CAPITALIZING OF COMPLEMENTARY PRODUCTS IN THE CONTEXT OF SUSTAINABLE DEVELOPMENT OF THE ROMANIAN FORESTRY LAND

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Abstract: *Romania's forestry land represents about 28% of the national territory. The predominant exploitation of the forests, only from the perspective of the rough processing of the wood material, can lead to hardly remediable effects, considering that, although the forest is one of the renewable resources of Romania, the restoration of these resources implies waiting of several decades, during which the factors of environment, social and economic have to suffer.*

Through this article we try to highlight the exploitation of non-wood material, by highlighting the economic results obtained by the private sector compared to those coming from forestry units.

Increasing the base of exploitation of complementary products, by encouraging the use of forest space for the purpose of harvesting these non-wood products, will create the premise of sustainable development and maintaining the forest as a factor of economic stability, considering its varied palette of natural resources.

Key words*:* Economic Development; Renewable Resources; General Regional Economics; Microeconomics; Production and Organisation; Forest products

JEL Classification*:* O1, Q2, R1, B21, D2, L73

Introduction

Complementary products, generically called non-wood products, together with the functions of ecosystem services, have started to gain increasing importance and international recognition in recent years,

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especially if we take into account a number of socio-economic trends and developments. As result of this accelerated development, complementary forest products and ecosystem services are becoming increasingly important, both, for society and for the owners of the forestry land who are trying to market them.

The semantic value of the expression "complementary products" is similar to "non-wood products", the latter much more being present in the materials dedicated to international forestry employees (Nikitenko, 2016). Therefore, they are officially defined “the non-wood products of the forest as material resources of vegetal nature, totally or partially lacking of wood, provided by the trees, shrubs and soil of the forests, as well as the lands affected to them, known in the past and under other names, such as: accessory products, secondary products, ancillary products of wood ”. (FAO, 2016).

According to the Department of Forest Statistics of the Food and Agriculture Organization of the United Nations (FAO), non-wood products are one of the three major categories that belong to the category of forest products.

Recent studies show that complementary forest products are the basis of life and provide the optimal means of living in many parts of the world, having a much more important role in nutrition than previously thought (FAO, 2018). For this reason, the Department of Forest Statistics of the Food and Agriculture Organization of the United Nations intervened to resolve the existing gap between the economic values resulting from the exploitation of wood and that offered by the complementary products.

However, there is a tendency to underestimate the role of these products, because they have poorly represented in international statistics, mainly due to the low financial value of the sector, and trade is limited to the informal sector only.

As a first starting point, a new definition of non-wood products has revised and "Complementary forest products are goods of biological origin, other than wood, as well as services, derived from forests and land uses from the forestry land" (FAO, 2018). Currently, the inclusion in this category and the functions performed by the forest, in particular those of carbon storage and oxygen production, have been discussed.

1. Complementary products in Romania

Romania is one of the 14 countries (Table 1) that provides statistical data in Europe, on the exploitation of non-wood products. The series of data are characterized by inconsistency, due to the lack of data, from year to year, of the different classifications, so that an analysis as close to reality as possible was hampered, all the more so if we were to develop an analysis at the level of the species that make up these complementary products.

Table 1. Non-EU products-2016 (th EUR)

Country	Year 2016
Bulgaria	0,75
Czech	193,67
Germany	51,70
Greece	5,01
France	60,90
Italy	15,60
Cyprus	0,50
Poland	177,62
Portugal	260,66
Romania	**46,33**
Slovak	3,10
Finland	76,00
Sweden	26,30
UK	6,10

Source: EUROSTAT

Compared with other EU countries, Romania has a good commercial value, with over than 46 million euros in the reference year 2016, being in the middle of the ranking of the countries that reported statistical data on the use of non-wood products, taking the seventh place.

Table 2. Non-wood products 2008-2016 (EURO mil)

An	2008	2009	2010	2011	2012	2013	2014	2015	2016
România	9,07	6,58	11,11	27,39	26,89	33	49,04	50,22	46,33

Source: EUROSTAT

Currently, many of the complementary products in the specific nomenclature in Romania have not found in the international ones, which leads to some difficulties of data aggregation and of ensuring comparability between the exploitations carried out by different countries.

