

Document downloaded from:

<http://hdl.handle.net/10251/190641>

This paper must be cited as:

Karanikolas, P.; Martinez Gomez, VD.; Galli, F.; Prospero, P.; Hernandez, PA.; Arnalte-Mur, L.; Rivera, M.... (2021). Food system integration of olive-oil producing small farms in Southern Europe. *Global Food Security*. 28:1-9. <https://doi.org/10.1016/j.gfs.2021.100499>



The final publication is available at

<https://doi.org/10.1016/j.gfs.2021.100499>

Copyright Elsevier

Additional Information

1 **Food system integration of olive oil small farms in Southern Europe**

2

3 **Abstract**

4

5 This study aims to identify the various forms of integration of olive oil producing small farms
6 (OSFs) into food systems in four Southern European regions, as well as to identify the most
7 beneficial strategies of integration. Drawing on data from SALSA Project, the study has found
8 that besides self-provision, OSFs are engaged in multiple types of integration, including
9 reciprocity relations, as well as relations with informal and formal markets. Multiple
10 strategies with synergistic effects co-exist at the farm/farm household level. Specific
11 territorial resources are partially mobilized by actors' strategies, consequently, olive oils'
12 identities are to some extent valorized on the markets, but less so through positive
13 externalities. Therefore, the unrealized potential of localization of the food systems in which
14 OSFs operate is identified.

15

16 **Keywords:** *small farms, olive oil, localized food systems, strategies, market integration,*
17 *Southern Europe*

18

19 **1. Introduction**

20

21 Olive tree cultivation has formed the Mediterranean landscape since ~~the~~-antiquity, and olive
22 oil is a hallmark of the Mediterranean diet and culture. Currently, 97% of all olive-oil is
23 produced around the Mediterranean, while four Southern European countries (Spain, Italy,
24 Greece, and Portugal) account for 69% of world production, with Spain by far exceeding all
25 other countries, holding 45% of world production (average production of the period 2009/10-

26 2018/19, see: IOC, 2019). In these countries, the majority of farms producing olive oil ~~are~~
27 ~~small, i.e., with~~ ~~have~~ ~~an~~ utilized agricultural area (UAA) less than 5 ha: 52% in Spain, 69% in
28 Italy, 70% in Portugal, and 84% in Greece (Eurostat, 2016).

29 Olive oil agri-food systems face a number of serious challenges, including a larger increase in
30 production than consumption in the medium and long term, an unbalanced negotiating power

31 in the value chains, with a myriad of producers, a shorter number of milling industries and a
32 handful of retailers with a significant market share, sometimes translated in unfair competition
33 practices as the product is sold to final consumers below the acquisition cost as a marketing
34 strategy, frequent price crises due to the alternate bearing pattern, the effects of climate
35 change that makes harvest more unpredictable than usually and increases the need for
36 irrigation in the dry areas where it is produced, as well as changes in agri-trade policies (Mili,

37 2010). Generally, the participation of small farms in modern food systems, is ~~seriously~~
38 ~~severely~~ constrained by factors such as the limited resource base, strict quality requirements,
39 minimum volumes of production and high costs of specific on-farm investments
40 (Rapsomanikis, 2015). Furthermore, small farms usually suffer from a scale mismatch in
41 comparison to other food system participants, in both the input and output sides (Vorley,
42 2003; McGullogh et al., 2008). Apart from these challenges and constraints, small farms
43 engaged in olive oil production run the risk of marginalization within an increasingly
44 consolidating system, in which, especially since the 1990s, more intensive forms of
45 cultivation are ~~constantly~~ ~~continually~~ expanding (Fernández-Escobar et al., 2013).

46 ~~A~~ ~~r~~ Remarkable literature ~~is~~ ~~develops~~ during the last years on the territorial dimension of food
47 systems. For example, in the perspective of ‘localized agri-food systems’ (originating in the
48 research on *Systèmes Agroalimentaires Localisés*), food systems ~~as~~ ~~are~~ rooted in specific
49 places and cultures and firmly attached to socially constructed territories (Bowen and
50 Mutersbaugh, 2014; Bérard and Marchenay, 2006). By considering a value chain as

Con formato: Resaltar

Con formato: Resaltar

Con formato: Resaltar

51 embedded into a territorial production system, this approach highlights the ability of local
52 food systems to generate positive externalities and public goods at both the value chain
53 and territorial levels (Arfini et al., 2019). Thus, ‘localization’ of food systems is
54 perceived as the process of utilization of specific territorial resources that are considered as
55 specific assets that influence the identity of food, and are seen as specific assets that~~which~~
56 support the valorization of the identity of agri-food products (Sanz-Cañada and Muchnik,
57 2016).

