

UDC (UDK) 338.4:630*89*(497.11)

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NON-WOOD FOREST PRODUCTS AS GENERATOR OF DEVELOPMENT OF RURAL AREAS OF SERBIA

SUMMARY

Due to the increasing concentration of population that is existentially dependent on forest ecosystems, the issue of non-wood forest products (NWFPs) is gaining importance in the forestry policies of many countries. Excluding a range of economic, social and environmental benefits to society in general, especially emphasizes the importance of NWFPs to local communities that rely on them as the only source of income. Taking into account that the revenues from their exploitation are increasingly approaching those achieved by forest product, it is reasonable to consider the potential contribution of NWFPs development of rural areas. The main actors in the use of NWFPs are usually socially marginalized people who mostly live in poor economic conditions. The availability in nature and low cost launch open access to a large number of small entrepreneurs, which indicates that the NWFPs sector development in rural areas in the future could be one of the most important instrument for reducing poverty in these regions. This research was conducted with the purpose of gaining insight into the commercialized quantities of NWFPs in Serbia within the companies involved in their purchasing, processing and marketing, where gathered data through surveys and interviews with participants in the chain of value creation NWFPs. The applied methodology is based on dynamic analysis and statistical methods, which are defined by the movement of quantities, purchased and implemented in the past and made projections of future trends. The aim of this paper is that through continued progressive trend which has been recorded in this study, indicate the possibility of developing NWFP sector in rural areas, through the organized collection and provide support to small and micro enterprises, generating income for local people. Entrepreneurship based on the NWFPs, through industrialization and job creation, can certainly be a factor essential for the economic development of marginalized areas and rural poverty alleviation.

Key words: Non-wood forest products, rural areas, dynamic analysis, Serbia

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Paper presented at the International Conference "Role of research in sustainable development of agriculture and rural areas". May 23-26. 2012, Podgorica, Montenegro

INTRODUCTION

The forest, in addition to wood contains a wealth of useful goods and services to create commercial value, merged together as non-wood forest products (NWFPs) and the backbone of the rural economies (Fuashi et al., 2011). Although there is no universally accepted definition of NWFPs, widely accepted view is that these are all products from forests, other than wood (Ahenkan and Boon, 2011). In the last period, NWFPs exceeding the local use with growing market significance, and assuming an increasing importance of the market, particularly in the expansion of organic production. Healthy food is an important issue in the debate on rural development and poverty in most developing countries (Kajembe et al., 2000). This is particularly important for rural areas, which are traditionally the most related to the use of natural resources for personal existence. NWFPs are generally low-value products, which makes them less attractive to large entrepreneurs. Low cost of entry into the market and the availability of this product group, provides access to many businesses, especially small and limited financial entrepreneurs, suggesting that in the rural development sector NWFPs in the future could be one of the most important instrument for reducing poverty in these regions. An important characteristic of NWFPs is reflected in their often vital importance in the fight against malnutrition or starvation during the seasonal lack of nutritional support or during droughts, floods and wars.

The study included five companies for the purchase of processing and marketing of NWFPs in various, mostly rural areas of Serbia. The main aim of the research is pointing out the importance and potential of NWFPs in general for rural entrepreneurship, through the example of five companies surveyed. The purpose of this work is to be based on data collected and processed data define trends in the purchase and implementation of NWFPs and conclusions of the possibilities of entrepreneurship development in rural parts of the country on the basis of basis of these products. The research subject was the amount of purchased raw NWFPs, the amount and kind of placed the final product, the price at which to implement, distribution methods and forms of promotional activities in the surveyed companies.

MATERIAL AND METHODS

Companies which are included in the survey are located in the wider area of Kraljevo, Ivanjica Lajkovac, Pančevo and Apatin, a period that is taken into consideration is the interval of 2004-2008 year. One of his companies are focused on the production and processing of medicinal and aromatic plants, while the second part focused on honey production and finished products based on honey.

In accordance with the nature of the problem and to research, the paper applied various general and specific research methods, but the primary method of modeling takes place, while the statistical methods used as a method of trend analysis, using the regression and correlation analysis. Based on the correlation

coefficient (R), t-statistics obtained by evaluation of the parameters and the F-statistic (for evaluating the significance of the correlation coefficient) was made to verify the obtained regression model trend. For all tests of statistical significance threshold was $\alpha = 0,05$ (level of error is equal to or less than 5 percent).