Statistical research in forestry is still far from exhaustive, especially in Romania. Data provided by state and private forest units, are included in the Classification of Activities in the National Economy – CANE REV.2, in section A, with the following groups:

- 021 "Forestry and other forestry activities", class 0210 "Forestry and other forestry activities";
- 022 "Forestry exploitation", class 0220 "Forestry exploitation";
- 023 "Collection of non-wood forest products from spontaneous flora", class 0230 "Collection of plants and fruits from spontaneous flora (excl. Woody material);
- 024 "Activities of services annexed to forestry", class 0240 "Activities of services annexed to forestry".

2. Capitalizing on complementary products in Romania

Currently, in Romania, many of the complementary forest products are sell abroad, mainly through intermediaries, their value oscillating in accordance with the market requirements, but also according to the weather, noting the decrease of production, especially in the drought years.

These products are find in abundance with an increasing potential. As species, in the national forest background there are the blueberries (*Vaccinium myrtillus*), the cranberries (*Vaccinium vitis-idaea*), the sea-buckthorn (*Hippophaë rhamnoides*), the hawthorn (*Crataegus monogyna fr.*), prunus (*Prunus Spinosa fr.*) or the rosehip *Rosa canina fr.*). For now, only the first three are included in the new FAO classification of complementary forest products, although the other fruits are included in Eurostat reports.

Regarding the exploitation of edible mushrooms from the spontaneous flora of the national forestry land, if we are looking to the potential we could say that it is below the normal level. In a recent statistic (Enescu, 2018) it is highlighted a quantity of 636.33 tones, as the annual

average of the period 2009-2015 for the collection of edible truffles and mushrooms from the spontaneous flora. These data refer to the entries that generate fiscal revenues. In the 1980s, it was about an average of around 800 tones, of mushrooms harvested from the forest area.

A reputed specialist in this field, prof. Univ. Dr. Eng. Ioana Tudor, appreciates that from the Romanian forest, a total quantity of wild and edible mushrooms of 300,000 tones can be harvest, annually. If they were taxed, "the revenues in this sector would be at least a quarter of a billion euros, annually" (Tudor, 2013).

In this context, if Romania would take steps to comply with the new standards, it could gain the opportunity to access international markets more easily and to obtain much higher revenues.

Harvesting of complementary products, from our country, has mainly done by the natural persons who have the right to enter into the forests and to collect from the spontaneous flora. Harvesters should not damage the forest environment and they are bound to follow the instructions set by the owner or the forest manager. All forest stands are accessible to people, and they can freely choose NFPs, regardless of the forest ownership (Giurgiu, 1980).

The prospects for planned cultivation of such products (especially herbs and certain berries) are very good, even though, the complementary forest products have not yet harvested and/or marketed by the owners, tenants or large-scale entrepreneurs. The prospects for planned cultivation of such products (especially herbs and certain berries) are very good given the fact that these are products that could be consider viable alternatives to agricultural production.

According to the statistical data released to the NIS, the value of the non-wood products that have been capitalized by the forest units in the Romanian forests is extremely low (percentage of the total declared turnover), the rest representing revenues from the sale of wood.

Table 3. The turnover of forestry in Romania, declared by the forestry units

Denumirea indicatorilor	U.M.	2016		2017	
		Cantitate	Valoare – mii lei – preţuri curente	Cantitate	Valoare – mii lei – preţuri curente
Cifra de afaceri a unităţilor silvice – total	***mii lei***	**~**	**2254830,1**	**~**	**2476254,5**
Masa lemnoasă (în volum brut) – total	***mii m³***	**11254,5**	**1946183,5**	**12021,83**	**2159876,7**
– masa lemnoasă pe picior	*mii m³*	8921,8	1462627,2	9398,84	1649808,4
– masa lemnoasă fasonată	*mii m³*	2302,4	467391,9	2589,86	486003,4
– cherestea şi alte semifabricate	*mii m³*	30,3	16164,4	33,13	24064,85
Puieţi forestieri şi ornamentali din pepiniere silvice	***mii buc***	**13630,9**	**11056,3**	**10476,61**	**9220,73**
Alte produse lemnoase – total	***mii lei***	**-**	**1728,7**	**-**	**1186,59**
Seminţe forestiere	***tone***	**7,6**	**561,9**	**8,7**	**279,27**
Fructe de pădure	***tone***	**2442,4**	**9972,3**	**3182,65**	**15803,72**
Trufe şi alte ciuperci comestibile din flora spontană	***tone***	**460,7**	**506,5**	**495,01**	**634,52**
Alte produse nelemnoase – total	***mii lei***	**-**	**2789,6**	**-**	**3256,05**
Produse vânătoreşti – total	***mii lei***	**-**	**5229,1**	**-**	**5170,15**
– carne de vânat	*tone*	250,2	2177.5	269,58	2252,39

