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Oleotourism as a Sustainable Product: An Analysis of Its Demand in the South of Spain (Andalusia)

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Abstract: Olive oil has generated a new tourism offer in Spain called oleotourism. Visitors can enjoy landscapes of ancient olive groves and visit its oil mills called almazaras, to learn about its manufacture and to taste different oil varieties. Andalusia, located in the south of Spain, produces 60% of Spain's olive oil, having the largest number of almazaras, and therefore most oleotourism offers. This differentiated tourism offer requires identifying the profile of oleotourists to determine sustainable strategies to increase demand without harming the local community. The objective of this study is to identify the Andalusian oleotourism offer according to the profile of oleotourists and project its demand evolution, in order to offer a sustainable product best suited to the demand. With this aim, three techniques are applied in this study: a random survey addressed to oleotourists in Andalusia, a SWOT (strengths, weaknesses, opportunities, and threats) analysis to evaluate the strengths and weaknesses of the oleotourism sector in the region, and finally, its demand is projected by using the ARIMA (autoregressive integrated moving average) model. The results indicate a favorable future scenario that should induce entrepreneurs and local authorities to invest in promoting and developing a product. Oleotourism is an alternative that can serve as a complement to agricultural income and generate employment.

Keywords: olive oil tourism; oleotourism; Andalusia; SWOT analysis; ARIMA; Protected Designation of Origin; gastronomic tourism; tourist perception

JEL Classification: O18; R15; R10; C13

1. Introduction

The recent expansion of rural tourism in Spain has resulted in a progressive consolidation of this product, in a market characterized for decades by a "monoculture" of sun and sand tourism [1]. The crisis in traditional tourism, resulting from a change in consumer preferences that tend to demand a broader set of products and quality over the quantity of products [2], has given way to a phenomenon of mass consumption of "nature" in its recreational and tourism forms. Rural areas have diversified their different economic activities to include rural tourism. This tourism offer is linked to relaxation, landscapes, traditional culture and escape from mass tourism. It enables contact with the natural environment and an interaction with local communities [3] through different forms, such as ecotourism, agritourism, cultural tourism, adventure tourism, sports tourism, gastronomic tourism, etc.

On the one hand, rural tourism emerges from the combination of the characteristic factors of postindustrial societies, where recreational consumption trends have evolved towards what is called

"a la carte tourism" [4]. On the other hand, since the 1990s, the rural crisis observed during recent decades prompted the European Union authorities to seek innovative solutions to improve the viability and competitiveness of rural areas. This promotion has led to a production diversification, the search for sustainable development processes and the highlighting of strategies, based on quality [2], as potential sources of income in the rural environment. Rural spaces have therefore diversified, and an example of this diversification is through tourism. Nevertheless, the development of this type of tourism offer should be sustainable. Moreover, sustainable rural tourism should be designed to be compatible with the ecological, socio-cultural and economic elements, and the way of life of future generations. This type of tourism, including oleotourism, serves as an alternative to the pursuit of short-term and medium-term economic benefits, and favors a rational use of natural and human resources, based on ecology, economic and social sustainability [5–11].

In this sense, pursuing sustainable development in rural regions has turned tourism into an economic policy tool which complements traditional income gains [12,13]. However, its economic impact on growth remains open to debate [14], due to the relative scarceness of complementary activities undertaken by visitors to rural areas [15,16]. In recent years, new behaviors and consumption patterns of tourists have been detected in rural regions. For example, the segments identified by Frochot [17] indicate that the attraction of rural areas is mostly to be found in broader attractive features, including their naturalness, scenery, culture and activities. The study by Bel et al. [18] indicates that rural tourism involves activities aimed at experiencing the outdoors or enjoying local sights, based on natural and cultural amenities. Additionally, Pesonen [19] identifies four segments: social travelers, wellbeing travelers, home region travelers and family travelers. Moreover, in the study by Rid et al. [20], another four segments are considered: heritage-nature seekers, multi-experience seekers, multi-experience-beach seekers, and sun-beach seekers. Thus, new rural tourists make greater and more profitable use of the landscape and of its environmental, cultural, and architectural resources. Based on the rural environment and rural activities, it is possible to classify rural destination resources. Table 1 shows the passive and active tourism resources in rural environments, based on the previous classification by Greciet [21], Martínez [22], Cohen et al. [23], and Sanchez and Vargas [24]. Bel et al. [18] considered that rural tourism demand can be divided into five segments, according to the activities undertaken: water-based activities, outdoor activities and experiencing nature, nature and heritage discovery, gastronomy and doing nothing.

Table 1. Passive and active tourism resources in rural environments.

Passive Resources		
Natural Resources	**Historic-Artistic Heritage**	**Cultural Expressions**
Landscapes	Monuments	Folklore
Climate	Castles	Gastronomy (oleotourism)
Natural parks	Popular architecture	Religious celebrations
Recreational areas	Sculpture	Artistic festivals
Roads, trails, routes	Handicrafts: smithy, pottery	Ferias (Fairs)
Wildlife	Sites	Carnivals
Flora		Customs and popular traditions

Active Resources			
Recreational Sports	**Socio-Cultural**	**Rural Participation**	**Others**
Mountaineering	Handicrafts	Agricultural activities	Painting
River tours	Languages	Livestock	Photography
Trekking	Study of flora	Smithies, basketwork, etc.	Thermal baths
Speleology	Wildlife study	Manufacture of local products	Ecological activities
Horse riding	Study of environment		
Cycling			

Among these activities, gastronomy is becoming more and more relevant, as tourists desire to travel and taste unique and authentic foods [25]. Nevertheless, although this type of tourism is linked

to local foods [26], it is also linked to the rural landscape, as stated in Aybar [27]. Thus, in the Spanish interior regions, the gastronomic sector is progressively gaining in popularity and tourists' activities are becoming more important. One of the most representative products of Spanish food is olive oil. It is a symbol of its gastronomic wealth and a product of quality bearing the Protected Designation of Origin (PDO) certificate.

Nevertheless, olive cultivation makes the population highly dependent on the evolution of income from olive production [28]. The result of this high dependence produces uncertainty among families, as their incomes will depend on the unpredictability of the quantity and quality of the annual production. This uncertainty is mainly related to annual climate changes. The effects of this uncontrollable factor are exacerbated by the seasonality of the olive harvest that concentrates the work and income of the whole year into a few months. To deal with the decrease of production and resulting income loss, complementary activities, which represent a sort of symbiosis between the agriculture and tourism sectors, have been created in these regions [29].

These complementary activities revolve around features of the olive oil production, such as the almazara (oil mill), olive groves and millenary olive trees. Millan et al. [28] define the oleotourists as individuals who travel in their leisure time, away from their habitual residence, to deepen understanding of olive growing and olive oil. Visiting its place of production, knowing how olive oil is produced and oil tastings, are more and more in demand, becoming a type of tourism, oleotourism, with strong potential in Spain, and specifically in Andalusia [30]. This new offer therefore falls within the framework of new types of tourism, consistent with the desires of the modern tourists, who place importance on taking part in different experiences during their travels. In addition, these activities generate new requirements to satisfy the oleotourist demand, which generate the production chain of oleotourism (Figure 1). Thus, as noted previously, oleotourism may foster new economic activities that improve the conditions of the rural population.