The research findings are based on the regression function. The criterion for selection was a function of the parameter value and the correlation coefficient, and statistical significance. By processing data in a standard Microsoft Office package, defines the elements of the model and as a result of the trend shown by graphs, where the x-axis shows the year, and the y-axis quantity of products purchased in a given year. In this way it is possible to monitor the dynamics of trend buying and selling NWTP, or their sub-period of growth or decline.

The data were analyzed in this paper were collected through surveys, direct communication with entrepreneurs, who are engaged in purchasing, processing, and sale of NWFPs in Serbia. Survey, as well as basic research techniques, included the open and closed questions of character: general information about the company, issues related to the product (raw material procurement, production, marketing, and plan for capacity expansion and product range), the prices of final products, forms of promotional activities, channels distribution, personal view of business conditions and problems faced by the market.

Table 1. Purchased quantities of NWFPs in the raw state for five of the surveyed enterprises

ROW MATERIALS	2004.	2005.	2006.	2007.	2008.
	kg				
Ribwort plantain (<i>Plantago lanceolata</i>)	200	300	300	400	400
Nettle (<i>Urtica dioica</i>)	100	200	200	300	300
Wild apple (<i>Malus communis</i>)	200	500	500	1.000	71.000
Dog rose (<i>Rosa canina</i>)	100	100	200	200	20.300
Cornelian cherry (<i>Cornus mas</i>)	100	100	200	200	300
Juniper blue (<i>Juniperus communis</i>)	0	0	0	0	100.000
Echinacea (<i>Echinacea angustifolia</i>)	2.000	3.000	5.000	5.000	6.000
Horse chestnut (<i>Aesculus hippocastanum</i>)	0	0	0	5.000	100.000
St John's wort (<i>Hypericum perforatum</i>)	500	500	800	1.000	1.000
Alder Buckthorn (<i>Rhamnus frangula</i>)	500	500	800	1.000	1.000
Elder (<i>Sambucus nigra</i>)	0	0	0	0	500

Table 2. Final NWTPs placed on the domestic market

FINAL PORODUCTS	Unit	2004.	2005.	2006.	2007.	2008.
Plantain syrup	litre	500	500	700	1.000	1.000
Nettle syrup	litre	200	200	300	350	380
Wild apple vinegar	litre	300	300	300	400	500
Cornelian cherry and dog rose vinegar	litre	0	0	0	100	250
Dried dog rose	kg	0	0	0	0	8.000
Dog rose jam	kg	0	0	0	0	1.000
Wild apple	kg	0	0	0	0	10.000
Selected diploid parent	piece	3.000	3.500	3.600	3.900	4.000
Swarms	piece	100	100	100	100	100
Honey	kg	3.900	3.800	4.400	3.800	4.400
Propolis	kg	5	6	4	4	5
Pollen	kg	10	10	10	10	10
Jelly	kg	4	4	4	4	4
Dried extract	kg	600	800	1.500	2.000	3.000

Model building trends and their analysis are based on the amount of purchased raw product, and placed on the amount of processed products, for the period 2004-2008 year. Baseline data in the study are presented in Tables 1 and 2. The entire study is based on primary data company whose main activity is buying, processing and marketing of NWFPs.

RESULTS

1. Purchase of raw NWFPs

In the period 2004-2008 the overall level of NWFPs purchase unprocessed marked a positive trend. Analyzing the purchase of certain types of raw materials it is obvious that different dynamics is present. (Figure 1, 2).

Based on the created model of the trend for the period 2004-2008 year (Table 3, 4, Figure 1,2) can be stated as follows:

- in the case of elder, wild apple, dog rose and juniper blue was selected for the model regression polynomial function of second degree $Y = a + b x + c x^2$, while for ribwort plantain, nettle, cornelian cherry, alder buckthorn, St John's wort, Echinacea and horse chestnut selected model linear regression function $Y = a x + b$;
- based on the chart shows that for most products there are no sub-period, but that all the observed products are characterized by constant growth. In the case of juniper blue and elder the purchase is recorded only since 2008 year.

