

THE MOST IMPORTANT NWFPS FROM DAMBOVIȚA COUNTY IDENTIFIED THROUGH THE ANALYTICAL HIERARCHY PROCESS

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ABSTRACT

The present paper analyses the main non-wood forest products (NWFPs) characteristic to Dâmbovița County, by using a specialised decision-making analysis software based on the analytical hierarchy process (AHP). The work starts with a short description of Dâmbovița County and of the NWFP concept. This is followed by the method in which the analysed products were grouped, as well as their analysis and classification method based on 19 criteria. Furthermore, the analytical hierarchy process (AHP) is also well explained and

defined. A total number of eight NWFP were analysed, belonging to the following categories: mushrooms, products originating from trees, plants and animals. The results section presents the most important non-wood products from Dâmbovița County as well as the advantages and disadvantages of the analysed criteria. Based on the obtained results, the most important NWFPs from Dâmbovița County are *Cantharellus cibarius* and *Sorbus torminalis*, while the least important one is *Alium ursinum*.

INTRODUCTION

The aim of this study was to highlight the most important non-wood forest products from Dâmbovița County.

Dâmbovița County has a surface of 4.054 km² (1,7 % of the country's surface). Situated in the central-south part of Romania (figure 1), overlapping Ialomița and Dâmbovița hydrographic basins (https://ro.wikipedia.org/wiki/Judetul_Dambovita).

The county's surface occupied by forests is of 55075 ha, having the following composition: 89,67% broad-leaved (19,93% common beech, 39,82% oak, 22,43% different hardness, 7,49%

different softness) and 10,33% resinous (8,05% Norway spruce, 0,42% fir, 1,86% other resinous species) (http://www.rosilva.ro/unitati_silvice/dambovita__l_15.htm).

According to the Food and Agriculture Organization (FAO), non-wood forest products (NWFP) are biological products, other than wood, obtained from the forest, from afforested fields or from trees located outside forests. NWFPs include products used as food (fruits, seeds, plants, mushrooms, game), gum, resin, vegetal and animal plants used in cosmetic, medicinal or cultural purposes (Man and Funar, 2011).

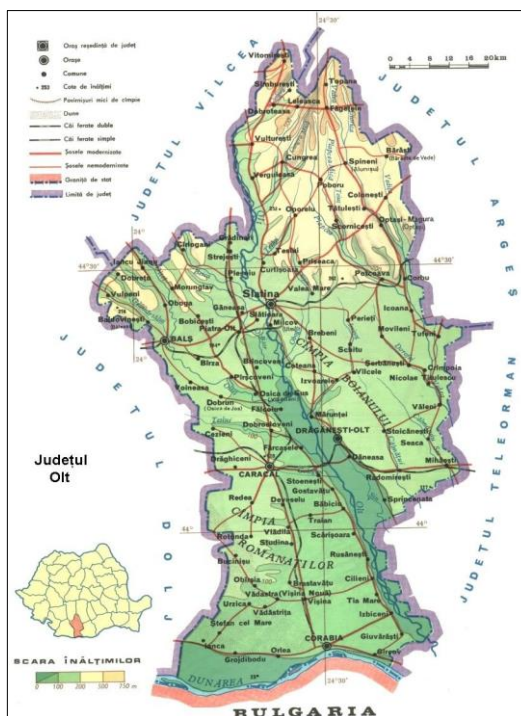


Fig. 1. Location of Dambovită County (Source: Google Maps)

MATERIAL AND METHODS

The studied NWFPs were grouped in four main categories: *Mushrooms*, *Understory plants*, *Tree products* and *Animal origin*. The most important NWFPs were then selected based on the above-mentioned data. Grouping NWFPs into these categories was done in the European project COST Action FP1203 and was also used in similar studies conducted recently for Prahova (Enescu et al., 2018), Maramures (Enescu et al., 2017), Bihor (Timiș-Gânsac et al., 2018), Timis (Enescu et al., 2018), Dambovită (Bragă and Dincă, 2019) and Dolj counties (Cântar et al., 2018).

The Expert Choice Desktop (v. 11.5.1683) software package was used for analysing the data, based on an analytical hierarchy process (AHP). This technique, developed by Saaty in 1970, is used for analysing and organising complex decisions, taking its inspiration from psychology and mathematics.

The four NWFP categories were evaluated by experts and graded from 1 to 9 based on 19 criteria. Both the criteria and the average obtained for each product can be analysed in Table number 1.

RESULTS AND DISCUSSION

The NWFPs selected for each category are the following: *Cantharellus cibarius* for *Mushrooms* category, needles and Christmas trees for *Tree products* category, *Sorbustorminalis*, *Alium ursinum* and *Hypericum perforatum* for *Understory plants* category and *Ursus arctos* and *Lutra lutra* for *Animal origin* category.

The average of the obtained graded for each NWFP mentioned above can be analysed in Table number 1.

According to the AHP results, the most important NWFPs products from Dâmbovița County are *Cantharellus cibarius* and *Sorbustorminalis*, while a smaller importance is obtained by *Lutra lutra* and *Alium ursinum* (Fig. 2).

