraging the adoption of organic practices (Soltani et al., 2013) or even sustainable practices.

The interviewed wineries for each mode of production all stated that the government did not support them in the transition process, although they did acknowledge that funding was available indirectly through various support and grant programs. However, these programs apply to all farm operations, whether organic, biodynamic, sustainable, or conventional. There was a perceived lack of state involvement in the management of ecologically-sound grape-growing practices in the Niagara region shared by most interviewed representatives.

5.3 Plural Approach to the Construction of Grape Growing Practices

The results of this research suggest that producers of each mode of production perceive opposing methods of production differently. Political ecology recognizes that there are multiple

perspectives concerning environmental relations that exist in any society simultaneously that are open to different interpretations. Interviewed organic and biodynamic producers viewed sustainability as a broad term that meant different things to different people and that it was “wishy-washy.” However, sustainable producers perceived sustainable certification as an adequate program that helped them become more mindful of their practices although several acknowledged that it needed to “level up” in terms of best management practices. The sustainable producers knew that their practices did retain classic environmental impacts, such as fossil fuel usage. However, they said that the point of sustainable certification was to decrease those impacts. Some of the sustainable producers’ motivations to adopt sustainability was to improve their sustainable practices.

Meanwhile, sustainable producers chose not to be organic and/or biodynamic for several reasons. These producers felt that it was difficult to be organic or biodynamic in the Niagara climate due to the usage of copper spray, the constant disease pressure they faced, and the risk of lower crop yields. The organic producers acknowledged the organic regulations as inadequate; they were aware that their use of the copper spray was harmful to the environment. Interestingly, some of the organic producers were motivated to adopt organic to refrain from using chemicals and to be more environmentally friendly. The organic wineries differed in how they viewed environmental impacts in terms of whether organic was sustainable or not. There was a lack of ecological data that proved which mode of production was the most environmentally friendly practice for the Niagara climate.

Complicating the issue was the question, what did sustainability exactly mean? There are multiple forms of sustainable agriculture, including conservation agriculture, integrated pest management, no-till agriculture, low-input agriculture, organic agriculture, biodynamic

agriculture, and so on. Robinson (2009) stated that there was no agreement as to which alternative was more sustainable because there was a myriad of ways to define sustainability, such as definitions from the World Commission on Environment and Development (WECD) or the Food and Agriculture Organization of the United Nations (FAO). An ambiguous definition of sustainability was problematic because it led to multiple discourses (Halberg, 2012) that resulted in exploitation of the concept where farmers and markets used it for their advantages (Velten, Leventon, Jager, & Newig, 2015). It also resulted in competing definitions to play against one another (Velten et al., 2015). This situation was prevalent in the case of the Niagara region because the definition of what constituted an environmentally friendly management practice for Niagara vineyards were all playing against each other.

All the organic/biodynamic and sustainable producers said they were environmentally friendly, and yet they challenged each other's practices in terms of just how 'environmentally friendly' these practices were. Rigby and Caceres (2000) assert that the lack of a concrete definition and set of indicators of what constitutes sustainable agriculture makes it challenging to evaluate sustainable practices. They also note that sustainability differs temporally and spatially in geographical regions, which means that factors such as location, weather, and fertility of soil differ across regions. This situation is prevalent in organic practices in the Niagara region. Organic certification allows the use of copper spray, which compacts the soil, and the application of nicotinoids, which kills target and non-target insects. However, these sprays are 'approved substances' since they are natural chemicals. This dichotomy compromises the values of organic agriculture, which questions whether organic was in danger of becoming conventionalized. The regulations of organic agriculture compromise the narrative of organic agriculture.

Arkenbout (2016) compares the corporate value chain to the alternative value-chain to assess whether organic regulations and practices follow the four principles of health, ecology, fairness, and care as defined by the International Federation of Organic Agriculture Movement (IFOAM). The author shows that the corporate value chain did not comply with each of the principles, while the alternative value chain did a better job of alignment. Farmers perceived regulations as ensuring greater fairness in certification and profitability while augmenting consumer trust (Arkenbout, 2016). Still, the regulations did not address the “monopolization of organic agriculture” which Arcuri (2015) stated meant that the state had complete control of the definition and practice of organic agriculture. Organic practices in Niagara are regulated by recognized certifying bodies and the provincial and federal governments. These regulations define approved practices, and these do approve the use of products that harm the soil and insects through the allowance of the use of copper and nicotinoid.

The vintners believe in organic practices but feel as if the regulatory requirements stray away from the values of organic practices; hence, why the vintners want regulatory improvements. There needs to be more research on whether the organic regulations represent the values of organic agriculture in Canada since the findings prove that organic is not necessarily sustainable in Niagara, which portrays a unique image of what organic means in Canada. The demand for organic products is growing, especially as the market share for organic agriculture becomes more than simply a niche market (Arkenbout, 2016). As it does gain a greater share of the market, organic agriculture runs the risk of becoming conventionalized as noted already. Arcuri (2015) asserts that this is, in part, the result of the organic regulations shifting from what he termed privatization to publicization. This can be better understood as representing a shift from perceiving and defining organic from the private realm of personal beliefs to the public

realm of formal regulations which has resulted in a dilution of the meaning of organic agriculture. Since the term organic became ambiguous, it led to the publicization of organic agriculture; thus, representing a barrier to the adoption of organic practices.

