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The Viability of Traditional Portuguese Olive Groves in the Alentejo Region under a Sustainable Development Framework

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Abstract

Portugal became self-sufficient in olive oil production in 2014 and produces 150% of its needs, which makes Portugal the world's fourth-largest exporter (DeAndreis, 2022). Olive groves in Portugal were once estimated to be 70-80% low-input traditional type, but rapid intensification toward a predominantly intensive mode of agriculture has been extremely fast (Beaufoy, 2001, p. 22; Silveira et al., 2018, p. 248). The Alentejo region, despite its dry Mediterranean climate and a tradition of extensive, multi-functional agricultural systems, is now home to 85% of Portugal's olive groves and responsible for 77% of the country's olive oil production (Dawson, 2019; Silveira et al., 2018, p. 248). The traditional farm structure in olive oil production, with a majority of smaller size, unirrigated farms, and a few properties with more than 100 hectares, is therefore shrinking due to rapid change in the industry (Silveira et al., 2018, p. 259). The research objectives of this study are to present insights about the economic viability of traditional Portuguese olive groves utilizing a framework for sustainable development that includes economic, environmental, and social aspects. This research is based on a case study analysis of two semi-structured interviews with traditional olive grove farmers in Alentejo, supplemented with data from relevant literature about the environmental impacts of different types of olive groves in the region, as well as their varying production yields and costs. The main findings of the study were 1) the importance of certified organic production methods for traditional farmers that allow for valuable product differentiation and access to higher-paying consumers, and 2) the degree to which traditional olive producers were open to planting Portuguese varieties with less aggressive intensive methods (but nonetheless more intensive than the traditional olive grove), with the tradeoff of producing a higher quantity of olive oil and a fighting chance to preserve the national history and tradition that accompanies the unique tastes and aromas of native varieties.

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1. Introduction

Olive farming has been a relevant part of Portuguese agricultural tradition and culture for centuries, with the first olive trees in the country estimated to have been planted more than 3,000 years ago (Moreira et al., 2019, p. 873). The Alentejo region of the country, a dry Mediterranean climate with a tradition of extensive, multifunctional agricultural systems, is undergoing a process of rapid agricultural intensification (Silveira et al., 2018, p. 248). Alentejo is now home to 85% of Portugal's olive groves and responsible for 77% of the country's olive oil production (Dawson, 2019). From 2017-19, Portugal was ranked the seventh largest producer of olive oil in the world, and the fourth-largest olive oil producer in Europe, behind Spain, Italy, and Greece (*Economic Affairs*; Sales et al., 2020, p. 3). Portugal became self-sufficient in olive oil production in 2014 and produces 150% of its needs, which makes Portugal the world's fourth-largest exporter (DeAndreis, 2022).

In the last three years, olive oil production in Portugal has generated a turnover that is 2.5 times higher (620€ million) than what was recorded between 2010 and 2012 (Sales et al., 2020, p. 3). The modernization of Portuguese olive groves, where the main national variety "Galega vulgar" is replaced with high-yielding, and low-vigor Spanish varieties, has the potential to make Portugal the third-largest producer of olive oil in the next 10 years (Sales et al., 2020, p. 1-3). This transition has been fuelled by local, national, European, and global factors and processes, including long-standing public investment in the Alqueva irrigation system, national and EU agricultural policies, and recent strategies of financial investment in agriculture-related assets since the 2008 financial crisis (Silveira et al., 2018, p. 248). Several factors explain the attractiveness of the Alentejo region for Spanish olive oil producers – good soil and water available at a lower price than in Spain, and subsidies to modernize and intensify agriculture in the region (Pires, 2012, p. 278). As a result, Portuguese traditional olive groves, the least viable in economic terms, have been traded in for production means utilizing large-scale Spanish intensive plantations to maximize yields. These vast groves use irrigation, high tree densities, agrochemicals, and mechanization, which causes landscape simplification, habitat loss, and degradation that contributes to the decline in biodiversity (Moreira et al., 2019, p. 873). This shift from traditional to intensive and super-intensive forms of production raises concerns among some Portuguese farmers, due to increasing land prices, and also environmentalists, who argue that the high quantities of water, pesticides, and herbicides used in intensive forms of production, have consequences for the environment (Pires, 2012, p. 278). Juan Vilar Strategic Consulting's data show that 64 percent of the Alentejo region is covered in intensive groves, half of which are high-density, while the other half are super-high-density (DeAndreis, 2022).

The knowledge gap that this research attempts to fill is how traditional Portuguese olive groves in Alentejo can be economically viable in this rapid transition of agricultural intensification to non-native and highly productive varieties. The research objectives are to present insights about the economic viability of these olive groves utilizing a framework for sustainable development that includes economic, environmental, and social aspects. As such, the

research ultimately aims to identify the growth areas of traditional olive farming under this sustainable development framework, and to propose how these farmers and their olive oil can become more economically relevant to also maximize their positive environmental and social footprints. The research is based on a case study analysis of two semi-structured traditional olive grove farmers in Alentejo, supplemented with data from relevant literature about the environmental impacts of different types of olive groves in the region, as well as their varying production yields and costs.

First, this paper covers a foundational background of the framework for sustainable development referenced in the study, an overview of the characteristics for traditional, intensive, and super-intensive olive groves in Alentejo, their varying degrees of environmental impact, typically planted varieties, and an approximation of production yields and costs. Then, this paper discusses the research methods used and limitations and ethics of the study. Subsequently, this paper shares analysis and excerpts of raw data from traditional Alentejo olive farmers connected with the literature to explain their standards for production, brand identity, business strategy, and economic challenges. Finally, this paper concludes with a summary of research and offers future research recommendations.

2. Background Information

2.1 Framework for Sustainable Development

The three-pillar conception of sustainability—social, economic, and environmental—has become ubiquitous in contemporary sustainability literature (Purvis et al., 2018, pp. 681-82). The United Nations identifies economic, social, and environmental aspects of sustainable development as key elements in its overarching framework (*Resolution Adopted*, 2005, p. 2). The concept of sustainable development was defined by Jeffrey Sachs, in alignment with the United Nations’s Sustainable Development Goals (SDGs), as “socially inclusive and environmentally sustainable economic growth” (Snauwaert, 2017). The SDGs were ratified in 2015, and they measure sustainable development within countries via different aspects, including economic, social, and environmental development along with institutional aspects (Neve & Sachs, 2020, p. 114). The present research contributes to SDG2 to “End hunger, achieve food security and improve nutrition[,] and [to] promote sustainable agriculture” (*Food Security*). SDG2 recognizes the interlinkages of supporting sustainable agriculture and tackling climate change in its 2.4 target and indicator 2.4.1. The 2.4 target states:

“By 2030, ensure sustainable food production systems and implement resilient agricultural practices that increase productivity and production, that help maintain ecosystems, that strengthen capacity for adaptation to climate change, extreme weather, drought flooding and other disasters that progressively improve land and soil quality”
(*Global Indicator*, 2022, p. 2).

