

Organic olive oil in Italy: a missed opportunity?

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Abstract

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This paper analyses the status and evolution of the value chain “organic olives and organic olive oil” in the 20 Italian Regions, to understand two contemporary phenomena. First, since many landholders (about 43 000) receive the CAP decoupled subsidy for conversion to organic methods and then for maintenance, on about 238 000 ha, we have quantified a potential output of 125 000 – 162 000 tons of organic oil, but only about 40 000 tons are certified. This means losing the opportunities linked with market valorisation, namely the premium prices. Second, there is an unquantified number of tiny producers, whose number and output remain unknown, who do not even apply for the organic area subsidy and consequently lose both this subsidy and the premium price. In both cases, the market potential of the organic olive oil, with its positive impacts on the firms contributing to the added value, is lost. Also lost is the potential impact on the diversification of rural economies, namely agri- and rural tourism. This means less incomes and jobs, especially in the southern Regions of Italy, where most of the potential organic EVO oil is located. The Authors suggest further research on the organization of the value chain, to understand better the difficulties and bottlenecks which limit the exploitation of the organic EVO oil. The Authors also propose a more integrated approach, for the value chain and for linkages with rural development actions, with the involvement of the different stakeholders, to favour the creation of more added value and the recognition of the small organic producers.

Keywords: Common Agricultural Policy; marketing; value chain; rural development; group certification

Introduction

This article represents an extension of the study conducted in 2019-20, within the framework of the research action project DIMECOBIO III, financed by the national Italian Ministry of Agricultural, Food and Forestry Policies (MiPAAF) for the improvement of the organic value chains in Italy.

In particular, this article explores the contradictions that undermine the full exploitation of the economic potential reachable in the rural areas by the value chain of the organic Extra Virgin Olive (EVO) oil: first, there is a formally organic certified vast area of about 239 000 hectares in December

2018, but a relatively small quantity of certified EVO oil, only 40 099 tons. Second, there is high number of small and tiny producers, who respect the rules of organic farming, but who do not apply for certification.

Taking into consideration the premium prices paid at the farm and by the consumers for organic EVO oil, the research questions have been: which is the potential production of organic olives on such large area? What happens to the olives produced on this surface? What prevents producers from certification?

This paper illustrates these two phenomena and proposes some policy actions for reducing / eliminating these main problems.

Organic agriculture in Italy extends nowadays on almost two million hectares and it is practiced by almost 70 000 producers, out of which 17 percent have some sorts of on-farm processing and add value to the raw output from their fields and stables (ISMEA-CIHEAM, 2019). Organic agriculture was – and still is – often indicated as an Italian success story (Santucci & Pignataro, 2002; Defrancesco & Rossetto, 2007; Viganò, 2013; Gamboni & Moscatelli, 2015), because all socio-economic indicators (average size, age and education of farmers, turnover, marketing strategies, income, employment) are much better than those of the whole Italian agriculture.

In particular, the value chain “olive trees and EVO oil” is considered the flagship of the sector, for its relevance in the Italian landscapes, cuisine and social-religious aspects.

Like in all other Mediterranean countries (Loumou & Giourga, 2003), olive trees and olive oil have an almost sacred value. Olive trees characterize the rural landscapes of Italy. Except for the alpine Valle d’Aosta, on the north-western border with France, and South Tirol on the north-eastern border with Austria, olive trees have been planted, throughout the centuries, all over the country. Thanks to an extreme biodiversity – about 250 – 300 varieties have been recognized, and many more are the ecotypes – and to its rusticity and adaptability (Lombardo, 2010; Fontanazza 2005), olive trees have been used to valorise unfertile and rocky soils, all along the Italian peninsula and on the islands. Furthermore, thanks to the enormous efforts of many generations of peasants, hundreds of thousands of hectares have been terraced, and made productive with olive trees. For centuries, the fields with olive trees have been a good asset, thanks to multi-cropping and mixed farming, with cereals, fodder crops and green manure plants cultivated between the lines of olive trees. In some cases, domestic animals like goats, sheep, and horses were led to graze between the olive trees, and their droppings acted as fertilizers, enriching the soils.

Olive oil is a main ingredient in the Italian cuisine, and it cannot miss on the tables of homes and restaurants; it is a fundamental component of the Mediterranean diet, recognized for its beneficial effects on human health. It is mentioned several times in the Old and New Testament and is part of the religious traditions of Christianity (Mueller, 2012) and other monotheistic religions.

The production of olives and then their processing and valorisation are at the centre of a vast network of inputs’ suppliers and service providers, whose income is deeply interconnected with the profitability of the primary sector (MiPAAF, 2010; MiPAAF, 2016). Furthermore, in the last decades olive oil has also become one of the drivers of agri-tourism, attracting into the rural areas of Italy tourists

from all over the world.

The main problem is that the primary production is very much fragmented, literally pulverized, with a huge number of small and tiny units. The number of the producers is difficult to quantify. In 2010 (MiPAAF, 2010; there were about 1 050 000 people who cultivated some olive trees; AGEA – the national authority in charge of the European Union interventions in Italy, recognizes 957 360 professional farmers having access to the decoupled subsidy; ISTAT – the national statistical agency, in 2007 quantified in 775 783 the specialised olive farms. It is also difficult to quantify the area with olive trees, which Fontanazza (2005) indicated in about 1 700 000 ha, out of which he considered 350 000 to be extra-marginal.

The structural analysis of the Italian farms with olive trees has been summarized in MiPAAF (2016) as follows:

- a) Average size slightly over one hectare, accompanied by fragmentation in many plots.
- b) Over 60 percent with less than 100 olive trees.
- c) 78 per cent of the units with less than 250 trees, representing 46 per cent of the olive output.
- d) 12 percent between 250 and 500 olive trees.
- e) 1.3 percent above 1000 trees, representing 25 percent of the output.
- f) 30 percent of area in difficult orographic situations.
- g) 66.1 percent are producing for self-consumption, only 4.3 percent are managed professionally; 29.6 percent are classified “complementary”, meaning that the farmer has other sources of income.
- h) Quite high age of producers.