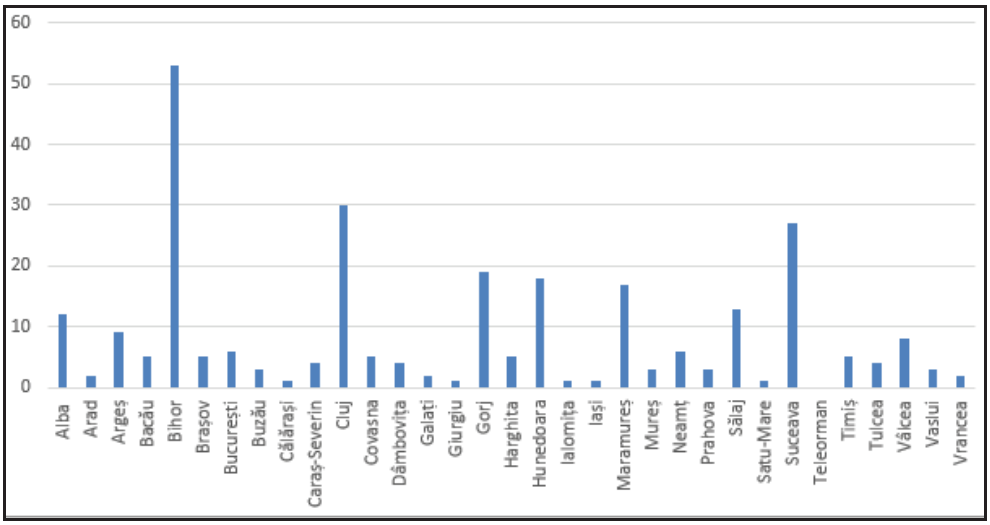
Source: INS

Compared to the turnover declared by the forestry units for the years 2016 and 2017 (respectively 13,830.30 thousand RON, respectively 19,973.56 thousand RON), related to the valorisation of complementary products (non-wood), the value of the turnover realized by the private sector at the end of 2018 (shown in Table 9), was significantly higher. There were identified 278 companies and authorized natural persons who together realized a turnover of **251,745,747 RON (approximately 53 million euros**), included a number of about 2,000 employees and made a profit of **10,381,000 (2.17 million euros)** lei, bringing state revenues, both, from the taxes derived from the labor force and from the tax on the obtained profit.

Table 4. The turnover and the profit realized on 31.12.2018 by the Romanian companies with CAEN code 0230 „Collection of plants and fruits from spontaneous flora (excluding woody material)