The United Nations measures this target via the proportion of agricultural areas utilizing productive and sustainable agriculture. Additionally, the 2030 Agenda for Sustainable Development includes the 2.3 target addressing the positive social impact of small farmers, specifically those of whom are indigenous people and/or operate family farms. The 2.3 target aims to double the agricultural productivity and incomes of small-scale food producers—particularly indigenous peoples and family farmers—by ensuring access to financial services, markets, and opportunities for value addition (*Global Indicator, 2022, p. 2*).

Extensive farmers of long-lived, traditional, Portuguese olive tree varieties (e.g. Galega, Cordovil) commercially target the local and national market and benefit from labeling as a product of protected origin (with the Portuguese acronym DOP – *Denominação de Origem Protegida*). However, national and regional statistics of 2015 reveal that since 1999, an increasing number of small farmers in the olive production sector have declared bankruptcy. More traditional farmers linked to extensive agriculture are showing very limited capacity to adapt to new physical infrastructures and market demands (Silveira et al., 2018, p. 265). In an effort to stay competitive in the market, approximately 20 extensive olive oil producers from Alentejo are joining a new sustainable olive farming development project, the Alentejo Olive Oil Sustainability Program (PSAA). PSAA aims to shrink the industry’s environmental footprint in Alentejo, while strengthening the region’s cultural heritage, and traditional producers’ economic relevance and vitality. The main challenge in the sector for traditional farmers is to win over more consumers and more markets that value their environmentally sustainable and culturally authentic practices. PSAA intends to address this by creating a production sustainability benchmark, in its environmental, social, and economic dimensions, for Alentejo olive oil—which can be used as criteria to earn a nationally and internationally recognizable and authoritative certification, or quality label, that proves the sustainable approach of the certified companies. Local producers claim it is very important that Alentejo olive oil can communicate its existing sustainable development practices across all three dimensions, which greatly impact the region (DeAndreis, 2022).

2.2 Types of Olive Groves and their Environmental Impact

In Portugal, olive groves were once estimated to be 70-80% low-input traditional type, but rapid intensification toward a predominantly intensive mode of agriculture has been extremely fast (Beaufoy, 2001, p. 22; Silveira et al., 2018, p. 248). Traditional groves are now estimated to make up only about 30% of all Portuguese olive groves (Dawson, 2022). The Alentejo region, despite its dry Mediterranean climate and a tradition of extensive, multi-functional agricultural systems, has shown an increase in both olive grove area and olive oil production. Statistical data show that the number of farms with more than 100 hectares has increased significantly—from 136 to 250 between 1999 and 2013, with a decrease in the number of all other smaller size farms (Silveira et al., 2018, p. 259). In 1998, olive groves occupied an

area of 144,759 hectares in Alentejo (Silveira et al., 2018, p. 259). The most recent data from 2021, says that olive groves now occupy 201,000 hectares in the region (*About the Alentejo*). This radical change was translated into tons of olive oil produced: from 99,000 tons in 1997 to 20,211,000 tons in 2021—an increase of 91% (*About the Alentejo*). The traditional farm structure in olive oil production, with a majority of smaller size, unirrigated farms, and a few properties with more than 100 hectares, is therefore shrinking due to rapid change in the industry (Silveira et al., 2018, p. 259).

General characteristics of three types of olive plantations found in the Alentejo region (Beaufoy, 2001, p. 23):

	Low-input traditional plantations, scattered trees.	Intensified traditional plantations.	Intensive modern plantations.
Typical location	Hill and mountain areas. Also in marginal lowland areas and around villages.	Hills and rolling plains.	Rolling and flat plains.
Range of tree density	40-250 per ha and scattered trees.	80-250 per ha	200-400 per ha
Tree characteristics and management	Old or ancient. Usually pruned, although may be infrequent. In some cases, pruning is very limited or non-existent and trees are allowed to develop a very large canopy. Olives may be in mixed orchards with other fruit trees.	Trees may be younger (due to replanting) and have a regularly pruned canopy. There is a tendency to increase the tree density in traditional plantations by planting between existing rows.	Short-stem varieties. "Dwarf" or "bush" varieties may be replanted at 25-30 years and mechanically pruned.
Terraces with supporting walls	Common.	Common in some hill areas.	Very rare.
Management of understorey	Grazing and/or mowing and/or tillage, which may be frequent or occasional. Animal traction or rotovators and hand mowers on narrow terraces.	Repeated cultivation and/or herbicides (e.g. Simazine, Glyphosate).	Repeated use of herbicides (e.g. Simazine, Glyphosate).
Fertilisation	None or manure and/or chemical fertilisers (e.g. 1-2kg combined fertiliser per tree).	Chemical fertilisers (e.g. 2-6kg combined fertiliser per tree depending on plantation, rainfall, irrigation, etc.).	Chemical fertilisers usually applied through irrigation and/or leaf sprays. Nitrogen input 150-350kg/ha.
Pesticide use	None or occasional. Sometimes use traditional products, such as Bordeaux mixture, copper, lime.	2-10 treatments per year depending on the area, pests, year, etc. See main text.	2-10 treatments per year depending on the area, pests, year, etc. See main text.
Irrigation	Not usual, although becoming common in certain specific areas, such as Crete.	Increasingly common (mostly drip although some sprinkler systems).	Usual (drip system).
Harvest method	By hand, or may be left in years of little harvest.	By hand or mechanical.	Mechanical.
Typical yield	200-1,500 kg/ha	1,500-4,000 kg/ha	4,000-10,000 kg/ha
Consistency of annual yield	Very low	Low	High
Labour requirement	Very high: harvest, pruning, maintenance of terraces and walls, scrub control, etc.	High: harvest (when manual), pruning.	Low.

Intensified traditional and intensive modern olive groves are different from low-input traditional plantations because of their high plantation density. In other words, they are distinguished by the high number of olive trees that coexist on the same hectare of soil, as well as the distribution of the trees, which are planted just 6 meters (intensified traditional) and 1.5 meters (intensive modern) apart from one another and are generally equipped with a water system (Olivarama, 2013). As a result of their particular plantation characteristics and farming practices, the low-input traditional plantations have potentially the highest natural value (biodiversity and landscape value) and most positive effects (such as water management in upland areas), as well as the least negative effects on the environment. These plantations however are also the least viable in economic terms and hence are the most vulnerable to abandonment, which can have significant environmental consequences. The intensified traditional and modern intensive systems are inherently those of least natural value and have potentially, and in practice, the

greatest negative environmental impacts particularly in the form of soil erosion, run-off to water bodies, degradation of habitats and landscapes, and exploitation of scarce water sources (Beaufoy, 2001, p. 22).