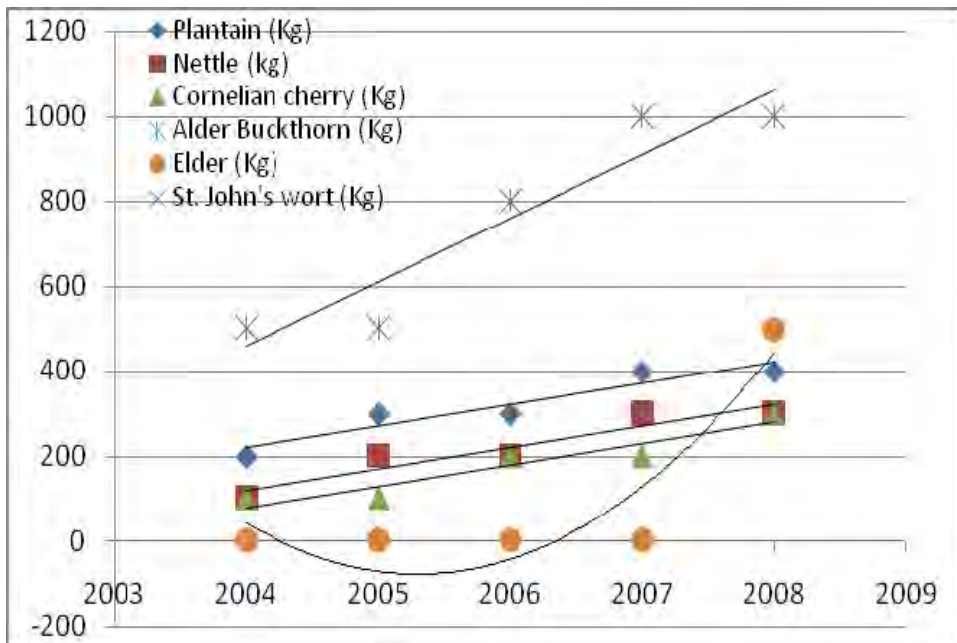


Figure 1. Trend of purchased NWFPs in the row state for the period 2004-2008.

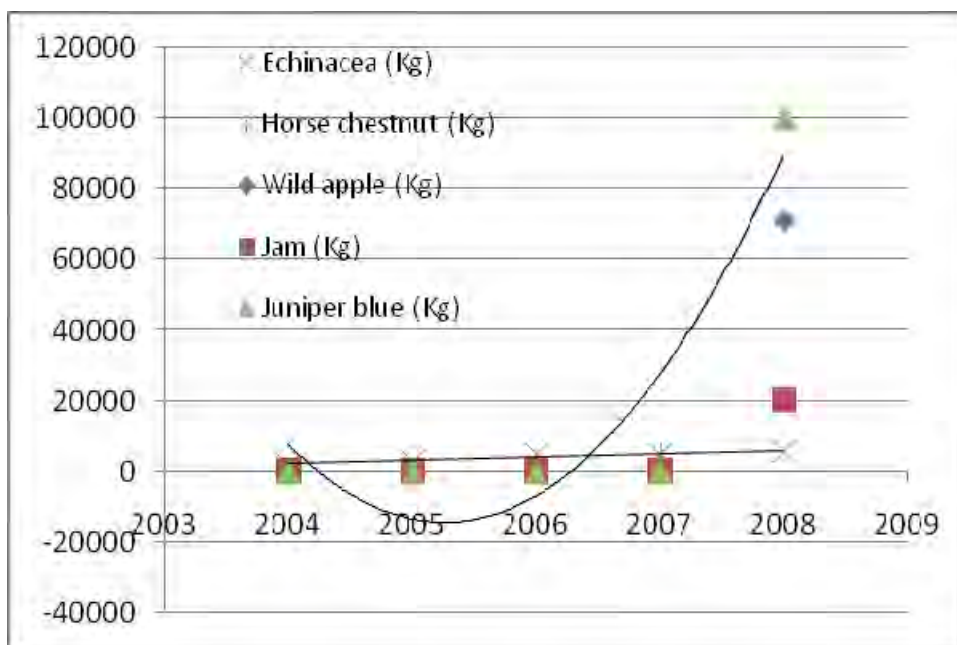


Figure 2. Trend of purchased NWFPs in the row state for the period 2004-2008.