5.4 Regulations and Complexity

The certification process, was not seen as particularly challenging or difficult by most participants. Most of the interviewed vintners said that it was relatively easy to get the certification. The greatest challenges involved paperwork.

The role of the inspectors proved to be a little more controversial. For many vintners, the inspectors acted more like third-party auditors, which the vintners viewed as being a positive. However, they also felt these inspectors could be better educated in grape growing to provide solutions to identified infractions. The exception was biodynamic transition because biodynamic practices involved researching which of the practices worked for your vineyard, which made it difficult to pursue the certification, but clearer in its expectations. Seppanen & Helenius (2004) found that the problem with advice was that it often appeared as separate from compliance. For system redesign, the problem was that the public rules left little room to develop different technical solutions for different farm climates and environments (Seppanen & Helenius, 2004).

The authors noted:

The findings show that system redesign is less present in compliance than items in inspection documents suggest. The advice in organic inspections is possible and sometimes indispensable. Our analysis supports the idea that advice, in which problems and their causes are jointly discussed in inspections is needed both for promoting system redesign and for enhancing anticipatory and developmental functions of organic inspections (Seppanen & Helenius, 2004, p. 11).

Participants stated a desire for the certifying bodies to better define the role of the inspectors or auditors and to expand their responsibilities to include the provision of advice and system redesign for vintners. The results suggest that the transition process was not challenging, and the regulations did not hinder adoption rates. Nevertheless, the problems for the wineries were how the programs and rules were set up, which led to the theory of regulations and complexity.

Regulations and complexity theory involve understanding the interaction between the regulated industry and the regulators in the meaning and effects of the regulations, as well as how to adapt to the regulations (Asquer, 2018). The wine industry is an important industry in the Niagara region – with a total of 101 wineries (VQA Ontario, 2019). Each winery’s motivation to transition to a particular mode of production differs, primarily concerning environmental, social, political, and economic factors. Each winery views the regulatory requirements and certification process differently, as shown in Chapter 4. They also see each mode of production differently, which reveals the complex regulatory environment within which they operate.

Three factors contribute to this complexity. First, the design of the regulations was from the context of past rules or institutions. The organic standards mirror the rules from the United States, and specifically California. The climate in California is very different from Niagara and it takes a long time for the organic regulations to adjust to the Niagara environment. Here, an important factor in this translation of regulations is that the organic realm is very political. There were various farmers and vintners – each with a different view of what organic represented. As one winery representative stated, there were straightforward farmers who will do what they are told and others who were dogmatic that will not do something that contravenes their values. Therefore, there was no cohesion on what the organic regulations should look like for Canada. Since the organic rules mirrored California, it was also easier to get California-approved sprays

into the Niagara region. However, the problem was that the sprays available in California were not what the vintners in Niagara needed.

Second, regulations that target one industry did not necessarily work for other industries. This factor is evident for organic and sustainable regulations. The organic regulations, as set by Ontario, are broad in the sense that these apply to all farming practices. There were some specific regulatory requirements to which wineries must adhere, but which were not relevant to their operations. For instance, organic producers are required to set mouse traps at every door and check them regularly. While mice may pose a serious pest for grain farms, they do not for a winery.

One producer expressed concern about the generic *Health and Safety* form, arguing it had nothing to do with organic winemaking. The organic regulations should separate requirements by crop type, which would save time and money for the non-targeted farms and vineyards. The organic regulations require wineries to submit their paperwork, ensuring that they complied with the regulations. Ideally, the paperwork should be customized for vineyards as this would help eradicate the complexity of the regulations and reduce management demands. This requirement was raised specifically by participating in small- and medium-scale wine producers that did not have a lot of “hands-on deck” to work on the paperwork while maintaining the vineyard. Paperwork targeted to the vineyards as a sector might encourage more wineries to adopt organic practices (Siepmann and Nicholas, 2018).

Third, regulations did not include penalties for non-compliance. Several wineries said that the sustainable regulations were not legally binding, and there was no punishment for non-compliance. For example, several questions in the sustainable questionnaire proved vague, simply asking if the vintner was aware of an environmental impact without any reference to the

corresponding corrective being required. Wineries could circumvent or bypass some regulations by being aware of an impact without addressing it, and still receive an acceptable score to obtain the certification. The regulations would ultimately require standardization to be credible or binding; hence, several wineries stated that the sustainable regulations needed to tighten up and to become more difficult for the wineries to achieve a future of sustainable winemaking. For instance, one winery representative suggested that the certification process be made more strenuous by giving wineries approximately five years to execute all sustainable practices to obtain sustainable certification. The lack of enforcement for sustainable certification led to the perception that the regulations were ‘watered down.’

