WHICH ARE THE MOST COMMON NON-WOOD FOREST PRODUCTS IN TIMIȘ COUNTY?

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Abstract: *Thanks to its high diversity as regards the forest composition and structure, Romania has a great potential for harvesting several categories of wood and non-wood forests products (NWFPs). The aim of this research was to highlight the most representative NWFPs in the case of Timiș County. Four categories of NWFPs (i.e. Mushrooms, Tree products, Understory plants and Animal origin) and nineteen criteria proposed within the FP1203 COST Action European non-wood forest products network were taken into account. An Analytic Hierarchy Process (AHP) was used in order to evaluate both qualitative and quantitative criteria and to assess the performance of selected alternatives (i.e. NWFPs) by means of pairwise comparisons. The analyses were carried out using the Expert Choice Desktop software package. Penny bun and European hare were the most representatives non-wood forest products, when all the 19 selected criteria received an equal importance. In the view of switching the focus from wood to non-wood forest products harvesting, the forest managers should take also into consideration this kind of analyses in order to assess the potential of certain products in a particular scenario.*

Keywords*: AHP, Expert Choice, non-wood forest products, Timiș*

INTRODUCTION

According to Article 58, paragraph (3) of the Romanian Forest Code (Law 46/2008), the non-wood forest product (NWFPs) include fauna of hunting interest, fish from mountain waters, forest fruits, forest seeds, truffles and edible mushrooms, medicinal and aromatic plants, resin, a.s.o.

Since the presence of certain NWFPs is dependent on the presence of the forest stands and by taking into consideration that the distribution of the forests across the country in not uniform, there are counties with great potential in harvesting and marketing of several categories of NWFPs, such as edible mushrooms (VASILE ET AL., 2017).

From a legislative point of view, the base of the harvesting and marketing of NWFPs is given by paragraph (5) of the Article 58, which states that the harvesting and marketing of these products should be done based on authorizations issued by the forest districts, in accordance with the instructions adopted by a ministerial order. Until present, no normative act was adopted by the responsible minister, reason for which in many cases the harvesting is done in a chaotic way. The situation is more clear in the case of the game species, the hunting being regulated by the Law no. 407/2006. According to this law, the hunting is permitted for 18 species of mammals and 39 species of birds in certain periods of time, under the supervision of the managers of the hunting funds. The national hunting area is divided into 2.151 hunting funds that are managed by hunting associations or state-owned or private-owned forestry units (ENESCU AND HĂLĂLIȘAN, 2017).

The aim of this study was to assess the potential of the most common NWFPs from Timiș County.

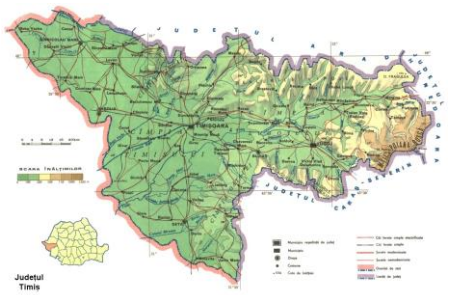
MATERIAL AND METHODS

Timiș County is situated in the western part of Romania, in Banat region, with the capital city at Timișoara (Fig. 1).

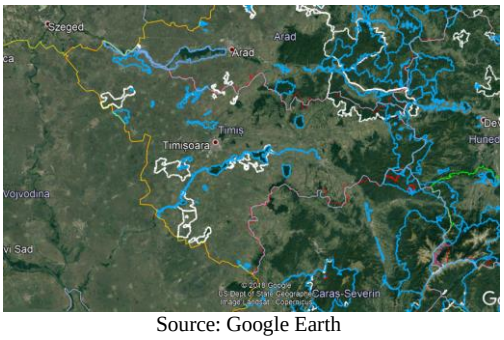
The total forest fund of Timiș County accounts for 105.200 hectares, out of which 103.300 hectares represent forests. The highest share of the forests (95%), namely 98.400 hectares, is represented by the broadleaved species, while the coniferous hold an area of only 4.900 hectares (INS, 2017). Compared with other counties, Timiș is regarded as a county with large deficit in forest vegetation, reason for which afforestation works of large areas of lands unsuitable for agriculture are needed (BANU ET AL., 2013). Timiș County faces not only with a deficit in terms of forested lands, but also with severe droughts and lack of rainfall that are generating big challenges for installing forest culture especially on degraded lands (BANU ET AL., 2013).

On the altitude gradient, the existing forests are distributed from 80 m a.s.l. (Tisa Plain) up to 1.373 m a.s.l. in Poiana Ruscă mountain area. If we take into consideration the species composition, the oaks (Genus *Quercus* L.) accounts for 38.6%, followed by beech (*Fagus sylvatica* L.) with 32.1% and other hardwood and softwood species (CHIRICHEȘ, 2013).