There are three broad categories in which olive farming techniques vary widely, and they can be used to determine the effects that olive farming has on the environment: plantation characteristics and farming practices, the physical and biological conditions in which farming takes place, and the socio-economic situation of holding (Beaufoy, 2001, p. 12). Olive farming has both positive and negative environmental effects that depend on several factors, including environmental conditions in and around the plantation (e.g. soil type, slope, rainfall, adjacent land-uses, presence of water bodies, etc.) and farm management practices. Especially influential practices are weed control and soil management, pest control, irrigation, and the type of land (and previous land cover) on which new plantations are established (Beaufoy, 2001, p. 30).

Summary of the environmental effects of different types of olive oil farming: (Beaufoy, 2001, p. 41).

	Low-input traditional plantations and scattered trees	Intensified traditional plantations	Intensive modern plantations
Soil	Low rates of erosion except in case of excessive tillage on slopes and vulnerable soils. Where manure and grass cover are used, organic content is maintained, reducing erosion risk.	Repeated tillage or herbicide use and chemical fertilisers reduce organic content and make soil more vulnerable to erosion. Some farmers now chip pruning residues which adds organic matter. Erosion also depends on slope, presence of terraces, rainfall patterns and practices. Repeated tillage not along contours can lead to very severe erosion even on moderate slopes, especially if soil is bare in autumn-winter rains.	Repeated tillage or herbicide use and chemical fertilisers reduce organic content and make soil more vulnerable to erosion. Some farmers now chip pruning residues which adds organic matter. Erosion is not normally severe as plantations are not on steep slopes and no-tillage systems are common.
Water	Terracing controls run-off and increases infiltration on hillsides.	Run-off of soil (often laden with herbicides) into water courses and reservoirs. Potential over-exploitation of surface and groundwater in some areas.	Possibly some run-off of soil (often laden with herbicides) into water courses and reservoirs and leaching to groundwater. Potential over-exploitation of surface and groundwater in some areas.
Air	Some air pollution from burning of pruning residues and invasive scrub.	Some air pollution from burning of pruning residues.	Some air pollution from burning of pruning residues.
Biodiversity	High due to habitat diversity (old trees, grass layer, adjacent land-use diversity) and minimum or no use of biocides.	Low due to reduced habitat diversity (especially understorey) and intensive use of biocides.	Very low due to reduced habitat diversity (especially understorey) and intensive use of biocides.
Landscape	High due to features such as terraces, old trees, stone walls, floral diversity.	Ranges from low to high, depending on overall landscape diversity.	Low to moderate, depending on age and overall landscape diversity.
Other environment effects	Important role as fire break in areas with high proportion of scrub/forest. But fires can be caused by farmers burning invasive scrub.	Local impact on habitats and landscapes of reservoir construction for irrigation.	Local impact on habitats and landscapes of reservoir construction for irrigation.

The Portuguese Ministry of Agriculture led a comparative case study in Alentejo of 11 low-input traditional plantations (under 200 trees/ha), 29 farms with intensive olive tree plantation (with over 200 trees/ha), and 7 farms with super-intensive olive tree plantation (with over 1000 trees/ha). The study found that the amount of nitrogen-based fertilizer in intensive olive groves was twice that of traditional groves, and phosphorus-based fertilizer in super-intensive and intensive groves was 32% higher than in traditional groves. Their research also demonstrated a significant decrease in the richness and diversity of vascular plants in the most intensive olive groves, with the number of species present in these olive groves to be only 49%

of those found in traditional groves (Silveira et al., 2018, p. 266-68). The literature suggests that the negative environmental effects of intensification could be reduced considerably by means of appropriate farming practices; and that, with appropriate support, traditional low-input plantations could continue to maintain important natural and social values in marginal areas (Beaufoy, 2001, p. 22).

Modes of organic olive production can be utilized to help reduce the environmental effects of intensification. Environmentally friendly modes of production began gaining importance in Portugal in 1994 with the Agro-Environmental Measures—a policy instrument to support sustainable farming methods and to improve biodiversity in the rural areas. The introduction of this legislation was an official attempt to reduce the negative impact of agriculture, reduce the abandonment of small traditional farms, and the loss of important cultural values. Thus it was in the 90s that olive groves in the Alentejo region began to use modes of organic production (Ferreira, 2010, p. 18). Organic farming practices can exist on traditional and intensive plantations and typically do not use genetically modified organisms, pesticides, fertilizers, growth promoters, or synthetic hormones. The main goals for olive groves that focus on organic production is to preserve the soil and develop its fertility, improve productions, preserve the spontaneous growth of the plantation, develop products with superior quality, and to boost the income of olive farmers by adding value to the product (Ferreira, 2010, p. 19).

Organic olive groves in the Alentejo region generally are intensive and present a density variation between 200 and 300 trees/hectare, planted 5-7 meters apart, with irrigation, which can be buried (subsurface), or installed on the surface (“drip”). The most common varieties are Portuguese, such as Cordovil, Cobrançosa, and Galega, and the olive groves have a lifespan of 30-40 years, acquiring their capacity for full production five years after installation (Ferreira, 2010, p. 41).

2.3 Production Costs and Yields of Alentejo Olive Groves

The cost structure of olive oil depends on multiple factors — the type of production system (traditional, intensive, or super-intensive), plant variety, and inclination of plots and productivity. The harvesting cost in general represents more than 50% of the total costs for farmers. The massive increase of production with the use of intensive farming at a lower unit cost has pulled down the overall market price, making traditional farms economically unviable. For the super-intensive groves, unit cost is only one fourth of that of traditional farms (Baptista & Biswas, 2010, p. 2).

Between 1986 and 2011, the Alentejo region increased its production of olive oil from 753 kg/ha to 18873 kg/ha—an increase of 149% (Neves & Pires, 2013, p. 1156). This result is a reflection of the appearance of new and larger olive groves, as well as the intensification of existing ones, being in both cases, olive groves with more trees per area, therefore, intensive and super-intensive plantations (Neves & Pires, 2013, p. 1156). The average production of olives per hectare in 2008 for traditional, intensive, and super-intensive plantations in Alentejo was found

to be 1.2 tons/ha, 5.6 tons/ha, and 9.1 tons/ha, respectively (Silveira et al., 2018, p. 266). The advantages of intensive and super-intensive groves are related to production and area profitability, as well as an increase of mechanical labor (Neves & Pires, 2013, p. 1156-57).

With the aim of maximizing production and saving resources, intensified groves utilize the latest technologies to manage irrigation, inputs application, and harvesting. The permanent labor needs of large firms associated with intensive forms of production are often covered by a few young and highly skilled individuals, most of whom are foreign to the region. Seasonal employment opportunities are often covered by employment agencies importing cheap labor from Eastern Europe and Asian countries. The widespread perception of a lack of labor (skilled or not) in the region is a significant factor fuelling decisions to transform extensive production systems into super-intensive ones, which are fully mechanized. The transformation into olive oil is done in high tech olive oil mills. Rather than selling the olive oil by the bottle, many of these businesses sell the largest proportion of their production in bulk. The olive oil is then transported in tank trucks with purchase prices set by the tank-load to facilitate international trade (Silveira et al., 2018, p. 264).