In the last decades, several factors have contributed to the decadence of the olive-oil sector: the rural exodus has drastically reduced the labour force available in the countryside, but – due to the orography of the territory, the steepness of the slopes – it was not possible to mechanize the operations (pruning, harvesting). Consequently, in many cases, the olive trees were / are abandoned or managed with the smallest amount of unpaid family labour. With growing costs and stable market prices, most of the Italian olive sector is unprofitable and it only survives thanks to the EU subsidies and the shadow prices of land, capital, and labour, far below the market prices.

In the meantime, the national demand by families and food industry for olive oil has been satisfied with oils of different qualities imported from other EU countries, like Spain and Greece, and from South Mediterranean countries (Niklis et al., 2014), mainly Tunisia, imports which have contributed to keep quite low the prices of Italian olive oil.

Within this difficult scenario, several actions have been imagined and implemented, in the last 30 years, by the most

motivated stakeholders, in order to stop the progressive reduction of the olive-oil sector and to convince the domestic and foreign consumers (Mili, 2006; Dekhili et al., 2011) to recognize higher prices for the Italian EVO oils: certified qualities, with Geographic Indications and with organic label, linkages with tourism (Oil Routes, Towns of Oil, fairs and events), and national and international promotion.

In 2017 Italy had 46 Geographical Indications (GI) for EVO oils, scattered all over the Country, which is the highest number within the European Union. This indicates the organizational efforts by many producers and local governments, but the certified production, compared to the output that could be certified, remains below 2-3 percent in terms of quantity (10-12 000 tons) and only 6-7 percent in terms of value. This information is relevant, because it indicates that there is a huge number of primary producers who, for several motivations, do not apply for the GI recognition. We will see that the same phenomenon occurs in the organic EVO oil subsector.

Since 1991, the organic option has been supported by the European Union, first with a definitory Regulation, then since 1992 with the provision of a decoupled subsidy that is given for the “conversion” phase, when the farmers convert their farms from conventional techniques to organic ones (normally three years), and then for the “maintenance” of the organic methods. In 2018, the organic area with olive trees, including both conversion and maintenance was 238 129 ha, and represented 21.3 percent of the national surface with olive trees. The organic area with olive trees occupies the fourth position, after Meadows and Pastures (about 400 000 ha), Fodder crops (about 400 000) and all Cereals together (about 326 000).

Materials and Methods

The main body of this article has been elaborated during 2019-20, within the framework of the research-action project DIMECOBIO III, financed by the national Italian Ministry of Agricultural, Food and Forestry Policies (MiPAAF), for the improvement of the organic value chains in Italy. Most data have been found in different public databases (AGEA, ISMEA, ISTAT, SINAB, SIB), in publications and in unpublished documents. Qualitative information has been provided by experts of the olive-oil value chain and by experts of the organic sub-sector, who work with public bodies, local organizations, public research centres and universities.

Results and Discussion

The discrepancy between the organic area and the organic output is an unsolved problem from many years. Almost

15 years ago, when the certified area was still below 100,000 ha (conversion + maintenance), it was esteemed (Paffarini & Santucci, 2005) that, after self-consumption and with an hypothesis of only 60 per cent of properly certified and valorised oil, several thousand tons of organic olives and potential EVO oil had another destination.

To quantify the actual potential organic EVO oil, the first data to analyse are the areas for which the producers have applied for the EU subsidy. In 2018, these areas (Table 1) were almost 240 000 hectares, unevenly distributed among the 20 Italian Regions (SINAB, 2020). It is worth noticing that, in some Regions, the share of organically managed olive trees is remarkably high: 36.4 per cent in Calabria, 27.6 per cent in Sicily, 19.7 percent in Puglia. These three southern Regions together account for 75.6 percent of the official organic area with olive trees. The average organic area with olive trees, nationwide, is 5.5 ha (Table 1), with the largest mean areas in Puglia (10.4 ha), followed by Calabria (6.9 ha). By December 2018, the certified organic producers are 43 069, with 58 percent concentrated in three Regions: Calabria, Sicilia, and Puglia. Moving northbound, we observe a lesser number of organic producers, with smaller areas, with the exceptions of Umbria and Toscana, two Regions famous for the quality of their EVO oils.

In other Regions, the attitude of farmers towards the adoption of organic methods (share of organic area on total area with olive trees) has been less relevant: in Campania, for example, a large southern Region, only 13.4 percent of the area with olive trees has been converted; in Abruzzo, only eight percent. In the central part of Italy, Marche, Umbria, and Toscana show a relatively high rate of adoption, respectively 20.8, 18.4 and 17.0 percent, followed by Lazio with 12.8 percent.

An important driver to the conversion from conventional to organic management has surely been the decoupled area subsidy, introduced with the Agro-environmental measures in 1994 and always renewed by the Rural Development Plans of the Italian Regions (Table 2). Since agriculture is a matter devolved by the national government to the regional ones, each Region can autonomously decide the amount per hectare and some criteria, to better calibrate the amount of the subsidy and to support some categories of producers. At the beginning, during the first application of this scheme, the differentiation between Regions was not very evident, whereas in the present planning period 2014-20, it appears quite clear.