Figure 1. Schema of the chain of production of oleotourism.

However, concrete measures are required to support both sectors (agriculture and tourism), in order to achieve a symbiosis between the gastronomic product and tourism, leading to socio-economic development of these areas. Thus, it is essential to understand the motivation of people who demand this type of tourism and to determine which factors influence its demand, so that appropriate measures can be implemented to accommodate supply to new demand and thus avoid creating imbalances between them. In that regard, it is worth noting that there is no single profile of the gastronomic tourist, as these individuals differ depending on the type of product. Thus, the enological tourist, for example, does not share the same characteristics as the oleotourist [31].

The objective of this study is to delve into the oleotourism characteristics in Andalusia, the Spanish region where olive production is mainly located. On the one hand, the study identifies Andalusia's oleotourism offer, according to the profile of oleotourists and the strengths and weaknesses of the oleotourism sector in the region. On the other hand, the study forecasts the evolution of the demand to offer a sustainable product, best suited to demand. With this aim, three techniques are applied in this study. Firstly, a random survey addressed to oleotourists in Andalusia was undertaken during 2016 and 2017 to determine the characteristics of oleotourists. This survey not only enlarged previous literature, related to the profile of oleotourists in Andalusia in a more recent period [32,33], but also considered a wider perspective by including questions related to travel expenses, number of overnight stays and tourist knowledge of the olive oil culture. Secondly, a SWOT (strengths, weaknesses, opportunities, and threats) analysis was performed to evaluate the strengths and weaknesses of the oleotourism sector in the region. Finally, a seasonal ARIMA (autoregressive integrated moving average) model

was estimated and the oleotourist demand was forecast. It is worth noting that these two analyses are linked. The results from the SWOT analysis may inform about the weaknesses and strengths of the sector, which could ultimately induce economic actors to adequately promote the sector. However, they would not act without knowing the evolution of the olive tourism. The economic actors will not risk their money without knowing or previously estimate the possible benefits from their investments. To estimate these benefits, they need to know the future evolution of tourism demands.

2. Literature Review

Some previous studies have been undertaken related to oleotourism and its demand, although different terms have been used to define the relationship between tourism and olive oil. For example, as stated in Lopez-Guzmán et al. [34], terms such as olive tourism, olive oil tourism, olive-based agritourism and oleotourism have been used before. Nevertheless, most studies have been using the term oleotourism to refer to this relationship.

Earlier studies in this field were conducted by Alonso [35] and Alonso and Northcote [36]; both being related to oleotourism in Australia. These studies have subsequently been extended to other countries, mainly Spain, Italy and Greece. Among the first should be mentioned the study by Murgado [37] analyzing the state of olive oil tourism in Spain. The author concludes that tourist routes are poorly developed, due to low marketing and management development. Moreover, the study by Ruiz et al. [38] shows the impacts that the olive oil tourism could have on the Spanish tourist industry by conducting a series of surveys of academic teachers and some professionals in the area. The authors consider that the potential of this type of tourism is high, although it could be limited by lack of knowledge of the olive oil culture, as many tourists do not know the traditional olive oil production processes. In this way, the surveys' respondents consider that visiting the place only for this reason is not enough. Therefore, the authors consider it appropriate to link it to other rural or cultural activities. In a similar study which also referred to the Spanish tourist industry, Molina et al. [39] indicate that the practice of oleotourism has emerged as an area similar to the practice of wine tourism, acquiring a high potential within rural tourism.

Additionally, the study by Campón-Cerro et al. [10] proposes a tourism management model for the olive grove areas in the South of Spain. Likewise, the study by Millán et al. [40] analyzes the strategies that the tourism sector could put into practice to convert olive oil into a benchmark for culinary tourism. In this sense, the authors consider that it could be advantageous to encourage the coordination of public and private institutions to promote culinary tourism. Among those related to Italy, the study by De Salvo et al. [41] developed a theoretical contextualization of oleotourism in the gastronomic tourism, and compared the experiences of extra virgin olive oil enhancement and promotion in Italy and Spain, using the technique of benchmarking. Additionally, in the study by Sabbatini et al. [42], a logistic regression is estimated with the aim of studying the tourists that decide to buy olive oil in Crete.

In addition to these papers, some recent ones have focused on the socio-demographic profile of tourists interested in learning about the production of olive oil, and their motivation to visit the olive oil areas. Among these, the study by Cañero Morales et al. [32] analyzes olive oil tourism from a demand point of view, by focusing on the motivation and satisfaction of visitors to museums, interpretive centers and olive oil mills, in the provinces of Cordoba and Jaen, the most important area in the world for olive oil production. The study by López-Guzmán et al. [34] also analyzes the socio-demographic profile of oleotourists in the same geographical areas of Andalusia. Likewise, the study by Aguera et al. [33] analyzes the socio-demographic profile of tourists and their activities, motivations, assessments and levels of satisfaction with the trip, in the same area. The results of these studies are very similar. In fact, these studies are all based on the same sample, on 414 surveys taken in 2014. The studies indicate that the socio-demographic profile of oleotourists is an adult, with a significant level of education and upper middle class. The main reasons for visiting places related to olive oil are: getting to know the geographical area, learning about olive oil, and eating and

drinking traditional products. Likewise, the studies pointed out that tourists mostly valued hospitality, environmental conservation and cultural activities.

In addition to these studies, Millán and Pérez [31] analyze the similarities between the profiles of wine and olive oil tourists to examine the commercialization possibilities between the two groups. The study shows that the socio-demographic profiles of wine and olive oil tourists are similar. The tourists are adults with a medium-high level of education. Nevertheless, the wine tourists have higher income level. Likewise, in both cases, only a small percentage of tourists come from outside Spain. The main reason for the trip is to visit the winery or the oil mill. Mostly, they were satisfied with their visit, although the percentage of wine tourists that would repeat the trip is considerably greater.

These previous studies have focused mainly on the socio-demographic profile and the motivations of the tourists that visit the geographical areas related to olive oil. Nevertheless, little has been said about the travel characteristics of oleotourism, as for example travel expenses and stays, and the tourists' knowledge of olive oil. Knowing the duration of the trip, number of stays and the average daily cost is of special interest for entrepreneurs in the area, who have to make economic valuations of possible tourist activities. Likewise, knowing the oil culture is also relevant, since it allows analyzing if the visitors already have a previous oil culture. This is pertinent because, as noted above, some tourists may not be interested in visiting an oil mill if they are not previously familiar with olive oil. Therefore, following these previous papers, this study aims to expand on these questions. Additionally, this study goes beyond the previous papers, since it not only analyzes the profile of tourists, but also evaluates the strengths and weaknesses of the oleotourism sector in the region and forecasts its demand.