Table 4. Basic elements of regression analysis trend of purchased NWFPs in the row state for the period from 2004-2008 year

Product	Dog rose	Wild apple	Elder	Juniper blue
a	236698014093974	2895377757135690	143615249999	574460999999370
b	-236072498142	-2887726301571	-143235714	-5729428571427
c	-236072498142	720023571	35714	1428571428
ta	2,23	2,23	2,23	2,23
tb	-2,23	-2,23	-2,23	-2,23
tc	2,23	2,23	2,23	2,23
R	0,925	0,925	0,925	0,925
F	6,00	6,00	6,00	6,00
Function	$Y=236698014093974+(-236072498142) \cdot x + (-236072498142) \cdot x^2$	$Y=2895377757135690+(-2887726301571) \cdot x + 720023571 \cdot x^2$	$Y=143615249999+(-143235714) \cdot x + 35714 \cdot x^2$	$Y=-574460999999370+(-5729428571427) \cdot x + 1428571428 \cdot x^2$
E _{sgr} (%)	113,2	124,3	354,5	460,5

With respect to the purchase of raw NWFPs, it was determined that all products recorded a positive trend of average annual growth rate (Table 3,4). With the highest growth rate are: horse chestnut (660,8 percent), juniper blue (460,5 percent) and elder (354,5 percent). Based on the F-statistics were also tested the significance of the correlation coefficient obtained, which showed that all elements are statistically significant at the significance level $\alpha = 0,05$. Correlation coefficient (R), as a measure of influence of selected independent variables on the dependent variable, it can be noticed that with all products there is a strong correlation between these two variables (Table 3, 4) and moves within the 0,7-1,0.

2. NWFPs sale in the domestic market

The product range of the surveyed enterprises are the dominant products based on honey, plantain and nettle syrup, wild apple vinegar, cornelian cherry and dog rose vinegar, dog rose jam and jelly. As with the purchase of NWFPs in raw and finished product sales had a progressive movement in the given interval of 2004-2008 year (Figure 2, 3).

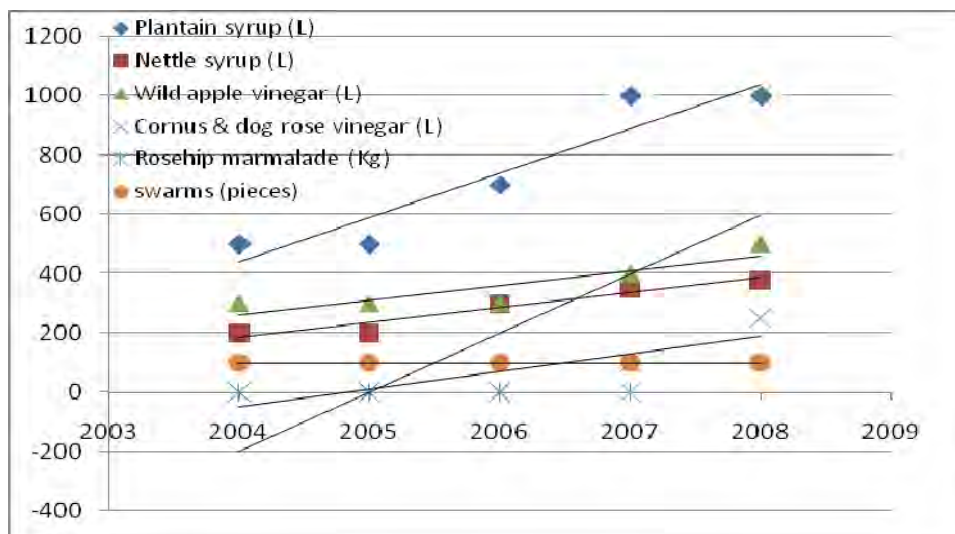


Figure 3. Trend of placements NWFPs on the domestic market for the period from 2004-2008 year

According to the defined model trend for the period 2004-2008 year (Table 5, Figure 3,4) can be stated as follows: the model is selected, a linear regression function $Y = a + b \cdot x$; looking at the chart reveals that most products are not sub-period, but that all the observed products are characterized by constant growth, with the exception of propolis, which marks the oscillations in their placement and pollen, jelly and swarms with consistent placement in the reporting period and the dog rose jam of the surveyed companies appeared in 2008 year.