The per hectare subsidy is calculated with the help of experts, from the Universities, the CREA (Centre for Research and Economic analysis in Agriculture) and the various farmers' associations, and is given to: a) cover the supposed dif-

Table 1. Total and organic areas with olive trees, Italy 2018

| Regions | Olive groves, ha | | | | | Organic Producers | | Mean area ha |
|-----------------------|------------------|-------|---------|-------|--------------|-------------------|-------|-----------------|
| | Total | | Org* | | Org/Tot % | n | % | |
| | ha | % | ha | % | | | | |
| Valle d'Aosta | 45 | | | | | | | |
| Piemonte | 1 020 | 0.1 | 114 | 0.0 | 11.2 | 52 | 0.1 | 2.2 |
| Lombardia | 1 963 | 0.2 | 328 | 0.1 | 16.7 | 162 | 0.4 | 2.0 |
| Veneto | 5 180 | 0.5 | 365 | 0.2 | 7.0 | 341 | 0.8 | 1.1 |
| Friuli Venezia Giulia | 425 | 0.0 | 47 | 0.0 | 11.1 | 73 | 0.2 | 0.6 |
| Trentino Alto Adige | 394 | 0.0 | 90 | 0.0 | 22.9 | 124 | 0.3 | 0.7 |
| Liguria | 11 108 | 1.0 | 307 | 0.1 | 2.8 | 128 | 0.3 | 2.4 |
| Emilia Romagna | 3 814 | 0.3 | 979 | 0.4 | 25.7 | 429 | 1.0 | 2.3 |
| Toscana | 91 907 | 8.2 | 15 599 | 6.6 | 17.0 | 3 362 | 7.8 | 4.6 |
| Umbria | 30 387 | 2.7 | 5 595 | 2.3 | 18.4 | 1 020 | 2.4 | 5.5 |
| Lazio | 67 438 | 6.0 | 8 620 | 3.6 | 12.8 | 2 687 | 6.2 | 3.2 |
| Marche | 13 515 | 1.2 | 2 805 | 1.2 | 20.8 | 2 030 | 4.7 | 1.4 |
| Abruzzo | 42 983 | 3.8 | 3 421 | 1.4 | 8.0 | 1 376 | 3.2 | 2.5 |
| Molise | 15 044 | 1.3 | 931 | 0.4 | 6.2 | 346 | 0.8 | 2.7 |
| Campania | 72 623 | 6.5 | 9 753 | 4.1 | 13.4 | 3 437 | 8.0 | 2.8 |
| Basilicata | 28 002 | 2.5 | 5 529 | 2.3 | 19.7 | 1 577 | 3.7 | 3.5 |
| Puglia | 373 285 | 33.2 | 73 402 | 30.8 | 19.7 | 7 055 | 16.4 | 10.4 |
| Calabria | 185 915 | 16.6 | 67 700 | 28.4 | 36.4 | 9 872 | 22.9 | 6.9 |
| Sicilia | 141 810 | 12.6 | 39 086 | 16.4 | 27.6 | 8 038 | 18.7 | 4.9 |
| Sardegna | 36 472 | 3.2 | 3 460 | 1.5 | 9.5 | 960 | 2.2 | 3.6 |
| Italia | 1 123 330 | 100.0 | 238 129 | 100.0 | 21.2 | 43 069 | 100.0 | 5.5 |

* In conversion + organic

ference between the conventional income and the organic income; b) pay the farmer for the positive externalities (nicer landscape, more genetic variability, lesser pollution, more shelter for wildlife, more nutritious foods, etc.); c) counter-balance the higher transaction costs.

The subsidies reported in Table 2 have varied in the different planning periods of the Common Agricultural Policy (Zanoli et al., 1999; Carillo & Ugati, 2008; Bacaloni, 2014). They are higher for the “conversion” phase, normally of three years (but it could be zero if the farmers can prove that they did not use any chemical products in the last years) and decreases for the “maintenance” years. Furthermore, the following adaptations are indicated in the table:

- ∧: Different zones have been defined;
- ∧∧: Olive trees not mentioned, included within the orchards;
- ∞: To facilitate aggregation and marketing, the subsidy is higher if farmers are members of associations;
- *: Different levels of rurality, but reduction foreseen after 2018;
- ** : Subsidy is higher for the small producers and slightly decreases for surfaces larger than 10 hectares.

We have consequently explored the hypothesis of a rela-

tionship between the amount of the subsidy and the share of the organic olive tree cultivation on the total area with olive trees, but we found no correlation at all.

The next step to calculate the theoretical potential of organic output is to acquire data about the yields in olives. A major problem is due to a natural aspect of the olive trees (Fontanazza, 2005), which are characterized by the so-called “alternation”, that determines natural fluctuations in the output. This phenomenon characterizes unevenly the many varieties cultivated in Italy, and the various Regions. In some years, the olive trees are loaded with fruits, but the next year almost nothing appears on the branches. Through the presence of different varieties, accurate (and costly) pruning, fertilization and (rarely) irrigation, producers try to stabilize the output. There are no studies to investigate the impact of organic management on this natural phenomenon. To calculate an acceptable mean production, under organic methods, we have used the data proposed in different years and presented in Table 3. For some Regions, there data about eight years, while for a few cases we have less. In recent years, only a few Certification Bodies have transmitted this type of information and only about few regions.