58 In the context of the above-mentioned challenges and characteristics, small farms engaged in
59 olive oil production try to achieve their goals through a series of strategies, including survival
60 or adaptation in adverse conditions, various forms of diversification, strengthening of their
61 business, intensification of production methods, etc. (Ilbery, 1991; Moran et al., 1993; Evans,
62 2009). Usually, the dual entity farm business/farm household uses more than one strategy in a
63 complementary way. Of particular importance for this study are the strategies of small farms
64 that aim at establishing a strong link of the olive oil with the territory in which it is produced,
65 in an effort to resist the ‘commodification’ of this product (see also Sanz-Cañada, 2009).

66 Based on a food system approach, the aim of this study is twofold. Firstly, to identify the
67 various forms of integration of olive oil producing small farms (OSFs) into food systems,
68 spanning from self-provision to reciprocity relations and relations with markets; secondly, to
69 identify the strategies adopted by the OSFs which are integrated into the food systems most
70 effectively. and contribute to the ‘localization’ of olive oil food systems. Drawing on data
71 from SALSA Project, the study conducts an analysis of OSFs in the Mediterranean regions of
72 Castellón (Spain), Lucca (Italy), Ileia (Greece) and Central Alentejo Central (Portugal).

73 The study comprises five parts. In the next section, the conceptual framework of the study is
74 exposed, along with materials and methods. The findings of the study are then presented, in

Con formato: Espacio Después: 0 pto

75 ~~two aspects of food systems: the first is the diversity of food systems and the second is the diversity of food systems. The diversity of food systems is the diversity of food systems.~~

76
77 **2. Conceptual framework, methods and data**

78
79 An impressive inter- and intra-regional diversity of food systems related to olive oil has been
80 detected. As a result of historical trajectories of the regional economies and various spatial
81 specificities, the four regions are highly differentiated in terms of farming systems, quality of
82 the product, relative importance of OSFs and small food businesses, scale of operations, as
83 well as interlinkages between food systems actors (for a more detailed description, see
84 Karanikolas et al., 2018a).

85 Moreover, as all farms, OSFs try to adapt to various constraints and opportunities and respond
86 to changing climatic, economic, policy and demographic conditions by adopting ‘survival
87 strategies’ (Whatmore et al. 1987), ‘paths of development’ (Bowler, 1992), ‘pluriactivity’
88 (Robinson 2013), ‘adaptation’, ‘adjustment’ and ‘development’ strategies (Marsden et al.,
89 1989; Mills et al., 2013; Andrade, 2015). These terms indicate a broad range of targets that
90 farmers try to achieve through their strategies. Scholarly research has indicated that one of the
91 main strategies, especially relevant for small farms, is the ‘territorial integration’ or ‘re-
92 grounding’ of farms into their territories, which is usually implemented in synergy with the
93 re-valorisation of small scale and proximity (Grando et al., 2019b; van Der Ploeg and Roep,
94 2003). Hence, we continue by identifying the strategies adopted by the OSFs, which are
95 integrated into the markets most effectively, as the integration of the food systems in question
96 is largely achieved through the markets. We argue that the effectiveness of this integration can
97 be demonstrated in two ways.

Con formato: Fuente: (Predeterminada) Times New Roman, 12 pto

98 World Bank. 2016. Farm Income and NFI. NFI is defined as the value of goods and services produced by the farm plus subsidies, minus cash expenses of the farm and
99 depreciation. The ratio of subsidies to NFI is an additional indicator of the vulnerability of a
100 farm to policy changes. Sales make up the bulk of total value of farm production, depending
101 on both the yield and the price received by the producer. Yields depend on several territorial
102 factors other than integration (e.g. natural factors: soil fertility, slope, level of land suitability
103 to growing crops). Yields are also affected by pests and diseases. Prices of farm products are determined by a number of factors, including the mode of sale, the mode of sale, the mode of sale,
104 sales through traders, cooperatives, producer groups, open-air markets, producer–consumer
105 networks, or other alternative channels; prices also reflect the bargaining power of food
106 system participants. More generally, the prices reflect the terms of integration of a particular
107 farm into the markets and the broader agri-food system.

109 NFI, or farm family income has been used as a key indicator for measuring the economic
110 sustainability of family farms. This is so, because, by covering all cash expenses and
111 depreciation, it ensures the reproduction of the productive system of the farm; also, it is a
112 good indicator for the standard of living of the farm household, because it measures the
113 returns to family labour, own capital, and management (Blank et al. 2009; Shadbolt et al.
114 2009; Dekker et al. 2011; Lontakis and Tzouramani, 2016). Thus,

115 Secondly, by examining the potential of localization of the food systems in which OSFs
116 operate. In this study, we approach the notion of localization of food systems through the
117 exploration of strategies developed by OSFs to establish strong links with the territory where
118 olive oil is produced. Strategies include those contributing to the valorisation of the quality
119 and the territorial specificity of olive oil, as well as strategies resisting the ‘commodification’
120 and de-localisation tendencies in olive oil systems (Sanz-Cañada and Muchnik, 2016). Thus,
121 we examine some of the territorially-based resources that are mobilised by OSFs to assign a
122 specific identity to the olive oil they produce, namely some of the biophysical, cultural and

123 socio-institutional practices and resources that are specific to the region in which OSFs are
124 localized (Bowen and Mutersbaugh, 2014). Of particular interest for our study are native-
125 traditional olive trees varieties and local social networks, which have been identified as core
126 elements of ‘localized’ food systems. Lastly, we examine the valorisation of this identity both
127 on the markets and through the creation of positive externalities.