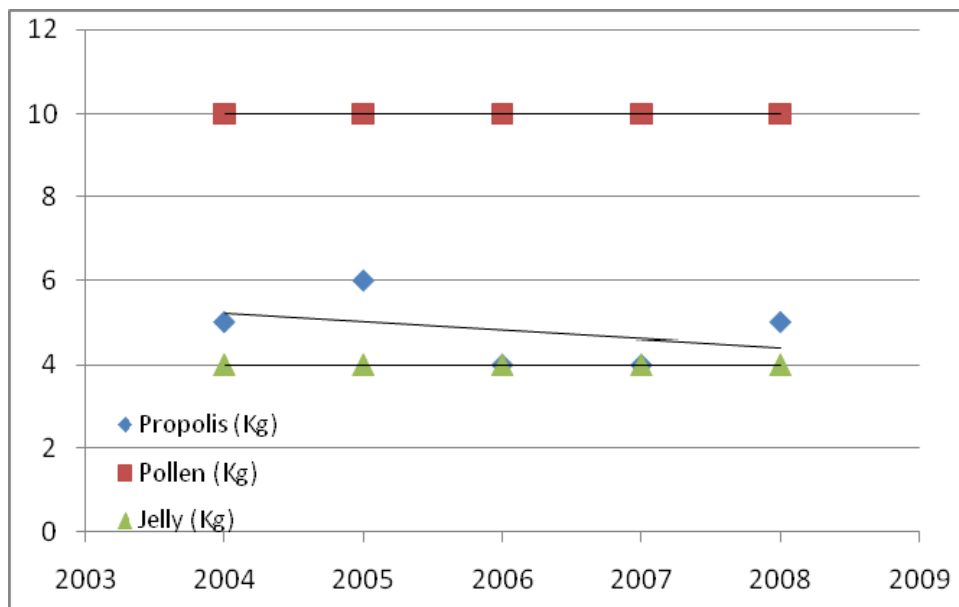


Figure 4. Trend of placements NWFPs on the domestic market for the period from 2004-2008 year

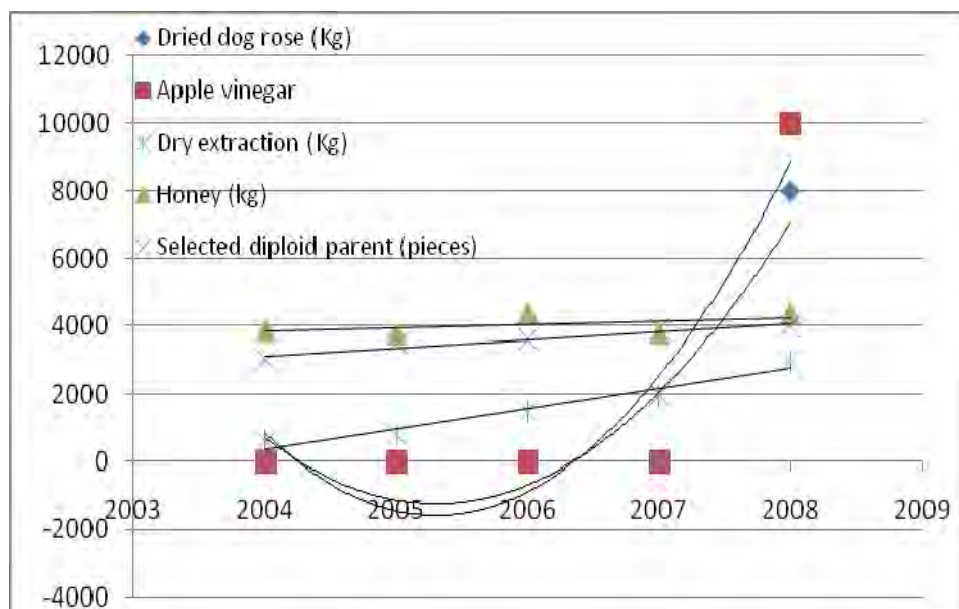


Figure 5. Trend of placements NWFPs on the domestic market for the period from 2004-2008 year

Table 5. Basic elements of regression analysis trend of placements NWFPs on the domestic market for the period from 2004-2008 year