Table 2. Decoupled subsidies (conversion and maintenance) for areas with olive trees, €/ha

| Regions | 1994-99, Measures A3+A4 (ECU) | | 2000-06, Measure 6 | 2007-13, Measure 214 | | 2014-20, Measure 11 | |
|-----------------------|-------------------------------|-------|--------------------|----------------------|-------|---------------------|-----------|
| | Conv | Maint | Maint | Conv | Maint | Conv | Maint |
| Valle d'Aosta | | | | | | | |
| Piemonte | | | | 645 | 630 | 900 | 700 |
| Lombardia | 483 | 483 | 778 | 620 | 570 | 900 | 810 |
| Veneto | 483 | 483 | 855 | 524 | 419 | 894 | 772 |
| Friuli Venezia Giulia | 483 | 483 | 540 | 400 | 400 | 575 | 523 |
| Trentino Alto Adige | | | 450 | 450 | 450 | 500-950^^ | 450-900^^ |
| Liguria | 483 | 483 | 825 | 680 | 555 | 710-781° | 680-748° |
| Emilia Romagna | 483 | 483 | 492 | 469 | 426 | 508 | 428 |
| Toscana | 483 | 435 | 450 | 780 | 680 | 720 | 600 |
| Umbria | 483 | 362 | 350 | 525 | 405 | 642-609* | 553-490* |
| | | | | | | 477-451* | 390-356* |
| Lazio | 483 | 483 | 194 | 390 | 355 | 390 | 330 |
| Marche | 435-223 ^ | | 550 | 600 | 480 | 680-750° | 600-660° |
| Abruzzo | 362 | 241 | 440 | 500 | 500 | 440 | 370 |
| Molise | 483 | 483 | 528 | 600 | 500 | 800 | 750 |
| Campania | 423 | 423 | 611 | 510 | 510 | 822 | 599 |
| Basilicata | 423 | 302 | 402 | 550 | 490 | 695 | 624 |
| Puglia | 483 | 483 | 368 | 335 | 335 | 448-483° | 377-380° |
| Calabria | 483 | 435 | 362 | 400 | 600 | 650-709° | 600-655° |
| Sicilia | 483 | 483 | 775 | 670 | 580 | 795 | 680 |
| Sardegna | 483 | 483 | 446 | 400 | 320 | 421-385** | 388-352** |
| Average in Italy | | | | 529 | 484 | | |

^: Different zones have been defined, ^^ : Olive trees not mentioned, included within the orchards;

° : To facilitate aggregation and marketing, the subsidy is higher if farmers are members of associations;

* : Different levels of rurality, but reduction foreseen after 2018; ** : Subsidy is higher for the small producers and slightly decreases for surfaces larger than 10 hectares

The data in Table 3 have been collected by different Authors and with different methodologies for 1997-2000 (De Gennaro, 2001), 2003 (ISMEA, 2005), 2009 (Callieris et al., 2010) and 2015 and 2016 (SINAB, 2020), but they represent the only quantitative information at our disposal. The unweighted arithmetic means are quite similar all over Italy, with the only exceptions of the three most northern regions, Piemonte, Trentino-Alto Adige and Veneto, where – as a matter of fact – only very small areas are planted with olive trees. The highest mean results in Puglia (6.4 tons per hectare), followed by Abruzzo with 5.1, and Molise (5.0 t/ha). Some data might be outliers, like Puglia, Liguria and Toscana in 2003, or Calabria, Campania and Puglia in 2009, but these high yields counterbalance the low productivity of other years. It is worth noticing that the weighted national yield calculated De Gennaro (2001) for the period 1997-2000 was only 2.3 tons per hectare, versus the much higher annual observation for 2009 (Callieris et al., 2010), when some southern Regions recorded a bumper harvest.

At this point, it is possible to estimate (Table 4) the likely output of organic olives, again with some approximation, because it is not yet available the distinction, at regional level, between “conversion” and “maintenance” areas.

Since only the olives produced in the areas after the period of conversion, can be marketed as “organic” the regional total data of surfaces of Table 1, column 3, must be adjusted. We have decided to apply, in all Regions, the same proportion (76 per cent maintenance – 24 per cent conversion) that is available at national level. By doing so, the estimated Italian output of organic olives in 2018 could have been 962 200 tons, with two leading southern Regions, Puglia and Calabria, respectively producing 37.2 and 25.3 percent of the national output. Third ranks Sicilia with 14.2 percent, followed at long distances by all other Regions.

After the harvest, all olives – conventional or organic ones, must be quickly processed in an olive mill, to avoid fermentations that could deteriorate the quality of the final product. At this stage, there are several options: the largest producers have their own olive mill, sometimes comple-

Table 3. Estimation of organic olive yields, t/ha

| Regions | Olive yield, (t/ha) | | | | | |
|-----------------------|---------------------|------|------|------|------|------|
| | 97-00 | 2003 | 2009 | 2015 | 2016 | Mean |
| Valle d'Aosta | | | | | | |
| Piemonte | na | na | 0.9 | | | 0.9 |
| Lombardia | na | na | 0.7 | 5.0 | 3.0 | 2.9 |
| Veneto | 1.4 | 1.5 | 0.9 | | | 1.3 |
| Friuli Venezia Giulia | 2.6 | 1.1 | 1.0 | | | 1.6 |
| Trentino Alto Adige | 1.6 | na | 0.9 | | | 1.3 |
| Liguria | 1.6 | 9.5 | 0.9 | | | 4.0 |
| Emilia Romagna | 2.5 | na | 1.6 | | | 2.1 |
| Toscana | 0.9 | 7.0 | 2.5 | 5.0 | 3.0 | 3.7 |
| Umbria | 2.3 | 1.8 | 1.8 | | | 2.0 |
| Lazio | 1.4 | 3.6 | 5.0 | 8.0 | 6.0 | 4.8 |
| Marche | 2.7 | 3.0 | 1.9 | | | 2.5 |
| Abruzzo | 2.5 | 4.0 | 4.0 | 8.0 | 7.0 | 5.1 |
| Molise | 1.1 | 7.0 | 7.0 | | | 5.0 |
| Campania | 2.7 | 4.0 | 8.0 | | | 4.9 |
| Basilicata | 1.9 | 4.5 | 4.3 | | | 3.6 |
| Puglia | 3.1 | 10.0 | 8.0 | 5.5 | 5.5 | 6.4 |
| Calabria | 2.7 | 3.0 | 12.0 | 3.0 | 3.0 | 4.7 |
| Sicilia | 1.2 | 3.8 | 5.5 | 8.0 | 4.5 | 4.6 |
| Sardegna | 1.0 | 2.0 | 6.0 | | | 2.3 |
| Italia | 2.3 | 4.2 | 9.5 | | | 5.3 |

