INTERNATIONAL TRADE OF THE NWFP: ANY OPPORTUNITY FOR THE ITALIAN FOREST SECTOR?

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The Italian forests, traditionally managed for wood production, need to tackle today a demand of good and services considered as secondary outputs by the forest manager. The Italian forest sector showed an increasing role of the of the non-wood forest products (NWFP), considered raw material in other sectors like food, floral green and chemical industries. The scarce attention to the production of non-wood forest products in the forest, the complex legal system linked to the harvesting rights and the increment of the use of such products by the industries, have pushed the companies to import raw materials from the international market with favourable quantities and prices. Moreover, in Italy, NWFP have been transformed in functional goods sold to the final users as recreational services inside the forest, instead of as commodities. Wild mushrooms, truffles, berries, nuts, resins, cork, tannins, and ornamental green are the most frequently traded NWFP toward and from Italy; country that covers a key role in the import and processing of several NWFP; the import and processing of the tannin for leather tanning, or cork for stopper and cork panel production or the processing of fresh and dried mushrooms for national and international market are examples of products that let Italy become a leader in the international market. The paper describes the economic volume and quantities of the more traded NWFP from and to Italy, calculated through the analysis of international trade data reported in COMTRADE.

Keywords: NWFP, international trade, forest sector.
Parole chiave: PFNL, commercio internazionale, settore forestale.

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1. Introduction

Forests provide a large variety of products and services, among which non-wood forest products (NWFP) have showed a rising interest in Italy (Croitoru, 2007; Merlo and Croitoru, 2005) as in the global context (Shackleton *et al*., 2011). Globally, the majority of the NWFP are harvested and used locally for the household needs, while only a small part is sold for commercial proposes (FAO, 2010a).

Despite the small fraction of harvest that reaches the market, NWFPs have been commonly traded as raw or semi processed material along several local or international supply chains working as economical bridge between developing and developed countries (Burgener and Walter, 2007) since after the second world war (Iqbal, 1995). For example, Italy has supplied 95% of the internal market of wild mushroom from the Eastern European Countries and China (Zuchegna, 2005) where the raw material has a lower cost of production. The lack of production and trade data did not allow to report a detailed picture of the economic dimension and market structure of NWFP, in order to enhance the better understanding of market complexity at global level. Some attempts have been done by FAO (2000, 2010a) to highlight the social and economic role of NWFP in the global context. Under the FAO Forest Resource Assessment, the NWFP have been formally considered in the forest accountability. At the same time UNECE-FAO (2000) highlighted the overall problem of production data availability at national level also in the developed countries, due to a lack of NWFP statistics, often mixed with information on other agricultural products. For instance, the NWFP production was estimated 1.1 billion € for Europe in the year 1995, while in the last available assessment is reported a conspicuous increase of the NWFP economic value from the year 1995 to 2007, accounting for 2.76 billion € (Forest Europe, UNECE and FAO and Europe, 2011). The most frequently reported NWFP were game meat, Christmas trees, wild mushrooms and berries, whereas only scattered information were collected for foliage, cork, pine resin, medicinal and aromatic plants, honey and nuts, often sourced from agriculture sector. Nevertheless, the same data have been re-evaluated by FAO (2014) at 4.53 billion € for the same geographic area and year, showing a persistency of data reliability on the production side[1]. These discrepancies on NWFP production are due in part to the improvement of the

[1] The value estimation from the FRA assessment in 2005 did not account for informal NWFP production (animal products excluded).

estimation over time, nevertheless still only few countries report regular and reliable statistics on NWFP, mainly based on the harvesting permits issued by the forest administration, or data collected among the forest owners. Notwithstanding this progress in data estimation, there is a persistent lack of data availability due to the high costs of data collection and a non-homogenous nomenclature among the EU countries on NWFP categories, either produced in the forest plantation or on agricultural land. While data on NWFP harvest for personal consumption or for non-market use are costly to be gathered in formal statistics, information along the supply chains are more accessible because formally recorded in the national or regional statistics. In fact, companies involved in any NWFP supply chain are subjected to public control (i.e. health quality in the case of edible products) or they are controlled by national fiscal agencies as they generate taxable economic values. According to Vantomme (2003), international trade data are an important source of information to see the global economic interest on NWFP among countries. Moreover, the analysis of trade data relay on a classification system that considers thousands of species within a set of commodity groups. The Harmonized System (HS) is the most frequent commodity classification system used worldwide for trade data reporting and it is provided by World Custom Organization (WCO). Trade data on NWFP based on HS are quite reliable and they may be recorded weekly, monthly or annually by all economic actors involved in the international trade.

Trade data are generally available from national statistical agencies or from international organizations (WTO, UN), while socio-demographic statistics on NWFP production and use are scattered, and are often linked to the specific geographic areas in which a given NWFP has an economic or social significance.

Due to highlighted problems of the NWFP statistics, the paper aims to study the economic importance of NWFP global trade, in order to provide a general overview of the market structure and dimension of some key NWFP in the Italian market. The paper provides a brief description of the NWFP classification and trade data source, followed by the methodology, the results, the discussion and the conclusion focused on the role of the Italian forest sector.

2. NWFP classification

NWFP have been introduced as concept in tropical forestry in the early '80s in order to account all the production generated by the forest sector. Beer and McDermott (1989) were among the first authors that addressed the issue and they provided a general definition of non-timber forest product (NTFP) as "*all biological materials, other than timber, which are extracted from forest for human use*"; the use was intended direct or indirect and it included also the use of wood biomass. The definition was adapted by FAO (1995) and formally used as reference definition. Nevertheless, only few years later FAO promoted an alternative definition that are still commonly used (FAO, 1999), where NWFPs were defined as "*products of biological origin other than wood derived from forests, other wooded land and trees outside forests*". The definition was draft to exclude wood biomass, but at the same time it was kept the broader possible to consider the large variety of cases recorded in all forests. The FAO definition has been a reference point for researchers till now; even though it triggered a scientific debate for understanding "*what to include or exclude*" in the NWFP concept.

The initial exclusion of wood material and wood industry by products from the definition helped the researchers to concentrate the attention to all the other products, usually considered positive externalities of the forest. Other debates focused on the origin of the NWFP while other discussions were based on the understanding of the key-factors used for discrimination the different forest products (Shackleton *et al*., 2011). Only products of biological origin for direct human uses were considered in the paper; hence products such as rock, clay, soil and peat were excluded, as well all the intangible products or services of forests. The most challenging debate addressed the type of land the NWFP are sourced from, or in other words whether to consider NWFP sourced from forests, plantations and other lands, like agriculture or urban areas. Among the NWFP, there are species that can be harvested only in the wild, and other that can be cultivated in plantations or in crop fields as domesticated NWFP, but also NWFP, which grow naturally in agriculture lands or other human-modified environments. Considering only NWFP sourced from forestland could help a lot in addressing sectorial policies; nevertheless, the higher is the reference scale (i.e. national or continental) the less detailed information can be found and consequently a data record may contain an unknown proportion of NWFP sourced outside the forest. For instance, in the international trade, that is the reference scale of the paper, there are no distinctions between wild and cultivated NWFP and even less between wild products sourced from forests or other lands. On the contrary, some specific information can be collected at local or sub-national scale, in which there are specific social or economic interests to have information on target NWFP.

Whether the inclusion or exclusion of species from the NWFP definition had a sparkling discussion among scholars and institutions, the "*classification*" of NWFP is an ongoing issue in the international debate. According to Mantau *et al*. (2007), there are different functional ways to classify NWFP; examples are the classification according to the management characteristics, the species form and the chemical components, the taxonomy family, the population size or the "*end use*" of the NWFP or "*product type*"; these last two classifications have been the most frequently used in socio-economic studies. "*End use*" approach might be useful to study the consumption and end user market, while the "*product type*" approach allows to assess the value of raw material supplied from the forest sector. Other classification systems exist in the field research, where more flexible categories have to be considered in order to address the targeted evaluation under research (Shackleton *et al*., 2011).

As a general rule assumed for the trade analysis in the present paper, we tried to follow the "*path*" of a given NWFP from the forest to the end user, hence the NWFP classification considers the ecological positions of the different NWFP, grouped within a macro category that contains different NWFP types (see Table 4). Moreover, the column "*Harmonized System codes*" links the "*NWFP type*" to the main HS commodity codes based on UN Comtrade data availability. The product type classification has a weak point due to the repetition of certain commodities in different NWFP types. The problem would have been the same also with the adoption of "*end user*" classification because different raw NWFP might be used to make several end products. The use of "*ecological positions*" was also considered because linked to the property rights of the NWFPs. In the present analysis, only the NWFP that may be sourced by European forest were considered, hence we excluded all the tropical and subtropical NWFP.
Due to the continuous changes of certain HS codes, Table 4 reports main NWFP commodity codes found in literature (Iqbal, 1995). Nevertheless, due to the large number[2] of traded commodities, there might be other HS codes that are referred to commodities containing NWFP (i.e. specific chemical compound, end products, etc.). In total almost 80 commodity groups were reported, and some with an inconstant data availability over time (see Tab. 2).