Product	Propolis	Dog rose jam	cherry and dog rose	Wild apple vinegar	Nettle syrup	Plantain syrup
a	406	-401000	-120290	-99940	-102020	-300160
b	-0,2	200	60	50	51	150
ta		-1,73	-2,99	-3,26	-6,37	-4,98
tb		1,73	3,00	3,27	6,39	5,00
R	0,377	0,707	0,866	0,883	0,965	0,944
F	0,5	3,00	9,00	10,71	40,85	25,00
Function	$Y=406+(-0,2) \cdot x$	$Y=-401000+200 \cdot x$	$Y=-120290-60 \cdot x$	$Y=-99940+50 \cdot x$	$Y=-102020+51 \cdot x$	$Y=-300160+150 \cdot x$
Exp. seasons growth rate (%)	-4,0	414,4	432,7	13	18,4	20,7

All products have an average annual growth rate of credit growth NWFPs on the domestic market, with the exception of propolis (4 percent). The most significant average annual growth rate of cornelian cherry and dog rose vinegar (432,7 percent) and dog rose jam (414,4 percent). All the statistical elements are significant at significance level $\alpha=0,05$. For all products there is a very strong association between dependent and independent variables (Table 5) and is located within the 0,7-1,0.

Based on the created model of the trend for the period 2004-2008 year (Table 6, Figure 5) revealed the following: in the case of dried dog rose and wild apples for the model is selected polynomial function of second degree regression $Y = a + b x + c x^2$, while for dried extract, honey and selected diploid parent chosen and selected the model of linear regression function $Y = a x + b$ dried extract and selected diploid parent is poised for continued growth in loans to the domestic market, while the honey noticeable fluctuations in the amounts realized. Placement of dried dog rose and wild apple on the market by the companies interviewed only starts in 2008 year.

The placement of final products on the domestic market had a positive trend of average annual growth rates across all products. In addition, the highest growth in terms of investments in the domestic market recorded a dried dog rose (456 percent), and wild apple (368,4 percent). Testing the relevance of the obtained correlation coefficient can be observed that all statistically significant elements of the significance level $\alpha=0,05$. Based on the results (Table 6) observed a strong correlation between the dependent and independent variables (0,7-1,0) can be seen from the table that with all products there is a very strong association, with the exception of honey (0,505 percent), where the word the high correlation.

Two of the surveyed companies have adopted ISO and HACCP standards, which resulted in raising quality assurance of products and control the production process, but also that a better placement on the market. As the primary problem in the current operations of all companies said they faced difficulties collection of products and lack of funds for investment in expanding production capacity and business in general. Also highlighted is the problem in order obsolescence of machinery and heavy off-road conditions and competition, and inadequate design and marketing of products. Based on survey results, it was noted that the promotional activities of the company through various trade fairs and exhibitions, and presentations on the site present in the two companies. Also, two of the surveyed companies have used state incentives in the form of subsidizing the production of selected nuts and loans from the Development Fund of the Republic of Serbia.

Table 6. Basic elements of regression analysis trend of placements NWFPs on the domestic market for the period from 2004-2008 year

Selected diploid parent						
Parameter		<i>t</i>	<i>R</i>	<i>F</i>		
<i>a</i>	-477840	- 6,21	0,963	39,272	Y=-477840+240·x	
<i>b</i>	240	6,21			Exponential seasons growth rate (%)	6,8
Honey						
Parameter		<i>t</i>	<i>R</i>	<i>F</i>		
<i>a</i>	-196540	- 0,99	0,505	1,027	Y=-196540+100·x	
<i>b</i>	100	1,01			Exponential seasons growth rate (%)	2,4
Dried extract						
Parameter		<i>t</i>	<i>R</i>	<i>F</i>		
<i>a</i>	-1202020	- 8,00	0,977	64,285	Y=-1202020+600·x	
<i>b</i>	600	8,00			Exponential seasons growth rate (%)	41,3
Wild apple						
Parameter		<i>t</i>	<i>R</i>	<i>F</i>		
<i>a</i>	57446099999993		0,925	6,00	Y=57446099999993+ (-57294285714)·x +14285714·x ²	
<i>b</i>	-57294285714				Exponential seasons growth rate (%)	368,4
<i>c</i>	14285714					
Dried dog rose						
Parameter		<i>t</i>	<i>R</i>	<i>F</i>		
<i>a</i>	36765503999996		0,925	6,00	Y=36765503999996+ (-36668342857)·x +9142857·x ²	
<i>b</i>	-36668342857				Exponential seasons growth rate (%)	456,0

DISCUSSION

Besides economic, social and environmental benefits to society, NWFPs have an important role for local communities because in many cases are only source of income. For a population that exists conditions of poverty NWFPs activities can make a crucial part of their survival strategy. Therefore, when designing policies and other institutional interventions aimed at reducing poverty, it is necessary to make a special plan for those who base their existence on the NWFPs, compared to those who wish to contribute to these activities, its standard (Arnold and Pérez, 2001).

