Quality Differentiation as a Strategy for the Viability of Traditional Olive Farming in Trás-os-Montes Region

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Abstract— Despite special quality of the olive oil of Trás-os-Montes (TM), producers fail to create niche market and raise price commensurate with the high cost. Some local manufacturers made some attempts to establish special brands for their oil and the association of the local producers (AOTAD) made the required efforts to bring the product of the region under PDO, designated as Azeite de Trás-os-Montes DOP. Only a small part of the marketed product is sold under PDO (4%) and a fraction of which is sold under some brand till date.

The cost structure of olive oil depends on multiple factors - the type of production system (traditional or intensive), plant variety, inclination of plots and productivity, among others. The harvesting cost in general represents more than 50 percent of the total costs. The massive increase of production with the use of intensive farming at lower unit cost in other regions has pulled down the overall market price making traditional farms unviable. For the modern super intensive farm unit cost is only one fourth of that of traditional farm.

The issue is not of protecting an unviable traditional system from the competition of an intensive system, but of the realisation of the true value of a product that the market mechanism fails to accomplish. This kind of problem of adverse selection due incomplete/ asymmetric information in the market is often interpreted in terms of the ‘lemon effect’ or ‘Gresham’s Law’. It states that in the case of buyer failing to discriminate between the products of different qualities at the time of purchase, the producers of higher quality products cannot charge a premium price. Under these circumstances, if the cost of high quality product exceeds that of low quality product, the producers of the former cannot sustain in the market. This is precisely what happens with the good quality high cost olive oil of TM against the competition of the low quality low cost olive oil of some other places. An exotic high quality product its characteristics must be described in most visible and attractive forms and search its niche market globally.

Keywords— Olive Oil in Trás-os-Montes, Quality Differentiation, Viability, Traditional Farming

II. INTRODUCTION

The olive is a key crop in Mediterranean countries from a social, economic and environmental perspective, as it occupies vast stretches of territory and it also grows extensively in the dry regions even without irrigation. Olive cultivation affects numerous farming families and thus is a highly important source of employment in the rural areas. Portugal has two principal regions producing olive oil - Alentejo and Trás-os-Montes (TM) sharing 30.4% and 32.4% respectively of the total oil production in the country during 2000-2004 [1]. The former region has adopted modern and intensive farming techniques for olive production which grew quite fast over the last two decades, while in the latter region it continues with the traditional method of farming and as a consequence faces steep competition leading to its stagnating. The traditional farming of the Trás-os-Montes has important socio-cultural, economic and environmental linkages in the mountainous region and thus needs to be promoted. The present paper provides an alternative approach and suggests some measures to invigorate the traditional olive farming of the region that is faced with the severe challenges posed by the other regions of the Portugal and neighbouring country, Spain, which adopted intensive and super-intensive olive farming techniques.

The fact that olive oil of TM region has a special quality is well known to the local consumers, manufacturers and farmers. Quite a few manufacturers made some attempts to establish special brands for their oil. Also the association of the local producers made the required efforts to bring the product of the region under Protected Designations of Origin (PDO) (designated as Azeite de Trás-os-Montes DOP). The success is however very limited either in terms of
number of brands or in bringing the product under PDO; only a small part of the total production is sold under PDO (up to 7%) and a fraction of which is sold under some brand till date. As a result, this product cannot fetch premium price at the local and broader market. A major part of the product is used for domestic consumption by the producers, some is sold to the local and regional consumers and only a small portion reaches the broader market. As the demand for the product is highly income elastic, even if the local people are aware of the special quality of the particular product, they are not capable or willing to pay premium price when a cheaper substitute is available. On the contrary, the value of a premium product can be realised only in the niche market and that market is thinly dispersed across Europe and North and South America. It requires altogether a different approach in the global positioning of the Trás-os-Montes brand as done by other countries like Italy for some of their similar products.