The organic and biodynamic regulations *are* legally binding, and the certifying organizations *do* enforce the compliance of the regulations. Regarding organic practices, the definition of organic, as mentioned in Chapter 2, was a system that promoted and sustained the health of the soil, ecosystem, and people without the use of chemicals. However, there was a significant concern that organic certification permitted the use of copper spray that harmed the soil of organic viticulture in Niagara. Another concerning example involved the use of nicotinoid, an insecticide derived from tobacco; however, it was considered a natural chemical. Similarly, copper, a heavy metal, was also considered a natural chemical. Sprays, such as copper and nicotinoid, were both harmful to the soil and insects, which contradicted what organic represented as a system that aimed to preserve soil fertility, plants, and animals. Halberg (2012) and Seufert et al. (2016) noted that organic regulations prohibited the use of chemical inputs and advocated for clear standards on environmentally friendly management practices. The regulations should focus on the principles of organic agriculture set out by IFOAM and set results-based indicators that assess farms’ performance against sustainable criteria. The metrics

would quantify organic practices' contributions to environmental impacts, such as nutrient leaching. For Niagara's wineries, there needed to be a focus on environmentally friendly management practices and an emphasis on finding sprays that minimized environmental impacts. The current organic regulations must represent the values of organic agriculture, rather than focusing on the prohibition of the use of chemicals. The *General Principles and Management Standards* and the *Prohibited Substances List* from the Government of Canada mainly outlined requirements that focused on the prohibition of the use of chemicals; therefore, there needed to be a focus on providing guidelines on environmentally-friendly management practices.

The purpose of the regulations and complexity theory was to understand the relationship between the regulated industry and the regulators to make sense of the regulations. Understanding how the regulated industries perceived the regulations enabled us to understand the reality of how the system worked. The end goal was to create cohesion between the regulated industries and the regulators to design better policies that benefited both parties (Asquer, 2018). Chapter 6 highlighted recommendations as to how the organic, biodynamic, and sustainable regulations and certification process could improve from the perspectives of the wineries to facilitate certifications that helped wineries to improve on environmentally friendly management practices, meanwhile assisting wineries to work with the system without challenges.

Chapter 6: Conclusion

Chapter 6 provides concluding remarks and policy recommendations. It begins by reiterating the research question and sub-questions. It then summarizes key points from each chapter and provides a list of recommendations to improve the certification systems for organic, biodynamic, and sustainable modes of production with further analysis from the literature in Chapter 2. Finally, Chapter 6 identifies future lines of research inquiry and summarizes the significance of this research.

6.1 Research Questions

This research uncovered various motivations and barriers in the adoption of ecologically-sound agricultural practices - varying from conventional, organic, biodynamic, and sustainable. It attempted to fill in a gap in the existing literature regarding the challenges that farmers encounter, and the role regulations play in the transition process. This research sought to determine the difficulties that wineries faced in the transitioning to organic, biodynamic, and sustainable practices in the Niagara region. Therefore, this research aimed to understand the reasons and motivations for vintners to adopt organic, biodynamic, and sustainable practices. This research also aims to understand the barriers and challenges in the transition process for each mode of production. Finally, this research aims to understand the roles regulations play in influencing vintners' decisions. Further, this research aimed to address several sub-questions: What motivated vintners to adopt organic, biodynamic, or sustainable modes of productions? How did vintners interpret their regulations? How did the rules affect their production activities with a focus on the transition process?

6.2 Key Points

The aim of this research is to determine wine producers' motivations to adopt organic, biodynamic, and sustainable practices in the Niagara region. As mentioned in Chapter 2, the motivations are due to environmental, social, economic, and political reasons. Many scholars (Siepmann & Nicholas, 2018; Soltani et al., 2013; Wheeler, 2007; Devitt, 2006) cited preserving the environment, improving human/environmental health, farm location, personal ideology, higher quality of wine/food, validation through certification, increasing profitability, CSR, costs reductions, and governmental support as motivations to adopt ecologically-sound management practices. Organic and biodynamic producers in the Niagara region motivations centre around environmental and social reasons, such as being stewards of the environment and protecting human health. For these producers, economic factors include creating a higher quality of the wine. For sustainable producers, their motivations are to be environmentally friendly and CSR. Although, the marketing benefits of sustainable certification do prove to be desirable; hence, encouraging adoption. The findings prove that motivations are indeed multi-faceted as Cranfeld et al. (2010) notes and are often based on values and beliefs.

There is a paradox to sustainability in the Niagara region. The findings reveal that producers view opposing practices in a negative light. Most organic producers perceive their own practices as environmentally friendly. Sustainable producers challenge this notion by stating that organic cannot be sustainable in Niagara due to its climate and the use of copper spray. Another factor is that organic agriculture does not contain guidelines on reducing your carbon footprint. Sustainable producers view their own practices as environmentally friendly because the producers are working on reducing their carbon footprints, such as reducing their energy and water usage. However, organic producers state that the sustainable certification is wishy-washy.

These findings reveal a plural approach to political ecology where there is a lack of environmental data that proves which practice is the most environmentally friendly for wine operations in the Niagara region. Hence, why there needs to be more research that focuses on proving which practice works best in the Niagara region to eliminate the tensions.

This research also reveals that there is tension between the discursive understanding of organic, biodynamic, and sustainable modes of production and the formalization of these ideas in regulations. Most organic producers state that they believe in the values of organic agriculture; hence why they adopted it. However, the vintners also note that they do not want to use copper spray, an allowable spray, that is detrimental to the soil. It is important to note that the organic producers respect the organic regulations; however, they want the regulations to improve by having sprays available that do not destruct the environment, but instead respects the values of organic agriculture, which includes preserving soil fertility. This reveals that there is tension between what organic means and how it is formalized in regulations. Sustainable producers like what sustainability entails and how the certification is formed. However, most sustainable producers want the regulations to improve by making it more concrete, adapting to changing technologies, and other reasons. The sustainable regulations are more aligned with what sustainability entails; however, the regulations need to evolve. The organic regulations, on the other hand, stray away from the values of organic agriculture by condoning the use of copper spray and nicotinoid. The organic regulations need to provide guidelines on environmentally friendly management practices.