3. Methodology

The global trade profile of a commodity can be delivered through the analysis of international trade data. The use of European scale data could deliver interesting outputs but the extra-EU trade would be ignored.
The globalization of the international trade let us opt to focus our attention on international databases in order to have a wider overview of NWFP trade. One option was the use of FAO database (FAOSTAT), but data aggregation level was too high, hence trade of many NWFP could not be analysed. The second option was based on the use of Comtrade databases that is also source of data for FAOSTAT. To use Comtrade data, the analyst needs a 'deep cleaning' before analysing the data. Despite a common thought, there is no formally recognized approach to clean the raw data (UN-ESCAP, 2009), but only a set of suggestions to help the analyst.
The core problem for data cleaning is the un-match of the data reported of the same trade relationships between two countries. Any country should report the sum of exported and imported quantity and value of the commodities traded during the year; hence, all the trade flows could be reported twice among the countries under the World Trade Organization (WTO), and the reported data should be the same. Nevertheless, several partner countries do not report the information, or when they do report, often the quantity and value information do not match. The question "*which country is reporting the correct information?*" is crucial for the analysis because these cases regard the majority a large proportion of the whole trade data of a given commodity. The UN "*Economic and Social Commission for Asia and the Pacific*" suggested four different approaches (UN-ESCAP, 2009) to select the correct data for double reported trade as showed in Table 3.
We found quite difficult to relay on one of the reported approaches or on their combinations.
A further approach addressed by UN Statistic Unit was the "*mirroring*", used by the analyst to fill the missing data with existing data reported by another country; however, the estimated prices needed an additional cleaning before obtaining fair results.
Twenty-two different approaches were tested in order to select the cleaning procedure that minimizes the standard deviation of the price. Exceptions have been treated case by case according the previous approaches. Finally we found that the record containing the higher quantity, between the two records reported for the same trade flow, was addressing more reliable and robust price outputs. Therefore all the records, containing the lower quantity between the two reported for the same trade flow, were removed from the final dataset, used for the analysis. The "*double-record-cleaning*" does not allow to assess directly the average international price for a NWFP commodity, so quantities were classified in three categories (small, medium and large) in order to remove outliers. A similar procedure was implemented also by Berthou and Emlinger (2011) in order to refine international trade data. In principle, lower quantities have higher prices, and often the outliers are referred to quantity values of few kilograms, while average and high quantity values are linked respectively to medium and low prices level. Finally, we compared the average prices related to the large quantity category to real data or information collected among European industries dealing with the specific commodities; the majority of the prices and trend outputs delivered in the present work were confirmed, with some exceptions, like dry mushrooms, due to the high number of species contained in the code. The descriptive analysis reported a snapshot of the international trade trends on quantity and traded values. Additional information are provided on the top traders of the commodities ending with a description of the European and Italian trade balance since the data have been available.

4. Results and discussion

Among all the NWFP commodity groups contained in Table 2, Italy has a key role in the international trade on tannins, cork stopper, chestnuts and fresh mushrooms, where it has held a top position within the five largest global trades for the last decade. Western Countries, like Italy, have traditionally supplied most of these NWFP, but the trade globalization pushed the companies to purchase raw material where the labour cost was lower. Despite the copious information we obtained during the

[2] Over 0.2 million within 5206 commodity groups in the last HS revision (United Nations, 2006).

data analysis, the following sub-chapters focus on four NWFP types, in which four key commodity groups are described in terms of market structure and trade balance of the EU and Italy. Finally an overview of the whole NWFP global trade is provided.

4.1 Tannins

Tannins are traded under four commodity codes used mainly by leather industries. The EU has implemented a set of laws (Dir.96/61/EC, Dir.2000/60/EC, Dir.20-06/121/EC) to reduce the environmental impact of leather industry with special regards to enhance the quality of freshwater streams and rivers in Europe.

The main target of the European laws was the reduction of hazardous substances[3] used in leather industry, which can be partially substituted with natural tannins. Tannins are extracted from wood and wood bark of different trees. In Europe they are obtained from oaks and chestnuts, and they have been almost completely substituted by quebracho and wattle, respectively produced in South America and South Africa. Tannins market is a mature market and it is used mainly in leather and food industries. The traded quantity had a stable-negative trend in the last decade that pushed the price and the total traded value up (Fig. 1-2). Among the tannin producers, South America and South Africa are the two major tannin exporters. Due to the long production cycle of the quebracho tree[4] (over 80 years), international market has promoted tannins extracted from more flexible sources like wattle bark (7-years of rotations) and other species with shorter rotation periods. The global leather production shifted from EU to other emerging countries like India and China in the last 20 years, and the tannin market followed the industry grow in these geographic areas (Table 4). In Europe only Italy has maintained a core role in the global tannin market. Growing demand in emerging countries, scarcity of raw tannins in the international market and the high environmental standards defined by the EU28 have been the main causes of the price increase by ~50% in the last ten years (Fig. 3).

New emerging countries like India and China are gaining more and more of the market share, hence the market is slowly moving towards Asian countries and North America. The stricter regulations on clean water and less harmful industrial processes for leather production may trigger the international demand of natural tannins, which will induce a shortage on the supply side with a consequent price increment.

The EU trade balance has been negative since the early nineties and it is responsible for 25.6% of the global import of raw tannins (Fig. 4), in which Italy contributed for over the 50%. The dependence from international suppliers together with the increasing demand for tannins from other economies could increase the problem of scarcity and increase the prices of tannin for the European industries (i.e. leather producers, tanners, food and food industry). Despite Italy is a net importer of raw tannins, it covers an important role in the tannin processing (Fig. 5). The net dependence from the international trade let Italy import raw tannins, but it allowed to invest in tannin refinery, in which Italy doubled the export value between the 2001 and 2011 and it was a net global exporter. Whether the current trend of price increment will be maintained, the increment of international tannin price may allow to re-establish a profitability of tannin national production at large scale in the near future, enhancing the role of chestnut and oak forests.

4.2 Cork

Cork trade data can be found in seven commodities groups; among these categories, we considered three related to rough materials (cork as harvested, pieces of cork and squared cork) and cork stoppers as final product. In 2012, the global traded raw cork accounted for 0.159 M tons (Fig. 6), value that was approximately near to the peak of global trade in the year 2000. The steep increase in terms of traded quantity may be understood as a new re-launch of the sector in the last three years. Nonetheless, the economic value of the raw cork represents only the 28.5% of the total traded value, while the higher added value of the cork supply chain is generated from cork trade, despite the negative trend of cork stoppers (Fig. 7). The negative trend is most likely related to the high competition of plastic and metal stoppers, which are more frequently used to decrease the cost of wine bottles. The price of cork stoppers has increased by 60% in the last decade in the global market, and the fluctuations are probably linked both to the presence of new competing raw materials and the high costs of cork stopper production that requires more and more organized supply chains as well as economic of scale for production (Ahlheim and Frör, 2011) (Fig. 8). On the contrary, prices of raw or semi-processed cork material have remained stable in the same period highlighting the matureness of the market. Higher price instability of cork can be explained due to the very long and rigid production cycle. After planting the cork oak, a first commercial harvest of cork can only be expected after 50 years with subsequent cork harvest every 10 to 15 year; consequently the traders have had an higher propensity to maintain strong trade relationships with regards to the weakest and smallest ones on emerging wine countries. Portugal is the main international cork stopper exporter in the global market and it covers also a relevant role as processor and producer of cork stoppers (see import in Table 5), followed by Spain, France and Italy, though this last disappeared from the top 5, probably due to the high demand on the internal market, highlighted by a growing position as global importers. The main importers are France and USA that held their positions despite the growing importance of the Spanish and Italian markets. Cork stopper is among the most valuable NWFP exported from EU28.

[3] http://ec.europa.eu/environment/water/water-framework/priority_substances.htm

[4] Quebracho is a tree that is harvested in the wild or cultivated in forest plantation in South America.

It accounts for the 94.7% of the global export of the cork in which 55% is traded within EU. The import value of cork stoppers accounted for 54.4%, in which the 95% is supplied within EU28. The monopolistic role of European forests in cork supply could allow a creation of new innovative products based on cork if we consider cork stopper crisis; cork panels, tissues, insulator for noise or temperature are examples of new emerging markets. The EU28 trade balance accounts for 300 M US$, a value quite stable over time (Fig. 9). The limited profitability from cork forest management is however imposing a strong constraint to increase the cork supply[5]. In Italy the trade balance has been negative since data were recorded: it reached almost the equality between the 1998 and 2003, while from 2004 the balance waves between the 20 and 30 M US$ of deficit (Fig. 10) due to the wine trade trend.

4.3 Nuts

Nuts are divided into two commodity families: the first considers coconuts, Brazilian nuts and cashew nuts, while the second gather all the other nuts. We looked at some nuts within the second group, such as hazelnuts, walnuts, chestnuts and pistachios, while we excluded pine nuts because the referred HS commodity code reported mainly tropical nuts. Among the traded nuts, only a minor part comes from forestlands, like chestnuts and part of traded almonds and pistachios. According to trade analysis, the most important traded nuts are almonds, which accounted for 1.1 million tons and 4.7 billion US$ in 2011, on a total quantity of 2.5 million tons and value of 12.9 billion US$ of traded nuts (Fig. 11-12). The trade of hazelnuts, walnuts, chestnuts and pistachios has increased on a almost constant basis by a billion US$ since 2001, a year in which trade value accounted for 3.38 billion US$. Shelled nuts have been the commodities that most impacted the global trade in terms of value; they represent the majority of the traded nuts, respectively 73.6%, 88.3% and 59.9% for almonds, hazelnuts and walnuts. The food industry and large retailers prefer to trade shelled nuts, a choice that pushed the global nuts trade to fulfil the large demand. In general the nuts' prices have doubled since 2001, except for chestnuts, whose price increased by 68%, stopping at 2.53 US$/kg in 2011 (Fig. 13). The shelling process on average doubles the commodity price per Kg, though in some years (from 2005 to 2008) the price differences reached three times. Large shelling plants, the introduction of new technologies and cultivars are the factors which allowed to keep the price proportion quite stable over time, regardless the market trends. Among nuts commodity groups, chestnuts trade requires a specific focus since it is the most forest-dependent production, and still a key NWFP in the South European countries like Italy. Despite the constant position of China as the main global chestnut exporter, European countries were able to erode position of China and Korea in terms of economic value (Tab. 6), which have decreased their export share from the 67% in 2000 to 42% in 2011 (total trade value 0.28 billion US$). In the same period, Italy, Portugal and Spain have increased their share of the export value from the 25% to 42%, probably as a combined effect of the EU Common Agriculture Policy implementation together with the consolidated EU know how in chestnut processing and marketing. The EU28 trade balance has been positive since 1988, oscillating around 30 M US$ in the last three years. EU28 was covering 40.5% of global import in 2011, mainly generated within the European Union and it supplied over 50% of the global export value, though almost 70% does not leave EU28 countries (Fig. 14). Despite the increasing export trend, there is also an increasing dependency from the international trade, since the trade balance has been quite stable in the last decades. An explanation of this stable trend is surely the static low dimensions of the chestnut forests combined with several pests that have limited the chestnut production (i.e. "chestnut gall wasp" and chestnut blight). Italian trade was also affected by the same problems, which stimulate the import from the international market (Fig. 15), thus becoming the third largest importer in 2011 (Tab. 6).