Across Timiș County several Natura 2000 sites were designated in the last decade (Fig. 1 - right part, white and blue color polygons).



Source: http://pe-harta.ro/judete/Timis.jpg



Source: Google Earth

Figure 1. Location of Timiș County

Almost three quarters of the forests from Timiș County are managed by Timiș Forestry Directorate (TFD), a territorial branch of National Forest Administration ROMSILVA. TFD is divided into six forest districts (ro. ocoale silvice), namely Ana Lugojana, Cosava, Făget, Lugoj, Lunca Timișului and Timișoara, all of them being FSC certified for a total forest area of 76.614 hectares (RNP, 2016). Timișoara forest district manages also a pheasant reserve in Pișchia locality, that was producing high numbers of common pheasants (*Phasianus colchicus* L.) and gray partridges (*Perdix perdix* L.) (DRONCA, 2008).

The selection of the most common NWFPS was done based on the data available in the forest management plans of the six above-mentioned forests districts. In the case of the game species, the information available on the website of Ministry of Waters and Forests as regards the population size and the hunting quota (MAP, 2018) were taken into account.

In order to highlight the most important NWFPs for Timiș County, an Analytic Hierarchy Process (AHP) was performed. AHP is a multi-criteria decision analysis that was developed by Thomas L. Saaty four decades ago (SAATY, 2008). Four NWFPs categories

were used, *i.e.* Mushrooms, Understory plants, Tree products and Animal origin and for each category the most promising two NWFPs were selected. These categories were designed in the European project COST FP1203: *European Non-Wood Forest Products (NWFPS) Network.* In order to achieve the goal, the following 19 criteria were taken into account: harvesting period, portfolio of derived products, harvested quantity by one worker in 8 hours, harvesting cost, knowledge for recognition, knowledge for harvesting, tools needed for harvesting, complexity of harvesting process, distribution range, market potential, the price of raw product, the price of the derived product, transport from the harvesting point to the storage center, perishability, "celebrity" of the product on the market, market demand, biotic threats, abiotic threats and development of the process of harvesting. For each criterion a scale from 1 (lowest level) to 8 (highest level) was used. The same methodology was used also for similar studies, conducted for Ialomița (ENESCU, 2017) and Maramureș (ENESCU ET AL., 2017) counties. The analyses were done by using Expert Choice Desktop software package (v. 11.5.1683).

RESULTS AND DISCUSSIONS

The selected eight NWFPs were the following ones: penny bun (*Boletus* spp.), milk-caps (*Lactarius* spp.), linden flowers (*Tilia* spp.), European blackberry (*Rubus fruticosus* L.) common hawthorn (*Crataegus monogyna* Jacq.), St John's wort (*Hypericum perforatum* L.), European hare (*Lepus europaeus* Pallas) and grey partridge (*Perdix perdix* L.). The AHP alternative ranking is given in Table 1.

Based on the data provided by the Ministry of Waters and Forests regarding the population size of certain game species, the largest population of European hare recorded in 2017 was located in Timiș County (Fig. 2, left), accounting for 73.962 individuals (7.1% of the entire population recorded in Romania, namely 1.038.107 individuals. If we take into account the data regarding the population size at national level recorded in the last two years (ENESCU AND HĂLĂLIȘAN, 2017), we can say that the population of European hare is stable. In Timiș County there is also an important population of grey partridge, 5.272 individuals being recorded in 2017 (Fig. 2, right).

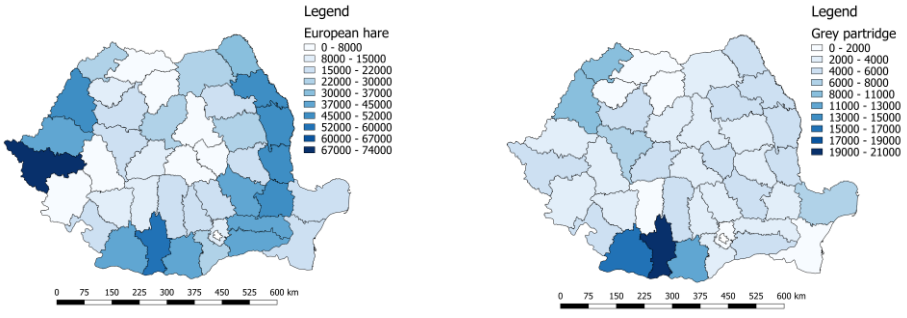


Figure 2. Population size for European hare (left) and grey partridge (right)