6.3 Moving Forward

Many scholars proved that there were barriers that hindered farmers from transitioning to ecologically-sound management practices, including organic, biodynamic, and sustainable, but these are not insurmountable. This research aimed to determine the challenges that wineries faced in the transition process and how the relevant regulations contributed to making the process difficult. It revealed that there were challenges in the transition process; however, the winery representatives said that they overcame those challenges. Some of the challenges aligned with the barriers the farmers faced across geographical regions and commodities. How could we improve the organic, biodynamic, and sustainable certifications and regulations in the Niagara region? Table 8, below, describes specific recommendations that organic, sustainable, and opted out of sustainable certification producers would like to see with their certification.

The producers who had opted out of the sustainable certification stated that time and money was a major contributor as to why they opted out. Scholars (Soltani et al., 2013; Mariani and Vastola, 2015; Seufert et al., 2016) supported the notion that converting to organic or sustainable was expensive due to higher production costs. Therefore, this section helped focus on how certifying agencies could alleviate those challenges to help wineries successfully adapt to a more ecological form of viticulture practice. Biodynamic producers did not offer any areas of improvement for the biodynamic certification since the regulatory requirements were more flexible than the organic regulations.

| | Organic | Biodynamic | Sustainable | Opted Out |
|--------------------------|----------------|-------------------|--------------------|------------------|
| Local Regulations | ✓ | | ✓ | |
| Easier Paperwork Process | ✓ | | ✓ | |
| Transition Programs | ✓ | | | ✓ |
| Direct Grants | | | ✓ | ✓ |
| OMRI Canada | ✓ | | | |
| Education | ✓ | | ✓ | ✓ |
| Stronger Regulations | ✓ | | ✓ | |

Table 8. Recommendations from organic, biodynamic, and sustainable producers in the Niagara region on how to improve the certification program and transition process that could potentially encourage more wineries to partake in a more ecological form of viticulture.

As mentioned in Chapter 5, both the organic and sustainable regulations mirrored other countries' programs; therefore, organic and sustainable producers wanted the regulations to more closely reflect conditions in the Niagara region. Regarding the organic regulations, it should be modelled on the European regulations because Europe had better standards for organics, as well as better spray products available. The sustainable regulations were modelled off Oregon and California, USA, as well as New Zealand; therefore, the Ontario Craft Wineries needed to tweak the regulations to best adapt to Niagara's climate. Low Input Viticulture Enology (LIVE) was a program in Oregon, USA. LIVE brought the wineries together to create a sustainable program that included spray products that were salmon safe, which meant it would not leach into the waterways and harm the salmon. The wineries in the Niagara region could work together to create a Niagara based program, like LIVE in Oregon.

For organic and sustainable certification, the paperwork proved intensive. Each certification required wineries to explain their entire operation in terms of what they were doing or not doing. For organic producers, the paperwork was so broad and involved that it was time-consuming.

Siepmann and Nicholas (2018) supported the notion that the paperwork involved was a barrier to the adoption of organic practices; however, a few vintners of organic wine in the Niagara region stated that the paperwork was time-consuming, yet they had pursued the certification anyway. The vintners recommended ways to reduce the bureaucratic paperwork. They recommended designing paperwork geared specifically for certain crop production, and in this case, paperwork targeted towards viticulture. This design would help wineries focus on incorporating organic practices that fit within their operations rather than using their costs and labour to add practices deemed unnecessary (i.e, mouse traps). Wineries had a lot of administrative paperwork, including forms related to: Alcohol and Gaming, manufacturing license, federal excise, and certification. Vintners further recommended combining some of the paperwork and eliminating unnecessary paperwork (i.e, Health and Safety). Ultimately, vintners wanted to spend more time in their vineyards, rather than in the office going through a large pile of paperwork. Small- and medium-scale producers who performed most of the viticulture duties themselves would benefit most.

Some of the producers noted that the challenges with sustainable certification were the completion of the questionnaire and the identification of which practice applied to their vineyard. They recommended making the questions in the questionnaire more specific and streamlined, rather than vague. This clarity would ensure that vintners understood the questions and could take measurable actions to address the impacts. They also recommended that the Ontario Craft Wineries be clearer and more explicit in what they expect from wineries. Vintners felt they had lost marks unfairly when their process could not incorporate certain unnecessary requirements (i.e, Expanding Your Winery Section). The vagueness of the questions led to the vintners to

bypass the regulations, rather than addressing their impacts. The regulations need to be tweaked for relevance to benefit both the wineries and the Ontario Craft Winery.