3. Materials and Methods

3.1. Area of the Study

Andalusia is the geographical area of this study. Spain is the world's leading producer and exporter of olive oil with the 2015–2016 harvest yielding 1,393,572 tons, corresponding to 60% of world production, with 700,000 tons exported [43]. Production is mainly located in Andalusia. As shown in Figure 2, its olive cultivation surface area represents 60.2% of the total in Spain in 2016. In addition, there are 31 PDO certificates of virgin and extra virgin olive oil, 14 of them located in Andalusia, as shown in Figure 3.

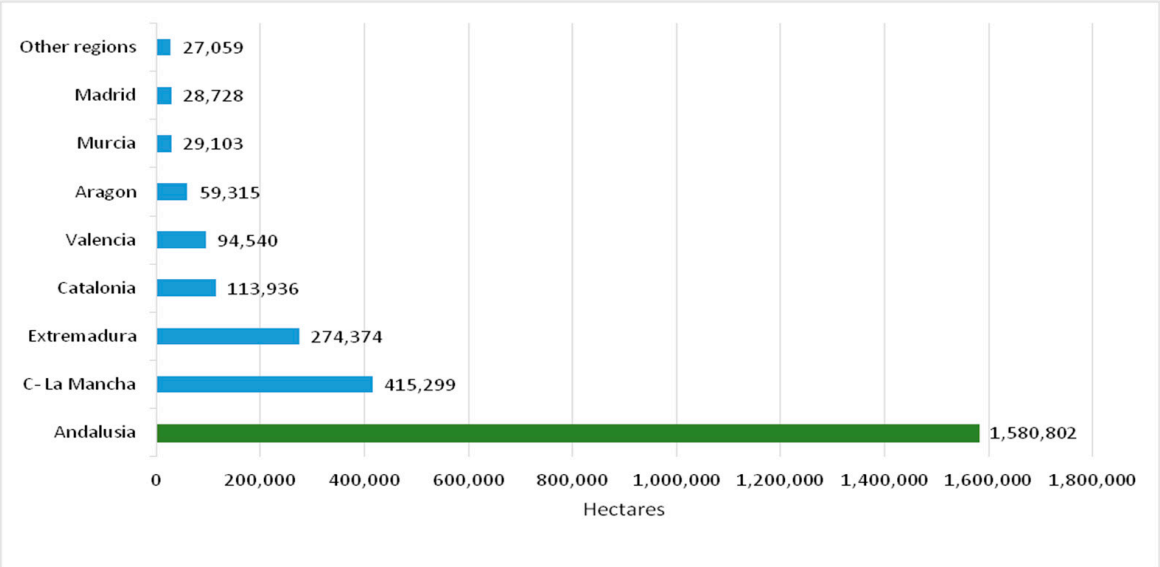

Figure 2. Olive growing surface areas in the Spanish regions in 2016. Source: Own elaboration from MAGRAMA [43].

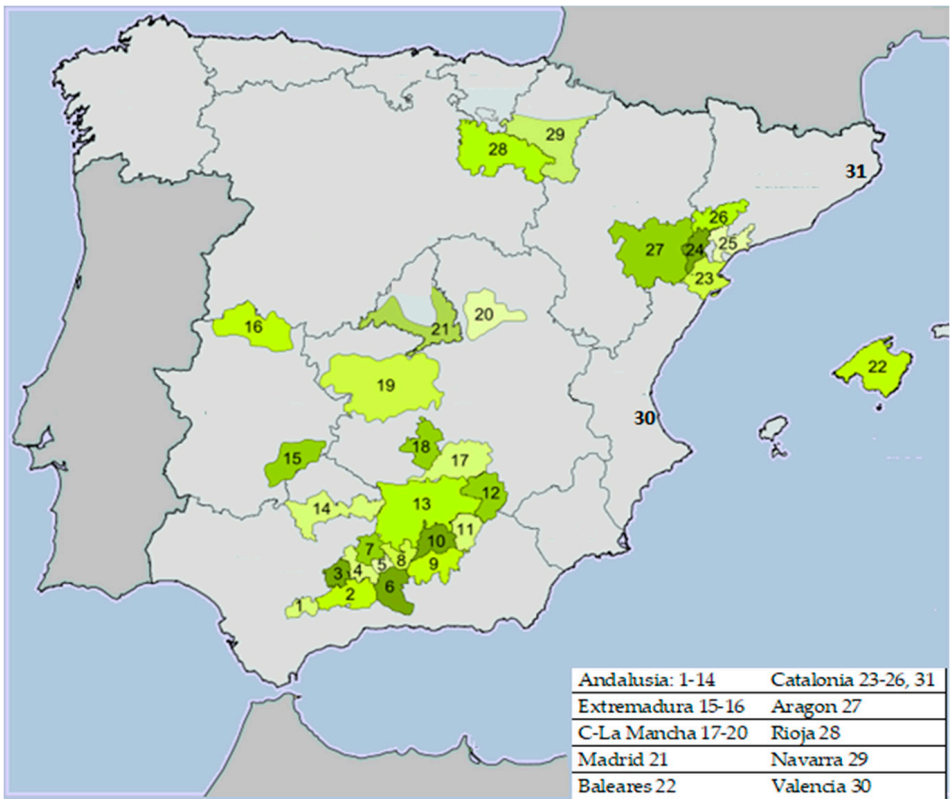

Figure 3. Location of the olive oil Protected Designation of Origin certificates.

Likewise, Andalusia also possesses the highest number of olive resources in Spain, as shown in Table 2. Olive oil related activities are the main economic resource for more than 250,000 families in more than 300 Andalusian municipalities. Therefore, Andalusia can be considered representative of the olive oil tourism sector and thus serve to determine the profile of oleotourists and anticipate the demand of the sector.

Table 2. Number of olive resources by the Autonomous Communities of Spain in 2014.

Autonomous Communities	Almazaras (Oil Mills)	Packaging	Orujera *	Refineries	Packaging/Curing	Laboratories
Andalusia	818	669	39	15	242	349
Aragon	103	108	1	1	37	16
Balearic Islands	9	19			3	88
Castile-La Mancha	252	240	9	3	10	1
Castile and Leon	19	19			9	55
Catalonia	197	221	6	4	28	39
Extremadura	119	115	7		104	9
Galicia	3	4				
Madrid	20	25			17	13
Murcia	40	42			16	3
Navarre	17	18	1	1	4	3
Basque C.	4	5			2	1
La Rioja	22	25			2	32
Valencia C.	133	133			13	8
TOTAL	1756	1643	63	24	487	617

Source: Own elaboration from MAGRAMA [43]; * Crude olive pomace oil extraction industry.

3.2. Methodology

To analyze the demand of oleotourism in Andalusia, three techniques are applied in this study. The first technique is quantitative. It is based on a random sampling obtained using a questionnaire addressed to oleotourists in Andalusia. The technical data of the survey are provided in Table 3.

Table 3. Technical data of the survey.