Table 4. Estimation of the organic olives and organic EVO oil produced in 2018

| Regions | Output organic olives | | Oil extraction at mill | Output organic oil | |
|-----------------------|-----------------------|-------|------------------------|--------------------|-------|
| | (t) | % | % | (t) | % |
| Valle d'Aosta | | | | | |
| Piemonte | 78 | 0.0 | 13 | 10 | 0.0 |
| Lombardia | 723 | 0.1 | 13 | 94 | 0.1 |
| Veneto | 351 | 0.0 | 13 | 46 | 0.0 |
| Friuli Venezia Giulia | 56 | 0.0 | 13 | 7 | 0.0 |
| Trentino Alto Adige | 86 | 0.0 | 13 | 11 | 0.0 |
| Liguria | 933 | 0.1 | 13 | 121 | 0.1 |
| Emilia Romagna | 1 525 | 0.2 | 13 | 198 | 0.2 |
| Toscana | 43 627 | 4.5 | 13 | 5 672 | 4.5 |
| Umbria | 8 419 | 0.9 | 13 | 1 095 | 0.9 |
| Lazio | 31 446 | 3.3 | 13 | 4 088 | 3.3 |
| Marche | 5386 | 0.6 | 13 | 700 | 0.6 |
| Abruzzo | 13 260 | 1.4 | 13 | 1 724 | 1.4 |
| Molise | 3 561 | 0.4 | 13 | 463 | 0.4 |
| Campania | 36 320 | 3.8 | 13 | 4 722 | 3.8 |
| Basilicata | 14 987 | 1.6 | 13 | 1 948 | 1.6 |
| Puglia | 358 143 | 37.2 | 13 | 46 559 | 37.2 |
| Calabria | 243 882 | 25.3 | 13 | 31 ,705 | 25.3 |
| Sicilia | 136 882 | 14.2 | 13 | 17 795 | 14.2 |
| Sardegna | 6 136 | 0.6 | 13 | 798 | 0.6 |
| Italia | 96 2200 | 100.0 | 13 | 125 086 | 100.0 |

mented by machinery for bottling in different formats (25, 50, 100 cc) and / or for canning, again in different formats (50, 100, 300, 500 cc).

The small and tiny producers must bring their olives to an external mill, which can be managed by a cooperative or by an individual owner. In both cases, these services are normally paid in kind, with a share of the oil. The smallest producers normally get back their oil, which is then consumed within the family, or sold, to a network of friends and relatives, who trust the producers and obviously do not care about certifications and labels. Most medium and large producers (but not all of them) have their oils valorised, through bottling / canning, packaging, and certifications, at the mill. Again, the cooperative or the owner of the mill is normally paid in kind. Other important actors in the oil value chain are the specialised bottlers, medium and large companies, also international ones, which buy olive oils in bulk, from the producers or from the olive mills, from all Italy and from abroad, and proceed with blending, bottling and canning in large and highly automatized plants, with their own labels or with the private labels of large retailers. Finally, we must consider the demand from the food industry, which needs olive oil and extra-virgin olive oil as an ingredient for its many products.

This complicated network of actors, which requires controls and certifications at each stage, is even more complicated for the producers of organic olives and oil, who must act very carefully for not mixing their olives and then their oils with the olives and oils produced in the conversion phase, or with the conventional ones.

For example, when the producer of organic olives arrives to the mill, and the mill has, until this moment, processed conventional olives, the plant must be cleaned and the oil coming from the first quantity of organic olives cannot be certified organic and must be sold as conventional. This aspect will be better analysed in a next paragraph.

At this stage, taking into consideration a very prudential oil extraction rate at the olive mills, a net 13 percent, that

considers the quantities that cannot be certified as organic, we have estimated (Table 4) the national potential organic EVO oil output in 125 086 tons.

The comparison with the official figures (Table 5) enlightens either the differences or the contradictions of the organic olive oil subsector: our estimated output of organic olives is 12.7 percent higher than the official one, and the potential organic EVO oil is 22.9 percent lower than the potential one calculated with the official data. But the reality is that the certified olive oil is only 40 099 tons, one fourth of the official potential, and 32 percent of the potential organic EVO oil we have so prudently calculated. In other words, there is in both cases a huge amount of “missing” organic olives (between 642 and 750 000 tons) and consequently a huge amount of “missing” organic EVO oil (between 85 and 122 000 tons).

Why does this happen? Why do so many farmers / owners of olive groves not bring their olives to the mills? The answer is not simple and must be articulated and well explained.

First, there are many “eco-smart” landowners, who cannot be defined “producers”, because their primary objective is not the production of olive and oil, but the decoupled area subsidies we have seen before. This category normally owns olive groves on marginal areas, on slopes difficult to mechanize, old plantations that should be rejuvenated, areas where fertilizers and fine chemicals have not been used from several years. Areas in some cases already abandoned decades ago. For this typology, whose amount is impossible to quantify at this stage, the “organic option” has been a good opportunity to increase their income without much effort. These “eco-smart” landowners are not found only in the olive – oils subsector, but also in the “pastures” and “meadows” subsectors, where in many cases the decoupled subsidies are given for areas abandoned from years. It is “paper farming” at its best, where the only output of the system is the application submitted to enter the “conversion” phase and then to stay in the “maintenance” phase. There is not any reduction in

Table 5. Estimates of potential production, t

| Variable | 2018 ° | This study | Δ % |
|--|---------|------------|-------|
| Output of organic olives * | 853 830 | 962 200 | 12.7 |
| Organic olives certified at the mill * | 211 980 | 211 980 | |
| Missing organic olives | 641 850 | 750 220 | |
| Extraction rate (%) * | 19.0 | 13.0 | -31.2 |
| Organic EVO oil certified * | 40 099 | 40 099 | |
| Organic EVO oil potential | 162 228 | 125 086 | -22.9 |
| Missing EVO oil | 122 129 | 84 987 | -30.4 |
| Missing EVO oil (%) | 75.3 | 67.9 | |