Several countries had transition grant programs that helped farmers transition successfully. For example, the United States has *USDA Certified Transitional Program*. The USDA believes that supporting farmers in the transitioning process and supply chain recognition are both keys to encouraging farmers to transition to organic. Therefore, the Organic Trade Association employed a Task Force to develop a USDA Transitional Grant program. The program included: farm loans, conservation incentives, risk management products, supply chain management, and a transitional market (OTA, 2016). Currently, Canada does not have transition programs to help pay for certification, nor does it educate farmers on how to transition, or compensate them for any risks or losses. Many scholars (Wheeler, 2007; Soltani et al., 2013) stated that a lack of governmental support was a barrier to the adoption of organic, biodynamic, and sustainable practices. However, they defined the lack of governmental support in different ways. Therefore, organic producers provided recommendations; however, it should expand measurably to include sustainable producers as well. Organic producers said that the government could provide subsidies for the organic transition to ensure that farmers would not lose money during the transition period of three years. For sustainable producers, the government could provide transition funds and retrofits to help wineries implement sustainable practices. Some producers who opted out of the sustainable certification said that transition grants could provide funds to match what the wineries invested in their farms to become sustainable. Another recommendation was providing subsidies to become sustainable.

One of the sustainable producers recommended having direct grants available for sustainable farms. Currently, the government provides grants for all farms, whether the farm was

organic, biodynamic, sustainable, or conventional. But grants, such as transition grants, retrofits, or even tax reductions could be targeted towards sustainable farms. It would be beneficial for wineries to have their taxes reduced if they followed sustainable practices. For example, tax reductions could occur for wineries who met a certain level of energy or water consumption. A tax reduction would help save on costs for wineries since the wine industry was an expensive manufacturing business.

Specifically, for organic certification, one of the recommendations was to have OMRI Canada work on getting more spray products approved and available for Canada's organic producers. Currently, Canada has limited sprays available, which include copper sprays. Scholars such as Wheeler (2007) and Siepmann and Nicholas (2018), support the notion that there were on-farm issues related to pest and disease management as well as the use of copper spray as a barrier to the conversion to organic. Vintners of organic wines revealed that some sprays, such as copper and nicotinoid, were harmful to the environment. Subsequently, the sustainable winery representatives noted that they did not want to be organic because it was not sustainable, especially due to the use of certain sprays, such as copper. Therefore, OMRI Canada must provide organic products that are both sustainable and effective in combatting the disease pressures faced in the Niagara region. Europe and the United States has a bigger market for organics; therefore, they have more approved organic products to use. Hence, it would be valuable for wineries in Niagara to have access to the same products approved in Europe and the United States (perhaps they could even be automatically approved in Canada). It would be beneficial for the vintners to have more products available in Canada that could help them to counteract the disease pressure in their specific climate, instead of resorting to using products that prove harmful to the environment (i.e, copper spray).

For both organic and sustainable certification, education was needed. Many scholars (Soltani et al., 2013; Siepmann and Nicholas, 2018; McCarthy and Schurmann, 2018; Dodds et al., 2013; Mariani & Vastola, 2015; Pechrova, 2014) all identified lack of knowledge (including lack of available information) as a barrier to the adoption of organic, biodynamic, and sustainable practices. Notably, scholars viewed a lack of knowledge differently; however, they all shared a common agreement that it was a barrier. Niagara's winery representatives noted that education was important to encourage more wineries to transition because they had to figure out what to do without outside help, which sometimes proved difficult. For organic producers, there needed to be more education on how to be an organic producer and how to transition successfully. Even the sustainable producer noted that education was needed to help them understand how to complete the questionnaire. Sustainable wineries were in different rural areas and operated differently; therefore, education would enable them to understand how to implement the sustainable practices that were most effective for their vineyard.

This need for education also extended to organic practices as there needed to be a local expert in the Niagara region for the organic producers to call upon for guidance on organic transition. Most of the producers that opted out of the sustainable certification noted that having an expert to guide you through the certification would help to make it easier for them to obtain the certification. They also noted that having workshops available for wineries to share their knowledge would help vintners learn the ropes and understand which sustainable practices work best in their climate. They also requested a workbook from the Ontario Craft Wineries on how to get started on implementing sustainable practices. Having education can potentially encourage more wineries to adopt ecologically sound management practices because it would offer support in the transition process so that vintner would not need to figure it out on their own. Vintners of

organic, biodynamic, and sustainable certified wine all said that the transition process itself was easy. Still, a few encountered challenges that they had to figure out how to address on their own - without outside help. Having education programs would help vintners feel more secure in the ability to transition successfully.

Both organic and sustainable producers want regulations to improve. Regarding the organic certification, one of the recommendations was that the government could enact stricter regulations by bringing in more products to combat the disease pressure and enact regulations that ban the use of certain products, such as neonic insecticides. The government must also provide a pay scale for organic grapes, as explained in Chapter 4. Concerning sustainable certification, the Ontario Government must make it mandatory for wineries to be sustainable. For example, New Zealand made it mandatory for its wineries to be certified sustainable to export their wines to other countries, particularly to Europe (Dodds et al., 2013). The regulations must evolve in terms of incorporating new sustainable management practices regularly, and the transition process must be made more difficult by giving wineries five years to transition.

Regarding sustainable certification, there must be someone to run the sustainable program, which would help to ensure that the regulations evolve to include new sustainable practices and enforce punishment for those who failed to implement sustainable practices. By 'levelling up' the regulations, this would ensure that both the organic and sustainable certification could improve, which would benefit wineries, governments, and society. The recommendations were not about changing regulations per se, but instead, it was about improving the regulations to benefit wineries and their operations.