128

129 3. Methods and data

130 The research approach chosen is a mixed-method, comprising qualitative and quantitative
131 methods. Following the broader methodology of SALSA project (Brunori et al., 2019; Grando
132 et al., 2019a), the data for this study have been derived from four different sources:

- 133 • Desk research, with a literature review and statistical information from diverse sources,
134 including Eurostat, national and regional statistical authorities, sectoral data, etc.
- 135 • Forty-four semi-structured interviews with key informants, conducted from March to July
136 2017. A broad range of stakeholders took part, including administration staff, farmers, co-
137 ops’ and producer groups’ staff, researchers on plant protection issues, and food
138 businesses representatives.
- 139 • Four Focus groups (one per region) with 32 olive oil related stakeholders, held between
140 September and December 2017. {who were they??? Appendix Table}
- 141 • Face to face interviews with 72 small farmers producing olive oil, conducted in the June-
142 November 2017 timespan, which were selected according to four main criteria (Grando et
143 al., 2019a): 1) small farmers with UAA up to 5ha and/or small farms of up to 8 Economic
144 Size Units; 2) small farms with different degrees of market integration; 3) small farms that
145 have different degrees of self-sufficiency in the household; and 4) farms geographically
146 dispersed within each region.

Con formato: Color de fuente: Automático

Con formato: Sin Resaltar

147

148

Table 1: Data sources by region

	Castellón (Spain)	Lucca (Italy)	Ileia (Greece)	Alentejo Central (Portugal)	All Regions
Interviews with key-informants	12	11	12	9	44
Focus Groups on olive oil	5	10	13	4	32
Interviews with olive oil small farmers	14	17	25	16	72

149

150 [Although there is no universally accepted definition of a small farm \(Guiomar et al. 2018;](#)
151 [Davidova and Thomson 2014\), small farms are usually identified through thresholds set for](#)
152 [different size indicators, influenced by the aim of the classification as well as by the](#)
153 [geographical context in which the analysis is conducted \(Hazell et al., 2010; Lowder et al.](#)
154 [2016\). In this study, we define small farms as those with less than 5 hectares of total UAA](#)
155 [\(EPRS 2014; EU, 2018\) and/or those with an economic size of up to 8 Economic Size Units.](#)

156 ~~All the above data have been analyzed and used in the next sections.~~ It has to be noted that
157 the four data sources complement each other. Statistical information, key informants, and
158 focus groups allowed for the identification of quantified flows between the different actors, as
159 well as the extent of self-provision, reciprocity relations and the commercialization pathways
160 available to OSFs. On the other hand, despite the fact that the sample of farms is not
161 'representative' in the strict statistical sense, interviews with farmers provided valuable
162 detailed information, which along with all the information from the other sources, allowed for
163 the representation of OSFs within their food systems and connections to their respective value
164 chains.

165

166 **4. Results**

Con formato: Numerado + Nivel: 1 + Estilo de numeración:
1, 2, 3, ... + Iniciar en: 4 + Alineación: Izquierda + Alineación:
0 cm + Sangría: 0,63 cm

167 [An impressive inter- and intra-regional diversity of food systems related to olive oil has been](#)
168 [detected. As a result of historical trajectories of the regional economies and various spatial](#)
169 [specificities, the four regions are highly differentiated in terms of farming systems, quality of](#)
170 [the product, relative importance of OSFs and small food businesses, scale of operations, as](#)
171 [well as interlinkages between food systems actors \(for a more detailed description, see](#)
172 [Karanikolas et al., 2018a\).](#)

174 **4.1 Types of ~~economic~~ integration**

176 **4.1.1 Self-provision and reciprocity relations**

178 Interviews with key-informants, as well as material from the focus groups show that olive oil
179 systems in the four regions are mainly export oriented, as a large share of the oil produced is
180 exported or sold to other national regions, ranging from 40% in Lucca, to 93% in Alentejo
181 Central. Most of OSFs are engaged in multiple types of ~~economic~~ integration, including
182 reciprocity relations, as well as relations with various markets, covering a variety of spatial
183 scales (table 2). OSFs in all regions present a high degree of self-provision in quality olive oil,
184 accompanied with extended non-market exchanges in the context of kinship and friends, as
185 well as own informal networks of customers; part of the latter involve the disposal of olive oil
186 in the agri-touristic part of the farm as well as to customers in the adjacent areas.