AHP alternative ranking

Table 1

Criterion	Mushrooms	Tree products		Understory plants			Animal origin	
	<i>Cantharellus scibarius</i>	Needles	Christmas trees	<i>Sorbus torminalis</i>	<i>Allium ursinum</i>	<i>Hypericum perforatum</i>	<i>Ursus arctos</i>	<i>Lutra lutra</i>
Harvesting period	4	8	1	5	2	6	3	7
Portfolio of derived products	6	5	1	7	3	8	4	2
Harvested quantity / worker / 8 hours	5	3	4	6	7	8	1	2
Harvesting cost	3	6	5	4	1	2	8	7
Knowledge for recognition	7	3	2	8	5	4	1	6
Knowledge for harvesting	3	5	6	4	1	2	8	7
Tools needed for harvesting	3	5	6	4	2	1	8	7
Complexity of harvesting process	3	5	6	4	1	2	8	7
Distribution range	4	6	5	3	8	7	2	1
Market potential	4	3	6	7	5	8	2	1
The price of raw product	7	5	6	3	1	2	8	4
The price of the derived product	4	5	6	7	1	2	8	3
Transport (harvesting - storage center)	8	6	7	3	1	2	5	4
Perishability	8	2	1	7	5	4	6	3
“Celebrity” of the product on market	4	5	7	6	1	3	8	2
Market demand	6	8	7	5	1	4	3	2
Biotic threats	8	4	3	6	5	7	2	1
Abiotic threats	8	4	3	7	6	5	2	1
Development of harvesting process	2	4	6	5	1	3	8	7

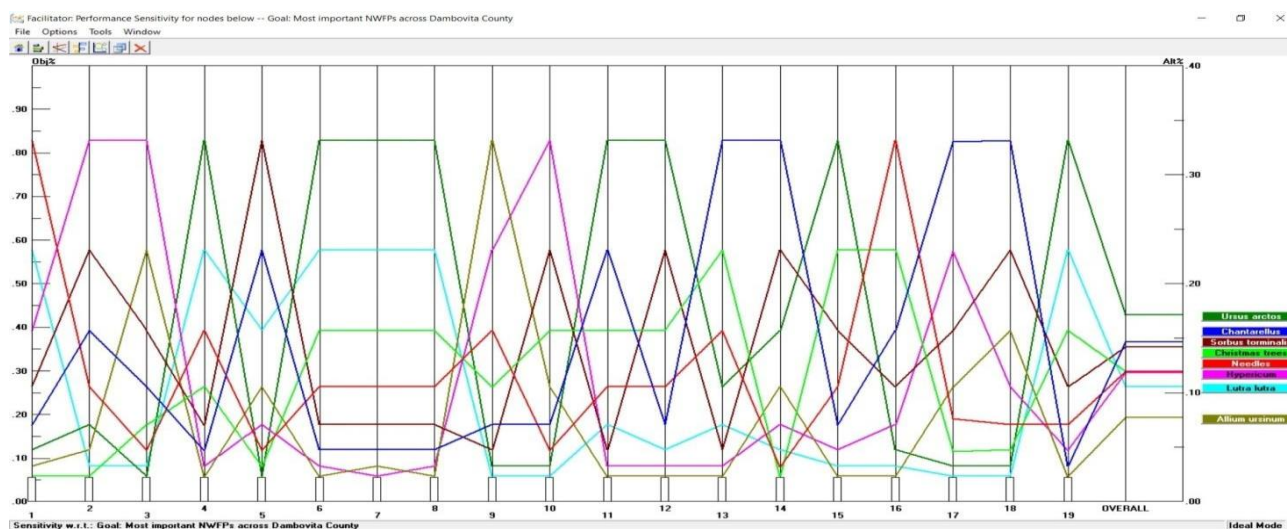


Fig. 2. Ranking of the eight NWFPs

According to the obtained classification, *Sorbustorminalis* is the second NWFP and has obtained good grades in regard with recognition knowledge, the price of derived products, perishability and abiotic threats, being an extremely appreciated tree species (Dincă, 2003).

Christmas trees, classified on the third place, have an extreme importance

CONCLUSIONS

Using AHP and Expert Choice Desktop software proved to be an easy to use method for solving complex decisional problems.

The present study brings an important contribution in regard with the general evaluation of NWFPs potential, especially in Dâmbovița County.

Taking into consideration the fact that NWFP can represent an important

in regard with their celebrity on the market, market demand and transport.

The last place is occupied by *Aliumursinum*, with a lot of minimum grades obtained for 9 out of 19 criteria. However, we consider that a good understanding and promotion of this plant and its potential in naturist medicine and cooking can propel it in the average side of the analysed NWFP classification.

economic alternative for capitalizing wood mass, they can become an important income source for forest managers and owners.

More precise results in regard with the realized analysis can be obtained by introducing other criteria and by involving specialists from connex NWFP domains and even other NWFPs that can prove to be important.

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