Source: ° Del Bello, 2020

Table 6. Olive oil mills in Italy

| Regions | Total mills 2017 | | Change 2002-17 | Mills also Org | | Org/Tot | Org ha/ Org mill |
|-----------------------|------------------|-------|----------------|----------------|-------|---------|---------------------|
| | n | % | | n | % | | |
| Valle d'Aosta | | | | | | | |
| Piemonte | 4 | 0.1 | ∞ | | | | |
| Lombardia | 31 | 0.6 | 24.0 | 10 | 0.6 | 32.3 | 32.8 |
| Veneto | 60 | 1.2 | 62.2 | 18 | 1.1 | 30.0 | 20.3 |
| Friuli Venezia Giulia | 13 | 0.3 | 333.3 | 5 | 0.3 | 38.5 | 9.4 |
| Trentino Alto Adige | 6 | 0.1 | 200.0 | 6 | 0.4 | 100.0 | 15.0 |
| Liguria | 161 | 3.3 | -5.8 | 19 | 1.2 | 11.8 | 16.2 |
| Emilia Romagna | 36 | 0.7 | 44.0 | 13 | 0.8 | 36.1 | 75.3 |
| Toscana | 413 | 8.4 | 0.5 | 227 | 14.0 | 55.0 | 68.7 |
| Umbria | 217 | 4.4 | -17.2 | 93 | 5.7 | 42.9 | 60.2 |
| Lazio | 345 | 7.0 | -7.0 | 91 | 5.6 | 26.4 | 94.7 |
| Marche | 175 | 3.6 | 10.8 | 60 | 3.7 | 34.3 | 46.8 |
| Abruzzo | 359 | 7.3 | -26.9 | 64 | 4.0 | 17.8 | 53.5 |
| Molise | 106 | 2.2 | -10.9 | 24 | 1.5 | 22.6 | 38.8 |
| Campania | 379 | 7.7 | -27.7 | 73 | 4.5 | 19.3 | 133.6 |
| Basilicata | 135 | 2.8 | -19.6 | 32 | 2.0 | 23.7 | 172.8 |
| Puglia | 904 | 18.4 | -21.5 | 265 | 16.4 | 29.3 | 277.0 |
| Calabria | 858 | 17.5 | -16.3 | 343 | 21.2 | 40.0 | 197.4 |
| Sicilia | 614 | 12.5 | -11.1 | 251 | 15.5 | 40.9 | 155.7 |
| Sardegna | 84 | 1.7 | -23.6 | 26 | 1.6 | 31.0 | 133.1 |
| Italia | 4 900 | 100.0 | -14.7 | 1 620 | 100.0 | 33.1 | 147.0 |

the use of chemicals, there is no reduction of pollution, and obviously there is no increase of the supply of healthy food for the consumers.

Secondly, there could be some technical and bureaucratic barriers due to the olive mills, which need to be certified to produce organic EVO oils. It is interesting noticing (Table 6) that, nationwide, the number of olive mills has fallen from 5744 in 2002 to 4900 units in 2017 -14.7 percent, with much stronger reductions in the Regions of southern and central Italy, where most olive production is concentrated. This apparent contradiction, again, has several explanations. First, there was a real need to close many old and small olive mills, which had obsolete machinery and low productivity, and concentrate the extraction in more efficient olive mills, with modern extraction and bottling lines. Then, many small olive mills have been closed because less and less olives were brought to them, due to the abandonment of marginal olive groves. The opposite, in small number, has happened in the northern Regions, where olive trees and oil production are less present, but the number of olive mills has increased. The activation of new olive mills can be explained with the search of added value, through extraction within the farm, or establishment of cooperative mills, and proper bottling and marketing.

All over Italy, the contraction of the number of olive mills has been accompanied by a progressive adoption of the organic option, which is now accepted by 1 620 operators, 33.1 percent of all olive mills. Very few of these certified olive mills process only organic olives, the millers accept both conventional and organic olives, with all the problems due to the necessary separation of these two lines of production, as described before. For the owner of an olive oil mill, the decision to process also organic olives carries on a long list of costly compulsory documentation, some to be prepared only once, to enter into the system, and another long list of accomplishments, to be prepared annually. For both cases, with the few exceptions of the biggest and more structured ones, the millers must rely on the paid support of specialised advisors, and then the millers must also pay for the services of the Certification Body, that certifies the respect of all procedures. The data in Table 6 reveal a clear difference between the southern and central-northern Regions. In the South, each mill with organic certification should process the olives from more than 130-150 ha, with a peak in Puglia, with 277 ha per olive mill. This could probably determine two negative and opposite problems: on one side, there could be bottlenecks, with olive producers unable to process their output in the due time, and on the other side there could be

an excess of output, with the millers and producers unable to valorise the organic EVO oil, as the prices actually indicate.

After the extraction, the certified organic EVO oil must be valorised, through bottling and packaging, with several options. It could have a) the label of the farm, the original producers of the olives, or b) the label of the miller, c) a third party label, or d) it could be sold to large-scale bottlers, specialized processors who purchase organic EVO oils from all over the world, and operate large scale bottling plants, where the organic EVO oils are bottled and packaged, again with several options for the labels.

Obviously, once again, also this last phase of the value chain must be controlled and certified, to be sure that the oil contained in the bottles and cans corresponds with what is printed on the labels.