3. Methods

This study's approach is based on a case-study analysis that informs the insights shared on traditional olive grove sustainability. Based on the information in the literature about traditional olive groves in Portugal, the study focuses on organic production methods. The two olive farmers researched in this study are organic producers of olive oil in the Alentejo region. Farmer A owns a traditional olive grove that is five hectares on a family estate which has been passed down for three generations. The olive grove is a 62-year-old dryland 12mx12m plantation that has been producing 100% extra virgin organic Galega olive oil for the last seven years. They produce on average 500 liters of olive oil per year, a small drop compared to other producers in the region. The olives are hand-picked and transported to be processed at a certified-organic olive mill owned by Farmer B. Farmer B owns an estate with around 100 hectares of organic olive groves, containing three native varieties and one Spanish variety: Cobrançosa, Cordovil, Galega, and Arbequina (respectively). They host one traditional and two intensive olive groves on their estate, which are 100% organic and have been used to produce olive oil for the last 25 years. In addition to the olives from Farmer B's estate, they buy olives from 60 local farmers who grow native/non-native varieties organically/non-organically on traditional and intensive groves. With the supply of olives from their estate and local producers, they are able to sell four brands of extra virgin organic olive oil: a single varietal Galega and three blends of native and non-native varieties. They also sell four brands of extra virgin non-organic olive oil: a single varietal Cordovil and three blends of native and non-native varieties. In their 2021 harvest, they produced 1,465,255 liters of olive oil total, including 330,561 liters of organic olive oil. Olive oil only makes up 15% of the company's total revenue, as they also have a Michelin star restaurant, winery, and wine tourism on their estate.

Farmers A and B were identified for the case study due to their affiliation with university colleagues. Through an educational excursion with the SIT Portugal Sustainability and Environmental Justice program, the researcher visited Farmer A's olive grove in Alentejo, which precipitated their participation in this study. A one-hour long, in-person interview was conducted with Farmer A a few weeks later in Évora. An interview with Farmer B was arranged shortly afterwards via connection over email from a university professor. The one-hour long interview was conducted remotely. Both farmers were asked the same questions about the history of their estates, production levels, fixed and variable costs, revenue and profit margin, brand strategy, definitions of sustainable, traditional, and organic farming, and how they would advise aspiring olive farmers to enter the local sector (please see appendix 1 for expanded interview questions). These questions were intended to answer what challenges farmers face in being economically profitable, and where the potential growth areas lie to make the sector more entrepreneurial. Interviews were recorded and transcribed to support the accuracy of data analysis. In spite of the relevant differences between the two farmers, there were many similarities in their business strategies and values, and the challenges they face in the market. As such, the data analysis was organized according to comparable statements made by the two farmers, which were then categorized into subsections in the results.

3.1 Limitations

Limitations of the study include the short number of weeks for this research and data analysis, the relatively small sample size, and the lack of data about costs and revenue shared by Farmer B. Data collection from the literature, interviews with olive farmers, data analysis, and the writing of this final document took place over a four-week time period. If afforded more time to work on the project, the study would have included interviews from a larger sample of traditional organic farmers in the Alentejo region. A larger sample size would make the findings more likely to be accurate and precise, thus better for application of traditional farmers in the Alentejo region. Finally, protocols within Farmer B's organization made sharing data about costs, revenue, and profit margin impossible. Thus, the research does not include data about their business venture in comparison with Farmer A's costs, revenue, and profit margin. However, in an effort to include more data about the economic costs and benefits of organic production, information from the literature was included to illustrate more robust findings. Unfortunately, data in the literature on the economic profitability of organic olive production remains scarce.

3.2 Ethics

This study was evaluated and approved by the Institutional Review Board for Human Subjects. Participants were not asked to answer any questions that included sensitive information, and all participants were above the age of 18. Participants signed an informed consent form including information about the purpose of the study and interview. Both farmers

consented to an audio-recorded, one-hour long interview, which would be quoted from in this final report. Participants had the right to not answer questions at any point in the interview, and/or to decline being recorded and quoted. Data was stored on the researcher's password protected device, and the farmers' names and any information that could be linked to their identity was anonymized. (Please see appendix 2 for the informed consent form).

4. Results and Discussion

4.1 Priorities for Traditional Farmers

Both traditional farmers interviewed in the study shared similar sentiments about the value placed on organic modes of production, planting Portuguese varieties, and having a competitive and clear business model that uniquely positions them in the local olive oil market.

4.1.1 Organic Production

Both farmers cite organic farming methods as a measure of the sustainability of their businesses. When asked to define "sustainable olive farming," Farmer A says "it's all about being organic." They also indicate the dimensions of sustainability that organic production covers:

"[Organic] is sustainable because at the end, you can get more than enough money to preserve [the groves]. We try to preserve ourselves, which is all about preserving the soil. Social responsibility, which is really important in [our business] because it's all about the [olive oil] and the story that we are selling right now, which can generate enough money for us to continue to have our farm."

This quotation emphasizes the interlinkages between environmental, social, and economic sustainability because the organic farming methods employed in Farmer A's olive grove allow them to preserve the health of the soil, sustaining their ability to produce Galega olive oil, and, in turn, generate enough revenue for the farm to continue with the traditional model because it is economically viable. Like Farmer A, Farmer B prefers to describe themselves as an organic farmer because "sustainable olive farming" has become a "confusing term, since all of the [olive oil] companies in Portugal call themselves sustainable." The cause of the vagueness and misuse of "sustainability" may be due to the fact that the olive sector is exempted from environmental requirements. There is no regulation to promote the maintenance of traditional olive groves, limit the area occupied by continuous olive tree monocultures, or introduce environmentally friendly management practices into the industry (Moreira et al., 2019, p. 873). Farmer B says:

"There are companies in Alentejo calling themselves sustainable who are planting Spanish varieties on super-intensive olive groves because they want a fast return on investment and aren't concerned about the environment or the soil."

Similar to Farmer A, Farmer B says that for olive oil production to be sustainable, environmental and social concerns must be taken into account, which is not appropriately articulated by the use of “sustainable” in the sector. Instead, Farmer B prefers to say: “organic olive oil grove because [we] are talking about the culture operation on the field—the people who are working at the company, the investment, and financial return because this is what sustainability means too.”

For Farmer B, organic farming means that there are no chemical pesticides on the fields during production. They believe that the best fertilizer for their olive groves can be sourced from the products of their other production processes. As such, they produce their own compost with a mix of the byproducts of the winery and olive mill: olive leaves, olive pomace, manure, and grape stalk. They allow this compost mixture to ferment for a few months before they use it as fertilizer in the olive grove. Farmer B calls this a good example of sustainable agriculture because it is made possible by their organic methods of farming:

“Organic production in the olive oil mill means that we have to separate. We receive the olives, we wash them, pick the leaves, crush the olives, and mix the pomace, separating by centrifugation. We have to separate the organic production from our three different lines of production, and we are certified to do this, which means we have an external company that visits us and makes a report about the work we are doing with our production. We have to produce good things because they check if we are doing things well on the field, which means not using chemical products, and they see in the olive oil mill if we are using different machines for organic production. They take a sample and do some analysis to search if we use pesticides because it's organic production.”