Population	Male and female tourists 18 years of age or more on a visit to the PDO
Sample size	564 valid questionnaires
Margin of error	±4.6%
Level of confidence	96%; p = q = 0.5 *
Sampling system	Simple random
Fieldwork dates	September 2016–February 2017

* To calculate the sample size needed, $Z_a{}^2pq/d^2$ is used, where Z_a is the level of confidence, p and q are the success and failure probability, respectively, and d is the margin of error.

The design of the questionnaire consisted of 27 questions with dichotomous answers, Likert scales (values from 1 to 10, where 10 is the best and 1 the worst), and open responses along the lines of the following five sections:

- Oleotourist socioeconomic profile: gender, age, educational level, family status, monthly income, etc.
- Itinerary characteristics: price, how one learned of it, where purchased, etc.
- Assessments and opinions on the itinerary: accommodation, restaurants, roads, signage, customer care, etc.
- Degree of satisfaction with the product: visits to oil mills, oil tasting, visits to millenary olive trees, etc.
- Knowledge of olive oil: habitual olive oil consumption, distinguishing between virgin and extra virgin olive oil, etc.

The second technique is qualitative. It is based on a SWOT analysis and evaluates the strengths and weaknesses of the oleotourism sector in Andalusia based on the threats and external opportunities. This analysis was founded on 102 interviews conducted with people in business (oil mill, hotel and restaurant executives), representatives of public entities (councils, rural development groups, and regulatory councils of PDO certificates) and associations from the rural world linked to olive oil production. The survey consisted of 25 questions grouped into three blocks. The first block consists of several closed questions about the type of company, personnel and production. The second block consists of Likert scales questions (values from 1 to 5, where 5 is the best and 1 the worst) about the valuation of olive oil tourism in the area. The third block consists of open questions. The respondents were able to comment on their oleotourism experience and on the threats, opportunities, strengths and weaknesses that they appreciated.

The third technique attempts to determine the oleotourist demand in Andalusia, based on a sampling (96 data) collected from January 2009 to December 2016. The Box–Jenkins (BJ) methodology [44], technically known as the autoregressive integrated moving average (ARIMA) model, is applied to carry this out. According to Gujarati [45], the virtue of this predictive method is not in the construction of uniequational models, or simultaneous equations, but in the analysis of the probabilistic or stochastic properties of the economic time series themselves, in this case, the number of oleotourists in Andalusia. This was undertaken following the philosophy of "to let the information speak for itself". Unlike regression models in which the number of oleotourists variable can be explained by other regressors, such as income, in time series models (BJ), the number of oleotourists variable is explained by past or lagging values and by stochastic terms of error.

According to Chu [46], ARIMA models have been widely used in forecasting tourism demand. In addition, several variants of the ARIMA modeling approach have also been applied in most of the post-2000 studies that used forecast techniques with time series [47]. In this regard, several previous studies have shown that the ARIMA model and its variants obtain good results in the forecast of tourist demand and, in most cases, exceed other time series methods, such as the periodic autoregressive model [48,49], the moving-average and exponential smoothing models [50] and the multivariate adaptive regression splines [51].

Among the ARIMA models, seasonal ARIMA (SARIMA) models have been quite popular within the tourism literature [52]. Some recent SARIMA model estimates can be found in the literature (e.g., [52–54]). The stationary ARIMA models consider the mean of the series constant over time, and the correlation function depends on the delay, and not on the time, in which it is calculated. However, time series, in addition to random, cyclical and seasonal variations, present trends and seasonal components (the mean varies over time and seasons), which means that stationary processes are not sufficient for modeling. For this reason, SARIMA models are introduced, which make it possible to eliminate the trend and seasonal component.

Therefore, taking into account the advantage of using the ARIMA model to forecast tourism demand, the goodness of the SARIMA model which performs reasonably well for forecasting tourism demand [55], and the frequent use in these types of studies, the model used in this study to forecast the oleotourism demand is the univariate SARIMA (p,d,q) × (P,D,Q)s model, where p denotes the number of autoregressive parameters, d denotes the degree of integration, q denotes the number of moving average parameters and s is the period of seasonality. The SARIMA model may be defined as follows:

$$\begin{gathered} \varphi(B)\,\Phi(B^s)\,Z_t = \theta(B)\,\theta(B^s)a_t \\ Z_t = (1-B)^d\,(1-B^s)^D\,Y_t{}^{\lambda} \end{gathered} \quad (1)$$

where Y is the oleotourist demand, λ is the correction of the tendency of variance of the series, B is the "backshift operator" or lag operator, B^s means backshift s times, d and ^{D} denote the non-seasonal and seasonal differencing, respectively, and Z_t is the stationary series. In addition, the ordinary autoregressive and moving average components are represented by polynomials φ(B) and θ(B) of orders p and q, while the seasonal autoregressive and moving average components are $\Phi(B^s)$ and $\theta(B^s)$, with P and Q being their orders.

Once the model is estimated, the sample autocorrelation is examined, based on the Ljung–Box Q-statistics. The Ljung–Box Q-statistics have been used in previous studies (e.g, [56,57]). Likewise, the model was validated through the autoregressive conditional heteroskedasticity (ARCH) test, as previously made in tourism studies (e.g., [53,58]). The ARCH model is suitable for modeling the volatility of a series. To detect the presence of ARCH effects, traditional Ljung–Box statistics are used in the correlograms of the residuals of the equation of the mean and the squared residuals. It also uses a Lagrange multiplier test. Therefore, this test implicitly includes the previous Ljung–Box Q-statistics. Finally, it has also been verified whether the series is stationary, since the application of the ARIMA methodology requires the use of stationary economic series in variance and on average. When a series is not stationary on average, i.e., when it is not integrated zero order I (0), it has at least one unit root. When this happens, it is possible to obtain a stationary series by means of differencing the original series. To test the presence of unit roots, the Augmented Dickey–Fuller seasonal unit root test is performed. Previous studies, such as that by Goh and Law [49], have also used this test to analyze the series integration order.

4. Results

4.1. Univariate Results

The results show that the socio-economic profile of an oleotourist is male (56.7%) and over 45 years of age (57%), the number of tourists decreasing with age. In addition, oleotourists mainly have medium level studies (84.5%), with an income level between €1001 and €2000 per month (44.2%), married (51.4%) and from Andalusia (48.9%). It is also worth noting that only a small percentage of oleotourists come from outside Spain (8.2%).

With regard to the characteristics of the itinerary of this type of tourism (Table 4), it is noteworthy that 63% of the respondents did not spend the night in the area, due to deficient hotel infrastructure and the proximity of their residence. They usually travel as a family (40.1%) or with friends (42%), and spend around €36–€50 per day (53.3%). Furthermore, many of these oleotourists are willing to return to the area, due to their high degree of satisfaction with visits to the mills. In fact, the visit

to an oil mill is the main motivation of oleotourists (48.3%), as they desire to learn more about the process of manufacturing the product. These factors could therefore generate wealth in these areas by creating jobs in the restoration and crafts sectors, as more than 35% of the tourists did not purchase souvenirs (ceramics, typical local products, etc.), the main reason expressed by the respondents in an open question being the absence of specialized souvenir shops.