The enhancement of the production will be core issue for the Italian policy makers, factor that was already underlined in the national chestnut plan.

4.4 Mushrooms

The global mushroom trade shows a continuous increase in the trade volume and value (Fig. 16). According to the results, wild mushrooms cover the 26.4% of the total traded volume (1.79 Mt) and 45.6% of the total value (4.98 B US$ in 2011) of mushrooms. The proportion of quantity and economic value was also confirmed in 2012, though the global trade decreased to 4.52 B US$. Among all wild mushrooms categories, fresh and frozen mushrooms have a relatively stable increment rate of 37.6 M US$ per year since 2002, accounting nine years later for 0.8 B US$; a value that was confirmed also in 2012 (0.77 B US$) when the trend breaks its linearity (Fig. 17). Dry mushrooms had a slower increment as preserved mushrooms, accounting respectively for 28.4 M US$ of average annual growth from 2002 till 2009 and 14.6 M US$ from 2002 till 2012. The total value of wild mushrooms trade was estimated at 2.08 billion US$ in 2012, since commodity groups considered in the trade analysis contained part of cultivated mushrooms; indeed, the trade value is affected by Chinese export of dry shiitake and other cultivated mushrooms that can be assessed around 0.25 billion US$. This was a draft estimation based on data comparison and information analysis, which can be calculated better through more detail data (i.e. HS8 or HS10 codes), unavailable in COMTRADE database at the moment. Prices of wild mushrooms had a positive trend in the last decade (Fig. 18) with a slight stabilization after 2008 crisis. On the global context, China is undoubtedly the largest fresh

[5] Cork oaks were planted in California, Chile, China, RSA, Australia but plantations in all these countries failed so far to produce bottle stoppers of good commercial quality. Only Morocco, Algeria and Tunisia have natural cork oak stands where cork production could be increased, however this is not happening at a significant scale.

wild mushrooms exporter, both in terms of quantity and economic value (Tab. 7). Alone, it accounted for the 21.2% of the global export value in 2012. The Netherlands and Poland cover an important role in the wild mushrooms trade as main suppliers of the European market; the two counties represent also the main gates of EU28's market, though the role of the Netherlands is influenced by the presence of shiitake mushrooms inside the commodity code 070959. The trade data within the EU are generally underreported due to the custom declaration exemption for small quantities (EU 2010), hence the export or import values are affected by statistical bias. On the import side, the top 4 importers in terms of economic value have been the same from 2005, with a predominant role of Germany and Japan followed by France and Italy. The high level of imports with regard to the exports led to a negative trade balance within the considered period (Fig. 19). Nonetheless, the deficit has slightly decreased in absolute value from 82.2 M US$ in 2004, to 58.2 M US$ in 2013, while in general the level of import and export increased. Due to the high perishability of fresh wild mushroom there is still a large amount of intra-EU28 trade, though Europe is a net consumer of wild mushrooms.

The reduction of trade balance have to be considered positively, since Chinese welfare enhancement might raise the production costs and domestic demand, hence cause the EU internal production to be competitive even for industrial purposes. Lastly, Italian market is clearly suffering from more competitive importers that have higher purchasing power hence they stimulate the supplying countries to change partners. Italy lost nearly the 20% of the import value between 2010 and 2012 (Fig. 20).

4.5 A global snap perspective

The trade analysis of NWFP may show different trade profile according to what is considered a forest product or an agricultural product. The trade data do not make distinctions between wild and cultivate origin of the NWFP, hence only few commodity groups are explicitly referred to wild collected NWFP.

Among the commodity groups we analysed, all contain a part produced on agriculture land, and some commodity groups could be considered entirely sourced by farmers. Moreover, the commodities can be supplied in the international trade as raw or processed products, though there is no a clear-cut edge between the two concepts; for simplicity in this paper we considered as raw commodities all fresh, frozen and dried products, while preserved, prepared, shelled (only for nuts), cut and shaped products were studied as processed. The approach has been undertaken according to the information collected among the Italian industries. Focusing on the commodities that contain raw and partially wild harvested products, the global trade generated a value of 10.76 Billion US$ in 2011, in which EU-28 contribute to the 35.4% of the global export and to the 48.1% of the global import (see Tab. 8), while Italy accounted for a 3.7% and 3.5% respectively as export and import global share. Nevertheless, beyond these aggregated figures, Europe and Italy hold some monopolistic role as most important trades for certain commodities. The highest share were recorded on cork and cork products and fresh and frozen truffles; all commodities on which the export share of EU-28 exceed the 80% of world trade. Also NWFP have a share near the half of the total value exchange for the specific commodities, nonetheless the trade balance of EU-28 would need to increase the 36% of the export value, in order to reach the equity. Only cork products turn the EU-28 trade balance positive, while almost all the other commodities reported negative values that indicated the lack of internal supply. Italy is a global leader on few commodities: preserved mushrooms and quebracho tannins as importer, and chestnuts and truffle as exporter, these last two mainly sourced by Italian forests. The national trade balance, for raw and partial wild harvested products, is positive thanks to the high added value generated on the previous commodities and foliage. The import regards all the forest products collected in the past in the Italian forests, but now mainly become a recreational activity; an example can be given by wild mushrooms, which were an important comercialised commodity in the past, while now they are mainly connected with the recreational service of picking the products in the forest. As it occurred in many western countries, Italy sought new international suppliers to insert in the market cheaper commodities with similar qualitative standards. Regardless the supplier position and origin of the raw material, the traders involved in the supply chains have been stimulated to substitute the national production with cheaper commodities.

So far, the welfare enhancement of several eastern European countries and China, the raw material started to be more expensive for the global traders that started to obtain lower economic margins.

5. Conclusions

The international trade might be seen both in positive and negative terms for the Italian forest sector. On one hand it allowed to maintain within the national boundaries competences and firms specialized on processing and marketing, while on the other hand it moves the production of many commodities on cheap labour countries. The same happened for many European countries, though the enlargement of European Union on the east improved the overall NWFP trade balance of the present EU28. The movement of labour intensive production to the East and Far East is a well known issue on macro-economic terms; nevertheless the present work highlighted some peculiarities of the EU and Italian forests, like cork, chestnuts and truffles that are core products sourced from the European and Italian forests and still able to compete in the international market. The high dependence on international trade for NWFP should make the European and its Member States's policy makers rethinking the role of forests. Forests provide not only wood and wood products, and the value of raw NWFP may worth approximately 40% of the wood and biomass value (estimated at 26.8 B US$). The EU-28, and even more Italy, invested quite strong effort

on the introduction of quality standards and new rules in order to create new barriers on import. Nevertheless, the high demand of NWFP stimulated the global trade to enhance the production quality. The implicit effort of European food and environmental standards has already been translated into a higher quality of the imported commodities, and an increment of global prices. While it is unrealistic to cover the demand for all the NWFP from European forests in the short run, more attention should be given to the enhancement of the standards and overall quality of the internal supply, in order to differentiate the market and to cover the high quality segments (i.e. higher prices). This target can be reached with an increase in innovation in production techniques, in marketing and in general with more advanced entrepreneurship by NWFP internal producers and processors. Italy have shown a positive trade balance on the NWFP trade that might be seen as a key message for the Italian forest sector. Despite the limited outputs, trade analysis allows to provide a tendency on the use of certain commodities at global scale as well to understand biological effects on the production due to pests or large scale damages or the effects of policy acts on the production and comercialization of certain commodities like chestnuts. The future of Italian forests looks promising looking at the importance of NWFP with regard the traditional timber and wood production; nonetheless there would need large investments on new silviculture techniques and land management tools in order to enhance production of NWFP and coordination of the stakeholder involved in the supply chains, starting from the weaker one: the forest owners. The implementation of a clear property right system would allow the internalization of the revenues that consequently stimulate the forest owners to invest on NWFP provision. There are few cases in Italy where the NWFP are considered primary forest outputs, but the recent studies show that the trend on this perspective is more than confortable, though the policy makers almost forget the NWFP existence on the forest sector. NWFP user awareness, the coordination of the forest owners and the formation of new skilled technicians are three key factors that might trigger the economic role of the NWFP in the near future. The adoption of a new NWFP classification taxonomy and the provision of regional and national statistics could help the economic actors to invest on NWFP. Despite the distinction between cultivated and wild harvested origins for the same product is not relevant for the agencies that collect and publish trade statistics on international commodities, they are fundamental for the policy makers for structuring new policy tools. Detailed trade data are required to study complex commodity groups (i.e. tannins, mushroom, berries, nuts, etc.).

For instance, the use of databases with higher commodity code specification (i.e. HS8 and HS10) will help to trace global trade at the species level, which would then lead to more detailed overview frequently asked by the main player of the sectors. Would the public authorities be willing to hear the needs of the local economic actors? Hard to say, but needed to be answered.

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Table 1. NWFP list, the classification adopted in the paper, and respective HS codes.