The recommendations made above were based on vintners' perspectives on how the certification and regulatory requirements could be improved. This raises the question: who

should be the primary architects of regulations? Governments and non-governmental actors formalize organic, biodynamic, and sustainable narratives and practices into regulations. However, as evident from this study, the existing formal regulations sometimes do not benefit or target ecological winemaking and yet these vintners have to abide by these regulations.

Who, then, should have power over the regulations? Under regulatory capitalism, the vintners could have power in creating standards that are geared towards ecologically-sound winemaking. This power could be given to them in terms of drafting recommendations on standards that, for example, include a cap on energy and water usage, based on available sustainable technologies. However, at the same time, there needs to be a power balance. This means a balance between industry and governmental power. Industries can create standards that benefit them, but government needs to get involved for the sake of the wider society. For example, the sustainable certification is so broad that wineries can be aware of an environmental impact without addressing it and still receive an acceptable score to obtain the certification.

It is a delicate balancing act. Government must ensure that standards are not watered down to the point of being simply symbolic. Vintners must have input to ensure standards are relevant to their operations. The mandatory mousetrap in the organic regulation, which does not benefit wineries, illustrates why vintner input is critical. Therefore, wineries should have the choice to not implement a regulatory requirement that is not geared towards their operations. There needs to be a balance in power in regulatory design.

The adoption of ecologically-sound management practices for viticulture in the Niagara region was ultimately low. To pave the way for a future where wineries want to be environmentally friendly and pursue certification, the challenges associated with the regulations and certification require action. This research did not include wineries who were against the

certification; therefore, it was difficult to say whether these recommendations would lead to an increase in the adoption rate.

6.4 Future Research

Focusing on how vintners perceive regulatory requirements and certification processes enables us to understand the challenges in the certification process that could potentially hinder other winegrowers from adopting a more ecological form of viticulture. It also helps us to better understand existing challenges to aid policymakers in developing stronger regulations and facilitating a smoother certification process that could encourage more wineries to engage in environmentally friendly management practices. However, there still needs to be more research on the wine industry in Niagara to move forward positively. There needs to be research that looks into the environmental benefits and impacts of organic, biodynamic and sustainable practices in the Niagara region to understand which mode of production would be the most ecologically-sound practice, especially within the Niagara climate and the soil. And there needs to be a focus on what sprays were considered sustainable for the soil and climate in the Niagara region, which meant understanding whether organic or conventional sprays were better, as well as how much spray application affects soil fertility.

There also needs to be research that focuses on why wineries in the Niagara region chose not to pursue organic, biodynamic, and sustainable certification. This current research focused solely on the challenges certified wineries dealt with in the transition process. Therefore, it would be beneficial to understand why wineries did not opt to certify, and what could be done to improve the adoption rate. This line of inquiry would glean insights into a different perspective on certification - from those who were not certified.

Researchers could also focus on what the local definition of sustainability is in the Niagara region. Zucca et al. (2009) assert that for a sustainable program in California, it must have a local definition of sustainability and must meet local needs. Local associations and officials should collaborate on the design of a sustainable program that benefits the locals. The local area also needs to develop marketing platforms that can help consumers identify sustainable practices and distinguish between different farming practices. This requirement also applies to the Niagara region for each mode of production because it would help develop a certification that benefits governments, consumers, and wineries.

Lastly, there needs to be research to investigate the benefits of certification, including financial gains and governmental support. The benefits of certification play a vital role in influencing farmers and vintners to adopt certification. Therefore, a lack of knowledge asymmetry of the benefits could hinder adoption rates as well. Future research further needs to focus on improving environmental practices in viticulture in Niagara, developing and facilitating a smoother transition process that benefits all stakeholders, and creating a knowledge platform that highlights the benefits of certification.

6.5 Significance of the Research

Investigating the challenges that wineries faced in the transition to organic, biodynamic, and sustainable agricultural practices could help to facilitate an easier transition process to encourage more wineries to partake in ecologically-sound management practices. The transition process proved lengthy, time-consuming, and expensive; hence farmers did not want to transition. What if the certification process and the regulatory requirements were pared down, helpful, and more seamlessly interconnected, to help farmers and vintners? It was important to focus on vintners as

stakeholders, rather than solely focusing on governmental organizations, because they were the ones with the knowledge and experience in vineyard operations. Hence, they understood whether the regulatory requirements would be beneficial for their vineyard.

This research studied three modes of production to understand the difference between each practice, and to uncover the vintners' rationales in their decision to adopt a certain practice over another. It opened avenues into understanding the environmental benefits and impacts, as well as the certification benefits and risks or downsides that influenced their decision-making processes. The researcher will share the research findings with the certifying bodies with the hope that these agencies might re-design the certification process and regulations to benefit both the wineries and the wider society. All free trade agreements demand that companies must be sustainable to sell their products in Europe (MacMillan, 2020). Wineries in the Niagara region must be certified in an ecologically-sound management practice not only to compete internationally but also to reduce their environmental impacts in the face of climate change. Therefore, Canada must encourage and to support their vintners to adopt ecologically-sound management practices.