In 2018 (SINAB, 2020) there were in Italy 4138 label holders (Table 7) for organic EVO oil, an enormous increase since 1996, when a first survey was conducted (Santucci, 1997). The booming expansion has characterized all Regions, with the only exception of Piemonte and Friuli Venezia Giulia, where very few producers have a label. However, only 3150 of these labels belong to farmers, while the balance – 988 – belongs to other actors of the value chain: millers (profit-oriented firms or cooperatives) and blenders/bottlers. These 3150 organic EVO oil labels might seem a

huge number, and – as a matter of fact – it is not small, but it must be compared with the 43 069 people who apply for the decoupled subsidy for organic olive trees cultivation: Only 7.3 percent of them valorise autonomously their organic olive oil.

About one fourth of all labels (1 078), 26.1 percent, is concentrated in Toscana, followed by Sicilia (18.7 percent) and Puglia (16.7 percent).

In Liguria, the attitude to valorise the organic EVO oil is also demonstrated by the high rate of label holders compared to the total number of producers: 40 percent of them have their own label. Quite active are also the organic EVO producers in Toscana and in Veneto, where respectively 32 percent and 25 percent differentiate their products with their own label. Lower propension to own marketing are found in all other Regions, with a minimum in Calabria, where only three percent of producers have their own label.

Another likely explanation of the low propension for market differentiation could have been the absence of a premium price for the organic EVO oil, but the analysis (Meo, 2020a) of the market prices for bulk quantities (Table 8) recorded in the last 11 years (2009 – 2019) indicates that, nationwide, the organic EVO oil has always received a relatively higher price than the conventional EVO oil, with a peak in 2010 (+54 percent) and the smallest difference in

Table 7. Label holders for organic EVO oil

| Regions | 1996 [36] | | 2018 [30] | | Growth, % 1996-2018 | Labels/ producers, % |
|-----------------------|-----------|-------|-----------|-------|------------------------|-------------------------|
| | n | % | n | % | | |
| Valle d'Aosta | | | | | | |
| Piemonte | 1 | 0.6 | 7 | 0.2 | 600.0 | 13.5 |
| Lombardia | 5 | 3.0 | 15 | 0.4 | 200.0 | 9.3 |
| Veneto | 7 | 4.2 | 85 | 2.1 | 1 114.3 | 24.9 |
| Friuli Venezia Giulia | | | 6 | 0.1 | ∞ | 8.2 |
| Trentino Alto Adige | | | | | | |
| Liguria | 5 | 3.0 | 51 | 1.2 | 920.0 | 39.8 |
| Emilia Romagna | 11 | 6.6 | 65 | 1.6 | 490.9 | 15.2 |
| Toscana | 24 | 14.5 | 1 078 | 26.1 | 4 391.7 | 32.1 |
| Umbria | 12 | 7.2 | 153 | 3.7 | 11 75.0 | 15.0 |
| Lazio | 17 | 10.2 | 224 | 5.4 | 12 17.6 | 8.3 |
| Marche | 2 | 1.2 | 125 | 3.0 | 61 50.0 | 6.2 |
| Abruzzo | 8 | 4.8 | 162 | 3.9 | 19 25.0 | 11.8 |
| Molise | 5 | 3.0 | 34 | 0.8 | 580.0 | 9.8 |
| Campania | 18 | 10.8 | 194 | 4.7 | 977.8 | 5.6 |
| Basilicata | 3 | 1.8 | 60 | 1.4 | 19 00.0 | 3.8 |
| Puglia | 20 | 12.0 | 692 | 16.7 | 33 60.0 | 9.8 |
| Calabria | 15 | 9.0 | 342 | 8.3 | 21 80.0 | 3.5 |
| Sicilia | 8 | 4.8 | 775 | 18.7 | 9 587.5 | 9.6 |
| Sardegna | 5 | 3.0 | 53 | 1.3 | 960.0 | 5.5 |
| Italia | 166 | 100.0 | 4 138 | 100.0 | 2 392.8 | 9.6 |

2015 (+ 12 percent). Obviously, the national average hides the price differences that might arise between the many areas of production and the different varieties. Prices tend to be lower in southern Italy, in the areas where most of production is concentrated, while in the central and northern regions prices can be much higher. For example, in 2019 the organic EVO oil was priced, at farm gate in Toscana, 16.9 euros/litre, vs 5.5 euro/litre for the conventional one, meaning a premium of 206 per cent. Totally different the situation in Sicily, where the premium was only four percent, with 6.3 euros paid for the organic EVO oil vs six euros paid for the conventional product.

Such premium prices become even more important after valorisation (bottling and distribution), when the oils arrive on the shelves of the large retailers and the consumers can finally chose what to buy from an extremely wide range of products: national or imported, from EU member states or from Third Countries, blended or not, Geographically Indicated or not, organic or conventional, bottled or in tin cans, spanning from 25 cl to 5 litres, private label or farm label. Add the variety of distribution channels, which can also affect the final price proposed to the potential client /consumer: large international retailers, national chains, regional chains, gastronomy boutiques, and traditional family-run food stores, low-cost retailers managed by immigrants, open air weekly farmers' markets, and more recently internet.