Table 4. Itinerary characteristics and knowledge of the olive oil culture.

Characteristics			Percentages
Itinerary	Number of days	Less than 24 h	62.7%
		Between 2 and 3 days	29.1%
		More than 3 days	8.2%
	Average daily expenses	Less than €35	27.2%
		Between €36 and €50	53.2%
		More than €50	19.6%
	Souvenirs purchased	Yes	64.8%
		No	35.2%
	Alone or accompanied	Alone	17.9%
		Family	40.1%
		Friends	42.0%
	Motivation	Oil mill visits	48.3%
		Know the region	36.4%
		Visit millenary trees	5.4%
		Other	9.9%
	Satisfaction with the destination	Satisfied	83.2%
		Indifferent	10.7%
		Not satisfied	6.1%
Knowledge of olive oil	Consumption of olive oil	Daily	56.3%
		More than once a week	24.8%
		Occasionally	14.6%
		Does not consume	4.3%
	Knows the different varieties of olive oil	Yes	84.6%
		No	15.4%
	Type of olive oil consumed	Extra virgin	64.5%
		Virgin	35.5%
	Motivation to consume olive oil	Good for the health	48.9%
		For the taste it gives dishes	48.5%
		Other	2.6%

Regarding knowledge and use of olive oil (Table 4), 56.3% responded positively to a daily consumption in the kitchen. For this reason, olive oil is considered a key element in Mediterranean cuisine. In addition, 64.5% responded positively to consuming extra virgin olive oil, which is of a higher quality than virgin olive oil. Motivation for consuming olive oil is divided between health reasons (48.9%), and its exquisite taste (48.5%).

An essential element for the success of a tourism product is its rating by the tourists themselves. Figure 4, which shows a comparative assessment of the olive oil itineraries with respect to rural tourism in Andalusia, suggests that the aspects to be improved are leisure and entertainment (with a scoring of 4.7/10) as there are few options for staying overnight. There is little rural accommodation and few hotels, and all are below the three-star rating. It is apparent that entrepreneurs hesitate to invest in infrastructure if they are not guaranteed a minimum stay to amortize their investment.

The signage and information on itineraries also require improvement, as certain oil mills are hidden away and difficult to access, leading many tourists to lose their way. The 7.3/10 rating of the olive oil mill visits indicates that tourists consider the sites to be in good condition, although, in some cases, the individuals offering the explanations of the production process to the tourists were mill workers and not qualified guides. This is one of the main handicaps of the itineraries, as these individuals are not able to explain the manufacturing process in English, a drawback to attracting foreign tourism.

On a positive note, oleotourists gave a high rating (9/10) to their reception in the mills, higher than the score attained by rural tourism (8.6/10). With regard to the quality of the tourism offered by landscapes and Natural Parks, the score of 8.6 for oleotourism should be regarded within the context that the olive growing region in Andalusia includes a national park (Doñana), and 11 natural parks (Sierra de Hornachuelos, Sierra de Grazalema, Sierra Magina, Sierra de las Nieves, Sierras Subbeticas, Los Alcornocales, Sierra de Aracena and Picos de Aroche, Sierra Nevada, Sierra Norte de Sevilla, Sierras de Cazorla, Segura and Las Villas, Sierras of Tejeda Almijara and Alhama) that are very near the mills. Hence, this supposes a joint tourism offer combining nature and gastronomy tourism.

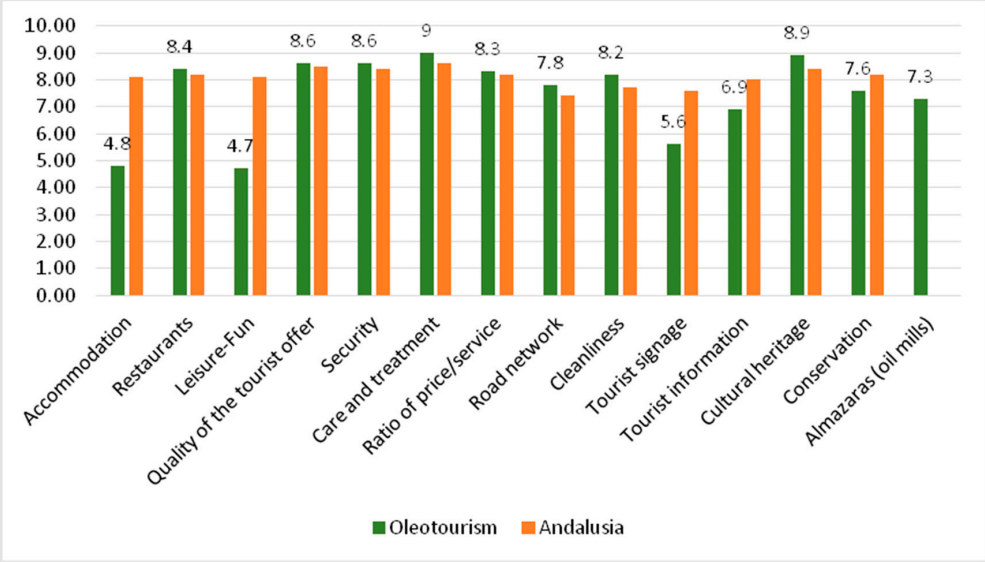

Figure 4. Evaluation of the Olive Oil Itinerary compared to General Tourism in Andalusia.

4.2. Results of the SWOT Analysis

The SWOT analysis, summarized in Figure 5, leads to the following conclusions:

Strengths:

- A good road and rail network connected with the rest of Spain.
- The oil and wine itineraries tend to pass through areas conducive to other activities: hiking, hunting and fishing, etc.
- Access to an important number of sites of artistic and monumental heritage.
- Access to festivities and cultural activities (carnivals, Easter, pilgrimages, flamenco festivals, etc.) throughout the year.
- There is a great regional tourism tradition with much experience in the sector.
- Little dependence on favorable climatic conditions to carry out many of the rural activities.

Weaknesses:

- Inadequate hotel infrastructure at certain times of the year (rural houses and rural hotels).
- Inadequate training of the sector's workers and entrepreneurs.
- Absence of awareness about this potential source of income that is beyond that of agriculture.
- Little co-ordination between the actions promoted by the tourism sector and that of the other sectors (lack of a strategic vision).

Opportunities:

- Progressive increase of consumers demanding higher quality and willing to pay higher prices for local products that are organic and/or bear the Protected Designation of Origin label.