Ecological position	*NWFP category*	*NWFP types*	*HS Codes*
Products of the stem, leaves or tree reproductive system	Full tree-based or strem-based products (tree is cut)	Christmas tree	0604.90*
		Fibre	4601.91;4601.29;4601.94,4601.99; 4602.19
		Bio-refining	3826.00
		Tar	3803.00; 3807.00
		Tannins	3201.10; 3201.20; 320130; 3201.90
		Sorbitol and mannitol	2905.43; 2905.44; 3824.60
	Leaf based products (branches are removed from the tree, only re-sprouting trees remain alive)	Essential oils	3301.29*; 3301.90*
		Phytochemical	2939.90*; 2939.99*
		Pigments	3204.17*
		Foliage	0604.20*;0604.90*; 0604.91; 0604.99*
	Extracted from tree (tree is kept alive)	Sap	1302.19*
		Natural gums and resins	1302.39; 1301.20; 1301.90; 3806.30
		Exudates	3301.30; 3805.10; 3805.20; 3805.90; 3806.10; 3806.20; 3806.90
	Bark and cork (tree is kept alive)	*Bark products*	4501.10; 4501.90; 4502.00; 4503.10; 4503.90; 4504.10; 4504.90
	Fruits & flowers (tree is kept alive)	Tree flowers	1211.90*;
		Fruits	0810.90; 2001.90*; 2007.10; 2007.99
		Edible nuts	0802.11; 0802.12; 0802.21; 0802.22; 0802.31; 0802.32; 0802.41; 080240; 0802.42; 080250; 0802.51; 0802.52; 0802.90; 2001.90*; 2007.10; 2007.99; 2008.19;
Tree dependent product	Flower and bug substances collect by animals	Honey and Bee Products	0409.00*; 1521.90
	Wild fungi	Wild mushrooms	0709.51; 0709.59*; 0711.51; 0711.59*; 0712.30; 0712.31; 0712.32; 0712.33; 0712.39;2003.10; 2003.90;
		Truffle	0709.52; 0711.59*; 2003.20; 2003.90
Forest understory and grassland products	Berries	Berries	0409.00*; 0810.10; 0810.20; 0810.30; 0810.40; 0810.90; 0811.10; 0811.20; 0811.90; 0812.90; 0813.40; 0813.50; 2001.90*; 2007.10; 2007.99; 2008.80; 2008.93;2008.97 2008.99; 2009.81; 2009.89; 2009.90
	Forest plants	Live tree/plants	0409.00*; 0602.10; 0602.20; 0602.90;
		Medicinal and aromatic plants	0409.00*; 0909.50;0909.61; 0909.62; 0910.20; 0910.40; 0910.99; 1211.90*; 1302.19*; 3204.17*; 3301.29*; 3301.90*; 2939.90*; 2939.99*
		Mosses & lichens	0604.10; 0604.20*;0604.90*

Note: *in italic* the NWFP types selected for the trade analysis in which Italy has a core role in the international trade; the Harmonized System (HS) codes are not referred to a single period of validity but to all the available data in COMTRADE database, that means we reported also commodity codes not considered in the last HS revision (HS2012); the first four digits of the code refer to the heading of the commodity group, and the last two state the specific subheading referred to the specific commodity group. *= code repetition in two NWFP types.

Table 2. Data availability for the selected NWFP types.

NWFP type	*Category*	*Commodity group*	*HS Code*	*Period of validity*				
				1992-1995	*1996-2001*	*2002-2006*	*2007-2011*	*2012-2017*
Tannins	Tannins	Quebracho tanning extract	320110	x	x	x	x	x
		Wattle tanning extract	320120	x	x	x	x	x
		Oak or chestnut tanning extract	320130	x				
		Vegetable tanning extracts	320190	x	x	x	x	x
		Tanning or dyeing extracts	320300					x
Foliage	Foliage, branches and other parts of plants	Mosses & lichens	060410	x	x	x	x	
		Fresh (mosses & lichens included)	060420					x
		Other (generally dry) (mousses & lichens included)	060490					x
		Fresh	060491	x	x	x	x	
		Other (generally dry)	060499	x	x	x	x	
Bark products	Cork and cork products	Cork as harvested	450110	x	x	x	x	x
		Cork in pieces	450190	x	x	x	x	x
		Cork squared	450200	x	x	x	x	x
		Cork stoppers	450310	x	x	x	x	x
		Cork articles	450390	x	x	x	x	x
		Cork agglomerates	450410	x	x	x	x	x
		Cork agglomerates products	450490	x	x	x	x	x
Edible nuts	Hazelnuts and filberts	In shell	080221	x	x	x	x	x
		Shelled	080222	x	x	x	x	x
	Walnuts	In shell	080231	x	x	x	x	x
		Shelled	080232	x	x	x	x	x
	Chestnuts	Unsorted	080240	x	x	x	x	
		In shell	080241					x
		Shelled	080242					x
	Pistachio	Unsorted	080250	x	x	x	x	
		In shell	080251					x
	Other nuts	Unsorted	080290	x	x	x	x	x
Wild mushrooms and truffles	Fresh or chilled	Mushroom of genus Agaricus	070951	x	x	x	x	x
		Truffles	070952	x	x	x		
		Other mushrooms both wild & cultivated (and truffle from 2007)	070959			x	x	x
	Provisionally preserved	Mushroom of genus Agaricus	071151			x	x	x
		Other mushrooms	071159			x	x	x
	Dried	Mushrooms	071230	x	x			
		Mushrooms of genus Agaricus	071231			x	x	x
		Mushrooms of genus Auricularia	071232			x	x	x
		Mushrooms of genus Tremella	071233			x	x	x
		Mushrooms of other species	071239			x	x	x
	Prepared or preserved	Mushroom of genus Agaricus	200310	x	x	x	x	x
		Truffles	200320	x	x	x	x	
		Other mushrooms both wild & cultivated (and truffles from 2012)	200390			x	x	x
Berries	Fresh Berries	Strawberries	081010	x	x	x	x	x
		Rasperry,blackberry,mulberry and loganberry	081020	x	x	x	x	x
		Black, white or red currants and gooseberries	081030	x	x	x		x
		Cranberries, bilberries, similar fruits	081040	x	x	x	x	x
		Other fruits	081090	x	x	x	x	x
		Strawberries, (uncooked steamed or boiled)	081110	x	x	x	x	x
		Raspberries, mulberries, etc. (uncooked, steam, boil)	081120	x	x	x	x	x
		Fruits and nuts (uncooked,steamed, boiled)	081190	x	x	x	x	x
	Provisionally	Strawberries provisionally preserved	081220	x	x			
	Provisionally	Fruits and nuts, provisionally preserved	081290	x	x	x	x	x
	Dried berries	Fruits	081340	x	x	x	x	x
		Mixtures of edible nuts, dried and preserved fruits	081350	x	x	x	x	x
	Fennel seeds, juniper berries	Entire and crushed	090950	x	x	x	x	
		Not crushed	090961					x
		Crushed	090962					x
	Berry jam	Homogenised jams, jellies, etc.	200710	x	x	x	x	x
		Jams, fruit jellies, purees and pastes, except citrus	200799	x	x	x	x	x
	Berry prepared or preserved	Strawberries	200880	x	x	x	x	x
		Mixtures of edible parts of plants	200892	x	x	x	x	
		Cranberries (Vac*cinium macrocarpon*, *V. oxycoccos*, *V. vitis-idaea*)	200893					x
		Mixtures	200897					x
		Other	200899	x	x	x	x	x
		Single fruit juice (not fermented or in spirit)	200980	x	x	x	x	
		Cranberries (*Vaccinium macrocarpon*, *V. oxycoccos*, *V. vitis-idaea*)	200981					x
		Other fruits juice	200989					x
		Mixtures of juices	200990	x	x	x	x	x

Source: UN COMTRADE (2014) modified and elaborated.

T able 3. Data cleaning approaches.

Approach	*Pro*	*Cons*
a) Use the raw data as reported	No data cleaning	Double accounting of quantity and economic value of specific commodities
b) Use an average of the reported data from each source	Fast data cleaning and database preparation	Problems on price estimation and quantity accountability
c) Use import data in preference to export data (the rationale is that many countries are much more strict in regulating imports than exports, and hence records are likely to be better)	Fast data cleaning and database preparation	Quantity underestimation and unreliable reporting of some developing countries
d) Use data from developed economies in preference to data from developing economies, or large economies in preference to small economies (this may be justified on the basis of assumed better reporting practices, or the law of large numbers)	Better comparison with Eurostat and US trade statistic bureau	Problems persist in trade data among developing countries

Note: Adapted from UN-ESCAP (2009) page 34.

Table 4. Top 5 global importers and exporters of quebracho and wattle tannins (economic value).

Exports (million USD)							
2000		*2005*		*2010*		*2011*	
Argentina	49	Argentina	46	Argentina	68	Argentina	69
Brazil	25	South Africa	34	South Africa	50	Brazil	57
South Africa	20	Brazil	31	Brazil	49	South Africa	53
Hong Kong	6	USA	8	USA	5	USA	6
Kenya	3	Zimbabwe	4	Zimbabwe	4	Zimbabwe	5
Imports (million USD)							
2000		*2005*		*2010*		*2011*	
Italy	25	Italy	22	India	28	India	29
Mexico	12	India	18	China	27	Italy	28
India	10	Mexico	16	Italy	23	China	26
China	9	China	12	Mexico	18	Mexico	22
USA	6	USA	6	USA	8	USA	8

Table 5. Top 5 global importer and exporters of cork stoppers (economic value).

Exports (million USD)							
2000		*2005*		*2010*		*2012*	
Portugal	502	Portugal	592.1	Portugal	483.1	Portugal	524.0
Spain	58.6	Spain	79	Spain	81.6	Spain	87.7
France	53.7	France	38	France	33.2	France	27.9
Italy	28.5	Italy	29.3	Italy	29.1	USA	17.5
Germany	16.2	Germany	18.9	USA	13.5	Germany	9.4
Imports (million USD)							
2000		*2005*		*2010*		*2012*	
France	192,7	France	205,3	France	189,5	France	181,3
USA	115,6	USA	146,1	USA	137,4	USA	150,1
Australia	58,8	Spain	73,1	Spain	49,7	Spain	47,0
Spain	55,4	Australia	55,5	Italy	46,3	Italy	44,8
Germany	52,1	Italy	45,1	Chile	30	Portugal	38,0

Table 6. Top 5 global importer and exporters of chestnuts (economic value).