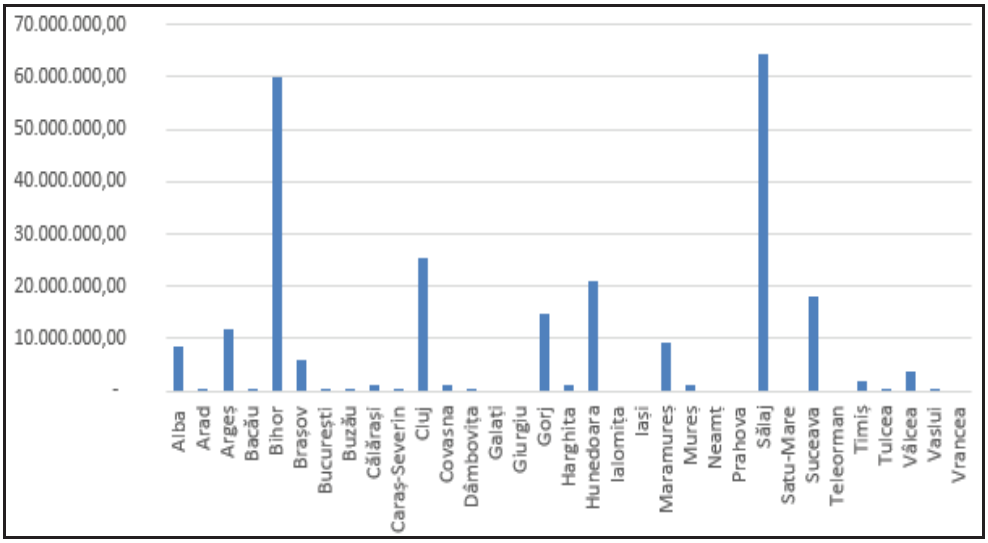
Counties	31.12.2018		
	Number of companies	Turnover (ron)	Profit/Loss (ron)
Alba	12	8.353.642,00	- 129.004,00
Arad	2	390.812,00	98.936,00
Argeş	9	11.892.522,00	388.591,00
Bacău	5	1.863,00	1.452,00
Bihor	53	59.910.436,00	2.977.359,00
Braşov	5	5.806.489,00	40.449,00
Bucureşti	6	270.156,00	- 108.963,00
Buzău	3	168.741,00	45.438,00
Călăraşi	1	1.331.843,00	64.189,00
Caraş-Severin	4	511.280,00	479.956,00
Cluj	30	25.519.587,00	1.385.747,00
Covasna	5	1.189.401,00	100.085,00
Dâmbovița	4	175.320,00	113.824,00
Galați	2	–	–
Giurgiu	1	–	–
Gorj	19	14.725.419,00	1.813.421,00
Harghita	5	1.220.737,00	153.692,00
Hunedoara	18	21.099.446,00	247.410,00
Ialomița	1	–	–
Iași	1	–	–
Maramureş	17	9.413.711,00	410.982,00
Mureş	3	1.086.139,00	- 118.234,00
Neamț	6	–	–
Prahova	3	–	- 7.915,00
Sălaj	13	64.385.718,00	1.829.172,00
Satu-Mare	1	–	–
Suceava	27	18.242.373,00	236.471,00
Teleorman	0	–	–
Timiş	5	2.042.232,00	- 107.325,00
Tulcea	4	73.523,00	- 19.592,00
Vâlcea	8	3.699.773,00	446.877,00
Vaslui	3	234.584,00	38.906,00
Vrancea	2	–	–
Total	**278**	**251.745.747**	**10.381.924**

Source: author's processing based on the balance sheet data published in the Ministry of Finance and ONRC



Source: author's processing based on data from ONRC and the Ministry of Finance

Figure 1. Number of active companies for CAEN code 0230 (31.12.2018)



Source: author's processing based on data from ONRC and the Ministry of Finance

Figure 2. Turnover (RON) of the companies in operation having CAEN code 0230 as of 31.12.2018

It has noted that the county of Salaj occupies the first place, with the highest turnover, of **64.385 million RON**, although, according to ONRC, it operated a smaller number of companies that had as object of activity the collection of plants and fruits from spontaneous flora. Taking into account the fact that Sălaj County is one of the counties with an average afforestation area (mainly with deciduous forests), **the theory is confirmed that the efficient exploitation of the forested areas in Romania brings high economic benefits, from the perspective of using complementary (non-woody) products.**

In the "mirror", the production collected by Romsilva, in its quality of the state forest manager, is much smaller (Table 5), the turnover realized from the exploitation of the complementary products is only 16% of the total turnover of the state company. Of the approximately 500 million euros, only 4 million euros come from non-wood products (berries and mushrooms, including truffles), given that the National Forest Administration-Romsilva manages 48% of the national forestry land, about 3.13 million of hectares.

A conclusion that justifies the difference between the financial achievements of the private companies and the RNP-Romsilva (13 times higher compared with the state level) can be explain by the fact that the "individuals" collect complementary products from the state forests.

Table 5. Turnover, by all compartments, made by Romsilva in 2018

SPECIFICATII	VALORI	%
Masă lemnoasă, din care	2.028.624.190	88,3
- masă lemnoasă pe picior	1.284.313.580	55,9
- masă lemnoasă fasonată	722.287.100	31,5
- cherestea și alte semifabricate	22.023.510	1,0
Puieți forestieri și ornamentali din pepiniere silvice	5.990.550	0,3
Alte produse lemnoase (arbori și arbuști ornamentali, pomi de Crăciun, rachită)	617.930	0,0
Semințe forestiere	611.390	0,0
Frute de pădure	17.913.080	0,8
Ciuperci comestibile din flora spontana	869.070	0,0
Alte produse nelemnoase (plante medicinale și aromatice, sucuri răcoritoare, rășină, etc)	5.584.460	0,2
Produse vânătorești	4.234.460	0,2
Produse piscicole	8.503.180	0,4
Produse apicole	97.320	0,0
Alte produse	5.039.070	0,2
Prestări servicii, din care:	130.018.871	5,7
- servicii de pază	65.844.030	2,9
Autorizații, despăgubiri, tarife, alte venituri	88.134.130	3,8
TOTAL CIFRA DE AFACERI	**2.296.237.701**	**100,0**