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APPENDIX A. Interview Questions – Organic, Biodynamic, and Sustainable

- What form of agricultural production do you follow?
- How long have you followed this mode of production?
- What motivated you to adopt (organic/ biodynamic/ sustainable) agricultural practices?
- What factors led to this decision? (Factors might include ideology, sustainability, certification, profits, etc.)
- How do regulations/ certification motivate you to transition to (organic/ biodynamic/ sustainable)?
- What do you think of the regulations? Do you feel as if the regulations represent your values as a vintner?
- Do you think the regulations benefit you and your vineyard? If yes, how so? If no, how so? Who do you think they benefit?
- Do you feel that the regulations respect the principles of your agricultural production? If they don't which aspect is out of synch?
- What would you change or fix about your current agricultural regulation?
- Did the transition to (organic/ biodynamic/ sustainable) go as you envisioned?
- What were the challenges associated with the transition?
- Did regulations pose a challenge in the transition? If yes or no, how so?
- Do the regulations represent how you want to produce wine?
- What material practices make your vineyard "sustainable"?
- How do you understand the environmental impacts of your operation?
- How do the regulations mitigate the environmental impacts? How do the regulations provide guidelines for environmentally-sound management practices?
- Have the regulations helped you become more economically viable?
- How has the government or industry supported you in the transition? How could they do even better in this regard?
- If you had to do it all over again, would you still do the transition process?

APPENDIX B. Interview Questions – Opted Out of Sustainable Certification

- What motivated you to get the sustainable certification in the first place? Why not organic or biodynamic?
- Why did you opt out?
- What did you think of the sustainable certification?
- Do you still use sustainable practices on your vineyard?
- What were the primary challenges with certification?
- How might the certification be improved - or under what conditions would they consider certification again.

APPENDIX C. Letter of Invitation

Letter of Invitation – Subject headline for email: Invitation to Participate in a Research on the Transition to Organic, Biodynamic and Sustainable



Department of Geography and
Environmental Studies
B349 Loeb Building
1125 Colonel By Drive
Ottawa, ON, K1S 5B6

March 17, 2019

Dear Sir or Madam,

Research Title: *Challenges in Transitioning to Organic, Biodynamic, and Sustainable Agricultural Production Systems: The Case of Niagara Vineyards*

My name is Tess MacMillan. I am a Master's student in the Department of Geography and Environmental Studies at Carleton University. I am conducting research on the challenges facing wineries in transitioning from conventional production systems to more ecological production systems. My goal is to interview representatives of estate wineries in the Niagara Region that have successfully been certified organic, biodynamic and/or sustainable in order to learn, from them directly, the challenges they faced in achieving certification in one or more of these categories. This study also aims to gain insights into what motivates vintners to transition to such ecological production practices.

I am excited about undertaking this research. Having earned my undergraduate degree in political science, I am interested in environmental policy and the dynamics of government versus industry regulations. Now, as a Masters student in geography, I seek to learn more about viticulture and wine making, and the bonds between terroir and vintners. The benefits of the study are to reveal the challenges in the transition process and the reasons why vintners are transitioning and to provide meaningful insights to both vintners and policymakers. In addition to sharing my results with industry organizations, I will provide a copy of my research findings to all participants as well.

As an estate winery recognized as certified organic/biodynamic/sustainable on the Wine Country Ontario web site or Ontario Craft Wineries web site, I am writing to you today to seek your involvement in this study. If you agree to participate, I would visit your estate at an agreed day and time to conduct an on-site interview with yourself and others you feel can provide insights into the process and challenges associated with the certification process. This interview can also take place off your estate at some other mutually convenient, safe location, if you wish. I estimate this interview will last between 60 to 90 minutes in duration.

Please be assured that the confidentiality of all information shared during our discussion will be respected and will not be shared with anyone outside of the research team. Given that I am deaf, I will have a research assistant with me during the interview to take notes for me. I assure you that the research assistant will sign a confidentiality agreement. With your consent,

interviews will also be audio-recorded. I will also have a transcriber to transcribe the interviews for me. As with the case of my research assistant, the transcriber will be signing a confidentiality agreement as well. Once the recording has been transcribed, the audio-recording will be destroyed. All transcripts and other information would then be held in a secure cabinet and destroyed upon completion of the thesis.

The study may involve a follow-up questionnaire distributed using e-mail after the interviews are done to help provide you with the opportunity to elaborate on any responses you have made as well as for posing any questions of clarification that may arise following your interview.

This project was reviewed and cleared by the Carleton University Research Ethics Board A as of May 2, 2019. My clearance number is 110765. If you have any ethical concerns with the study, please contact Dr. Bernadette Campbell, Chair, Carleton University Research Ethics Board (by phone at 613-520-2600 ext. 2517 for CUREB or by email at ethics@carleton.ca). Please find attached a copy of the approval letter from the university's Ethics Committee. It outlines my commitment to your confidentiality and rights.

If you request more information on my research, I will be happy to fill you in or you can contact either of my co-supervisors, Professor Patricia Ballamingie (e-mail: patricia.ballamingie@carleton.ca) and Professor John Milton (e-mail: john.milton@carleton.ca), both of the Department of Geography and Environmental Studies.