Exports (million USD)							
2000		*2005*		*2010*		*2011*	
China	85,4	China	66,5	Italy	73,2	Italy	79,7
R. of Korea	84,3	Italy	64,1	China	70,1	China	78,4
Italy	40,2	R. of Korea	53,0	R. of Korea	45,4	R. of Korea	48,1
Portugal	13,1	Portugal	11,8	Portugal	22,5	Portugal	25,8
Spain	9,0	Turkey	9,4	Spain	16,6	Spain	20,0
Imports (million USD)							
2000		*2005*		*2010*		*2011*	
Japan	149,6	Japan	72,5	Japan	54,4	Japan	59,0
France	13,8	China	21,9	China	23,1	France	28,6
USA	11,5	USA	16,0	France	21,7	Italy	24,2
Asia, nes	9,8	France	13,9	USA	19,9	Switzerland	19,5
Switzerland	6,8	Switzerland	10,9	Germany	17,8	China	19,1

Table 7. Top global importer and exporters of fresh wild mushrooms (economic value).

Exports (million USD)					
2005		*2010*		*2012*	
China	139,1	China	145,1	China	163,7
Netherlands	48,0	Netherlands	77,5	Poland	93,8
Poland	44,5	Poland	75,5	Netherlands	69,4
Romania	25,0	Italy	49,6	Italy	54,4
Russian Fed.	24,3	R. of Korea	44,7	R. of Korea	37,9
Imports (million USD)					
2005		*2010*		*2012*	
Japan	152,9	Japan	99,1	Germany	100,1
Germany	75,4	Germany	95,4	Japan	97,8
Italy	61,8	France	83,8	France	90,9
France	51,7	Italy	61,2	Italy	51,9
UK	34,5	UK	58,7	USA	51,1

Table 8. Italian NWFP trade: comparison with global and European trade in Million of US$. Source: Comtrade (2014).

Commodities	*Code*	*Level of processing*	*Part of wild harvest?*	*World*	*From EU28*	*To EU28*	*EU28 balance*	*World-EU28*		*From IT*	*To IT*	*Italian balance*	*World-Italy*		*EU28-Italy*	
				2011	*2011*	*2011*		*Exp. %*	*Imp. %*	*2011*	*2011*		*Exp. %*	*Imp. %*	*Exp. %*	*Imp. %*
Honey	040900	Raw	Yes	1906	616	1019	-403	32.34	53.48	33	62	-29	1.74	3.28	5.38	6.13
Mosses	060410	Raw	Yes	58	33	37	-4	55.98	62.61	2	2	0	3.23	2.64	5.77	4.21
Fresh foliage	060491	Raw	Yes	1210	729	887	-157	60.29	73.28	90	29	**61**	7.42	2.41	12.30	3.28
Dry foliage	060499	Raw	Yes	367	170	231	-61	46.33	63.06	17	18	-1	4.52	4.80	9.75	7.60
Fresh & frozen Agaricus	070951	Raw	No	1302	1102	972	**129**	84.63	74.68	4	12	-9	0.27	0.92	0.32	1.24
Fresh & frozen truffles	070952	Raw	Yes	-	-	-	-	-	-	-	-	-	-	-	-	-
Fresh & frozen mushrooms	070959	Raw	Yes	785	414	480	-66	52.69	61.12	58	51	**7**	7.38	6.45	14.01	10.55
Preserved Agaricus	071151	Processed	No	101	32	53	-21	32.07	52.99	0	31	-31	0.13	30.74	0.41	58.01
Preserved mushrooms	071159	Processed	Yes	119	17	85	-68	14.45	71.68	1	46	-45	1.06	38.73	7.33	54.02
Dried mushrooms	071230	Raw	Yes	-	-	-	-	-	-	-	-	-	-	-	-	-
Dried Agaricus	071231	Raw	No	116	41	58	-17	35.52	49.94	4	7	-3	3.65	5.96	10.27	11.93
Dried Auricularia	071232	Raw	Yes	196	4	16	-12	1.95	8.12	1	1	**0**	0.59	0.35	30.06	4.27
Dried Tremella	071233	Raw	Yes	55	2	2	**0**	2.30	3.08	0	1	**0**	0.58	1.41	25.03	45.85
Dried mushrooms	071239	Raw	Yes	1370	71	170	-100	5.17	12.44	15	40	-25	1.12	2.92	21.63	23.46
Almonds	080211	Raw	No	1043	36	55	-19	3.41	5.28	3	8	-5	0.32	0.80	9.37	15.13
Shelled almonds	080212	Processed	No	3369	671	1710	-1038	19.93	50.75	50	181	-131	1.47	5.37	7.38	10.58
Hazelnuts	080221	Raw	No	180	25	41	-17	13.61	23.00	6	17	-11	3.37	9.52	24.76	41.39
Shelled hazelnuts	080222	Processed	No	1782	296	1342	-1046	16.60	75.32	112	332	-219	6.31	18.63	38.04	24.73
Walnuts	080231	Raw	No	987	164	308	-144	16.61	31.23	5	120	-115	0.50	12.14	2.99	38.87
Shelled walnuts	080232	Processed	No	1545	219	678	-459	14.15	43.88	14	49	-34	0.91	3.14	6.44	7.16
Chestnuts	080240	Raw	Yes	299	153	121	**31**	51.05	40.60	80	24	**55**	26.65	8.10	52.19	19.96
Pistachios	080250	Raw	No	3013	524	1287	-763	17.38	42.70	16	119	-103	0.54	3.97	3.11	9.29
Fresh strawberries	081010	Raw	No	2579	1604	1533	**71**	62.18	59.41	63	109	-46	2.43	4.21	3.90	7.08
Fresh raspberry	081020	Raw	No	1173	410	442	-32	34.97	37.70	7	20	-13	0.58	1.70	1.65	4.52
Fresh currants	081030	Raw	No	-	-	-	-	-	-	-	-	-	-	-	-	-
Fresh cranberries	081040	Raw	Yes	1428	345	488	-143	24.14	34.18	8	20	-12	0.59	1.42	2.43	4.15
Fresh other	081090	Raw	No	2948	713	914	-201	24.19	30.99	21	67	-46	0.73	2.28	3.00	7.37
Frozen strawberries	081110	Raw	No	1090	479	706	-227	43.95	64.73	10	25	-15	0.96	2.30	2.17	3.55
Frozen raspberries	081120	Raw	No	951	416	694	-278	43.72	73.00	4	22	-17	0.44	2.27	1.00	3.11
Frozen fruits and nuts	081190	Raw	Yes	2530	1033	1484	-451	40.82	58.66	60	76	-16	2.35	2.98	5.76	5.09
Prepared Agaricus	200310	Processed	No	1179	572	568	**4**	48.48	48.17	11	21	-10	0.95	1.80	1.95	3.74
Prepared truffles	200320	Processed	Yes	29	24	17	**6**	82.02	59.62	14	1	**13**	49.45	4.47	60.30	7.50
Prepared mushrooms	200390	Processed	Yes	228	84	87	-3	36.77	38.20	9	5	**4**	4.10	2.38	11.16	6.22
Quebracho tannins	320110	Raw	Yes	85	7	32	-25	8.27	37.07	2	17	-15	2.62	19.73	31.66	53.22
Wattle tannins	320120	Raw	Yes	130	4	24	-19	3.37	18.25	1	11	-10	0.97	8.83	28.73	48.38
Other tannins	320190	Raw	Yes	195	92	57	35	47.05	29.12	26	16	**10**	13.58	8.42	28.88	28.91
Natural Cork	450110	Raw	Yes	147	140	132	**8**	94.88	89.67	10	9	**0**	6.61	6.38	6.97	7.12
Cork in piecies	450190	Processed	Yes	93	79	69	**10**	84.94	74.10	4	4	**0**	4.38	3.89	5.16	5.25
Cork squared	450200	Processed	Yes	72	63	42	**21**	87.82	58.45	1	3	-2	1.12	4.15	1.28	7.09
Cork Stopper	450310	Processed	Yes	743	705	406	**299**	94.92	54.71	32	53	-21	4.34	7.15	4.58	13.08
Total overview				35403	12086	17247	-5161	34.14	48.72	796	1629	-833	2.25	4.60	6.59	9.45
Total overview (only raw and partially wild sourced products)				10761	3811	5180	-1368	35.42	48.13	403	377	27	3.75	3.50	10.58	7.28

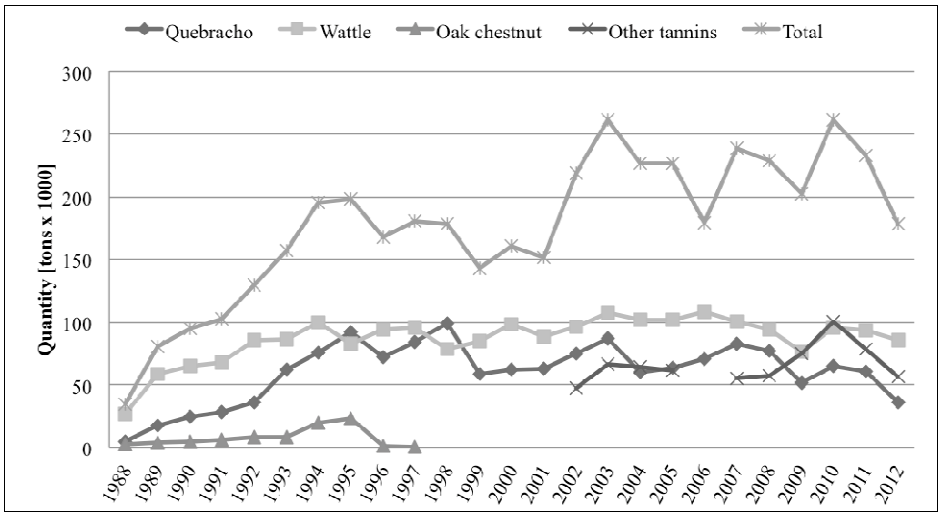

Figure 1. Global tannins tradeby commodity from 1988 to 2012: quantity.