- An increase of free time among potential tourists which promotes the development of an important free time and/or leisure industry.
- A change in the habits and values of individuals resulting in a new sensitivity as to what sustainable rural tourism represents (experiences in a rural/natural and traditional environment).
- An obvious saturation of traditional destinations (such as sun and beach).
- The increase in awareness of rural communities where development does not depend on exogenous elements, but on mobilization of local resources.
- Public policies to promote rural development initiatives such as the LEADER (*Liaison Entre Actions de Développement de l'Économie Rurale*) I and II, PRODER (*Programa Operativo de Desarrollo y Diversificación Económica de las Zonas Rurales*) and FEDER (*Fonds Européen de Développement Économique et Régional*) programs or the Olive Tree Law in Andalusia.

Threats:

- The lack of entrepreneurs.
- Lack of experience in the marketing of this type of tourism.
- Limited access to finance for small and medium-sized businesses in the sector.
- Existence of seasonality in the sub-sector depending on production (although compensated by complementary activities).
- The economic crisis that reduces the number of tourist visits and spending.
- Certain individuals still link sustainable rural tourism, and gastronomic tourism in particular, with high income (luxury items).
- Persistence of environmental pollution problems that project a negative image to the population and the tourists that visit certain areas.

In general, it is observed that oleotourism has many opportunities to become a suitable tourist activity for rural Andalusia. Both the tourist's tendency to look for open spaces and new types of activities, as well as the positive attributes of the Andalusian rural environment, with green spaces, an inherited culture and adequate basic means of infrastructure, that allow the development of oleotourism. However, some elements hinder, or may hinder, its suitable development. The lack of entrepreneurs and training of the rural population, as well as the lack of trained people to put new tourist programs into operation, can limit the capacity for development. Likewise, the difficulties of access to finance for entrepreneurs can limit the development of these activities and the creation of basic infrastructure, such as hotels, that would reinforce the potential benefit for rural areas of Andalusia.

STRENGTHS	**OPPORTUNITIES**
1. Communication networks 2. Natural Parks 3. Increase in associations 4. Artistic and monumental heritage 5. Yearly festivities and cultural activities	1. Increase of consumption of certified quality organic products 2. More public administration aid for heritage and rural tourism development 3. Saturation of traditional destinations and increase of importance of interior tourism 4. More free time
WEAKNESSES	**THREATS**
1. Poor hotel infrastructure 2. Inexperience of the tourism sector 3. Lack of potential for development awareness 4. Lack of integrative strategic vision	1. Insufficient tourist training in the companies of the tourism sector 2. Seasonality of oleotourism 3. Deterioration of the environment, native flora and fauna due to fires and uncontrolled dumping

Figure 5. Strengths, weaknesses, opportunities, and threats analysis of oleotourism in Andalusia.

From the interviews carried out to prepare the SWOT analysis, it is observed that the entrepreneurs and the members of cooperatives, who until now have been exclusively dedicated to the production of the olive grove, consider that the incorporation of this activity, oleotourism, is a new and interesting way to generate income and also an opportunity to supplement income in times where olive production is low. Nevertheless, in order to prepare their mills and their natural spaces to accommodate the tourist visits, they need to understand the tourism demand trends and be able to forecast future demand. Being an incipient and little commercialized activity where economic risks are high, and the benefits unknown, many entrepreneurs prefer not to become involved in it. To try to limit this uncertainty, it is desirable to estimate demand for oleotourism, with the objective of quantifying the evolution of this tourism segment.

4.3. Results: Estimating the Demand for Rural Tourism in Andalusia for 2017

Adapting an almazara for tourist visits requires an economic investment by the entrepreneur, due to the need to upgrade the infrastructure to meet standards of safety, and to train the personnel as guides to explain the techniques of oil production and the characteristics of the oil to the visitors. It is therefore necessary to estimate the potential demand of oleotourism to decide if the investment will yield a profit.

This study is based on the monthly number of oleotourists visiting oil mills in Andalusia between January 2009 and December 2016. To model the number of oleotourists, equation (1) is used. The demand for oleotourism in Andalusia, called "Oleotourism" in the model, is a variable with a tendency of variance which is corrected by the Box–Cox transformation $\lambda = 0.3$ (Oleotourism1 = oleotourism$^{0.3}$), and the tendency in average and cycle were corrected with a differentiation of average and cycle. The estimate results are shown in Table 5. Therefore, the estimated model of the forecast of monthly oleotourism demand in Andalusia is as follows:

$$(1 + 0.338695B^{12})\ (1 - B)1\ (1 - B^{12})1\ \text{Oleotourism}^{0.3} = (1 + 0.977792\ B^{12})a_t$$
$$t\Phi 1 = -7.52\ *$$
$$t\theta 1 = -59.35\ *$$
$$*\ \text{Significant parameters}\ \alpha = 0.05$$

Table 5. Estimate of oleotourism demand in Andalusia: Seasonal autoregressive integrated moving average SARIMA $(0,1,1) \times (0,1,1)_{12}$.

Dependent Variable: D(OLEOTOURISM1,1,12)				
Variable	**Coefficient**	**Std. Error**	**t-Statistic**	**Prob.**
AR(12)	−0.338695	0.044980	−7.529977	0.0000
MA(12)	0.977792	0.016474	59.35276	0.0000

Figure 6 shows the oleotourism demand forecast obtained by using the SARIMA $(0,1,1) \times (0,1,1)_{12}$ model. The green line shows the stationary series real data, the red line shows the estimate values of oleotourism demand, and the blue line shows the residues. Most are within the interval of ± 2 times its standard deviation.

All estimate coefficients were found to be statistically significant and, based on the Ljung–Box Q statistics, there was no evidence of autocorrelation. Table 6 shows the Q-statistic probabilities adjusted for 2 **autoregressive–moving-average** (ARMA) terms. This correlogram measures whether the residuals of the estimated SARIMA model are independent. The last column (Prob.) shows that most Q-statistic probabilities are higher than 0.05, indicating that the null hypothesis of non-relation of model errors (no autocorrelation) cannot be rejected, except for some of the first residuals (3°, 4° and 6°).

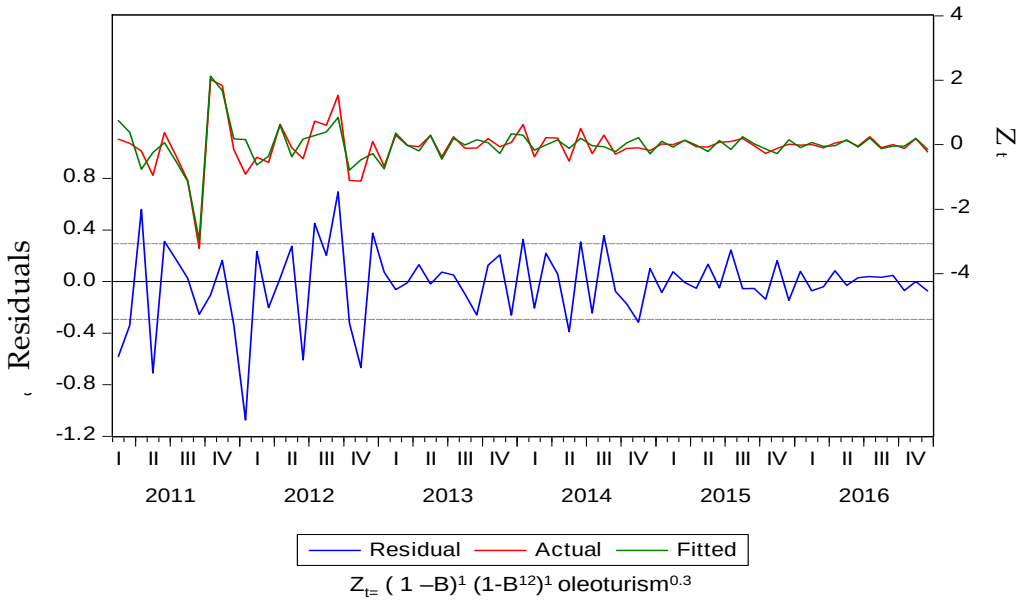

Figure 6. SARIMA $(0,1,1) \times (0,1,1)_{12}$ residuals.

