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## **THE ECONOMIC CONTRIBUTION OF HUNTING PRODUCTS TO THE TURNOVER OF THE FORESTRY UNITS IN ROMANIA**

### **SUMMARY**

Game species are among the main categories of non-wood forest products (NWFPs) in Romania. Thanks to its diversified relief and forests, Romania has a high diversity of wildlife species. The national hunting area is divided into 2.151 hunting grounds that are managed by private-owned or state-owned forestry units and hunting associations. On the current territory of the country, hunting was a regular practice since the Middle Ages, and the first modern regulation dates from the second half of the 19th century. According to currently valid legislation, hunting in Romania is permitted for 18 species of mammals and 39 species of birds. Special attention is given to three species of EU interest, namely brown bear (*Ursus arctos* L.), gray wolf (*Canis lupus* L.) and wildcat (*Felis silvestris* Schreber). The annual contribution of hunting products to the turnover of the forestry units is usually less than 1%. In order to increase this contribution, forest managers should develop and promote other hunting related activities.

**Keywords:** forestry units, game species, hunting, NWFPs, Romania

### **INTRODUCTION**

During the developing of mankind, but especially in the last two centuries, specific wood and non-wood forest products provided income and job opportunities both for local communities and also for several categories of forest owners and managers from Romania.

Even if the area of Romanian forests (*i.e.* 6.55 million hectares; MMAP, 2015) is currently lower than it used to be one hundred years ago, forestry remains one of the most important sector from social, cultural, ecological and economic perspectives. There were several factors that have contributed to reduction of the forested area, such as: increasing the farmlands, expansion of communities, payment of war debts, increasing the exports of wood products and diversification of wood use in different industries.

Starting with the application of the first forest management plans and the appearance of the first modern regulation, forest management in Romania is focused on producing high volume of timber, by assuring in the same time the

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ecological functions of the forest ecosystems. Little attention was and continues to be given to the management of non-wood forest products (NWFPs). This category of forest products includes: fauna of hunting interest, fish from mountain waters, forest fruits, forest seeds, truffles and edible mushrooms, medicinal and aromatic plants, resin and tree sap. In Romania, according to Article 58 of the Forest Code (Law no. 46/2008), the forest products belong to the owners or their holders, as the case may be, except for the game and fish species.

NWFPs have several uses in food, pharmaceutical, chemical, handicraft, and livestock industries (Enescu, 2017), their sustainable harvesting being currently a matter of concern, especially in the case of edible mushrooms (Vasile *et al.*, 2017) and game species. Regarding the latter category, in Romania, according to Law 407/2006 on Hunting and Protection of Hunting Stock, hunting is permitted for 18 species of mammals and 39 species of birds and every year the hunting quota is revised.

## RESULTS AND DISCUSSION

### Romanian hunting fund and infrastructure

In 2015, in Romania, the total hunting area was 21.9 million hectares and it was divided into 2.151 hunting grounds that were managed as follows: 1.873 by hunting associations and organizations, 255 by ROMSILVA and 23 by forest research and teaching institutions. Most of the hunting funds are located in the plain region (41.7%), followed by the ones from hilly regions (37.5%) and mountain regions (20.8%) (MMA, 2015).

The hunting infrastructure is well developed thanks to more than 50 years of investment. For example, in 1964, there was a total of 4.500 kilometers of managed paths, more than 600 hunting chalets and almost 3.000 hunting observatories (Miron, 1964). Recently, sportive fishing and hunting activities represent an important source of income, especially for the rural communities from mountainous areas (Otoman, 2008). In some regions, like Galați County (eastern part of the country), the hunting infrastructure needs to be improved (Camară and Munteanu, 2016).

### Diversity of species and population size

Romania is known as European country that has important hunting resources and holds worldwide records in hunting trophies, such as the biggest skulls and valuable brown bear furs (Bouriaud *et al.*, 2005).

According to legislation, the main game species for which the hunting is permitted are: European hare (*Lepus europaeus* Pallas), red deer (*Cervus elaphus* L.), common pheasant (*Phasianus colchicus* L.), European roe deer (*Capreolus capreolus* L.), wild boar (*Sus scrofa* L.), fallow deer (*Dama dama* L.), pheasants, quails, geese, ducks, etc.