The regulation that is associated with organic certification allows Farmer B to claim real and tangible sustainable value of their business, and it is a key differentiator for them among a sea of other big companies in Alentejo who boast about sustainability. Farmer A benefits from the organic certification of Farmer B’s olive mill for their olive oil production, but they add another perspective about organic farming in the harvesting stage, which to them means the “natural way of farming because [they] are not using any kind of chemicals [with an approach that] is all about working with nature.” They explain how this manifests in their lack of costs that are spent on fertilizers and chemicals, where instead they invest to prune and manage their grass every year.

“[Natural farming] means that we let the grass grow all year. By the end of May, we cut the grass, but we let the grass stay in the sun because then [we] can incorporate nutrients into the soil. [We] can create a barrier between the peaks of heat during the summer, and the soil, so [we] can preserve some humidity. I have to pay [a] machine that cuts the grass once a year.”

Although Farmer A is not speaking about the regulatory process of organic certification, they are discussing a different stage in the production of olive oil and cite the very real methods of working with their land without chemicals.

4.1.2 Portuguese Varieties

Both farmers demonstrate their commitment to planting Portuguese varieties, specifically Galega, to protect the natural landscape that is integral for traditional farms. Farmer B hosts a traditional grove on their estate, but they also support local producers as part of their initiative to sell olive oil at scale. Despite the fact that “Galega makes similar [quality olive oil for their brand] from the traditional and intensive groves,” they “prefer to work with traditional farmers because we need to protect the old trees.” Their business strategy is to fight the abandonment occurring to traditional olive groves by “investing more into local producers and suppliers.” This manifests into hands-on action:

“We pay more to visit these local producers every month and explain what they have to do to pay attention to the trees. We talk to them about sustainability too, about the environment, the pesticides, cover crops, and the culture operations that they have on the field. The cover crops are very important for the soil, too. Our strategy is to help our suppliers have better production with Portuguese varieties and the old trees, to stop cutting them down.”

Farmer B is able to use their relatively large size to give traditional olive farmers who may not be producing olive oil for a brand of their own, economic incentive to continue producing extensively instead of abandoning the landscape for an intensive grove with faster return on investment. According to Farmer A, traditional olive groves without their own olive oil brand can create more profit by “harvesting their olives when they are still green because they can sell their olives to companies who value high quality olives.” In this case, Farmer B is the company that is valuing these high quality olives and is creating economic opportunity for traditional farmers. Farmer A is in agreement that the landscape must be protected:

“There is nothing traditional in super intensive olive groves. And one of the most sad things around [Alentejo] is that the landscape changed a lot since they started to plant the super intensive olive groves. The landscape is completely different because of all of the chemicals. So there is nothing traditional in this, [they] are not thinking about the future, [they] are thinking about getting money right now.”

This quotation illustrates the destruction of the traditional landscape that super intensive olive groves inflict, which happens after the old trees are cut down, as Farmer B also stated. Farmer A adds that the degradation of the landscape also diminishes the possibility for traditional groves to exist in the future, erasing the legacy of the landscape.

In addition to preserving the landscape, Portuguese varieties are also important to plant to pass on the history and tradition of authentic-tasting native varieties. Farmer A continues to say that protection of the soil is paramount for the quality of the Galega variety:

“Traditional olive farming is preserving your soil because olive oil is a natural product. That means if you want to make high quality olive oil, you need high quality olives. And if you want to get high quality olives, you need solid nutrients. So the beauty of the traditional olive groves is that those trees are really resilient, they are really well adapted to this climate, even to climate changes. So you don't have to do a lot of things to

the tree, you just have to take care of your soil and then expect that you have good weather conditions, and at the end, you can have a good crop.”

Although Farmers A and B disagree about the equal quality of Galega from traditional and intensive groves, they agree that preserving native varieties for future generations is important for Portuguese tradition and history. Instead of focusing on the profound quality of taste of Galega that explicitly traditional groves preserve, Farmer B talks about the relevance of planting these varieties regardless of plantation type:

“We have to plant Portuguese varieties because in 10 years, buying Galega or Cordovil will be a huge challenge for us. In 10 years, we can double the price of this kind of variety because they are in extinction. We should always plant Portuguese varieties because we have to tell Portuguese history and our own flavors, our own aromas, because our olive oils are of a very different variety.”

Focused more so on the risk of erasure for these native varieties, Farmer B demonstrates the importance of planting the variety to pass on the tradition of Portuguese history. Although still speaking about the unique flavors and aromas of native varieties, it is important to note that Farmer B does not characterize authentic quality olives and olive oil as specific to traditional groves, a divergence from Farmer A.

Despite this subtle variation, Farmer A does still mention the risk of extinction that native varieties face, as well as the concern of their preservation for Portugal’s history and tradition. They cite a lack of investment in the native varieties that is causing desertion, and unfortunately, mass production of non-native varieties that dilute Portugal’s tradition:

“We didn't study our variety, we didn't improve our varieties. You cannot plant the Galega variety in super intensive groves because the olive trees grow very large. We are producing a lot of olive oil in Portugal, but it's Portuguese olive oil with non-Portuguese varieties. If you are in Portugal, you should have olive oil, or buy an olive oil using Portuguese major varieties. If I want to try an Arbequina variety of olive oil, I go to Spain because that's where the Arbequina variety was born. It would be really good if we could at least value our traditional varieties because mostly we are losing our soul.”

Farmer A adds valuable specificity about the impact that a lack of investment in major native varieties has on the tradition of the country, but also the experience of tourists who want to learn about the national history. They emphatically point out that prioritizing mass production of non-native varieties over investing in native varieties, is a loss of the Alentejo region’s heritage.

4.1.3 Competitive Offering

Farmers A and B share different philosophies about what makes their olive groves competitive in the international market. For Farmer A, it is the value of an experience that makes their business economically viable. Farmer A makes 60-70% of their revenue from hosting people at their farm, which means that they are getting more money from tourism associated with the olive grove and olive oil than from selling olive oil. After seven years of business, their total

revenue is more than enough to offset their most expensive costs (harvesting, shipping, bottles, product labels, and caps); 70-75% of their revenue is profit, an estimate of 35,000€ for the year. Farmer A shares their insights about the strategy of creating a memorable experience for consumers:

“[People] don't mind coming [to my farm] and paying the same that they would at a Michelin star restaurant. You are not going to find fancy food or fine dining [on the farm], but you are going to be able to sit at the table with us, you are going to be able to hear our story. And we are the producers, we are sitting at a table with people. What we provide there, you cannot find around anywhere else because it's my story, my farm, and the brand that we have has a really strong identity. This business is all about having a good quality olive oil, having a strong identity, and also a farm that has 2000 year-old olive trees. All of that together, allows us to go on and to offer something different around here. I have a lot of stories of people that travel around Portugal for one or two weeks, and then they go to my farm for lunch and after the experience, they leave and say 'this was the highlight of my trip.' It's nothing special. It's our story, really simple—but of course, authentic, something different.”