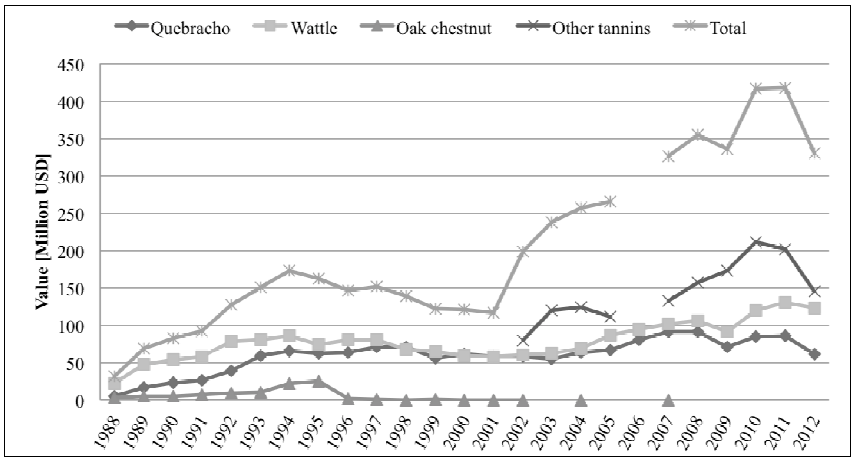

Figure 2. Global tannins trade by commodity from 1988 to 2012: economic value.

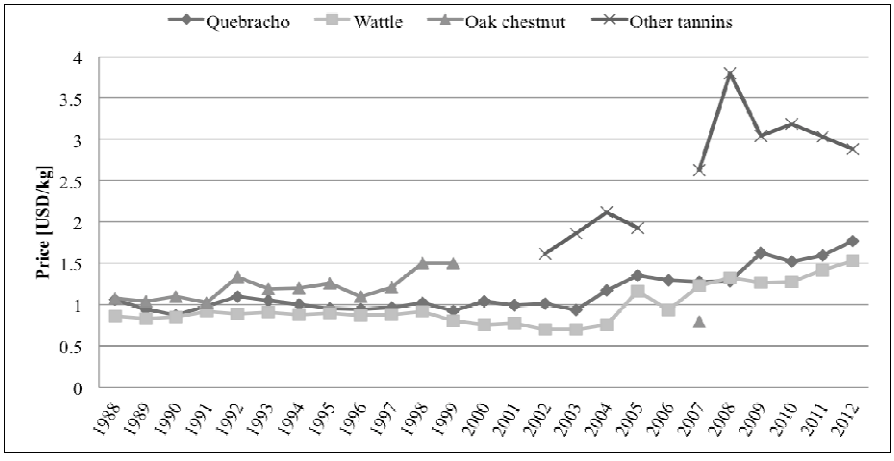

Figure 3. Global tannins trade by commodity from 1988 to 2012: price based on large quantities (> 50 tons).

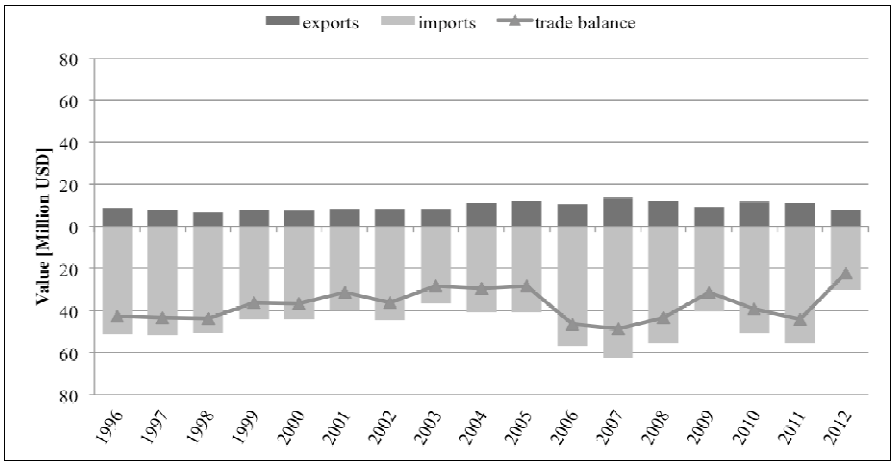

Figure 4. EU28 imports, exports and trade balance for quebracho and wattle tannins in 2011: economic value.

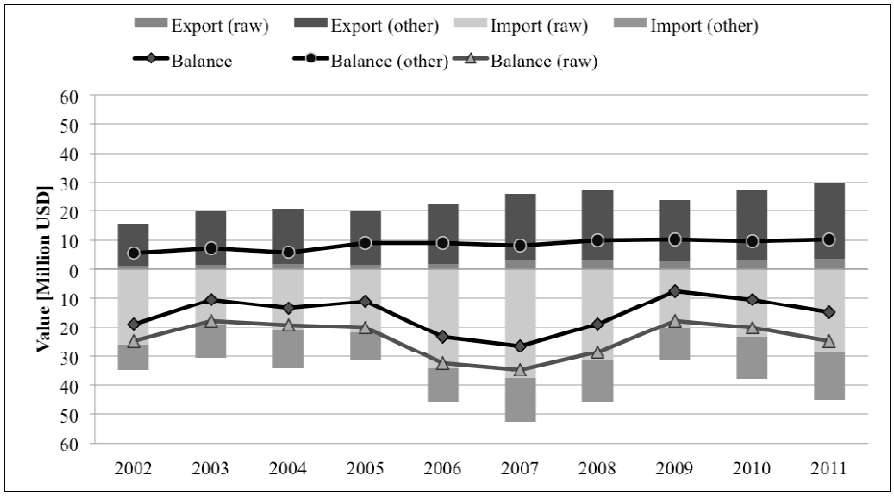

Figure 5. Italian imports, exports and trade balance for quebracho and wattle tannins in 2011: economic value.

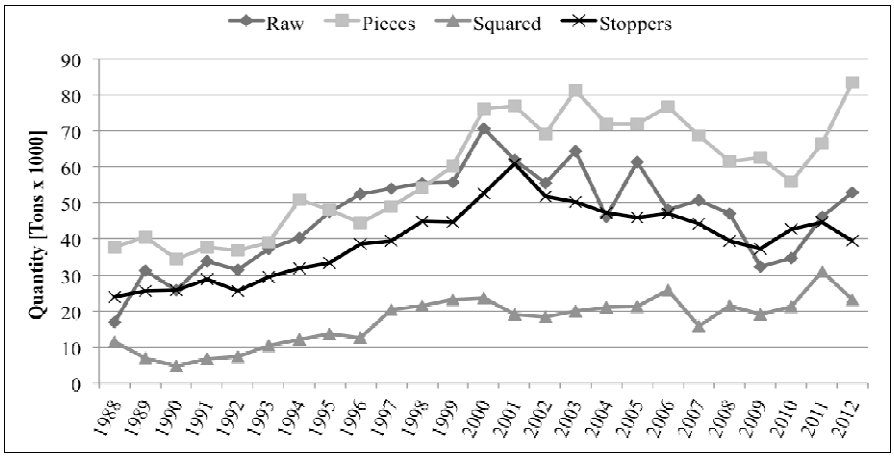

Figure 6. Global cork trade by commodity from 1988 to 2012: quantity.

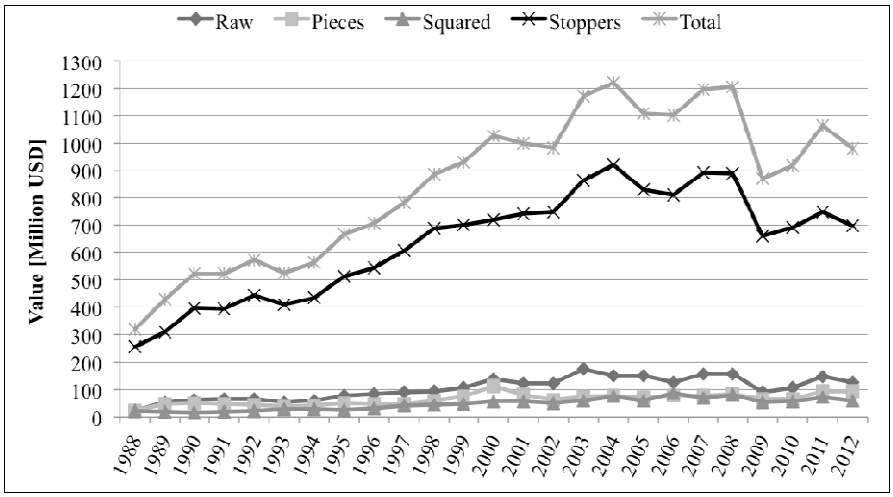

Figure 7. Global cork trade by commodity from 1988 to 2012: economic value.

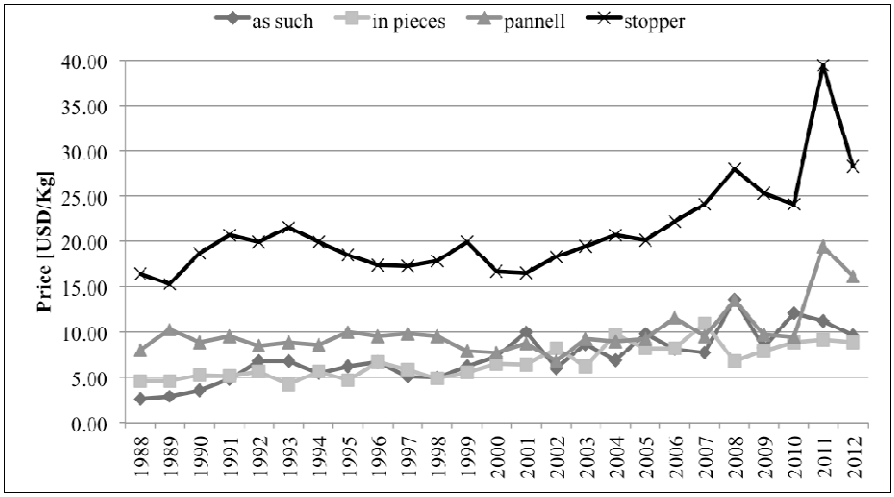

Figure 8. Global cork trade by commodity from 1988 to 2012: price based on large quantities (> 100 tons).