Source: INS

3. The sustainable development of the Romanian forestry land

Starting with the analysis of the economic data, related to the activity of collecting mushrooms and fruits from the spontaneous forest flora, noting the remarkable results obtained in Sălaj County, it can be conclude that the activity of valorisation of the complementary products, under the conditions of environmental protection, is an inexhaustible activity. This yearly generates, perennial incomes, compared to the activity of exclusive exploitation of wood. After a while, the revenues obtained from the use of complementary products will increase (because the forest is that factor of production that generates annual revenues, if it remains standing). Also, the environment will not be affected and the human factor permanently involved in the exploitation activity, in other words, in full agreement with the three pillars that define the principles of sustainable development: economic, social and environmental (Zaman, 2006)

It is noted that in the counties where the exploitation was mainly focused on the use of wood material (Alba, Hunedoara- for example), the incomes obtained from the complementary products are much lower. Although, apparently, from the exploitation of the wood material, high incomes have resulted, the fact that the forest – as a wood mass – is a more difficult renewable resource, this aspect implies the passing of decades until the restoration and exploitation again, while also the exploitation of the complementary products has largely compromised. It is worth mentioning that both Alba and especially Hunedoara have important areas of forestry land (rosilva.ro, 2019).

Whether the Romanian forestry land is in the private property of the natural and legal persons or in the public and private property of the administrative-territorial units, its sustainable development has been formulate, in restricted terms, in the Forest Code (Law 46/2008). The sustainable developments was only limited to the allocation of the amounts, from the state budget, on different activities. Examples of activities: the management of the forestry land, for the conservation and regeneration of forests, for the control of diseases and pests, for the restoration of the forest transport routes affected by natural disasters, for the forest education materials regarding the protection and conservation of the forests, for granting compensation due to restrictions on timber harvesting.

Compared to the provisions of the Forestry Code, in 2018, the Ministry of Waters and Forests formulated the National Forestry Strategy for the period 2018 – 2027. This strategy has the aim to ensure a sustainable development, by correlating the activity of the sector with the policies of environment, agriculture and rural development, energy, education, tourism, having as a general objective "the harmonization of the forest functions with the present and future requirements of the Romanian society through the sustainable management of the national forest resources." The vision of the development strategy of the forest sector is "A developing Romania in which the forest sector contributes to human well-being in a sustainable way from an economic, social and environmental perspective".

The target audience described by the strategy refers to the entire society, but in particular the forestry land owners, forest managers/service providers for the national forestry land, the economic operators who carry out their activity in the forestry field, the forestry employees and the trade union organizations and professionals with activity in the forestry field. The estimated impact of the strategy (political, legislative, environmental and financial) is to achieve a series of objectives. Examples of objectives: revising the legislative framework, harmonizing indicators with European ones, improving the methodology for evaluating woody and non-woody products in accordance with the reporting structure existing at European level, increasing the area occupied by forests, realizing the system of forest curtains, improving biodiversity, high-performance technologies, limiting illegal logging, increasing the value of products and creating new jobs, etc.

The objectives of the sustainable development strategy intend to correct the identified issues in the forestry sector. These issues are looking to the followings: excessive and amended legislation very often; lack of an efficient correlation with regulations from other fields; failure to complete the forest retrocession process; the existence of an important forest area for which forest management or services is not provided and for which no forest facilities are developed; failure to provide appropriate forms of support for private forest owners; failure to update indicators for sustainable forest management in European and national contexts; insufficient and distorted statistical data collection, not correlated at national and European level; the lack of a national policy regarding the use of wood so as to maximize the value of the wood on the market, with minimal costs and with

little impact on the environment; the impossibility of performing a real radiography that provides predictability; the lack of development and training strategies, in the medium and long term, for human resources in the forestry field; lack of occupational standards adapted to current situations; lack of forest education for civil society and especially for children, etc.

Complementary products need specific climatic conditions that only the forest can provide. Looking from the mentioned sustainable development objectives, non-wood products could benefit from a broader base, if forests will be manage by a kind of symbiosis: by merging the objectives of classical forestry (timber, firewood) with that of production of complementary forestry products, adding ecosystem services, considering that our country has the most important elements of biodiversity, among the states of the European Union.