Sincerely,

(Insert signature)

Tess MacMillan

APPENDIX D. Research Consent Form

Name and Contact Information of Researchers:

Name: Tess MacMillan

Telephone: 613-316-6103 (Text Only)

Email: tessmacmillan@cmail.carleton.ca

Supervisor and Contact Information:

Name: Patricia Ballamingie John Milton

Telephone: 613-520-2600 ext. 8566613-520-2600 ext. 6209

Email: patriciaballamingie@carleton.ca johnmilton@carleton.ca

Carleton University, Department of Geography and Environmental Studies

Project Title

Transitioning to Organic, Biodynamic, and Sustainable Agricultural Productions: The Case of Ontario Vineyards

Project Sponsor and Funder (if any)

Carleton University

Carleton University Project Clearance

Clearance #: 110765 Date of Clearance: May 2, 2019

Invitation

You are invited to take part in a research project because your estate winery has been certified as organic, biodynamic and/or sustainable. You make an ideal participant because you have already experienced the transition from conventional to more ecological models of production and can provide valuable insights on the challenges in the transition process. The information in this form is intended to describe more fully what I am asking of you so that you can decide whether you agree to participate in this study. Your participation in this study is, of course, completely voluntary. As you read this form, and decide whether to participate, please ask all the questions you might have, take whatever time you need and consult with others as you wish.

What is the purpose of the study?

The aim of this study is to better understand the challenges in the transition process from conventional production models to more ecological models. This research seeks to examine three issues: the challenges of such a transition, the reasons why estate wineries have transitioned, and the regulatory issues associate with transitioning.

What will I be asked to do?

If you agree to take part in the study, we will ask you to:

- First, take part in a one face-to-face interview that will last approximately sixty to ninety minutes. The nature of the requested information will consist of a semi-structured interview that will allow for you to speak at a great length of your experiences. The interviews could take place at your winery or a mutually, safe location if you wish. The interviews will be audio recorded.
- Second, take part in a possible follow-up questionnaire seeking clarification and elaboration of comments made during the initial interview.

Risks and Inconveniences

We do not anticipate any risks to participating in this study.

Possible Benefits

You may not receive any direct benefit from your participation in this study. However, your participation may allow researchers, industries and policymakers better understand the challenges in the transition process and the reasons why vintners are transitioning. This will provide meaningful insights to both vintner and policymakers of the findings.

Compensation/Incentives

You will not be paid or compensated for your participation in this study. However, you will be sent an electronic copy of my thesis or Executive Summary of my research findings if you wish to receive them.

No waiver of your rights

By signing this form, you are not waiving any rights or releasing the researchers from any liability.

Withdrawing from the study

If you withdraw your consent during the study up to analysis of the results, all information collected from you will be discarded, unless you request that it still be used in the study. As analysis is expected to commence in January 2020, January 1, 2020 is the designated cut-off date for withdrawal.

Confidentiality

I will treat all of your provided information as confidential. No information that discloses your identity will be intentionally released, shared or published. In addition, I shall be taking the following actions to protect your anonymity.

First, you will be assigned a code [or pseudonym] so that your identity will not be directly associated with the data you have provided.

Second, all data will be stored and protected by the Department of Geography and Environmental Studies at Carleton University in a secured room and on an encrypted and password-protected USB. Access will be limited to myself.

Third, because I am deaf, I will be using a field research assistant and a transcriber. Both these individuals will sign confidentiality agreements and will be bounded by these agreements.

Fourth, the results of this study may be published or presented at an academic conference or meeting, but the data will be presented so that it will not be possible to identify any participants.

Data Retention

Your de-identified data will be securely destroyed upon completion of this thesis. The audio-recordings of your interview will be destroyed upon completion of transcribing.

New information during the study

In the event that any changes could affect your decision to continue participating in this study, you will be promptly informed.

Ethics review

This project was reviewed and cleared by the Carleton University Research Ethics Board A. If you have any ethical concerns with the study, please contact Dr. Bernadette Campbell, Chair, Carleton University Research Ethics Board (by phone at 613-520-2600 ext. 2517 for CUREB or by email at ethics@carleton.ca).

Statement of consent – print and sign name

I voluntarily agree to participate in this study. Yes No
I agree to be (audio/video recorded/photographed ...) Yes No
I agree to be contacted for follow up research Yes No

Signature of participant

Date

Research team member who interacted with the subject

I have explained the study to the participant and answered any and all of their questions. The participant appeared to understand and agree. I provided a copy of the consent form to the participant for their reference.

Signature of researcher

Date

APPENDIX E. Confidentiality Agreement



Confidentiality Agreement

Name:

Contact (email and phone number):

I have been hired as a Research Assistant / Transcriber (circle one) to take part in a study conducted by Tess MacMillan of the Department of Geography & Environmental Studies, Carleton University. In this role, I will have access to confidential data relating to a research study. Confidential information refers to all information obtained about the participants in the research study that is personal in nature.

I hereby agree to:

1. Keep all the data shared with me confidential by not divulging information or making it accessible in any form or format with anyone other than the members of the research team. I will exercise caution in ensuring that information is not inadvertently disclosed.
2. Keep all information in any form secure while it is in my possession.
3. Return all information in any form to the Principle Investigator upon the completion of my involvement in the research study.
4. Erase or destroy all research information in any form or format regarding the research study that is not returnable to the Principle Investigator (e.g. information stored on my computer hard drive or in emails) after consulting with the research team.
5. I will not speak of the data in any form to anyone outside of the research team.

Confidentiality Agreement

Research/Transcriber Personnel Name

Principal Investigator Name

Research/Transcriber Personnel Signature

Principal Investigator Signature

Date

Date