Romania is also famous for its brown bear (*Ursus arctos* L.) and gray wolf (*Canis lupus* L.) populations, having around 25-35% and 30% of the European

bear and gray wolf populations, respectively (Predoiu and Ungurean, 2010; Pecineaga *et al.*, 2016). The presence of these large carnivores near livestock is greater than in other European countries and is generating several conflicts (Mertens and Promberger, 2001). The high number of brown bear population was mainly due to certain aspects of wildlife management in Romania that flourished during the Communist Era (Leslie *et al.*, 1995).

According to statistics, the brown bear and gray wolf populations have decreased after the Second World War due to their intense control. In the period 1989-2004, the bear population decreased with 14%, while wolf population increased with 23% (Micu, 2010). Romanian bear population was never less than 800 individuals (Straka *et al.*, 2011). In the past five decades, the minimum number of brown bears was recorded in 1968, *i.e.* 2.500 individuals, while the maximum number was achieved in 1988, *i.e.* 7.800 individuals (Ionescu, 2016).

Across Romania, species distribution is not uniform, in the southern-eastern part of the country, mammal species account for 50% of the total number of the known species of the Romanian fauna (Murariu, 2002).

The estimation of the population size for the main game species is done by the administrators of the game management units for more than 60 years (Cazacu *et al.*, 2014). According to recent data provided by the Ministry of Environment, Waters and Forests (MMAP, 2016a), the population size of the most common game species is given in Table 1.

**Table 1:** Population size of the main game species in Romania

Species	Year	
	2015	2016
<i>Lepus europaeus</i> (hare)	1090882	1089090
<i>Phasianus colchicus</i> (common pheasant)	463054	461464
<i>Perdix perdix</i> (grey partridge)	206032	206613
<i>Capreolus capreolus</i> (European roe deer)	197626	203924
<i>Sus scrofa</i> (wild boar)	90860	96685
<i>Vulpes vulpes</i> (red fox)	64940	65537
<i>Cervus elaphus</i> (red deer)	45233	46702
<i>Ondatra zibethicus</i> (muskrat)	24864	23353
<i>Mustela putorius</i> (European polecat)	22421	21788
<i>Mustela nivalis</i> (least weasel)	21810	20383
<i>Meles meles</i> (European badger)	21494	21210
<i>Martes martes</i> (European pine marten)	14500	14229
<i>Tetrao urogallus</i> (western capercaillie)	10713	10819
<i>Rupicapra rupicapra</i> (chamois)	7538	7693
<i>Martes foina</i> (stone marten)	6395	6326
<i>Mustela erminea</i> (short-tailed weasel)	6286	6069
<i>Dama dama</i> (fallow deer)	6215	6527

As in the case of the brown bear, the population of roe deer had also a special dynamic in the last three decades. If nowadays the Romanian roe deer population is around 200.000 individuals, in 1984 there were approximately 287.000 individuals, while in 2006 the population accounted 150.000 roe deers (Burbaitë and Csányi, 2009).

Special attention is given to three species of EU interest, namely brown bear, gray wolf and wildcat. Following the accession of Romania to the European Union and the adoption of the Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora, starting from 2007 on the basis of ministerial orders, derogations for the three species were approved. So, in the period 2007-2015, the hunting was permitted for a total of 12.169 individuals (Table 2). Starting from 2016, the project of the ministerial order (MMAF, 2016b), which provided derogations for 552 brown bears, 657 gray wolves and 482 wildcats, was not adopted.

**Table 2:** Hunting quotas for brown bear, gray wolf and wildcat in Romania

<b>Year</b>	<b>Brown bear (<i>Ursus arctos</i>)</b>	<b>Gray wolf (<i>Canis lupus</i>)</b>	<b>Wildcat (<i>Felis silvestris</i>)</b>	<b>Ministerial Order</b>
2015	540	598	496	1439/2015
2014	550	520	440	1575/2014
2013	436	495	420	2187/2013
2012	365	520	430	3456/2012
2011	365	498	402	2278/2011
2010	340	450	400	1423/2010
2009	350	466	474	1223/2009
2008	357	505	459	1092/2008
2007	333	500	460	1386/2007
<b>Total</b>	<b>3636</b>	<b>4552</b>	<b>3981</b>	

### Legal framework

On the current territory of Romania, hunting was a regular practice since Medieval Period (Bejenaru *et al.*, 2010). The first regulation regarding hunting dates from 3<sup>rd</sup> of September 1138. According to this act, the people of Transilvania were obliged to offer to Dumis Monastery twenty martens, a bear skin and a horn of aurochs. Three centuries later, other legal regulations appeared. One of the most important was promulgated under the reign of Ștefan cel Mare (1457-1504). Its main objective was to protect the game species and other natural resources in specific regions (Giurescu, 1976).