Failure to effectively differentiate its product from the other products sold in the broader market results in severe disadvantages for the producers and this ultimately leads to gradual shrinkages of production until the early 1990s. High quality products are usually associated with high cost of production and this is particularly true in the TM region, where farming is based on traditional technique, quite close to the so called ‘organic farming’. In other words, the farming technique can easily be transformed into ‘organic farming’ with little adjustments/costs. This explains why the majority of organic area (27.2% in 2005) in TM is occupied with olive groves [2]. One example is that many of the olive trees in this region are more than 50 years old and no irrigation or chemical inputs are used to enhance productivity[1]. Productivity largely depends on the climatic conditions, soils and plant variety. It is obvious that under this farming technique the yield would be very low and the cost of production would be very high as compared to those of the modern technology intensive farming system practiced elsewhere, as in Alentejo and in the south of Spain. Like in other cases traditional system giving way to modernity, olive farming of TM shrinks with the growth of modern olive farming in some other regions. In Alentejo grove area has been increasing, approximately by 50 thousand hectares in the last decade (FENAZÉITES: Federation of Cooperatives of Olive Oil, 2009). These new olive groves have drip irrigation system and mechanised harvesting technique and therefore it has higher yield and lower unit cost [3]. This is a big challenge and threat for TM olive oil production.

The present paper takes into account the current state of olive farming in the TM region, analyses the trends in area, production and yield over the last two decades, and compares the present cost of production in this region with that of technology intensive production in Alentejo. We would then analyse their effects on the traditional olive oil price and production in TM. It then tries to formulate an alternative approach to promote this high quality product. The scheme of the paper is as follows. While the present one being introductory, section 2 discusses the production trends in the world, UE, and Portugal. Section 3 presents the socioeconomic importance of olive farming and then compares the different modes of farming practices and the associated productivity, price and cost differences. Special features of TM olive oil is discussed in section 4 and then formulates an analytical framework to explain the distortions created in the market due to incomplete information and based on this suggests corrective measures. Finally, section 5 suggests some alternative approaches to viability of the TM olive farming.

III. OLIVE FARMING IN THE WORD, PORTUGAL AND TRÁS-OS-MONTES REGION

The world production of olive oil is concentrated in the Mediterranean area with 98% share. In the last 15 years world olive oil production grew at an annual average rate of 3.2%. Average world production for the last three marketing years is about 2.7 million tonnes [4]. The EU countries, namely, Spain, Italy, France, Greece and Portugal, are the dominant players in the olive oil market, with 80% of the world production [4]. Other countries are

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[1] It needs to be studied whether these old trees yield better quality oil than the younger ones. If such a hypothesis is found to be true then it would fetch premium price for the oil.
Table 1 Olive oil production in the European Union (1000 tonnes)

<table>
<thead>
<tr>
<th>Year</th>
<th>Spain</th>
<th>Italy</th>
<th>Greece</th>
<th>Portugal</th>
<th>France</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000/01</td>
<td>974</td>
<td>509</td>
<td>430</td>
<td>25</td>
<td>3</td>
</tr>
<tr>
<td>2001/02</td>
<td>1.411</td>
<td>657</td>
<td>358</td>
<td>34</td>
<td>4</td>
</tr>
<tr>
<td>2002/03</td>
<td>861</td>
<td>634</td>
<td>414</td>
<td>29</td>
<td>5</td>
</tr>
<tr>
<td>2003/04</td>
<td>1.412</td>
<td>685</td>
<td>308</td>
<td>31</td>
<td>5</td>
</tr>
<tr>
<td>2004/05</td>
<td>990</td>
<td>879</td>
<td>435</td>
<td>41</td>
<td>5</td>
</tr>
<tr>
<td>2005/06</td>
<td>827</td>
<td>637</td>
<td>424</td>
<td>29</td>
<td>4</td>
</tr>
<tr>
<td>2006/07</td>
<td>1.111</td>
<td>490</td>
<td>370</td>
<td>48</td>
<td>3</td>
</tr>
<tr>
<td>2007/08*</td>
<td>1.222</td>
<td>470</td>
<td>307</td>
<td>35</td>
<td>5</td>
</tr>
<tr>
<td>08/09**</td>
<td>1.150</td>
<td>560</td>
<td>370</td>
<td>50</td>
<td>6</td>
</tr>
<tr>
<td>Average share 2006-09</td>
<td>56.2%</td>
<td>24.5%</td>
<td>16.9%</td>
<td>2.1%</td>
<td>0.2%</td>
</tr>
</tbody>
</table>