This quotation from Farmer A is an extremely rich sentiment about the unique value of a farm-to-table experience in the olive oil industry. As Farmer A explains, the story of their farm and its embeddedness in their brand's identity is a very simple story that dates back to their 2,000 year-old olive trees, and it is not economically costly to create this authenticity. Farmer A has very limited costs associated with hosting people on the farm—they only have to purchase food—but the money they get from tourism is a huge percent of their revenue. They also mention the potential value add for other local olive farmers to create farm-to-table experiences for tourists, not only to make their individual farms more economically competitive, but also for the prosperity of Alentejo traditional olive oil groves at large. Farmer A says:

“[Olive oil production is] not just about the variety that you are using, it's all about the soil, it's all about the sun exposure, everything kind of can influence the quality of your olive oil. So even if you have two producers using the Galega variety, the olive oils can be really different because the soil is different, the sun exposure is different. So we should have some network of small producers or routes that [tourists] could pass through to different olive oil producers and see different olive oil tastings, having different experiences.”

This recommendation from Farmer A on how to make the sector more entrepreneurial is extremely valuable and means that a larger number of traditional farms offering farm-to-table experiences for tourists will not boost competition within the group, but it will build investment across producers. Farmer A also highlights that traditional farmers in Alentejo are easily accessible to tourists due to the region's close proximity to Évora, a city with a high volume of tourism. Thus, a network of different olive oil producers that tourists could pass through has the capacity to flourish in Alentejo.

Both Farmer A and B have revenue streams independent of their olive oil sales which make them economically competitive. As previously mentioned, Farmer B's olive grove makes up a relatively small share of their company's total revenue. As such, they are afforded a somewhat unique safety net when it comes to their ability to stay in business, as compared to smaller farmers like Farmer A, whose only agricultural venture is olive oil. For this reason, only areas of profitability in Farmer B's olive grove business that can be utilized by other local traditional olive farmers are discussed in this study.

Farmer B talks about the competitiveness of organic olive oil in the marketplace, and the company's overwhelming success with their four organic brands. They explain the strategy for their current offering:

“In 2014, we started the production of these organic olive oils [on our estate], but we sold out. To meet demand, we decided to buy organic olives from local producers too because the consumers wanted to buy more organic olive oil, and we didn't have enough. We made different organic olive oil brands with the olives we bought from other producers. I think that every year the consumers try to buy more sustainable olive oil. We are selling more organic products, because the consumers are searching for it.”

Farmer B can now sell a higher quantity of expensive olive oil (between 10,00€ and 16,00€/50 CL) with this decision to purchase additional olives from local producers and expand their offering of organic olive oil brands. For reference, the price range for a 50 CL bottle of non-organic extra virgin olive oil is 7,50€ and 11,00€. Although they did not provide information about their revenue or profit margin from organic olive oil sales, the above quotation does demonstrate a need for the company to expand its organic offerings based on consumer demand, which would imply a growing volume of organic sales YOY. The literature confers that larger companies with their own certified organic mills, such as Farmer B, are able to sell olive oil to the very specific “*gourmet*” market; a market that due to the high demand in its standards of quality, manages to sell its products at an additional 20% valuation compared to non-organic olive oil (Ferreira, 2010, p. 40-44). A model that can be applied to each type of Alentejo olive grove in organic production, with an average olive grove area of 26 hectares, estimates the gross value of production for Farmer B's 100 hectares to be approximately 125,281€/year (assuming the grove is biological with irrigation 10mx10m) (Ferreira, 2010, p. 46). This is an estimation based on the literature and was the best available model. However, this figure may not represent the actual gross value of production of Farmer B's olive grove, as their gross value of production would likely be based on retail sales rather than wholesale sales.

4.2 Limitations of Traditional Farming

4.2.1 Quantity of Olive Oil

A notable limitation of traditional farming is the low and often inconsistent yield of Galega olives for olive oil production. According to Farmer B, most of the local producers are

cutting down old trees on traditional olive groves to put in intensive olive groves with high production yields instead, making Galega increasingly difficult to buy. Farmer B says, “in one year, you might have high production [of Galega], and in another you don’t, so high intensity is better for having fast and high volumes of production.” Despite that Farmer A produces only Galega on their traditional grove, their advice for aspiring Alentejo olive farmers is to plant other Portuguese varieties that have higher yields than Galega, on an intensive-type plantation:

“I would advise [people starting new farms in the Alentejo] to use Portuguese varieties, but not Galega. We have more than 20 different native varieties. Galega makes a low yield, and if you harvest them green like me it is even lower. But you have other varieties from the north of Portugal, really well adapted here in the south, and they have yields that can be up to double of Galega. Then, you have to see how many hectares you want to plant, because dimension is an issue. Maybe not a traditional olive grove, my trees are about 12 meters from each other, but five meters from each other would be more than enough.”

Despite Farmer A’s commitment to the landscape, they are still in support of less aggressive intensive methods of production with Portuguese varieties, to continue the tradition of native flavors and aromas. Farmer B already employs intensive models of farming on their estate and from their local producers, and they agree that this type of production with Portuguese varieties is best for new farmers:

“[New olive groves] should plant an intensive system with organic production and Portuguese varieties. It means that in one hectare, you can put around 300 trees to have a better production. Putting cover crops to protect the soil of the trees too. If you use the Portuguese variety, pay attention to the quality of the olives. You have to sell our history if you want to sell Portuguese varieties.”

However, Farmer B also adds the importance of organic farming methods (such as cover crops), which uphold the quality of olives from these intensive systems with native varieties. The relevance of selling Portuguese varieties from the Alentejo region to preserve history and tradition still remains present in the challenge to produce enough to be economically competitive.

4.2.2 Accessibility for the Local Market

The affordability of traditional olive oil for Portuguese people remains a large barrier for selling within the local market. Farmer A exports more than 90% of their olive oil that is sold on their farm, to restaurants and gourmet shops, and on their website. Farmer B exports 70% of their olive oil, a measurement that includes all of their native/non-native varieties and organic/ non-organic brands. Farmer A says that international visitors at their farm ask why they are not selling their olive oil for 20-25€, for which they answer that “15€ is a lot of money here in Portugal for a small bottle of olive oil.” Although Farmer A has a lower price point than what

they could sell internationally, they explain that it is still not low enough to attract Portuguese consumers:

“I am selling a quarter of a liter for 15 euros. It's all about the money that we don't have in Portugal. Minimum wage is 700 euros, you cannot afford to pay six euros for one liter. It is really difficult to sell my bottle here in Portugal to Portuguese customers, because people don't have money.”