187 ~~It has to be noted that an impressive inter- and intra-regional diversity of food systems related~~
188 ~~to olive oil has been detected. As a result of historical trajectories of the regional economies~~
189 ~~and various spatial specificities, the four regions are highly differentiated in terms of farming~~
190 ~~systems, quality of the product, relative importance of OSFs and small food businesses, scale~~

of operations, as well as interlinkages between food system actors (for a more detailed description, see Kannikola et al., 2018a).

Table 2: ~~Self-provision and~~ Types of economic integration of olive oil producing small farms

	Self-Provision of Olive Oil	Reciprocity Relations	Relations with informal markets	Relations with formal markets
Castellón (Spain)	Yes	Non-market exchanges of olive oil among extended family and friends	Direct informal sales by farmers to their own network of consumers inside the region	A relevant share is sold through cooperatives and small retailers or to restaurants in the province and a small percentage goes to neighboring provinces. About 40% of production (low quality oil) is sold to refineries in other provinces or abroad
Lucca (Italy)	Yes	Non-market exchanges of olive oil	Informal sales from OSFs only within the farms and the adjacent areas	Formal sales within the region, outside the region, and for exports to: Oil mills, sales representatives, exporters.
Ileia (Greece)	Yes	Non-market exchanges of olive oil	Direct informal sales from farmers to their own-network of consumers, both inside and outside of the region	Formal sales within the region to: wholesalers, packaging enterprises, oil mills, and to restaurants/hotels. <u>Also, sales to other national regions and exports.</u>
Central Alentejo (Portugal)	Yes	Non-market exchanges of olive oil and canned olives	Own-branded olive oil is sold at farmers' markets and local shops.	Intensive and super intensive olive grove production mainly for export outside of the region. Processing in private oil mills.

Source: Interviews with key-informants and Focus Groups discussions

195
 196 We have used the data derived from interviews with 72 olive oil small farmers in the four
 197 regions to distinguish three different categories of integration into [food-systemsmarkets](#). By
 198 using the criterion of NFI per hectare, we identify an effective, a moderate and a minor
 199 [market](#) integration, with a high (>2000 €), a medium (1000-2000 €) and a low (<1000 €) NFI
 200 per ha, respectively (table 3); the whole sample is almost evenly distributed among these three
 201 categories. Astonishing differences between these categories are observed in both NFI per ha
 202 and NFI per farm; the latter is less dependent on subsidies in the case of the effectively
 203 integrated farms.

204
 205 Table 3: OSFs by effectiveness of [market](#) integration

	NFI per Ha	No of Farms	Total No of different crops sold	Utilized Agricultural Area Irrigated (% of UAA)	NFI per Ha (€)	NFI per Farm (€)	Subsidies (% of NFI)
Effective Market Integration	High (>2000 €)	22	3.0	46%	4396	19403	7%
Moderate Market Integration	Medium (1000-2000 €)	25	3.2	39%	1460	8262	15%
Minor Market Integration	Low (<1000 €)	25	3.6	23%	294	3570	18%
All Farms	All Farms	72	3.3	34%	1952	10037	10%

206 *Source: Interviews with olive oil small farmers*

207
 208 Olive cultivation is part of mixed farming systems, encompassing more than three different
 209 crops per farm intended for sale (table 3), that co-exist with numerous other crops for self-

210 provision. The effectively integrated interviewed farms have the most intensified farming
 211 systems, as is evidenced by the highest percentage of their land, which is irrigated (46%, in
 212 comparison to 39% and 23% of the other categories). Higher irrigation rates imply a
 213 specialization of the farms in more intensified cultivations with high yields, such as
 214 vegetables and citrus fruits, as well as intensive olive groves in some cases.

215 All farms are fully integrated into the markets, as they sell 85%-87% of their production
 216 value, while a 13%-15% is not sold (table 4). The vast majority of the value of products that
 217 are not sold is intended for self-consumption by household members, including olive oil;
 218 interestingly, almost one-fifth of this value is given as a gift by the moderately and least
 219 integrated farms, which is an indication of some kind of reciprocity relations (table 4).