Source: [5] [4]
Note: * Provisional Values
** Estimated Values

Tunisia (4,6%), Turkey (5%) Syria (5,5%) Morocco’s (2,5%) and Algeria (1,4%) [5] [4]. The EU raised acreages and yields in the last decade, with Spain in the first place [4]. The average production in the period of 2006-09 shows that Spain alone has produced 56% of total EU olive oil production as may be seen in Table 1. The second most important producer is Italy (24.5%). Greece is in the third place among the EU countries (16.9%). Portugal has a small share of EU production (2.1%) which indicates that it is a small partner and can raise its market share without much affecting its competitors.

In Portugal the evolution of production in the last decade shows a sign of recovery: after a strong decrease since the beginning of the 1950s (90.000 tonnes) until the end of 1980s (35.000 tonnes) the production started increasing and within fifteen years it reached to 50.000 tonnes. One common feature of olive production is the high degree of year to year fluctuation. However one can clearly discern the rising trend in the recent time. Moreover, the amplitude of the fluctuation is also gradually declining. By the turn of the century there were around 24.000 farms with 47.000 ha of olive groves in this region.

The land area of olive groves in TM are 72 202 hectares and this represents 27.6% of the total agricultural land in the region [6] and 32.4% of the total production in Portugal in the period of 2000-2004 [7]. Farmers specialising exclusively in olive production represent 16.2% of the total number of olive growing farmers and the specialised farmers cover 28.7% of the total olive area. In economic terms, 41.3% of the olive growers are very small (Margin Bruts Standard up to 2 UDE) covering 14.6 % of the olive area. The size class of 4 to 8 UDE is the predominant one with an average olive area of 2.4 hectares. Income ranges between 4 800 and 9 600 € of MBS in this size class [8].

According to the estimates of “Casa do Azeite”, in 2008 Portugal exported 30.704 thousand tonnes of olive oil valued 92 million euros. Around a third of the olive oil production of the country is exported. Brazil is the main market with 30% (11.000 tonnes) share of the total exports. The other countries are Spain (1.250 tonnes), USA (625 tonnes), South Korea (419 tonnes), Venezuela (388 tonnes) and Angola (287 tonnes). The destination countries are primarily the ones having traditional links or migrated Portuguese population.

Notwithstanding these substantial exports, Portugal imports olive oil in large quantities, often more than what it exports, making it a net importer of olive oil. Portugal imports between 40.000 and 50.000 tonnes of olive oil, what correspond to 40 - 50% of domestic consumption (INE). The principal source of this import is Spain who supplies as much as 95% of the total imports. Being the world’s largest producer of olive oil and the single most important supplier to the neighbouring Portugal, Spain has the predominant role in setting prices of olive oil in Portugal.
IV. ALTERNATIVE MODES OF FARMING

One of the most important characteristics of olive oil production is that it is primarily concentrated in less-developed regions of the Community, namely, Spain, Italy, Greece, and Portugal. Even in Portugal the area of production is concentrated in two less-developed regions: Alentejo (41%) and TM (32%). Predominance of traditional family based small farming characterizes olive cultivation not only in Portugal but also in Greece and Italy. In these small farms the work is used to be performed by the family labour. However, with the migration of several family members to the urban areas the use of hired labour in these small farms has now become a common feature. Wage expenses for hired labour in the traditional family farms now reduces their competitiveness vis a vis modern large farms. In these large farms hired labour is used, but the different tasks are mostly mechanized. Although under intensive farming only 50,000 ha of area is covered as against 350,000 ha under traditional system, in the product market the former dominates both through much larger volume of production and much lower cost of production.