4. The complementary Romanian products and their use through the international trade

The international trade with complementary Romanian products is affected by the lack of a uniform classification of these products by agricultural categories. Equally, the rest of the countries of the world are affected, noting that the data on international trade and the production of complementary forest products (PFN) are partial and are not comparable, both, between countries and in time. The classification by agricultural categories of these products provided by the forestry land is make without any distinction between wild and farm or crop products, which causes major difficulties in collecting statistics on a unitary basis (McDermond, DeBeer, 1989).

Moreover, the information is available in national databases differently organized, countries reporting only on products that even have economic value for them.

In Romania, the statistics are compiled according to the old codes (the 70s), taking into account only the complementary products harvested from forests, without taking into account also the cultivated products (in the case of the berries, the crop products exceed by 80% those collected from forests).

In the ***European Union***, both, in production and in statistics, the focus is on cultural products, only certain countries in northern and eastern Europe, where the harvesting of wild fruits is an important activity related to forests, regularly collecting and disseminating data of reality. Thus, in Finland there is the best database structured on the harvest and income offered by forests in this Scandinavian state. The information has been disseminate by Finns since 1980, including on electronic media.

In Japan, the statistical yearbook provides data on the production of minor forest products, including shiitake, nameko, enokitake, oyser (beech trout), bunashimeji and maitake mushrooms. In addition to these species, the Japanese Forestry Agency also includes the production of matsutake.

In this regard, the Department of Forestry Statistics of FAO initiated three years ago the development of an international classification system to be used for the collection and dissemination of data on the production, trade and economic activities of the forest, but not including the exploitation and production part of the forest wood. For four months (July – October 2016), numerous specialists and experts in forest economics, biologists, foresters were invited to offer suggestions to help improve the initial study on complementary products.

Thus, the complementary products were identified and arranged in eight major categories, the study being a first step to improve data collection.

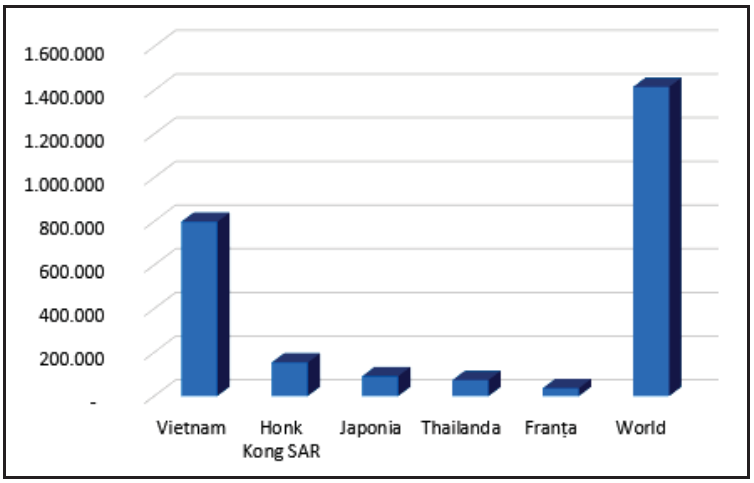
Of the eight major categories, the present paper will bring to attention the financial data regarding international trade only for the first two categories of complementary products, given their importance and weight in the international trade.

For species of mushrooms and edible truffles of spontaneous flora, FAO specialists have developed and imposed a standard classification, including over 800 species, 125 of which are also in Romania.

This classification will correct national and international statistics, implicitly the ranking of the exporting/importing countries that at present does not provide data on the production of wild mushrooms, because few countries systematically collect data on these products.