Although there is evidence of growing demand for these products, in Serbia there are still a number of limitations which these resources largely untapped. The lack of processing capacity of businesses greatly reduces the economic impact that could be achieved a greater degree of product finalization. The low percentage of use of existing capacities in the domain of NWFPs, as a result has inefficiencies in operations and the weak competitiveness of exports. Respondent companies as limiting factors in their operations have led difficult field conditions, outdated equipment and machinery, heavy collection of products, lack of specialized and skilled workforce, and the like. Lack of skilled labour in rural areas is a general problem (Niskanen et al., 2007).

Characteristics of non-wood forest products constitute a market attractive is that they have a different collection or harvesting season, which creates a continuous source of income for actors in their exploitation. Their intensive use, while respecting the principles of sustainability, there is a possibility of small and medium enterprises, encouraging employment and rural development. Many traditional products of the NWFPa, which were once associated with low-income people, are today considered as a natural product or as a medical specialty in the food industry, and represent a significant source of income (Meadley, 1989). A very important role NWFPs for the rural population is reflected in the assistance provided to households in these areas to tackle disasters in time, rapid economic, social and bio-physical changes in the environment in which households are in place (Shackleton and Shackleton, 2004).

The rural agricultural population is by far the poorest socio-economic category of the population in Serbia. The dominant part of the population is directly dependent on agriculture. The employment problem in rural areas is exacerbated by a chronic lack of capital to start new plants and the need of restructuring. Product diversification should be encouraged in the direction of new product lines, application of standards and increase the value of the product (packaging, processing, finishing, etc.). Producers with small production volume, such as respondents, do not make enough profit due to weak bargaining opportunities in the commercial chain, and consequently, can not make investments in increasing its export competitiveness. Due to dispose of accurate data about production and sales, and the number of people involved in the commercialization of these products, it is difficult to effectively assess the contribution of NWFPs lives of the rural population (Vantomme, 2004).

Increasingly difficult conditions for small rural households engaged in agricultural production, the transition from monofunctional to polyfunctional forestry, price decline of wood products, increased demand for healthy food and rural development policy (Burrows et al., 1998), increased the importance of non-wood forest products, as well as measures to prevent poverty and migration. Research results in the case of five companies surveyed revealed that raw purchase and sale of final products recorded a continuous growth year after year, at almost all the products individually. Due to financial limitations and lack of funds for investment in capacity and business expansion as the need arises more active support to small and micro enterprises in rural areas. This type of support should be directed through the strengthening of entrepreneurship through: active help in starting a business, practicing in the field of creating business plans, financial management and marketing knowledge (Bogdanov, 2007).

CONCLUSIONS

Based on the results of a survey of five companies surveyed is possible to formulate the following conclusions:

- purchase of NWFPS in the period 2004-2008 recorded a steady growth; average annual growth rate of cornelian cherry was 28,9 percent, Echinacea 27,0 percent, nettle 26,0 percent, alder buckthorn and St John's wort has a growth rate of 20,7 percent and ribwort plantain 16,7 percent;
- purchase of wild apple and dog rose to 2007 have had a moderate growth, while in 2008 the early redemption of these resources by one company at an aggregate level increased dramatically, so the purchase of wild apples in 2008 compared to 2007 year increased by 70 tonnes and 20,1 tonnes for the dog rose;
- horse chestnut only buying records since 2007 year and amounted to 5 tonnes, while in 2008 dramatically increased and amounted to 100 tonnes, while the juniper blue and elder begin to purchase only in the last year of observation intervals;
- as a final product, the highest annual average growth in sales was the dried extract with 41,3 percent, plantain syrup 20,7 percent, nettle syrup 18,4 percent, wild apple vinegar 13,0 percent;
- Sales of selected diploid parent had an average growth of 6,8 percent, honey 2,4 percent, only in propolis has been a drop in sales at an average of 4 percent, and jelly and pollen throughout the interval had a uniform sale;
- cornelian cherry and dog rose vinegar compared to 2007 year in 2008 has more than doubled sales, while sales of wild apples, dried dog rose and dog rose jam started in 2008 year;
- two of the surveyed companies have implemented ISO and HACCP standards, which resulted primarily a better product placement;