Table 6. Q-statistic probabilities adjusted for 2 **autoregressive–moving-average** (ARMA) terms.

	Autocorrelation	Partial Correlation	Q-Stat	Prob.
1	−0.025	−0.025	0.0468	
2	−0.250	−0.251	4.7444	
3	−0.125	−0.149	5.9386	0.015
4	−0.042	−0.127	6.0628	0.048
5	0.149	0.074	7.7955	0.051
6	−0.174	−0.245	10.221	0.037
7	−0.148	−0.072	11.454	0.051
8	0.051	−0.069	11.664	0.070
9	0.096	−0.010	12.437	0.087
10	0.065	−0.023	12.796	0.119
11	−0.066	−0.030	13.170	0.155
12	−0.018	−0.016	13.198	0.213
13	0.120	0.086	14.477	0.208
14	−0.165	−0.212	16.943	0.152
15	−0.119	−0.112	18.255	0.148
16	0.085	0.027	18.931	0.168
17	0.078	−0.006	19.517	0.191
18	0.151	0.099	21.744	0.152
19	−0.170	−0.103	24.612	0.104
20	0.075	0.160	25.177	0.120
21	0.144	0.081	27.320	0.097
22	−0.023	0.052	27.374	0.125
23	0.074	0.211	27.964	0.141
24	−0.046	−0.034	36.312	0.098
25	−0.027	0.025	36.394	0.058
26	−0.148	0.072	37.672	0.051
27	0.009	0.069	37.682	0.050
28	−0.021	−0.036	37.736	0.064
29	−0.046	0.009	37.992	0.078
30	0.046	−0.001	38.255	0.094
31	−0.026	−0.119	38.343	0.115
32	0.003	0.059	38.345	0.141

In addition, the results of the ARCH tests and augmented Dickey–Fuller unit roots tests are shown in Tables 7 and 8, respectively. Table 7 shows the absence of autoregressive conditional heteroskedasticity. The unit root tests indicate that differencing was required. Table 8 shows that, after differencing the series, this becomes stationary.

Table 7. Heteroskedasticity Test: Autoregressive conditional heteroskedasticity

F-statistic	1.931435	Prob. F(1,68)	0.1691
Obs * R-squared	1.933329	Prob. Chi-Square(1)	0.1644

* Absence of autoregressive conditional heteroskedasticity.

Table 8. Unit Root test.

		t-Statistic	**Prob. ***
Augmented Dickey–Fuller test statistic		−2.561844	0.1050
Test critical values	1% level	−3.510259	
	5% level	−2.896346	
	10% level	−2.585396	

* MacKinnon (1996) one-sided *p*-values. Null Hypothesis: OLEOTOURISM1 has a unit root. Exogenous: Constant. Lag Length: 11 (Automatic—based on SIC, maxlag = 11).

From the estimate results shown in Table 5, it is possible to forecast oleotourism demand values. Figure 7 shows the real oleotourism demand from January 2009 to December 2016 and the forecast demand for 2017. It shows a growing trend in the oleotourism demand in Andalusia, with a strong seasonality in November and December, the highest demand coinciding with the time of olive harvesting.

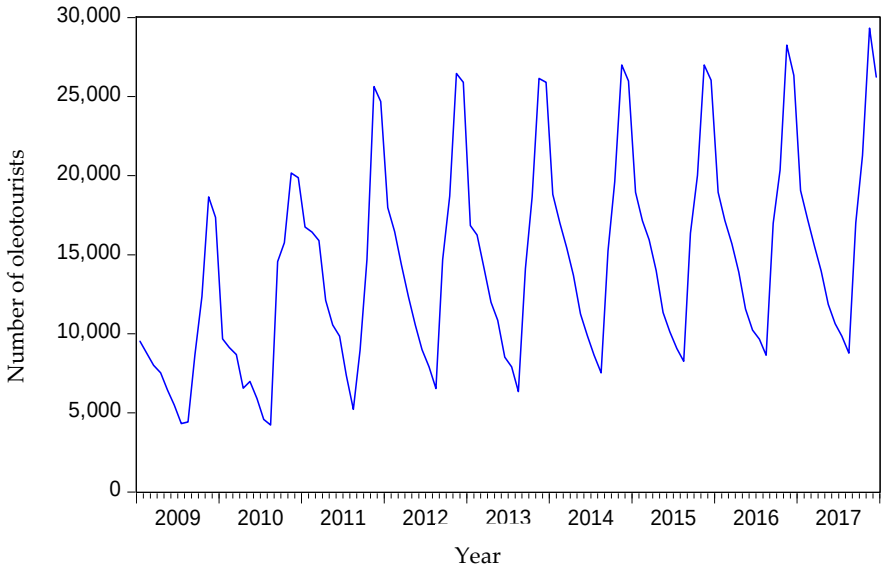

Figure 7. Number of oleotourists in Andalusia. Real data from 2009 to 2016. Forecast demand for 2017 according to the SARIMA model estimate.

The model led to the monthly forecasts for 2017 listed in Table 9. Results indicate that the oleotourism growth trend is on a slight rise (1.5%), with an increase of 3024 tourists taking part in oleotourism, compared to 2016. These results are lower than the expected growth of rural tourism (4.5%). The results also reveal a marked seasonality in the months of October, November and

December, corresponding to the harvest and processing of the olive. Oleotourism is more attractive in these months as the productive process can be directly observed with the mills at full capacity.

Table 9. Forecast of the oleotourism demand in Andalusia for 2017 as compared with 2016 (number of tourists).

	Year 2016	Year 2017
January	18,956	19,051
February	17,169	17,245
March	15,687	15,538
April	13,896	13,956
May	11,563	11,864
June	10,231	10,635
July	9653	9846
August	8642	8764
September	16,987	17,023
October	20,354	21,269
November	28,254	29,325
December	26,345	26,245
TOTAL	197,737	200,761

5. Discussion

Oleotourism can be an expression of sustainable gastronomic tourism, as it possesses all the defining characteristics, and serves as an effective tool of economic diversification in many of the olive oil production regions of Andalusia that are dependent on the primary sector.