A. Systems of production

In Portugal, as in other European countries, we found different systems of production that may be broadly classified into three groups: purely traditional system, intensive system and super intensive system. However in actual situation, several farms are placed at the intermediate ranges. In the traditional system we have 100 to 200 trees per hectare, with age more than 50 years. In this system we found small and large farms operate. The challenge for the large farm is much more because they have severe problems of finding workers and of the high cost of hired labour. The productivity of these farms is very low, varies between 700 kg and 2500 kg with an average of 900 kg/ha.

The traditional small groves often have terrace walls, as they are predominantly associated with steep terrain. Their soil is often maintained by grazing sheep rather than through the use of herbicides or heavy tilling. Little or no chemical fertilizer is used in these traditional farms. However manure is commonly applied for the supplement of nutrients. Pesticide application is rare. Traditional farms are not irrigated due to scarcity of water in this dry area. Farmers generally preserve olive trees even if they are no longer in their full productive capacity.

All the operation in small farms used to be done by the family labour. In many cases the family members doing the work in the holidays or in the weekend. Mechanization is, however, out of question on slopes steeper than 15 degree and, further, is economically justified only on holdings exceeding a certain size and with good yields per hectare. The scarcity of labour and the high cost is a big challenge for this system of production.

The intensive modern olive farms are located in the plains, with the capacity for 200 to 400 trees per hectare. There is no terracing and the soil is managed through repeated use of herbicides. Chemical fertilizers are always applied through drip irrigation. Finally, trees are treated with pesticides, as they are under intensified practices. The mechanization is partial; machines are used to harvest the product and to irrigate. Farmers have been benefited from the investment in modernization over the last decades. The super intensive system has grown rapidly in the last decade or so in the south of Portugal, particularly in Alentejo, with the favourable conditions created by the irrigation scheme of Alqueva. This irrigation scheme is predominantly benefiting the large farms, who use highly technology intensive method of cultivation, such as high yielding small plants (one or two varieties only), drip irrigation, highly mechanized operations from soil preparation to fruit collection and oil extraction and processing. The harvesting process, which used to be highly labour intensive in the traditional system, has become almost entirely mechanized where a worker using a machine can collect up to 100,000 kg in 24 hours. Plant density of the intensive farms is almost five times that of traditional farms (1000 to 2500 trees/ha). Productivity of the large modern farms is more than ten times the productivity of traditional farms (8 to 15 tonnes/ha). The intensive system covers only 50,000 ha till date but the coverage is still expanding primarily in the area of Alqueva in Alentejo.
Table 2 Some indicators about traditional and intensive systems

<table>
<thead>
<tr>
<th>Variables</th>
<th>Traditional</th>
<th>Intensive &amp; super-intensive</th>
</tr>
</thead>
<tbody>
<tr>
<td>Productivity/ha a)</td>
<td>700 - 2500 kg</td>
<td>8 - 15 thousand kg</td>
</tr>
<tr>
<td>Area in Portugal b)</td>
<td>315,000 Ha</td>
<td>50,000Ha</td>
</tr>
<tr>
<td>Number of Plant Varieties c)</td>
<td>5*</td>
<td>1 to 2</td>
</tr>
<tr>
<td>Number of olive tree/ha</td>
<td>70 to 300</td>
<td>1000 to 2500</td>
</tr>
<tr>
<td>Age (years)</td>
<td>&gt; 50</td>
<td>Up to 30 for intensive up to 20 for super intensive</td>
</tr>
<tr>
<td>Mechanization Degree</td>
<td>Nil (or partial)</td>
<td>Very high (or Complete)</td>
</tr>
<tr>
<td>Irrigation</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Water requirement</td>
<td>1500 m3/ha</td>
<td>2500-2500 m3/ha</td>
</tr>
<tr>
<td>Cost of fruits collection</td>
<td>20 euro cents/kg</td>
<td>5 - 7 euro cents/kg</td>
</tr>
<tr>
<td>(2007) d)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Olive oil prices (2007) e)</td>
<td>2.5 Euros/kg</td>
<td>2.5 Euros/kg</td>
</tr>
<tr>
<td>Olive oil prices (2009) e)</td>
<td>1.9 Euros/kg</td>
<td>1.9 Euros/kg</td>
</tr>
<tr>
<td>Olive fruits price(2007) f)</td>
<td>40 cents/kg</td>
<td>40 cents/kg</td>
</tr>
<tr>
<td>Olive fruits price(2009) f)</td>
<td>25 cents/kg</td>
<td>25 cents/kg</td>
</tr>
</tbody>
</table>