220

221 Table 4: ~~Disposal of production not sold~~ (Allocation of production value) and Reciprocity
 222 relations

	<u>Total Sales</u>	<u>Production Not Sold</u>				<u>Total Value of Farm Production</u>	<u>“Do You receive support (financial, technical, labour, in kind or other) from neighbours or relatives?” (% of “Yes” in each category)</u>
		<u>Total Value of Farm Products Not Sold</u>	<u>Of which, Ffor Household food consumption</u>	<u>Of which, for Gift</u>	<u>Of which, Other</u>		
<u>Effective Market Integration</u>	<u>84.5%</u>	<u>15.5%</u>	<u>14.3%</u>	<u>1.1%</u>	<u>0.1%</u>	<u>100.0%</u>	<u>32%</u>
<u>Moderate Market Integration</u>	<u>86.9%</u>	<u>13.1%</u>	<u>10.4%</u>	<u>2.5%</u>	<u>0.2%</u>	<u>100.0%</u>	<u>40%</u>
<u>Minor Market Integration</u>	<u>87.2%</u>	<u>12.8%</u>	<u>9.4%</u>	<u>2.4%</u>	<u>1.0%</u>	<u>100.0%</u>	<u>40%</u>
<u>All Farms</u>	<u>85.8%</u>	<u>14.2%</u>	<u>12.1%</u>	<u>1.8%</u>	<u>0.3%</u>	<u>100.0%</u>	<u>38%</u>

223

224

225 *Source: Interviews with olive oil small farmers*

226
 227 Moreover, although the share of the total value of farm production which is given as a gift is
 228 not impressive, ranging between 1.1% and 2.5%, many farms develop significant reciprocity
 229 relations, through various forms of support (such as financial, technical, labour, in kind or
 230 other) given to farmers from neighbours or relatives. Approximately one-third of the
 231 effectively integrated farms and 40% of the other two categories receive such a support (table
 232 [4](#)).

233 **Table 5: Reciprocity relations**

	Do You receive support (financial, technical, labour, in kind or other) from neighbours or relatives?—(% of “Yes” in each category)
Effective Integration	32%
Moderate Integration	40%
Minor Integration	40%
All Farms	38%

234 *Source: Interviews with olive oil small farmers*

235
 236
 237 **4.1.2 Relations with markets**

238 The interviewed farms are connected with markets through different channels (table [5](#)). The
 239 effectively integrated farms sell most of their products either directly or to wholesalers, while
 240 they provide small retailers with a non-negligible share of 11% of value of production.
 241 Wholesalers and cooperatives are the main channels for moderately integrated farms, whereas
 242 the least integrated farms present a relatively evenly distributed pattern of sales, with direct
 243 sales being the most important. It has to be noticed that part of ‘direct selling’ represents

244 informal activities on behalf of farmers, e.g. sales to own networks of customers without
 245 official documents.

246

247 Table 65: Disposal of farm production in the regional food system (Allocation of production
 248 value)

	Sales						Producti on Not Sold	Total Value of Farm Productio n
	Direct Selling (Farmers markets, Directly to consumers, etc.)	To Wholesale rs	To Process ors	To Small Retailers	Through Cooperati ves	Total Sales		
Effective Market Integration	39%	25%	9%	11%	1%	85%	15%	100%
Moderate Market Integration	15%	37%	4%	0%	31%	87%	13%	100%
Minor Market Integration	32%	16%	11%	12%	16%	87%	13%	100%
All Farms	31%	26%	8%	8%	12%	86%	14%	100%

249 *Source: Interviews with olive oil small farmers*

250

251 **4.2 Strategies of actors ~~to achieve effective~~ in the effectively integrated small farms**
 252 **integration in the food systems**

253

254

255 The interviewed farms follow different strategies to secure their livelihoods, as is evident
 256 from the composition of the sources of income. More specifically, the effectively integrated
 257 farms source their total household income mainly from the farm, in contrast to the other two
 258 categories, which rely mostly on income from off-farm activities of their members. However,
 259 even within the effectively integrated farms, several other important activities, beyond
 260 agriculture, take place (e.g. agri-tourism, catering), thus contributing a significant share to
 261 NFI (table 76).

262 Another important differentiation is observed in the strategies of OSFs in terms of labour
 263 usage, both on- and off- the farm. The effectively integrated farms mostly rely on hired labour
 264 (three-quarters of all on-farm employment), in contrast to the moderately integrated farms that
 265 largely use family labour. Interestingly, the farms with minor integration have the highest
 266 recourse on hired labour, which nevertheless, besides its trivial absolute magnitude, has to be
 267 seen in the context of extended off-farm employment of family members. In addition,
 268 cooperative membership ranges between 52% in the least integrated, and 72% in the
 269 moderately integrated farms.

270

271 Table 6: Composition of income, labour usage and Cooperative membership

	Share of NFI to Total Household Income	Share of NFI from non- agricultural activities	Hired Labor/Total Labor on-farm	Member of a cooperative (% of farm holders in each category)
Effective Market Integration	59%	46%	76%	64%
Moderate Market Integration	39%	8%	22%	72%

Minor Market Integration	25%	38%	88%	52%
All Farms	45%	35%	77%	65%

Source: Interviews with olive oil small farmers

272

273

274 As regards high quality olive oil, it is involved in various critical aspects of the food systems
 275 in the examined regions, as well as to the strategies followed by OSFs. Interviews with key
 276 informants and material from focus groups show that 60% of the olive oil produced in
 277 Castellón is characterised as virgin or extra virgin, while almost the totality of produce in Ileia
 278 is extra virgin olive oil; also, monocultivar and organic olive oil are largely produced in
 279 Lucca, whereas oil from traditional and organic olive groves is produced in Alentejo Central.