Table 8. Prices of organic EVO oil, €/l

| Year | Farm gate | | | Retail | | |
|------|-----------|-----|------|--------|-----|-------|
| | Conv | Org | Δ% | Conv | Org | Δ% |
| 2009 | 2.5 | 3.6 | 44.0 | 4.0 | 7.9 | 97.5 |
| 2010 | 2.7 | 4.1 | 54.0 | 3.8 | 7.9 | 107.9 |
| 2011 | 3.2 | 4.3 | 35.0 | 3.8 | 7.7 | 102.6 |
| 2012 | 2.6 | 3.8 | 44.0 | 3.7 | 7.7 | 108.1 |
| 2013 | 3.0 | 4.3 | 41.0 | 4.1 | 7.9 | 92.7 |
| 2014 | 3.9 | 4.8 | 23.0 | 4.0 | 8.0 | 100.0 |
| 2015 | 5.4 | 6.0 | 12.0 | 4.7 | 9.6 | 104.3 |
| 2016 | 4.1 | 5.9 | 44.0 | 4.8 | 9.0 | 87.5 |
| 2017 | 5.5 | 7.1 | 28.0 | 5.1 | 8.4 | 64.7 |
| 2018 | 4.6 | 5.9 | 29.0 | 4.9 | 8.0 | 63.3 |
| 2019 | 4.9 | 7.0 | 42.0 | 4.5 | 7.7 | 71.1 |

Several years ago (Monotti & Santucci, 2004), the prices of organic EVO oils were within the range of similar high-quality conventional EVO oils, in three Italian market channels: supermarket chains, food boutiques and internet. Conventional EVO oils, elegantly packaged and promoted, were sometimes much more expensive than the organic EVO oils.

More recently Meo (2020b) proposes a comparison (Table 8), between the average prices of the organic EVO oils

and those of conventional EVO oils, as registered in the main Italian supermarket chains, and calculates, for the last 11 years, premium prices up to 108 percent in 2010 and 2012, with a decreasing trend in the last four years, when the premium prices, however interesting, were down to 88 – 65 – 63 and 71 percent.

All these observations, accompanied by research on the Italian consumers (Giannocarò et al., 2019), lead to conclude that the markets recognize the value of the organic EVO oils and consequently the missing quantities of olives first, and of oil then, cannot be justified with scarce demand from the consumers or from the industry.

The second problem mentioned in the Introduction is completely different and still there are no quantitative information. It can only be described in qualitative terms. Many small and tiny olive producers, each one with a few dozens or hundreds of trees, find that the certification is too costly and complicated. These smallholders do not apply for it and consequently lose the decoupled area subsidy given by the European Union. This behaviour leads to underestimate the areas with olive trees under organic management and consequently the output of olives and EVO oil. This phenomenon does not happen only in the olive sector, but it characterizes all productions. Smallholders face an institutional barrier to entry that needs to be removed. Furthermore, their organic EVO oil output is consumed by the family and relatives or sold through a network of friends and long-time clients.

To facilitate the life of these smallholders, the European Commission, with its Regulation 848/2018 has opened to Group Certification. Considerations 85 and 87 and the whole Article 36 of the Regulation explain the present situation (high costs, excessive bureaucracy), describe the aims (local networks, economic development, competition with third Countries) and indicate the “group certification” as the solution. As a matter of fact, group certification is already present in 58 Countries of Latin America, Africa, and Asia, with 5,850 groups and 2,6 million producers (Meinshauen et al., 2019). Within 2020 the procedures for group certification in Europe should be finalized and then this hidden organic sector, composed of thousands of small and tiny producers could come to surface, receive the decoupled income subsidy and obtain a proper premium price, after extraction, bottling and packaging

Conclusions

With this paper, we have described two problems which affect the organic EVO oil value chain in Italy: first, we have quantified the huge amount of organic olives and thus EVO oil which is not valorised, compared to the large area with

olive trees that receives the decoupled subsidies, and then we have remembered the undefined number of smallholders, who do not even apply for the certification of their small areas with olive trees. In both cases, the premium price potentially achievable from the market does not materialize.

This could be due to rational and justified choices by the producers, either large landowners or tiny producers, but in both cases, there is a loss for the organic system and for the territories as a whole (Stotten et al., 2017). For example, the uncared olive groves determine less demand for skilled labour and less inputs for organic pest control. The olives that are not harvested mean again less labour demanded in the countryside, and minor use of machinery and tools for facilitating the harvest. There is less transport from the producing areas to the mill. There is less demand for all the components required for elegant and proper marketing: glass bottles and tin cans, labels, boxes and cages, information materials, from printed materials to websites. The multiplying effect of the valorisation (Schermer et al., 2015; Belliggiano et al., 2020), is lost, thus damaging indirectly all the potential providers of labour, goods, and services. This loss of added value is particularly high and worrisome in the regions of southern Italy, where unemployment is more relevant and average incomes are lower than in central and northern Italy.

Furthermore, considering the strict relationships that exist between agriculture and tourism (Renko et al., 2010; Santucci, 2013; Alonso & Bressan, 2014), this missing offer of organic EVO oils, especially in the southern Regions, also means a minor attraction of Italian and foreign tourists. The Italian extremely diverse gastronomy, accompanied by high quality wines and olive oils, attracts nowadays millions of “gastronauts” who spend their holidays in the countryside, overnight and eat in agro-tourism farms, purchase typical products made by skilled craftsmen, and so on. Italy is rich of attractions and proposals, like Wine Routes and Olive Oil Routes, Days of Open Cellars, food fairs and a multitude of events. The missing offer of organic EVO oil also damages this important component of the economy of many rural areas.

It is quite clear, at this point, that the present situation, partially determined by the political decision for the decoupled subsidies to organic areas, is not favouring the growth of the certified organic output and consequently it undermines the potential positive impact of the organic option, for more labour, more income and wider rural development.

More emphasis should be given to an integrated value chain approach that exploits the synergies between the area subsidy and the valorisation of the raw output, in our case the olives, through contracts with millers and other stakeholders of the value chain.

The surfacing of the mini and small producers, thanks to the group certification, should be accompanied by valorisation projects, to bring their olives to organic certified olive mills and their oils to the tables of consumers.

Such actions require the collaboration and the engagement of several stakeholders: the local decision makers – agriculture is delegated in Italy to the Regional Governments, the organic farmers’ associations within and outside the large Farmers’ Unions, the local advisors who promote organic agriculture, the olive mills owners. Time and commitment will be required, the success is not sure for all cases but, after almost 30 years of decoupled subsidy for the areas with organic olive trees, it is time to elaborate new and better supporting policies.

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