Quantification of Competitiveness of Yundola Training and Experimental Forest Range for different time periods

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Konstantin Kolev, Maya Tsoklinova, Galin Milchev

University of Forestry, Sofia

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The **goal** of this paper is to offer and verify practically applicable approach for complex quantitative assessment of competitiveness of timber. It is the main product providing more than 85% from the revenues of state enterprises, which are created with art. 163 from the Forest Act, for management of state forest territories in Bulgaria.

1. Definition of the Category 'Competitiveness of Product Being Offered'

For definition of timber competitiveness are used commodity and pricing approaches. Based on this and in conformity with the paper's goal the product competitiveness is estimated by means of two sub-indicators –quality and price of the main product – timber. Relative criterion for product's quality is the maximum volume of realized timber from a given forestry unit. Of course in assumption that on the local/regional market the supplied quantity of timber is sufficient to satisfy the demanded one from the respective tree species and category. Concerning the price of timber in present paper is supported the thesis that the higher price is equivalent to the higher competitiveness of the supplied timber of course in assumption that the prices of the alternative products remain unchanged.

2. Approach for Quantitative Assessment of Timber Competitiveness

The methods for assessing product competitiveness are diverse and can be conditionally systematized in two groups – objective and heuristic. The main disadvantages of most of them are lack of complexity in assessment and inability to obtain summarization that is normalized within certain limits. In present study these shortcomings are overcome by linear arrangement in two-dimensional space.

The sub-indicators for quantification of timber competitiveness substantiated above are in different units for measurement (m^3 and BGN/m^3). Their aggregation requires the quantity and the price to be transformed from named to unnamed values. For this purpose the following formula is applied:

$$z_{ij} = \frac{x_{ij} - \bar{x}_j}{\sigma_j}$$

The linear ordering of TP in regard to indicator timber competitiveness is done on the basis of point-pattern in two-dimensional space and establishment of location of the respective TP towards this point. On this basis are calculated two-dimensional indicators (quantitative assessment) normalized within boundaries from 0 to 1. For this purpose are used the standardized values of sub-indicators presented above and the coordinates of the pattern point in two-dimensional space are determined.

$$k_{ie} = \sqrt{\sum (z_{ij} - z_{ej})^2}$$

$$K_i = 1 - \frac{k_{ie}}{k_e}$$

Assessment of Competitiveness of Broadleaf Firewood Realized from Temporary Storage by Territorial Department (TP) of Southwest State Enterprise (UZDP) in 2018

Table 1. Sub-indicators for assessment of competitiveness of deciduous firewood realized from temporary storage in 2018 by TP of UZDP

TP	Price, BGN/m³	Realized firewood, m³	Standardized prices	Standardized quantities
DLS Aramlietz	40.63	5182	-1.7366	1.1398
DGS Belitza	58.14	860	-0.5813	-0.7096
DGS Belovo	64.12	3175	-0.1867	0.2810
DGS Blagoevgrad	109.97	2521	2.8384	0.0011
DGS Breznik	71.8	3233	0.3200	0.3058
DGS Cherni Vit	69.78	1346	0.1867	-0.5017
DLS Dikchan	65.33	3694	-0.1069	0.5031
DGS Dobrinishte	47.61	81	-1.2760	-1.0430
DGS Dupnitza	64.46	2507	-0.1643	-0.0049
DGS Eleshnitza	39.04	450	-1.8415	-0.8851
DGS Elin Pelin	69.22	9504	0.1498	2.9893
DGS Etropole	56.26	1152	-0.7053	-0.5847
DGS Gotze Delchev	48.96	1119	-1.1870	-0.5988
DGS Gurmen	53.91	883	-0.8604	-0.6998
DGS Ihtiman	68.04	7888	0.0719	2.2977
DLS Iskar	66.69	2752	-0.0172	0.1000
DGS Katuntzi	79.05	8046	0.7983	2.3654
DGS Kostenetz	56.28	1063	-0.7040	-0.6228
DGS Kresna	56.07	911	-0.7179	-0.6878
DGS Kustendil	56.28	1063	-0.7040	-0.6228
DGS Mesta	44.54	130	-1.4786	-1.0220
DGS Nevestino	59.04	1656	-0.5219	-0.3690
DLS Osogovo	64.81	3334	-0.1412	0.3490
DGS Petrich	64.78	813	-0.1432	-0.7298
DGS Pirdop	60.4	4417	-0.4322	0.8125
DGS Purvomay	49.28	825	-1.1659	-0.7246

Table 2. Ranking of TP of UZDP by level of competitiveness of deciduous firewood realized on temporary storage in 2018

№	TP	Assessment	№	TP	Assessment
1	DGS Katuntzi	0.8860	22	DGS Blagoevgrad	0.3387
2	DGS Elin Pelin	0.8815	23	DGS Yakoruda	0.3222
3	DGS Ihtiman	0.8167	24	DGS Petrich	0.2988
4	DGS Sofiya	0.6950	25	DGS Etropole	0.2913
5	DGS Simitli	0.6905	26	DGS Kostenetz	0.2850
6	DGS Radomir	0.5570	27	DGS Kustendil	0.2850
7	DGS Pirdop	0.5430	28	DGS Belitza	0.2785
8	DLS Dikchan	0.5164	29	DGS Kresna	0.2730
9	DGS Samokov	0.5145	30	DGS Rilski Manastir	0.2707
10	DGS Breznik	0.5018	31	DGS Gurmen	0.2607
11	DGS Sandansky	0.4898	32	DGS Trun	0.2557
12	DLS Osogovo	0.4878	33	DGS Gotze Delchev	0.2505
13	DGS Belovo	0.4733	34	DGS Purvomay	0.2321
14	DGS Slivnitza	0.4629	35	DGS Ribaritza	0.1944
15	DLS Iskar	0.4513	36	DGS Dobrinishte	0.1712
16	DLS Aramlietz	0.4265	37	DGS Mesta	0.1570
17	DGS Dupnitza	0.4252	38	DGS Strumyani	0.1455
18	DGS Zemen	0.4138	39	DGS Eleshnitza	0.1431
19	DLS Vitoshko	0.3845	40	DGS Razlog	0.1336
20	DGS Cherni Vit	0.3522	41	DGS Teteven	0.1106
21	DGS Nevestino	0.3405			

CONCLUSION

In present paper based on the commodity and pricing approaches the timber competitiveness realized by TP of UZDP Blagoevgrad is measured on the basis of two sub-indicators: quality and price of timber. Relative criterion for product's quality is the maximum volume of realized timber from a given forest range. Of course in assumption that on the local/regional market the supplied quantity of timber is sufficient to satisfy the demanded one from the respective tree species and category. Concerning the price of timber in present paper is accepted the idea that the higher price is equivalent to the higher competitiveness of the supplied timber of course in assumption that the prices of the alternative products remain unchanged. On these grounds the complex quantitative assessment of the timber competitiveness normalized within certain boundaries from 0 to 1 is achieved through transformation of both sub-indicators mentioned above into unnamed values and linear arrangement in two-dimensional space in accordance with the coordinates of pattern point. The adequacy of the proposed approach for product competitiveness assessment is confirmed by the logic in the ranking of 41 TP of UZDP Blagoevgrad by the level of competitiveness of broadleaf timber realized from temporary storage in 2018.

Thank You for Your Attention!