280 In addition, interviews with OSFs reveal a striking difference in the percentage of farms that
 281 use certification of farm products, between the effectively integrated (55%), and the
 282 moderately and least integrated farms (16% and 28%, respectively). Certification concerns
 283 mainly organic oil and to a lesser degree oil from integrated production; the use of
 284 geographical indications is negligible.

285 Interviews with key informants and material from focus groups show that OSFs source high
 286 quality olive oil from their own production, whereas high quality olive oil is the main vehicle
 287 through which OSFs are linked to markets at local and regional level, as well as to national
 288 and international markets. Although high quality olive oil is exported from three of the
 289 examined regions, in Castellón it is the low quality oil that is exported in bulk for refining,
 290 whereas in Ileia, more than half of all the quantity of high quality oil is exported in bulk.

291 Furthermore, from our interviews with key informants and focus groups discussions, it ensues
 292 that intensive and super-intensive olive cultivating systems are already spread in Castellón
 293 and Alentejo Central, in contrast to Lucca and Ileia, where more extensive and traditional

294 systems prevail. In Alentejo Central farms with intensive and super-intensive production
295 systems are entirely mechanized, and mostly processing olives in their own mills, while olives
296 from OSFs are mainly converted into olive oil in cooperative oil mills. A series of native-local
297 varieties of olive trees are cultivated in the examined regions: ‘Farga’, ‘Serrana de Espadán’
298 and ‘Borriolenca’ in Castellón; ‘Frantoio’, ‘Leccino’ and ‘Moraiolo’ in Lucca; and
299 ‘Koroneiki’, ‘Kollyreiki’, and ‘Matsolia’ in Ileia.

300 The OSFs engaged in extensive and traditional cultivating systems, provide a series of
301 positive externalities. Although we have not measured exactly these positive externalities in
302 our study, as it has documented by ample literature, these systems, while lagging behind
303 intensive systems in terms of yields, economic outcomes and profit, in many cases they
304 provide landscape and habitat diversity, along with multiple benefits for the local
305 communities (Russo et al., 2016; Borzçeka et al., 2018; Rodríguez Sousa et al., 2019).

306 It has to be noted that key informants and focus groups participants pointed out some
307 strategies for building local networks, with clear benefits for OSFs. Solidarity purchasing
308 groups in Lucca are a notable example in this category; in the same region (and to a lesser
309 extent in the other regions), in cases where the whole food system structure is less
310 concentrated, networks of small farms with small food businesses have been found to exert
311 effectively a countervailing power, which is translated into better prices for the producers of
312 oil. Finally, key informants and focus groups participants in all regions agreed that small
313 farmers ensure higher producer prices firstly, when they sell olive oil from traditional
314 varieties or organic, secondly, with direct sales to consumers and thirdly, through labelling
315 and branding.

316

317 5. Discussion

318

Con formato: Numerado + Nivel: 1 + Estilo de numeración:
1, 2, 3, ... + Iniciar en: 4 + Alineación: Izquierda + Alineación:
0 cm + Sangría: 0,63 cm

319 Olive cultivation in small farms of the examined Mediterranean regions is part of mixed
320 farming systems, encompassing more than three different crops per farm; these crops are part
321 of diverse value chains, which vary in terms of structure, geographical scope and governance
322 arrangements. Self-provision of olive oil (as well as of some other products) seems to be the
323 rule in the case of the OSFs, while noteworthy reciprocity relations were detected mainly
324 through various forms of support, such as financial, technical, labour, in kind or other, given
325 to farmers from neighbours or relatives.

326 Our interviews with small farmers reveal that OSFs develop extended non-market relations
327 with relatives and friends, which can be seen as forms of social proximity (Dubois, 2018), i.e.
328 interpersonal ties based on kinship and acquaintance. Also, OSFs develop own informal
329 networks of customers that are usually based either on inter-personal relationships or on on-
330 farm diversification strategies, such as the disposal of olive oil in the agri-touristic part of the
331 farm. In addition, OSFs are strongly integrated into formal markets, spanning local, regional,
332 national and international scales. Thus, our findings corroborate Winter's argument who
333 describes "a continuum, with embedded relations based on close social ties and loyalty on one
334 end, and disembedded, impersonal, price-based relations at the other end" (Winter, 2003). We
335 also confirm results from previous studies about the concurrent engagement of small farmers
336 in multiple forms of market relations (Thorsøe and Noe, 2016), as well as in both alternative
337 and conventional food systems (Brown and Miller, 2008; Tregear, 2011).