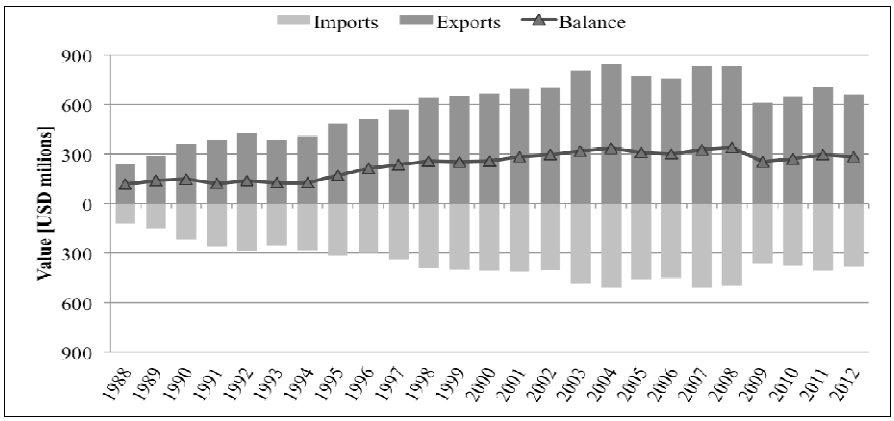

Figure 9. EU28 imports, exports and trade balance for cork stoppers in 2011: economic value.

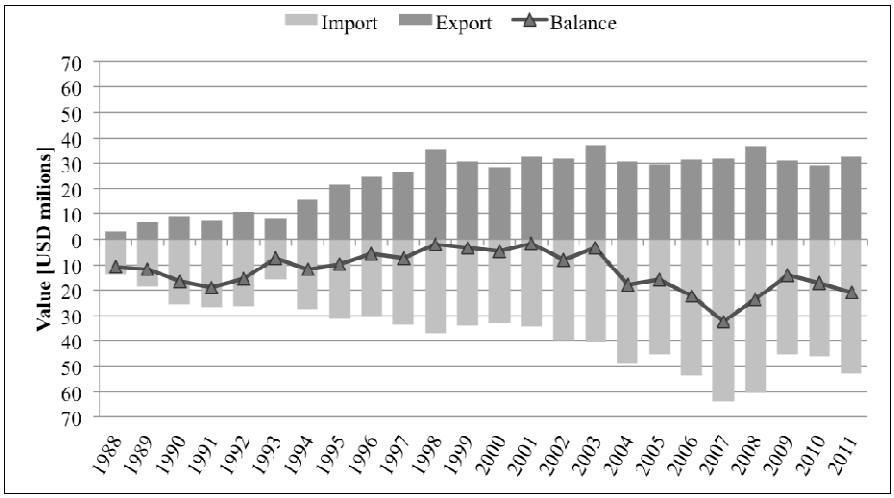

Figure 10. Italian imports, exports and trade balance for cork stoppers in 2011: economic value.

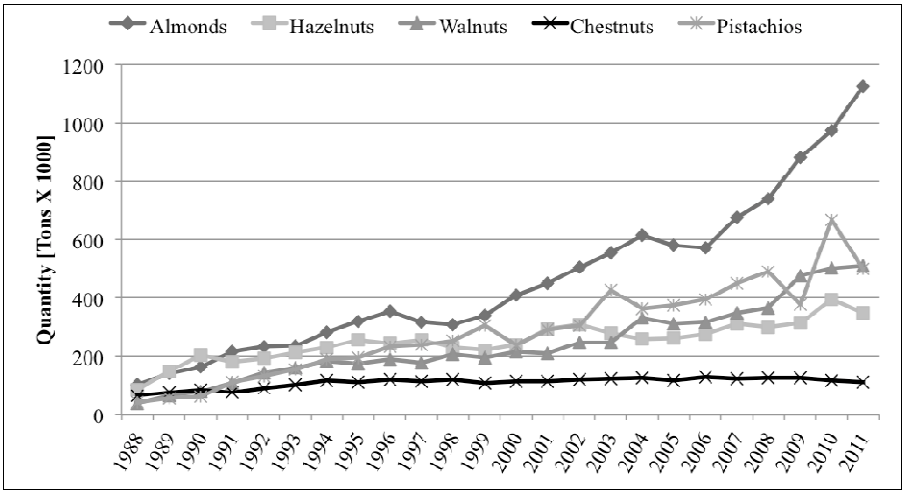

Figure 11. Global nuts trade by commodity from 1988 to 2012: quantity.

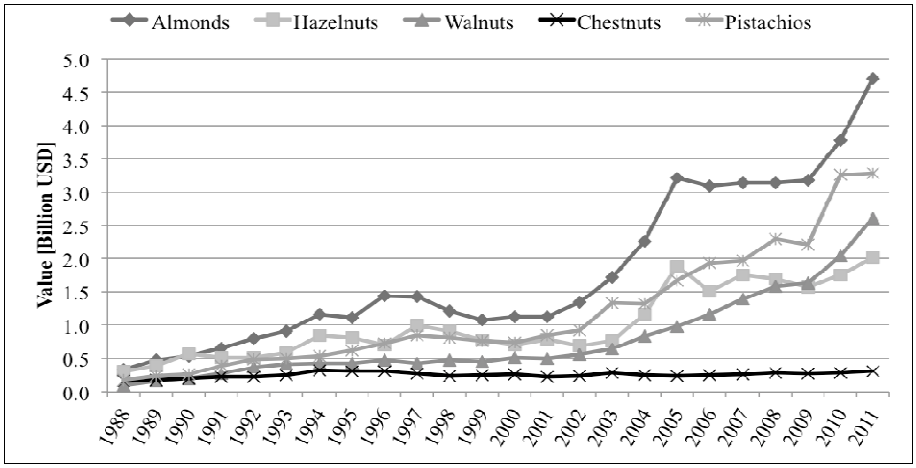

Figure 12. Global nuts trade by commodity from 1988 to 2012: economic value.

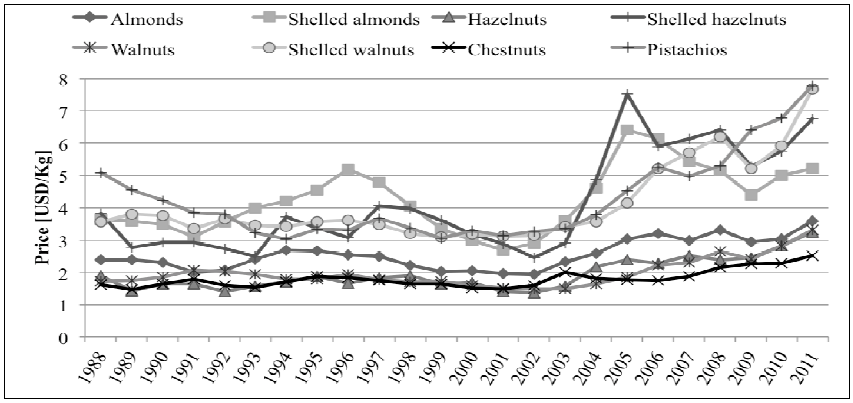

Figure 13. Global nuts trade by commodity trade from 1988 to 2012: price based on large quantities (>100 tons).

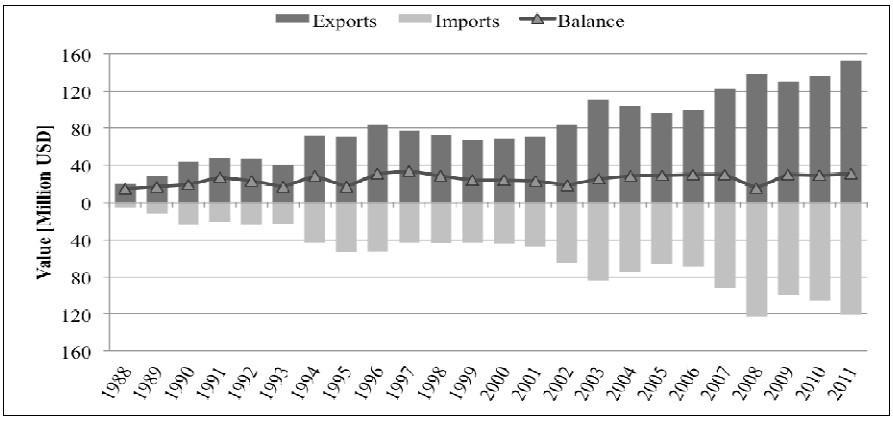

Figure 14. EU28 imports, exports and trade balance for chestnuts in 2011: economic value.

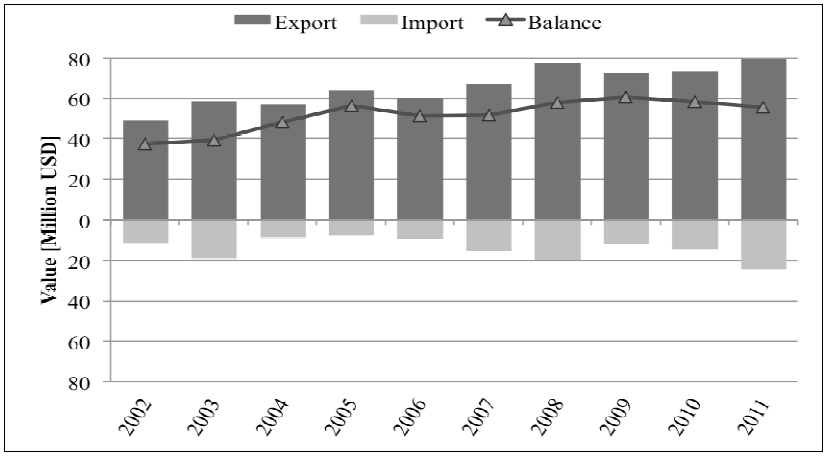

Figure 15. Italian imports, exports and trade balance for chestnuts in 2011: economic value.