This quotation illustrates very clearly the income gap between Portuguese consumers and those international consumers that are able to afford the relatively high price point for such a small quantity of olive oil. Like Farmer A, Farmer B mentions the same affordability issue of attracting Portuguese consumers to their traditional varieties; however, they add an insight about product segmentation with their blends of Portuguese and exotic varieties:

“People in Portugal don't want [the traditional varieties]. It's important and sometimes [they] forget what [they] want because of the money. [They] want to buy a Portuguese variety, [they] want to buy Galega, but [they] don't have the money to decide. That is why we make different types of olive oil. We have an extra virgin olive oil that is a blend of mostly Portuguese varieties mixed with a lower percentage of exotic varieties, produced non-organically. People that don't have money to buy Galega or organic, can buy a good olive oil at a cheaper price point. We are trying to have different types of olive oil to attract local consumers. Organic, non organic, single varieties, and cheaper olive oil for people who don't have as much money.”

Farmer B includes a solution to targeting Portuguese consumers, which is made possible by their relatively large size in comparison to Farmer A. They are able to offer lower-priced olive oil according to a number of product attributes: native/non-native varieties, single varietal or blends, and organic/non-organic production. As such, Farmer B is maximizing their ability to reach the local market, while also continuing to prioritize Portuguese varieties, an important aspect of their business strategy and values. Their non-organic, extra virgin olive oil blend that is mostly Portuguese varieties mixed with a lower percentage of exotic varieties, is a demonstration of their commitment to making native varieties affordable for local consumers. Farmer A also attempts to accommodate the local market with their lower price point (as mentioned above), but they do not have the product segmentation that Farmer B can offer, which mean they cannot make as flexible of an offering.

5. Conclusion

This research concluded that organic farming methods are a better definition of “sustainability” for traditional olive farmers because the sector is supersaturated with large, super-intensive farmers, producing high yields at a quick rate, calling themselves “sustainable” due to the lack of environmental regulation that exists in the olive oil industry. The certified nature of organic farming allows for traditional farmers to differentiate their product and appeal to the growing “gourmet” market; a consumer group that is willing to pay for more expensive

products that have guaranteed high production standards. Additionally, the importance of preserving Portuguese varieties should not be overlooked in the rapid intensification of the region because it is important to preserve the traditional landscape, and the history and tradition of Portugal that accompanies the unique tastes and aromas of native varieties. Although there are limitations to the quantity of Galega olive oil that can be produced on traditional olive groves, aspiring Alentejo olive farmers should look to more productive native varieties, such as Cordovil and Cobrançosa, which can produce authentic olive oil on intensive plantations, in addition to traditional groves. This finding reveals that there is room in the dialogue of traditional olive grove farming to plant Portuguese varieties with less aggressive intensive methods, which can accomplish the goal of preserving the national history and culture, while also allowing Portuguese varieties to be economically prosperous and therefore enduring.

The most notable limitations of this study were the relatively small sample size that included two interviews with Alentejo traditional olive farmers, the lack of economic data from one of the farmers, and the social aspects that were mentioned by the farmers but not detailed. Future research should focus on the logistical implications and importance of traditional Portuguese farmers to be in near-proximity to certified organic olive mills. The literature notes that in places where there is no certified organic olive mill, there is difficulty with valuing organic olives. In many places, there are still no drainage channels formed for original olive oil production, leaving some of the current mills and cooperatives uninterested in purchasing them due to the need to separate their non-organic olive production (Ferreira, 2010, p. 39). Research about the implementation of certified organic production for olive oil producers is an important step in the process for traditional olive groves in Alentejo to be economically viable.

References

- About the Alentejo Olive Oil Sustainability Program*. PSAA Alentejo. Retrieved December 9, 2022, from <https://psaalentejo.com/en/what-is-the-alentejo-olive-oil-sustainability-program/>
- Baptista, A., & Biswas, P. (2010). *Quality Differentiation as a Strategy for the Viability of Traditional Olive Farming in Trás-os-Montes Region* (No. 701-2016-48144).
- Beaufoy, G. (2001). *The Environmental Impact of Olive Oil Production in the European Union: Practical Options for Improving the Environmental Impact*. Science. Retrieved November 29, 2022, from <http://ec.europa.eu/environment/agriculture/pdf/oliveoil.pdf>
- Dawson, D. (2019, February 11). *The Changing Face of Alentejo's Olive Oil*. Olive Oil Times. Retrieved December 9, 2022, from <https://www.oliveoiltimes.com/production/the-changing-face-of-alentejos-olive-oil/66960>
- Dawson, D. (2022, August 29). *Olive Oil Production in Portugal Set to Slump After Record Year*. Olive Oil Times. Retrieved December 8, 2022, from

- <https://www.oliveoiltimes.com/production/olive-oil-production-in-portugal-set-for-slump-after-record-year/111817>
- DeAndreis, P. (2022, March 2). *Record Yields for Portugal in the 2021/22 Crop Year*. Olive Oil Times. Retrieved November 1, 2022, from <https://www.oliveoiltimes.com/production/record-yields-for-portugal/105753>
- DeAndreis, P. (2022, May 16). *Olive Farmers in Alentejo Seek Sustainable Certification Label*. Olive Oil Times. Retrieved November 3, 2022, from <https://www.oliveoiltimes.com/production/olive-farmers-in-alentejo-seek-sustainable-certification-label/108587>
- Economic Affairs & Promotion Unit*. International Olive Council. Retrieved October 24, 2022, from <https://www.internationaloliveoil.org/what-we-do/economic-affairs-promotion-unit/#figures>
- Ferreira, DJB. (2010). *The Olive Grove in Organic Production Mode: Costs and Profitability in the Region of Moura, Alentejo* (Doctoral dissertation, Technical University of Lisbon (Portugal)).
- Food Security and Nutrition and Sustainable Agriculture*. United Nations Department of Economic and Social Affairs. Retrieved December 4, 2022, from <https://sdgs.un.org/topics/food-security-and-nutrition-and-sustainable-agriculture#:~:text=The%20Sustainable%20Development%20Goal%20to,rural%20poverty%2C%20ensuring%20healthy%20lifestyles%2C>
- Global Indicator Framework for the Sustainable Development Goals and Targets of the 2030 Agenda for Sustainable Development*. (2022). https://unstats.un.org/sdgs/indicators/Global%20Indicator%20Framework%20after%202022%20refinement_Eng.pdf
- Moreira, F., Herrera, J. M., & Beja, P. (2019). Making Olive Oil Sustainable. *Science*, 365(6456), 873. <https://doi.org/10.1126/science.aay7899>
- Neve, J.-E. De, & Sachs, J. D. (2020, March 20). *World Happiness Report 2020*. Sustainable Development Solutions Network.
- Neves, B., & Pires, I. M. (2013). The Impact of Agricultural Policies and Growing Investment in Olive Sector in the Alentejo Region. *Políticas de Base e Recuperação Económica. Universidade do Minho, Braga, Portugal*.
- Olivarama. (2013, February 19). *Olivapedia: Intensive Groves*. Olive Oil Times. Retrieved December 6, 2022, from <https://www.oliveoiltimes.com/production/olivapedia-intensive-groves/32901>
- The Olive Groves*. (2022, June 2). Esporão. Retrieved December 5, 2022, from <https://www.esporao.com/en/about/alentejo-en/the-olive-groves.html/>
- Pires, I. M. 2012. "The Changing Role of the Border: Spanish Investments in Alentejo Region." In *Borders and Borderlands: Today's Challenges and Tomorrow's Prospects*, comp. I. Pires. Lisbon: Centro de Estudos Geográficos.