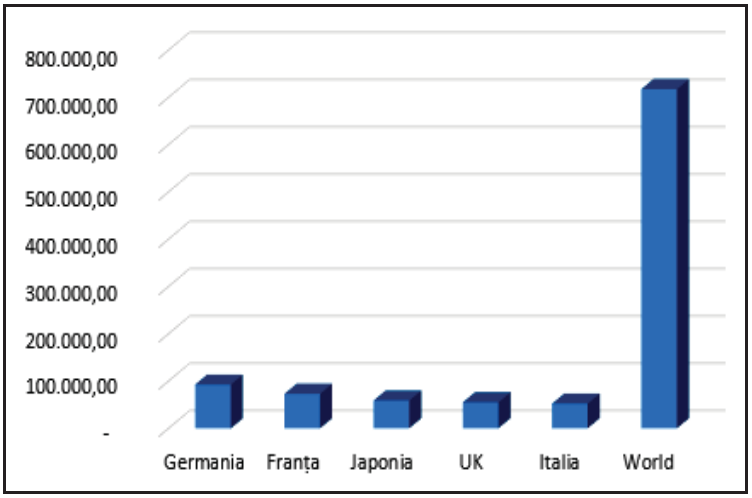
According to current statistics, China is the world's largest exporter of dried forest mushrooms, accounting for 89% of the total. It has noted that some countries have the quality of both exporter and importer, with visible

differences between the unit value of exports and that of imports (Wong, 2000).



Source: Author processing, based on FAO data

Figure 3. Value of exports (thousands USD) – fresh forest mushrooms



Source: Author processing, based on FAO data

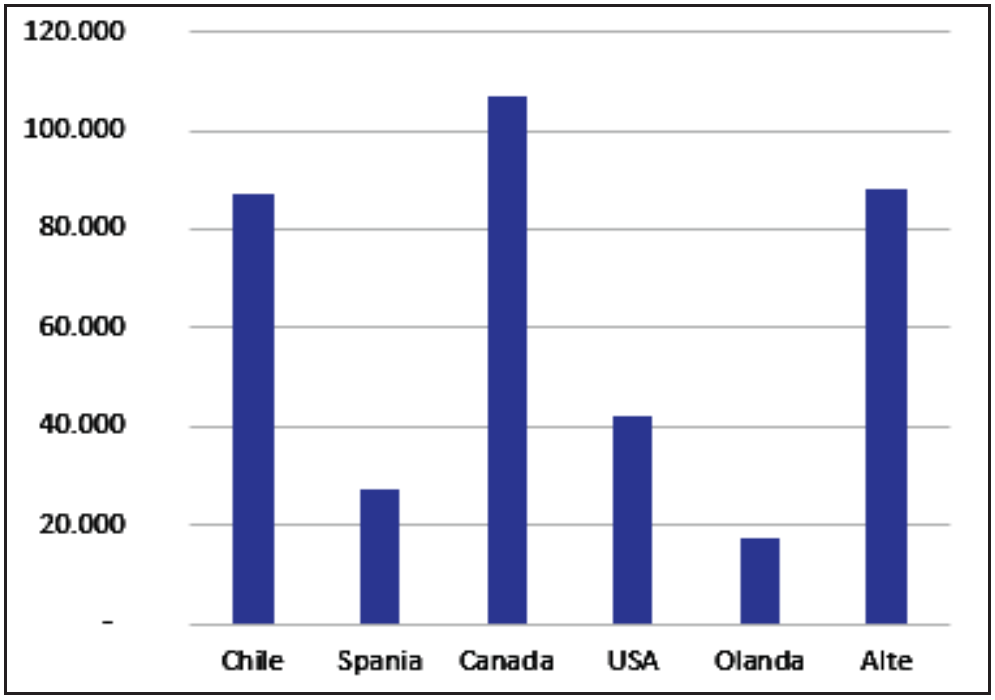
Figure 4. Value of imports (thousands USD) – forest mushrooms

The first three major importers of fresh forest mushrooms worldwide are EU Member States – Germany, France and the UK, which together account for one third of global imports.

For the species of berries, all the data in the international statistics reflect the production marketed internationally. The quantity used for direct consumption and informal market is not included. As a result, the harvested output may actually be much higher than shown in the statistics, but that will be corrected through the new classifications.