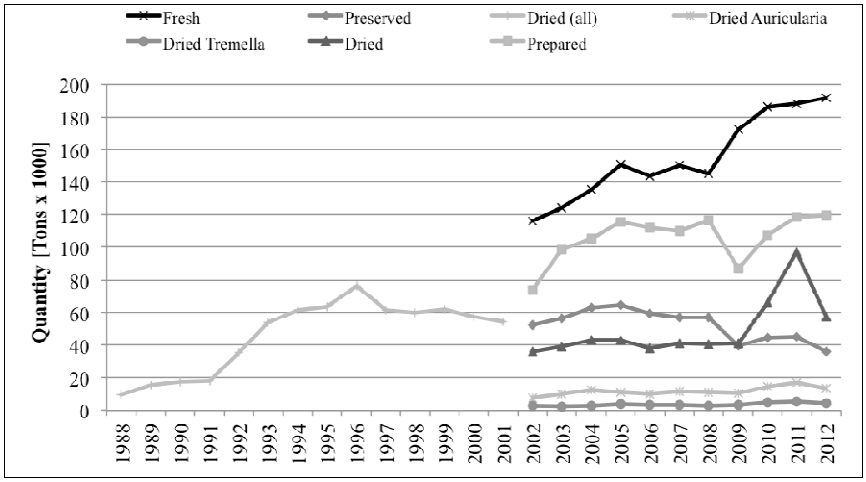

Figure 16. Global wild mushrooms trade by commodity from 1988 to 2012: quantity.

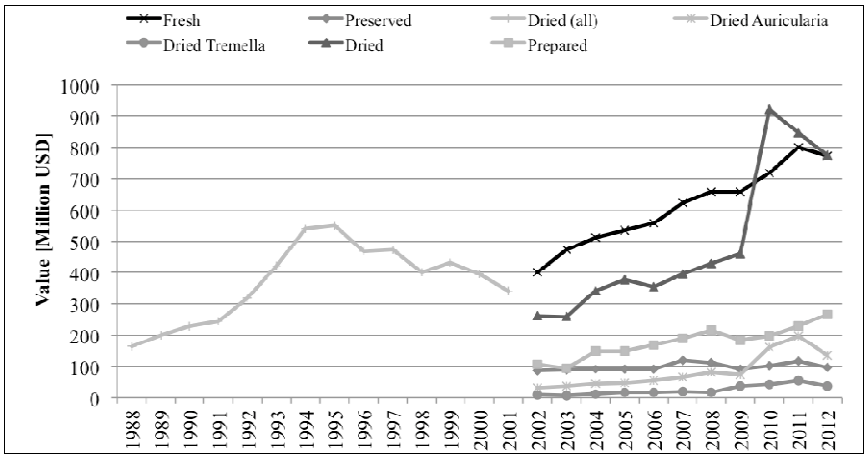

Figure 17. Global wild mushrooms trade by commodity from 1988 to 2012: economic value.

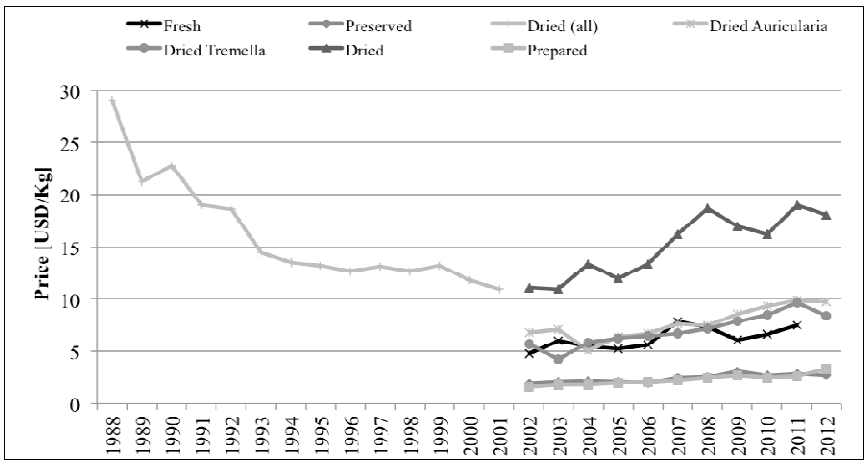

Figure 18. Global wild mushrooms trade by commodity from 1988 to 2012: price based on large quantities (>30 tons).

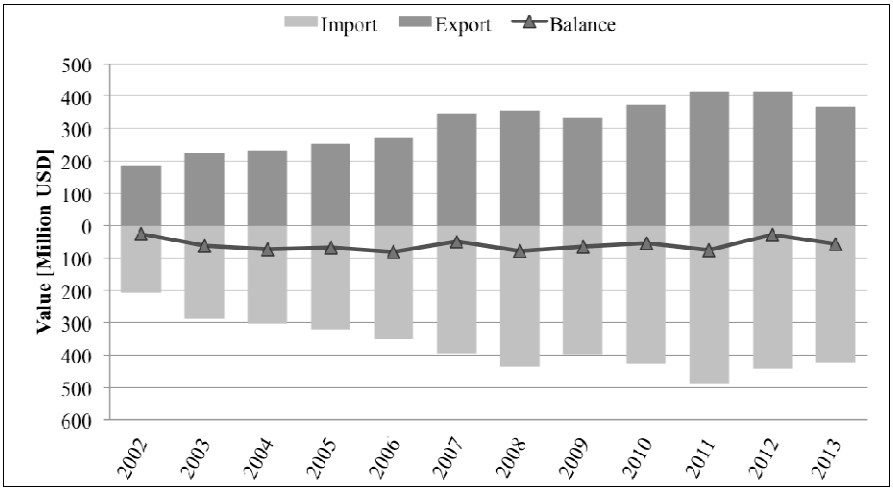

Figure 19. EU28 imports, exports and trade balance for wild mushrooms in 2011: economic value.

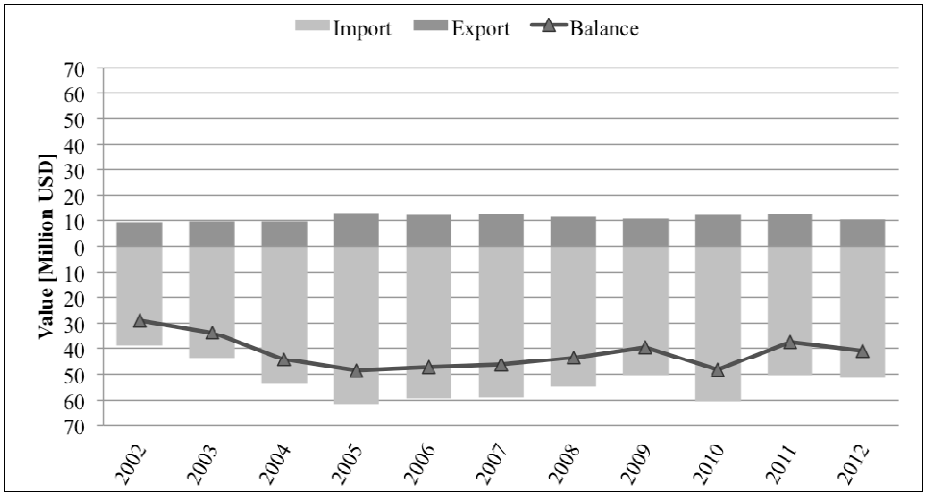

Figure 20. Italian imports, exports and trade balance for wild mushrooms in 2011: economic value.

RIASSUNTO

Mercato internazionale dei PFNL: qualche opportunità per il settore forestale italiano?

Le foreste italiane, tradizionalmente gestite per la produzione legnosa, si trovano oggi ad affrontare una domanda di beni e servizi abitualmente considerati secondari dal gestore forestale. I dati del settore forestale italiano mostrano un ruolo sempre più importante dei prodotti forestali non legnosi (PFNL), considerati materia prima in altri settori come quello alimentare, verde ornamentale o industria chimica. La scarsa attenzione alla produzione dei PFNL, i complessi sistemi legislativi legati ai diritti di raccolta, e l'incremento della domanda di tali prodotti ad uso industriale, hanno spinto le aziende a importare le diverse materie prime da inserire nelle filiere industriali, ottenute in quantità e prezzi più vantaggiosi nel mercato internazionale. Altresì, in Italia, i prodotti forestali non legnosi si sono trasformati localmente in beni funzionali del bosco commercializzati non più come bene di consumo ma bensì come servizio ricreativo attraverso la raccolta diretta in bosco da parte dell'utilizzatore finale. Funghi selvatici, tartufi, bacche, frutta in guscio, resine, sughero, tannini e verde ornamentale, sono i prodotti forestali non legnosi più commercializzati, verso e dall'Italia. L'Italia ricopre un ruolo chiave nell'importazione e successiva lavorazione di alcuni PFNL; l'importazione e lavorazione del tannino da concia o di sughero per la produzione di tappi e pannelli o la lavorazione dei funghi freschi e secchi per il mercato nazionale ed estero sono esempi di prodotti che vedono l'Italia nazione leader nel mercato mondiale. Il lavoro presenta volumi economici e quantità commerciate dei principali PFNL maggiormente importati ed esportati dall'Italia, calcolati attraverso l'uso dei dati di commercio internazionale riportati da COMTRADE.

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