During the second half of the 19<sup>th</sup> century, few steps were made. In 1872, the first Hunting Law was promulgated, that prohibited the hunting for some species (Didă, 2010). Also a first attempt to regulate the hunting exercise was done through the 1868 Rural Police Law, which specifies inter alia that the

hunting season should not be longer than eight months (Goicea and Bouriaud, 1999).

At the beginning of the last century, both the hunting laws from 1921 and 1938 gave the right to individuals with more than 1.000 hectares in the mountains and 100 hectares in the plains to dispose of existing hunting on those areas (Popescu *et al.*, 1973).

Currently, in Romania, the hunting is regulated by the Law no. 407/2006 on Hunting and Protection of Hunting Stock that provides legal framework of practicing it. According to currently valid legislation (Government Emergency Ordinance no. 1/2017 and Government Decision no. 20/2017), the central public authority responsible for game management is the Ministry of Waters and Forests, through the Directorate of Forestry and Hunting Control. This directorate is centralizing the data at national level and is establishing every year the hunting quota for the game species of interest.

### **The economic value of game species for the forestry units in Romania**

Contribution of Agriculture, Fisheries and Hunting sectors in national GDP ranged between 5.8% and 8.4% in the period 2005-2010 (Popescu, 2013). As regards "Hunting" sector, a special category consists in hunting products. According to recent reports of the Romanian National Institute of Statistics (NIS, 2008-2015), the annual contribution of hunting products to the turnover of the forestry units is usually less than 1% (Table 3). There are almost 500 forestry units (districts) in Romania, most of them managing the state-owned forests. For example, in 2015, there were 322 state-owned forestry districts, 149 private-owned forestry districts and 3 districts managed by "Marin Drăcea" National Institute for Research and Development in Forestry (MMAF, 2015). The hunting products include the meat and the furs, the pheasants, the horns (deer, roe deer, etc.), which are sold internally and / or exported.

**Table 3:** The contribution of game products to the turnover of the forestry units

Year	Turnover of forestry units		Game products		%
	(thousands RON)	(thousands Euro*)	(thousands RON)	(thousands Euro*)	
<b>2008</b>	1428025.8	317339.1	15402.4	3422.8	1.08
<b>2009</b>	1317345.2	292743.4	8126.6	1805.9	0.62
<b>2010</b>	1381452.5	306989.4	7126.4	1583.6	0.52
<b>2011</b>	1523819	338626.4	7036.8	1563.7	0.46
<b>2012</b>	1626799.4	361511.0	6376.7	1417.0	0.39
<b>2013</b>	1846976.5	410439.2	5709	1268.7	0.31
<b>2014</b>	2017620.9	448360.2	6997.7	1555.0	0.35
<b>2015</b>	2107590	468353.3	5903.4	1311.9	0.28

\* An exchange rate of 4.5 RON for one Euro was taken into account

In the last five years, National Forest Administration ROMSILVA, which is managing 12.4% of the total hunting area in Romania, sold around 30.000 - 40.000 pheasant, partridge and hare individuals, 160-220 tons of game meat, accounting in total for 1.3 - 1.6 million Euros (RNP 2013-2017).

## CONCLUSIONS

Even if Romania has potential in terms of game species, the contribution of this category of NWFPs to the turnover of the forestry units is almost insignificant. Similar contributions have also other NWFPs, especially forests fruits and edible mushrooms. This could be explained by the general view of both state and private forest managers, who are mainly focused on timber production.

A complementary method to attract funds would be to develop and promote other hunting related activities. For example, the modernization of the chalets and hunting infrastructure would attract more hunters who want to benefit from these facilities as close as possible to the hunting ground. In this way, the hunters will spend less time travelling from the accommodation to the hunting ground. This will also promote the local food and beverage products and other traditional activities.

The given results should be considered with caution because they represent only the data summarized from forestry units' yearly reports. No centralized data regarding the contribution of the game products to the turnover of the private hunting association is available. In this context, a real challenge for Romania is the implementation of national policies for encouraging the increase of the contribution of hunting products to the income of the hunting funds managers, regardless of the nature of the property or the way they are organized.

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