- Purvis, B., Mao, Y., & Robinson, D. (2018). Three Pillars of Sustainability: In Search of Conceptual Origins. *Sustainability Science*, 14(3), 681-695.
<https://doi.org/10.1007/s11625-018-0627-5>
- Resolution Adopted by the General Assembly on 16 September 2005*. (2005). United Nations General Assembly.
https://www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/A_RES_60_1.pdf
- Sales, H., Nunes, J., & Vaz Pato, M. C. (2020). Achievements and Challenges Towards a Sustainable Conservation and Use of 'Galega Vulgar'Olea Europaea Variety. *Agronomy*, 10(10), 1467.
- Silveira, A., Ferrão, J., Muñoz-Rojas, J., Pinto-Correia, T., Guimarães, M. H., & Schmidt, L. (2018). The Sustainability of Agricultural Intensification in the Early 21st Century: Insights from the Olive Oil Production in Alentejo (Southern Portugal). *The Diverse Worlds of Sustainability*, 3, 247-274.
- Snauwaert, D. T. (2017, October 1). *Sustainable Just Peace: Jeffery Sachs's "The Age of Sustainable Development."* Global Campaign for PeaceEducation. Retrieved November 30, 2022, from [https://www.peace-ed-campaign.org/sustainable-just-peace-jeffery-sachss-age-sustainable-development/#:~:text=Sustainable%20development%20is%20defined%20by,%5Bec%5D%20growth%20\(p](https://www.peace-ed-campaign.org/sustainable-just-peace-jeffery-sachss-age-sustainable-development/#:~:text=Sustainable%20development%20is%20defined%20by,%5Bec%5D%20growth%20(p)

Appendix

1. Interview Guide

- a. History and overview
 - i. Can you tell me about your olive grove and brand?
- b. Metrics
 - i. What are your fixed costs?
 1. Bottles
 2. Shipping
 3. Labels
 - ii. What are your variable costs?
 1. Treating the trees
 2. Organic fertilizers
 - iii. How many liters do you produce/year?
 - iv. Can you tell me about your production process?
 1. Irrigation
 2. Labor
- c. Revenue and strategy
 - i. What is your profit margin?

- ii. Do you stack production processes? (What is the share of those in your revenue?)
 - 1. Animals
 - 2. Vegetables
 - 3. Tourism
- iii. What is your brand's identity and/or business strategy?
- d. Concepts
 - i. What is sustainable olive farming to you?
 - ii. What is traditional olive farming to you?
 - iii. What is organic olive farming to you?
- e. Perspective about the future of olive groves in Alentejo
 - i. If you were to advise me to plant a new olive grove, what would you say and why?
 - 1. Plantation scheme (traditional, intensive, super intensive)
 - 2. Varieties (Portuguese, non-Portuguese)
 - 3. Size of land
 - 4. Organic
 - 5. Stacked production processes

2. Informed Consent Form

PARTICIPANT INFORMED CONSENT

TITLE OF THE STUDY – THE VIABILITY OF TRADITIONAL PORTUGUESE OLIVE GROVES IN THE ALENTEJO REGION UNDER A SUSTAINABLE DEVELOPMENT FRAMEWORK

My name is Sydney Soloway. I am a student with the SIT Portugal Sustainability and Environmental Justice program. I would like to invite you to participate in a study I am conducting for partial fulfillment of my Study Abroad Program. Your participation is voluntary.

Please read the information below, and ask questions about anything you do not understand, before deciding whether to participate. If you decide to participate, please sign this form and you will be given a printed or electronic copy of this form.

PURPOSE OF THE STUDY

The purpose of this study is to learn about traditional and sustainable Alentejo olive oil farming methods. The goal of the research will be to propose perspectives about how traditional olive farmers can be more economically competitive in international and local markets.

STUDY PROCEDURE

Your participation in the study will consist of a semi-structured interview and will require approximately 30-minutes to 1 hour of your time. The interview will be audio-recorded for my research analysis purposes. However, if you wish not to be audio-recorded, you are still able to participate in the study.

POTENTIAL RISKS AND DISCOMFORTS

There are no foreseeable risks to participating in this study and no penalties should you choose not to participate; participation is voluntary. During the interview you have the right not to answer any questions or to discontinue participation at any time.

POTENTIAL BENEFITS TO PARTICIPANTS AND/OR TO SOCIETY

The benefit of the study for the participant is to contribute to the growing literature about traditional olive farmers and their potential to become more economically relevant.

CONFIDENTIALITY

Any identifiable information about you obtained in this study will remain confidential and your name and brand will be anonymized in the results of the research. The audio-recorded interview will be stored on my password protected device.

FUTURE USE OF DATA

The participant's information collected in this study, even with identifiers removed, will not be used for future research studies or distribution.

VOLUNTARY PARTICIPATION AND WITHDRAWAL

Your participation is voluntary. Your refusal to participate will involve no penalty or loss of benefits to which you are otherwise entitled. You may withdraw your consent at any time and discontinue participation without penalty. You are not waiving any legal claims, rights or remedies because of your participation in this research study.

RESEARCHER'S CONTACT INFORMATION

If you have any questions or want to get more information about this study, please contact me at sydney.soloway.mail@sit.edu or my advisor/supervisor at catia.magro@sit.edu.

RIGHTS OF RESEARCH PARTICIPANT—IRB CONTACT INFORMATION

In an endeavor to uphold the ethical standards of all SIT proposals, this study has been reviewed and approved by the SARB or SIT IRB. If you have questions, concerns, or complaints about your rights as a research participant or the research in general and are unable to contact the researcher please contact the Institutional Review Board at: irb@sit.edu

School for International Training, Institutional Review Board, 1 Kipling Road, PO Box 676, Brattleboro, VT 05302-0676, USA irb@sit.edu, +001-802-258-3132

“I have read the above and I understand its contents and I agree to participate in the study. I acknowledge that I am 18 years of age or older.”

Participant’s signature: _____ *Date:*

Researcher’s signature: _____ *Date:*

CONSENT TO QUOTE FROM AN INTERVIEW

I may wish to quote from the interview with you either in the presentations or articles resulting from this work. A pseudonym (fake name) will be used for you in order to protect your and the farm’s identity.

Initial one of the following to indicate your choice:

_____(initial) I agree to consent to quote from an interview

_____(initial) I do not agree to consent to quote from an interview

Consent to Audio-Record Interview

Initial one of the following to indicate your choice:

_____(initial) I agree to consent to audio record an interview

_____(initial) I do not agree to consent to audio record an interview