338 OSFs' integration into formal markets is developed through various channels; in the case of
339 the effectively integrated farms, through direct sales and sales to wholesalers, in contrast to
340 sales to wholesalers and cooperatives for moderately integrated farms, whereas the least
341 integrated farms present a relatively evenly distributed pattern of sales, with direct sales being
342 the most important.

343 The effectively integrated OSFs combine various diversification strategies: off-farm sources
344 of income, although they rely mainly on on-farm income; on-farm activities beyond
345 agriculture (e.g. agri-tourism and catering); multi-cropping systems including olive groves,
346 both irrigated/intensified and rainfed/extensive cultures; certification of products; and
347 entrepreneurial characteristics, such as extensive use of hired labour. Therefore, we observe
348 the coexistence of multiple strategies at the farm/farm household level, which have a
349 complementary character and synergistic effects (see also: Grando et al., 2019b).

350 As the data of this study show, the special identity of the olive oil in the examined regions is
351 usually recognised by the consumers (mainly in relation to its production from local
352 varieties), however, olive oil has rarely obtained an official certification denoting a
353 geographical indication. Yet, it has to be noted that consumers appreciate the quality of the
354 virgin or extra-virgin olive oil produced in their region, even without branding, and look for it
355 in the cooperatives' shops, small retailers or through direct sales from OSFs.

356 This recognition of quality enables the formulation of strategies for building 'short' chains
357 between producers and consumers, as well as for ensuring premium prices. Besides product
358 differentiation (e.g. traditional olive oil, organic olive oil), we have seen that another strategy
359 that ensures high producer prices is labelling and branding, on behalf of some successful
360 cooperatives or OSFs with 'entrepreneurial' characteristics. This way, small farms can
361 overcome some major constraints emanating from the unequal distribution of power across
362 the value chains.

363 Nonetheless, some differences are observed, in the representation of the quality and value of
364 the olive oil issuing from traditional olive groves and tree varieties, which explain the
365 differences between the regions, in the added value of this oil in relation to oil resulting from
366 more intensive productions. Part of the olive oil system in the examined Spanish and
367 Portuguese regions seems to be lagging behind in relation to the marketing mechanisms and

368 capacity to obtain high prices for the oil from traditional groves, as if this oil had no particular
369 quality, while the Italian and Greek regions seem to manage a higher valorization of this oil in
370 the market, and make it possible for small farms to link to the market.

Con formato: Resaltar

371 Although intensification is an option, at least partly adopted by OSFs, we have seen that in the
372 examined regions, extensive olive farming systems are involved to varying degrees; in
373 addition, the cultivation of traditional olive trees varieties indicates that many OSFs are
374 engaged in activities of on-farm maintenance of agricultural biodiversity. The latter, imply the
375 creation-generation of some positive externalities, which could be key 'causal/anchorage factors' for
376 the construction of the specific identity of local olive oils (Sanz-Cañada and Muchnik, 2016).
377 This endeavour could build on the finding that intensified olive farming is a major cause of
378 one of the biggest environmental problems affecting the EU today, i.e. the widespread soil
379 erosion and desertification in all southern EU countries (Beaufoy, 2001). The expansion of
380 irrigated olive production is increasing the over-exploitation of water resources that have
381 already been eroded by other agricultural sectors. Adversely, traditional olive production
382 systems contribute substantially to the preservation of agricultural biodiversity. As recent
383 research shows, two critical factors/prerequisites for the on-farm conservation of local
384 landraces (including olive trees varieties), are, firstly, their integration into both domestic and
385 export markets, and secondly, the embeddedness of their products into the local culture and
386 diet (Karanikolas, et al., 2018b). The former has been highlighted in this study and, therefore,
387 with targeted strategies could help OSFs resist further marginalization.

388 Besides OSFs' involvement in various informal networks, some local social networks that
389 integrate both producers and consumers have been identified. Solidarity purchasing groups in
390 Lucca are a notable example in this category; in the same region (and to a lesser extent in the
391 other regions), in cases where the whole food system structure is less concentrated, networks
392 of OSFs and small food businesses exert effectively a countervailing power. This is a

393 manifestation of 'organisational proximity' (Boschma, 2005) with an effective collective
394 coordination. Finally, important coordinating activities, related to the valorization of local
395 produce have been undertaken by some cooperatives. Thus, in Castellón some cooperatives
396 with oil mills and own shop are taking the lead in promoting high quality oil from local
397 varieties (some organic), developing a range of olive products and selling through their own
398 shop, supplying small retailers and selling online. One marketing strategy put forward by
399 these coops is to emphasize the value of this high quality oil as a way of preserving the very
400 old olive trees (up to a thousand years-old), as part of the natural heritage in this area, and
401 they have developed branding around this concept. In contrast, in Ileia region, an extreme
402 fragmentation of both OSFs and small food businesses, along with inadequate collective
403 action and lack of coordinating activities, consolidate the imbalances of the system;
404 consequently, the large part of an extra virgin olive oil is sold in bulk, resulting in an inability
405 of OSFs to capture a larger share of the added value.