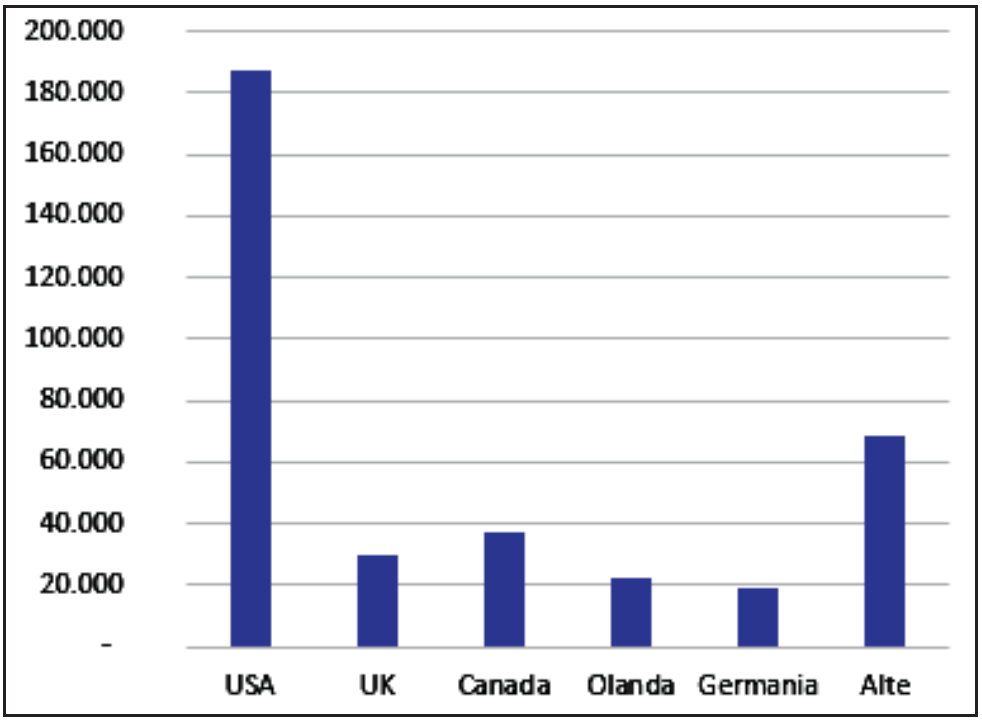
Chile is the world's top producer, exporting crop berries, not spontaneous flora, especially to the United States, the United Kingdom and Canada.

As in the case of mushrooms, there are countries that have both exporter and importer status, the fruits of the forest being more expensive to export than the imported ones, in the case of the Netherlands and the USA.



Source: Author processing, based on FAO data

Figure 5. Exported quantity (tones) – fresh forest fruits(cranberries,blueberries)



Source: Author processing, based on FAO data

Figure 6. Imported quantity (tones) - fresh forest fruits(cranberries, blueberries)

Conclusions

The importance and contribution of forests to food security, nutrition, community health, energy and employment has clearly recognized at international, national and local levels. However, there is a significant data gap in the current global statistics on non-wood forest products. Even when information is available, it is often partial or fragmented and has no cross-country and time comparability. This imbalance has led to an under-estimation of the existing and potential socio-economic benefits and, in addition, to an overview of the total economic contribution of forests (Hvesik & Subalai, 2014).

The Food and Agriculture Organization of the United Nations (FAO) is trying to gather under the same umbrella all the existing global data

regarding the complementary products offered by forests, but also of the ecosystem services of the forestry land. (FAOSTAT, 2016). Following a recent report, it has found that non-wood forest products are recognize in a wide range of categories from the three international schemes HS, CPC and ISIC, having different levels of detail. The HS system allows the highest level of product detailing and offers more specific codes than the other two classifications that, in most cases, include non-wood forest products (NWFP) as part of a larger product category (Falconer, 2018). In CPC, some particularly important classes, such as those of wild edible products and plant raw materials, do not have a detailed code for identifying the products in that class.

Given that complementary forest products are classified into categories without any distinction being made between those collected from the wild and those produced on farms, a clear delineation between agricultural products and forest products is necessary, especially for the purpose of collecting statistics, for the identification of food products. For the CPC, this could be based on the source of production (this is compatible with ISIC), although such a distinction could not be so easily made in SNA, except for the use of species as proxies for wild or cultivated production. (Sorrenti, 2017).

In this context, coherent policies are needed, both, in Romania for the unification of the methodologies for reporting statistical data and for encouraging the rational exploitation of forests, in accordance with the requirements of sustainable development. Ensuring an unique classification and reporting framework will contribute to the correct measurement of the results of the operations of the complementary products. The correct measurement of the results of the exploitation of the complementary products will allow the correct evaluation of the benefits brought by this sector (Cofari, 2011). Encouraging the rational exploitation of forests through convergent policies will contribute to increasing the base of exploitation of complementary resources, given that their exploitation has mainly done in the forested areas.

In this regard, in the next stage, my research will continue with the evaluation of the economic results obtained by the companies that have as activity object the exploitation of the wood material, compared with the economic results that could be only obtained from the exploitation of the complementary products.

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