Sources: a) [7]; b) [7]; c) [9], d) [10], f) [11].
Notes: *Verdeal", “Madural”, “Cordovil”, “Cobrançosa” and “Negrinha

B. Cost of production

As already indicated, the cost structure of olive groves depends on multiple factors - the type of production system (traditional, intensive or super-intensive), plant variety, the inclination of the plots and, of course, the productivity, among others. Due to the economies of scale, the unit costs of production are lower for high-density olive groves than for extensive olive-growing. The harvesting cost in general represents more than 50 percent of the total costs; it however varies depending on several factors like wage rate, the type of grove and its density as well as yield per hectare. The harvesting cost is greatly reduced by mechanization in the modern large holdings. The small size of the high yielding olive plants and the design of plantation of the trees in particular order and spacing enable complete mechanization of harvesting olives. Even many other tasks like soil preparation, application of fertilizers and irrigation are also mechanized. The particular design of the whole system of intensive farming (or modernized farms) is to minimize the use of human labour and the very high yield minimizes unit cost of machinery and other inputs. Because of these benefits intensive grove area has been increasing in some areas, for example, in Alentejo over the last few years. These new olive groves of Alentejo have drip irrigation system and mechanical harvesting and therefore yields are much higher and unit costs lower [3]. In accordance with [12], technical efficiency scores seem to be positively correlated with farms’ size and yields.

On the other hand, for the traditional system of olive farming mechanization is very difficult because the olive trees are very strong, taller and of uneven shapes and sizes. Moreover, these olive fields are age-old and mostly located on the inclined surface of the hilly tracts. Mechanization is further restricted because of their small holding sizes. Despite much larger size of the traditional trees yield of olive fruits per tree is much less than that of the genetically modified small trees planted in the modern large holdings. Because of their geographic location there is no provision for irrigation in the traditional fields. Although organic fertilizers are used in many of the traditional farms, almost nowhere chemical fertilizers are applied.

Olive fruits are susceptible to attacks by various pests, viruses, bacteria and fungi and as a result not only the yield would decline but also the quality of oil deteriorates. Despite that problem little insecticides and pesticides are applied in the traditional farms whereas the modern farms protect the fruits against all these attacks by using chemicals. In some instances, traditional farmers use organic farming techniques for protection of olive fruits. Fortunately, in the TM region the olives are less affected by the microbial or other pest attack [13].

C. Market effects

As already indicated, the massive increase in production with the use of intensive farming associated with lower unit cost would pull down the overall market price to such a low level that would make the commercial functioning of the traditional farms almost impossible unless imputed wage to family labour is assumed to be negligible or the market demand to be infinite elastic. Both these assumptions are however unrealistic given the nature of the product and the present labour market and migration pattern. Now the possible price drop can be imagined by looking at the unit cost differences

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presented in Table 2 - for the super intensive farm it is only one fifth of that of traditional farm. Thus the super intensive farms can potentially reduce the price to such a low level that the survival of the traditional farms would be impossible.

However, there has been a recent trend in the growth of per capita consumption of olive oil. The rising demand would nevertheless prevent from drastic fall in price. Moreover, the overall domestic consumption in Portugal is much higher than domestic production of olive oil - around 50 to 60 percent of the demand is met through domestic production and the rest of the demand is met through imports mainly from Spain. Thus the deficiency of domestic production does not help the traditional farms to raise their price. The existing agreement of free trade within EU member countries enables even cheaper imports of olive oil from neighbouring Spain where the cultivation is done in much larger farms using more advanced technology and production cost is also very low. All this indicates that under the existing mode of organizing production and marketing traditional olive growers of TM have little prospect. Moreover, they always bear the potential risk of price cut not only by the domestic large farms but also due to cheaper imports from neighbours. It is therefore imperative on the part of the TM farmers to adopt an altogether different approach to production and marketing, which would be based on the special advantages that they possess as discussed below.