The findings of this analysis indicate that the degree of satisfaction of tourists visiting areas of olive oil production is high, and that oleotourism has a strong potential, in line with the results shown in the study by Molina et al. [39]. In that sense, previous studies, such as by Cañero Morales et al. [32] and Agüera et al. [33], have shown that higher scores are related to hospitality, conservation of the environment and cultural activities and entertainment. Our results are in line with those obtained in these studies, as the higher scores are related to hospitality and cultural heritage. In addition, the tourist profile obtained in our study is also quite similar to that obtained before [32,33], as the main visitors are seniors with income greater than €1000 per month. Nevertheless, in our study, the visitors' expenses are also analyzed, which are in the range of €36–€50 per day. This value could be considered low, as the average daily expenditure made by tourists in Andalusia in 2016 was €64.80 [59]. It should also be noted that this value can also be considered lower than that of inland tourism in the area since, according to the Consejería de Turismo and Deporte [60], this is an average daily expenditure of €66.80. In that sense, it is worth noting that the income level of the oleotourists is found to be lower than other types of tourists, for example wine tourists in the study by Millán and Pérez [31]. Likewise, it is also worth noting that the average number of overnight stays for inland tourism is 5.7 nights, while most oleotourists do not spend the night in the area.

In addition, the study results reveal that although this type of tourism has great growth potential (since its evolution is increasing, as evidenced by the seasonal ARIMA model), oleotourism would not attain the projected rise in rural tourism in Andalusia. Some of the factors that could explain this fact are the lack of hotel infrastructure, the lack of promotion of olive oil itineraries, the lack of training of employees, and, the lack of entrepreneurs from the olive sector. Moreover, the lack of awareness of the local population of its potential and the different aspects related to sustainability are important deficiencies for oleotourism development. As stated in Murgado [37], there is low marketing and management development.

In addition, as stated in Ruiz et al. [38], the lower tourists' potential growth could also be related to the lack of knowledge of the olive oil culture of potential tourists. In fact, it is worth noting that most oleotourists are familiar with olive oil, know their varieties, and are frequent consumers. Therefore, greater promotion of olive oil culture would be advantageous, especially among foreign tourists,

to increase their knowledge and interest. In this regard, knowledge of the olive oil culture is lower than similar products such as wine. Thus, as stated in Millán and Pérez [31], while 75% of oleotourists knew different wine PDOs in the geographical zone, only 12% of enotourists knew of some olive oil PDOs.

In this line, the current oleotourism demand is very far from that of other similar products, such as enotourism. In that sense, it is worth noting that enotourism generates a total of 2,242,941 wine route visitors in Spain, most of them visiting the location of Penedes in Catalonia and Jerez in Andalusia, with a daily expenditure of €133.98 and 2.07 average days stay [61]. Therefore, combining itineraries of both offers could have great benefits and save costs, especially those for promotion in international markets, as these products are typical of the Mediterranean Basin and attractive to visitors with great purchasing power from Northern Europe, Germany, Netherlands, etc. Such a scenario would enable a complementary tourism offer, thereby increasing the number of overnight stays in rural areas and increasing daily expenditure. In addition, coupling its offer with different products would encourage investment in infrastructure such as rural road network improvements, accommodation, etc., resulting in the creation of more stable employment and income for residents.

It is worth noting that the forecast demand in this study is estimated by a SARIMA model. The main disadvantage of this type of model is that, being a univariate analysis, it ignores all causal relationships with other endogenous variables, and does not offer information regarding the behavior of explanatory variables. Therefore, it is the temporal stability of the set of causal factors that operate on the dependent variable, the key element on which predictions are articulated through time series [62]. Therefore, it cannot be known which changes may be positive for the increase of oleotourists in the future. Therefore, it may be advisable to carry out studies to analyze the evolution of oleotourism in relation to other economic, social or environmental variables linked to tourism in the area.

Finally, it should be noted that, despite its potential growth, oleotourism is not advocated to be the main source of income in the olive oil producing areas, but it may be a complementary means of income for this rural population. Therefore, it could be appropriate to promote sustainable rural oleotourism through environmentally friendly projects which generate wealth and employment over time, maintain and conserve the environment, and safeguard elements of the industrial heritage such as almazaras (oil mills). This tourism activity is not going to replace, but complement the agricultural sector. In doing so, it will require synergy between all the public and private agents, as well as the local community.

6. Conclusions

This study analyzes the oleotourism characteristics and trend in Andalusia. It identifies the profile of oleotourists, their motivations, their itinerary characteristics and their olive oil knowledge. It also analyzes the weaknesses and strengths of the sector. Finally, the study forecasts the evolution of the demand to offer a sustainable product, best suited to demand. With this aim, three techniques were applied in this study. Firstly, a random survey addressed to oleotourists during 2016 and 2017 in Andalusia was undertaken. Secondly, a SWOT analysis was performed. Finally, a seasonal ARIMA model was estimated and the oleotourism demand was forecast.

The results show that the socio-economic profile of an oleotourist is male, over 45 years, with medium level studies, with an income level between €1001 and €2000 per month, married and mainly from Andalusia. Most oleotourists did not spend the night in the area, travelled with their family or with friends, and spent around €36–€50 per day. The results also show that some aspects related to the oleotourism travel ought to be improved, mainly related to leisure and entertainment. In addition, information about itineraries and guides' explanations also requires improvement. Finally, improving accommodation is also recommended. On the other hand, the results show that oleotourists are highly satisfied with landscapes and natural parks.

The SWOT analysis reveals that oleotourism could become a suitable tourism activity for rural Andalusia. The elements that can boost oleotourism are the tourist's tendency to look for open spaces and the positive attributes of the Andalusia rural environment. The elements that can hinder the

oleotourism are mainly the lack of entrepreneurs, training of the rural population and people trained to put new tourist programs into operation. In addition, difficulties in accessing finance, high risks and unknown benefits can limit the development of these activities.

Finally, the results of the SARIMA model estimates indicate a growing trend in the oleotourism demand in Andalusia with a slight rise (1.5%), these values being lower than those expected for the rural tourism in the region. In addition, a strong seasonality is observed, especially in November and December, coinciding with the time of olive harvesting.

In general, the results indicate that oleotourism has a strong potential, although it would not attain the projected rise in rural tourism in Andalusia. In this sense, some policies could be undertaken to boost oleotourism, such as including oleotourism in the main tourist routes in rural Andalusia, focusing mainly on the foreign tourist. Combining oleotourism with other rural activities or visit offers could have a synergistic effect on demand. The increasing demand would also reinforce the expected profits, which could lead to rural investments, for example, in hotels or other services, which finally could increase the tourists' stays and satisfaction.

The lower growth of this type of tourism also makes it desirable to carry out future research comparing oleotourism with other types of rural tourism in the region, so that their differences between can be better understood, and therefore more appropriate specific policies could be applied. In addition, the evolution of oleotourism in relation to other economic, social or environmental variables linked to tourism in the area should be analyzed.

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