Table 1

AHP alternative ranking

Criterion	Boletus spp.	Lactarius spp.	Tilia spp.	Rubus fruticosus	Crataegus monogyna	Hypericum perforatum	Lepus europaeus	Perdix perdix
1	8	3	1	4	6	2	7	5
2	8	5	1	4	3	2	7	6
3	4	3	8	6	5	7	1	2
4	5	4	6	2	3	1	7	8
5	7	8	1	3	5	6	2	4
6	6	5	2	1	4	3	7	8
7	4	5	6	2	3	1	7	8
8	5	4	6	2	3	1	7	8
9	7	5	2	6	4	3	8	1
10	8	5	2	4	1	3	7	6
11	6	5	2	4	3	1	7	8
12	6	5	1	4	2	3	7	8
13	8	5	3	4	1	2	7	6
14	8	7	3	6	1	2	4	5
15	8	3	7	6	2	4	5	1
16	8	6	5	7	2	3	4	1
17	6	4	3	5	1	2	8	7
18	8	7	3	4	1	2	6	5
19	6	5	4	3	2	1	8	7

According to AHP results, the most promising non-wood forest products were the representatives of genus *Boletus* (that recorded the highest score in 8 out of 19 criteria), followed by European hare, while the less important ones were the St John's wort and the common hawthorn (Fig. 2).

By taking into consideration that several non-wood forest products could represent an important component of the gastronomic tourism (CÎRNU AND NICHIFOREL, 2014), if a forest manager of forest owner from Timiș County would like to develop a business in this field, he/she should mainly focus on NWFPs with a large portfolio of derived products, such as penny bun, European hare, grey partridge and/or milk-caps. These results should be also correlated with the normative aspects regarding the harvesting of game species. For example, according to the paragraph (4) of the Article 58 of the Forest Code (Law no. 46/2008), all the categories of the NWFPs belong to the owners, with the exception of the game species and the fish from mountainous area. In addition, in the case of the European hare, it should be also taken into account that this species is very sensitive to parasites (HORA ET AL., 2015), reason for with it received the highest score (8) for criterion no. 17 (abiotic threats).

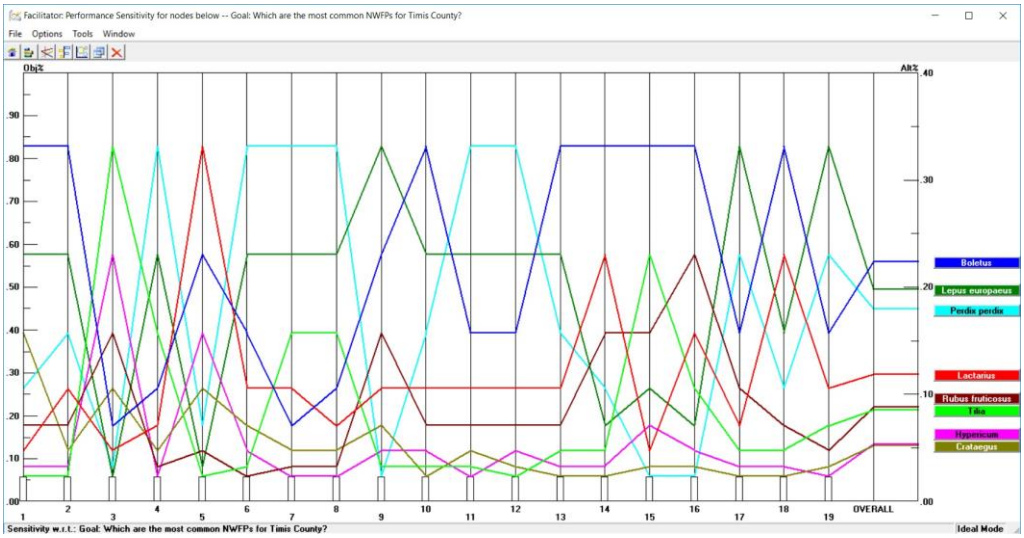


Figure 2. The ranking of the non-wood forest products

CONCLUSIONS

The diversity of the NWFPs in Timiș County is not so high, mainly due to the fact that the forests are not very well represented in comparison with other counties.

The analysis model designed for this study proved to be a good choice if one has/wants to choose a certain non-wood forest product, based on the criteria taken into account. This easy-to-use model could be replicated for other counties across Romania or for other similar research studies.

The results of this study could be also regarded as an incipient step in assessing the importance and potential of specific NWFPs at county level. In order to obtain more reliable results, more criteria should be taken into account, that will offer to the possibility to designed scenarios focused on certain targets, such as economic, sustainable development, harvesting process, etc.

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