As presented in Table 2, the cost of production per liter of olive oil varies widely from one system to another but the market price for the oil varies a little. Some estimates indicate that the unit cost in the super intensive systems is a fifth of that of the traditional system. The primary contributing factor for the large differences in the production costs is the high cost of manual harvesting in the traditional system. The price of olive oil in bulk between the two systems does not vary significantly [1].

Due to several reasons mentioned above, TM does not have the required conditions to adopt the same intensive model implemented in some areas of Alentejo. However, there have been several changes/innovations in the farming techniques and management over the last twenty years in TM. But, this change is too limited as compared to modern farms and thus is not enough to compete economically with the cost effective super-intensive farms.

Over the last few years olive oil prices declined substantially—between 2007 and 2008 the price fell by as much as 30 percent. Given this declining trend in price, only the super intensive system can maintain profitability and thus survive whereas the high cost traditional system would decline. But is that what is desirable? The super-intensive system needs a lot of water and phytosanitary treatments which make the system environmentally hazardous and unsustainable. On the contrary, the traditional olive groves have important environmental functions that need to be protected.

V. SPECIAL FEATURES TRÁS-OS-MONTES OLIVE OIL

There are several advantages and weakness for the traditional olive farming of Trás-os-Montes vis-a-vis modern technology intensive farming: (i) Plants varieties are five in number in the former whereas only one variety of olive plant (Arbequina) is predominantly used by the latter. (ii) Olive fruits and plants are less affected by the pests and microbes in the former than the latter and the latter has to use chemicals for protection of plants and fruits. Thus the product of the latter would be degraded or contaminated by chemicals whereas the former can in general maintain stable quality. (iii) Because of intensive farming the latter has to supplement soil nutrient by applying chemical fertilizers. The approach to farming of the former is quite close to organic farming and thus it can enjoy a premium price for its product [14]. (iv) Most importantly, the product quality of the former is much superior to the latter measured in terms of standard parameters like acid content, mineral content, colour or smell and this difference should be reflected in the difference between prices. (v) Since many of the traditional olive trees are more than 100 years old it has developed special environmental linkages like an autonomous ecosystem. Further, the old trees are likely to yield special quality oil which needs to be tested and established in the laboratory.

The question is to what extent the farmers of TM are able to exploit these advantages and enjoy
premium price for their product. Available evidence indicates that there were several attempts to do so but with limited success. For instance, creation of PDO, branding of products by some entrepreneurs, labelling as organic product or a combination of them are made. However, in terms of coverage of total production or raising price of the product, the success is very limited. It is quite evident that the producers are yet to realise the worth of their products and exploit the advantages that they have. Their products more or less remain undifferentiated from the products of modern farms or of other regions in the country/ imported ones and thus they compete in the same market. As we have discussed above, it is not possible for the olive oil of TM to compete in the national or international market with ordinary olive oil at the same price. Quite often TM olive oil is sold in bulk without any product labelling or differentiation and thus its price is mainly formed by the very low price and production costs in Spain and Alentejo in Portugal. In any case the undifferentiated competitive market price makes the production of olive oil in TM unviable.

The special quality of olive oil is now being recognized not only in Portugal but also in the important global market. Some of the special features and the national/global recognition are stated below:

- In TM, approximately 95% of the olive oil marketed in bulk had a degree of acidity below 0.8%, and only 1% was lampante olive oil (> 2%).
- A AOTD estimated that 60% of the product has the potential to be sold in bottle as Trás-os-Montes DOP.
- The transition from traditional to organic farming is not difficult.
- The number of brands that win some of the best world award is growing in the last few years. Some examples of this recognition is given below:
  - Olive oil of Trás-os-Montes DOP has been classified among the best olive oils in the Premium Mario Solinas,2 2009. This premium for the quality is promoted by the International Olive Council, and was considered one of the most important awards in the world. The awards were attributed to:
  - A Producer from Vale de Madeiro – Mirandela win in first prize in the category of “Maduro Intenso”. The second place was assigned to other farmer from Almendra. Both the producers belong to Trás-os-Montes.
  - The third prize in the category “Maduro Médio” went to a farmer of Trás-os-Montes;
  - More four olive oil brands from Trás-os-Montes have been presented in the final table classification [15].
  - The Presence of one olive oil from TM in the best twenty brands confirms the product quality.
  - In 2009 at Concorso Oleario Internazionale Sol d’Oro, AOTAD has send 8 brands of DOP Trás-os-Montes for competition and all are selected among the top 19 brands. [15].