Con formato: Resaltar

406 The success (or lack of) of these valorisation strategies as a tool to avoid marginalisation can
407 have also impacts on land use. Cropland abandonment is a common phenomenon in Europe
408 (Strijker, 2005; Pointereau et al., 2008), being the problem particularly acute in the case of
409 permanent crops as olive groves. The lack of profitability is the main reason for cropland
410 abandonment, although there are many other interlinked reasons (Benayas et al., 2007;
411 Pointereau et al., 2008). Land abandonment implies a loss of production potential, and entails
412 a greater risk of fires, rural depopulation and soil degradation (OECD, 2001; López-Iglesias et
413 al., 2013). Literature has discussed on land consolidation policies, and Sikor and Müller
414 (2009) critically assessed state-led (i.e. top-down) versus community-based (i.e. bottom-up)
415 initiatives. Thus, public strategies to prevent land abandonment have to necessarily support
416 community-based actions on land use policies -such as common management of lands, or
417 easing land sales, rentals and cessions. By the same vein, bolstering valorisation strategies

Con formato: Resaltar

Con formato: Resaltar

418 started by OSF or their associations -like the territorial integration efforts presented in this
419 paper-, can also be part of the agricultural policies aimed at deterring land abandonment via
420 supporting OSF.

Con formato: Resaltar

Con formato: Resaltar

421 Finally, it should be noted that despite the worth of our findings, the preceding analysis
422 presents some limitations, primarily due to the small sample of farms surveyed, which is not
423 representative in the strict statistical sense and, second, to the fact that olive oil trees are just
424 one of the crops of these farms, under multi-crop systems. However, these limitations are
425 tempered by the fact that farm-level information is supplemented by data from key informants
426 and focus group discussions.

428 6. Conclusions

Con formato: Sangría: Izquierda: 0 cm, Sangría francesa: 0,63 cm, Numerado + Nivel: 1 + Estilo de numeración: 1, 2, 3, ... + Iniciar en: 4 + Alineación: Izquierda + Alineación: 0 cm + Sangría: 0,63 cm

430 The aim of this study has been, firstly, to identify the various forms of integration of olive oil
431 producing small farms to food systems and secondly, to identify the strategies adopted by the
432 OSFs which are integrated into the food systems most effectively, the most beneficial
433 strategies of economic integration, i.e. those that secure the long term sustainability of OSFs
434 and contribute to the 'localization' of olive oil food systems.

435 Olive cultivation in small farms of the examined Mediterranean regions is part of mixed
436 farming systems, encompassing more than three different crops per farm which are part of
437 diverse value chains. All forms of integration of OSFs into food systems have been identified,
438 i.e. self-provision of olive oil, reciprocity relations (mainly through various forms of support
439 given to farmers from neighbours or relatives), extended non-market relations with relatives
440 and friends, informal networks with customers that are usually based either on inter-personal

441 relationships or on on-farm diversification strategies, as well a strong integration into formal
442 markets, spanning local, regional, national and international scales.

443 The whole sample of our interviewees is almost evenly divided into three groups, with
444 effective, moderate and minimal integration, respectively. Multiple strategies with synergistic
445 effects co-exist at the farm/farm household level. Thus, the effectively integrated OSFs
446 combine various on- and off-farm diversification strategies; direct sales and sales to
447 wholesalers; multi-cropping systems; certification of products; and entrepreneurial
448 characteristics, such as extensive use of hired labour.

449 Strategies for building 'short' chains between producers and consumers, as well as for
450 ensuring premium prices for olive oil, are enabled by product differentiation (e.g. traditional
451 olive oil, organic olive oil), and labelling and branding, on behalf of some successful
452 cooperatives or OSFs with 'entrepreneurial' characteristics.

453 A series of specific territorial resources have been identified in the examined regions,
454 including local olive trees varieties, extensive olive farming systems, recognition of the
455 quality of olive oil by the consumers, as well as OSFs' involvement in various informal and
456 formal networks, that integrate both producers and consumers and indicate forms of social
457 and organizational proximity. However, these resources are only partially mobilized by
458 actors' strategies, thus not creating a 'strong' identity of the various olive oils. These
459 identities are to some extent valorized on the markets, but less so through positive
460 externalities. Therefore, the unrealized potential of localization of the food systems in which
461 OSFs operate, points to the need for targeted strategies that will contribute to the valorisation
462 of the quality and the territorial specificity of olive oil.

463

464 **Acknowledgements**

465

466 We would like to thank all the interviewees and participants in the focus groups for the time
467 they dedicated and the valuable information they provided to us.

468 This study draws on material from the Project 'SALSA' ('Small farms, small food businesses
469 and sustainable food security'). This project has received funding from the European Union's
470 Horizon 2020 research and innovation programme, under grant agreement No 677363.