All these prizes demonstrate clearly that the olive oil “Azeite de Trás-os-Montes DOP” was recognised in the international market and it has quality that can be valorized significantly in the word marketed.

VI. ALTERNATIVE APPROACHES TO VIABILITY

The issue is not however of just protecting an unviable traditional system from the competition of a modern one. It is more in terms of realisation of the true value of a product that the present market mechanism fails to accomplish. It is well established that the TM olive oil has very low acidity, as well as distinct aroma, flavour, colour and taste and thus more healthy and palatable than their modern counterparts. However, market often treats the two products as homogeneous and accordingly, prices are determined on the basis of demand and supply of the aggregate products. This failure of the market to differentiate between the two products has its adverse effect on the high quality traditional variety product. It is obvious that high quality products are more costly to produce and if the producers do not receive price commensurate with the cost, these products would ultimately disappear from the market.

This kind of problems of adverse selection due incomplete or asymmetric information in the market is often interpreted in terms of the ‘lemon effect’ or what may be called ‘Gresham’s Law’ - the proposition that bad drives out good from the market [16] [17]. It states that in the case of buyer failing to discriminate

\[\text{2 Concurso Internacional de aceites de oliva virgenes extra 2009. Premio à la calidad del Consejo Oleicola International (Marios Solinas).}\]
between the products of different qualities at the time of purchase, the producers of higher quality products cannot charge a premium price. Under these circumstances, if the cost of high quality product exceeds that of low quality product, the producers of the former cannot sustain in the market. The sellers of bad quality products thus drive out sellers of good quality products by under cutting prices. This in turn implies bad quality products drive out good quality products from the market. This is precisely what is happening with the good quality and high cost olive oil of TM against the competition from the low quality and low cost olive oil of some other places that are produced by using technology intensive farming techniques.

It thus appears that under valuation of the good quality olive oil of TM is primarily due to inadequate/incomplete product characterization. No one is going to buy the idea that the product is of good quality because the product is originated in particular region unless the person has special knowledge of the region or special affinity/attraction to the region. However, Portugal being a small country its people has some idea that the olive oil of TM is of good quality and is willing to pay some extra price for the same as noted by several studies [14]. But this is not enough for its viability. Firstly, the demand in this market segment is very limited due its small size as determined by the income elasticity of demand and the income of the people. Secondly, there are other apparently similar products with low acidity and their brands are well established, for example, some Italian brands. Thus just Azeite de Trás-os-Montes PDO and it has very low acidity are not enough to create its niche market in Portugal. Further, searching its market only in Portugal will solve only a small part of the problem. As an exotic high quality product it must search its niche market globally. For that it must distinguish the product from all others detailing its special characteristics in most visible and attractive forms. At present two different forms of differentiation are practiced in Trás-os-Montes, namely DOP and Organic olive oil, which are in a sense complimentary to each other as discussed below.

### A. The PDO strategy for product differentiation and valorization

According [14], various factors, such as (1) the climate conditions and the soils, (2) the dominant traditional varieties and (3) the chemical and organoleptic characteristics of the olive oil, led to the creation of the PDO. The traditional production techniques are close to organic farming, and the most common processing methods allow the production of high quality olive oil. The changes introduced in the last couple of decades in this field were based on a wise combination of innovation and tradition. This product can only be certified as PDO if several characteristics are respected such as having a maximum acidity of 1% for extra virgin olive oil and 1.5% for virgin olive oil (non PDO olive oil can go up to 2%).

The product with this designation (Azeite de Trás-os-Montes PDO) started being produce only in 1994, after the approval of the EU Regulation 2081/92 and the development of certification procedures in Portugal. The bodies involved in the quality monitoring of the product are (a) the management body - Associação de Olivicultores de Trás-os-Montes e Alto Douro (AOTAD), and (b) the certification body – Associação Interprofissional do Azeite de Trás-os-Montes e Alto Douro. In 2004, the production of olive Oil PDO represented only 3% of the total production in Portugal and in TM this percentage was a little higher [8]. That implies TM olive oil has a lot of space to grow further. Only a modest attempt has been made by the manufacturers association and some manu-facturers with own initiative to internationalise the Azeite de Trás-os-Montes PDO through participating/organising fairs and festivals. The AOTAD in its site (http://www.aotad.pt/?p=83) presents some examples of participation in fairs and festivals and some cases of their products winning prize. Quite a few websites of the producers display special quality of their products. [15].

However, compared to the volume of production and the potentiality of TM olive oil this effort appears to be too inadequate (less than 7% of the total product of the region). As already mentioned, it needs to be done at a much larger level and with more details about the specialty of the product.
B. Organic Olive Oil a very important form of differentiation

With actual conditions and practices, it is not easy to produce good olive oil, except in specific regions with the better natural conditions and less pests and diseases problems. Northeast region of TM has those good conditions and is already producing high quality organic olive oils. Other regions could produce also good quality oils with their specific regional olive varieties, but in actual practice that is a very difficult task given the nature of existing olive groves [13]. At the northeast region of Portugal (Trás-os-Montes), it is however easier to produce high quality olive oil. Main reason is the lower incidence of pests and diseases related to climate conditions and ecological balance. Normally there is no problem with olive fly and C. gloeosporioides. This quality had already been proved at international events as PremioBio (Andria / Italy). Thus, it is easier to produce a high quality organic olive oil at TM. In other regions it is necessary to improve plant protection practices as required for maintaining organic standards [13].

Right now product characterization of TM olive oil is done in terms of acidity level and with its GI, which is too partial description inadequate for a product that has so many other positive attributes like smell, taste, colour, digestibility, different types of fat, vitamins or minerals contents, laxative effects, etc that have special utility to the people and can attract customers. All these measurable characteristics should be quantified and labeled on the product. There is further scope of finding new attributes of the product that have special effect on health or otherwise and thus have special appeal to the people. For instance, one can see if trees with higher age (more than 100 years) have better quality oil! But, all this requires R&D. Detailed product characterization would help create a niche market for the high quality products, which is generally thinly dispersed. However, a necessary precondition would be a mandatory product description detailing the product characteristics on the label and as and when a new attribute is identified that should be included in the label. State also has an important role in promoting the required R&D as it may be very costly for individual private enterprises.

There needs to be an awareness campaign by the state integrating the promotion of the product with the preservation of the environment, landscape and local heritage or cultural tradition. In this regard, Trás-os-Montes Olive Route is an innovative concept supported by the state. With the growth of tourism in this rural area the awareness of product, its landscape and cultural tradition would simultaneously spread among the people of a wider area and thus indirectly help create a special market for the product. The creation of gastronomic routes, linked with olive meals, as space alive of culture, animation, tasting, educational tests, fairs or festivals, all these are elements essential to the valorization of products (AOTD). A major part of olive oil is sold in bulk often at lower prices. With greater effort to commercialize and selling branded oil in smaller bottles (one liter or less) would enable realization of higher values for the products of this region.

Finally, preservation of the olive farming in this region serves dual purpose – commercial and environmental. Being very old groves in a particular landscape, they have been integrated into the local ecosystem. The survival of the farms would thus generate substantial externalities including promotion of tourism from which the farmers do not directly benefit. This provides further ground for state support to promote olive farming in this region. This would indirectly help achieve the objectives of maintenance of that tree for environmental and landscape preservation. In the future the support must be directed towards the traditional olive grove and not for the super intensive farms which are commercially highly efficient but have adverse environmental effects. The state supports need not necessarily be in terms of money but in terms of promoting the traditional system through R&D, part mechanization of the harvesting, as well as product promotion.

VII. REFERENCES

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