- as a business development limiting factors cited difficulty collection of products and lack of funds for investment in expanding production capacity and business in general;
- although there are problems of obsolescence of machinery and heavy off-road conditions and competition, and inadequate design and marketing of products;
- promotional activities of the company through various trade fairs and exhibitions, and presentations on the site present in the two companies;
- two of the surveyed companies have used state incentives in the form of subsidizing the production of selected nuts and loans from the Development Fund of the Republic of Serbia.

Starting from established research results in the case of five companies for the purchase of processing and marketing of NWFPs, and favourable external conditions, such as the expansion of organic production and demand for the products of natural origin justified the Administrative Board of observations can be done in this sector lies the possibility of development of rural entrepreneurship and therefore team and reduce rural poverty.

ACKNOWLEDGEMENT

The authors thank the communities and traders who participated in this work. Names of individuals have been changed to preserve their anonymity. We also thank two anonymous reviewers for their suggested improvements to the paper. This publication is an output from a research project funded by Ministry of Education and Science of the Republic of Serbia and Ministry for Agriculture, Trade, Forestry and Water Management (Directorate of Forests). We would like to thank projects: TR 37008, TR 31041 and “Value chain of non-wood forest products and it’s role in development of forestry sector in Serbia”.

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NEDRVNI ŠUMSKI PROIZVODI KAO GENERATOR RAZVOJA RURALNIH PODRUČJA SRBIJE

SAŽETAK

Zbog sve veće koncentracije stanovništva koja je egzistencijalno zavisna od šumskih ekosistema, tema nedravnih šumskih proizvoda (NDŠP) dobija sve značajnije mjesto u šumarskim politikama mnogih zemalja. Izuzimajući niz ekonomskih, socijalnih i ekoloških koristi za društvo uopšte, posebno se ističe značaj NDŠP za lokalne zajednice koje se oslanjaju na njih, kao jedini izvor prihoda. Uzimajući u obzir da se prihodi od njihove eksploatacije sve više približavaju onim ostvarenim od drvnih sortimenata, opravdano se razmatra potencijalni doprinos NDŠP razvoju ruralnih područja. Glavni akteri u korišćenju NDŠP su obično socijalno marginalizovani ljudi koji pretežno žive u lošim ekonomskim uslovima. Stav da NDŠP predstavljaju idealnu osnovu za generisanje prihoda ruralnog stanovništva, skoro uvijek se zasniva na pretpostavci da ovih proizvoda ima konstantno i relativno u izobilju. Dostupnost u prirodi i niski troškovi izlaska na tržište otvaraju pristup velikom broju malih preduzetnika, što ukazuje da bi razvoj sektora NDŠP u ruralnim područjima u perspektivi mogao da bude jedan od najznačajnijih instrumenata za smanjenje siromaštva u tim regijama. Ovo istraživanje je sprovedeno sa svrhom sticanja uvida u komercijalizovane količine NDŠP na teritoriji Srbije u okviru preduzeća koja se bave njihovim otkupom, preradom i plasmanom, gdje su podaci prikupljeni putem anketa i intervjua sa učesnicima u lancu stvaranja vrijednosti NDŠP. Primijenjena metodologija je zasnovana na dinamičkoj analizi i statističkim metodama putem kojih su definisana kretanja u otkupljenim i realizovanim količinama u proteklom periodu i izvršene projekcije trenda u budućnosti. Cilj ovog rada je da se kroz kontinuiran progresivan trend koji je zabilježen u ovom istraživanju, ukaže na mogućnost razvoja sektora NDŠP u ruralnim područjima, kroz organizovanje sakupljanje i pružanje podrške malim i mikro preduzećima, kao generatorima prihoda za lokalno stanovništvo. Podsticanje preduzetništva zasnovanog na NDŠP, kroz industrijalizaciju i otvaranje novih radnih mjesta, sasvim izvjesno može biti faktor od suštinskog značaja za razvoj ekonomski marginalizovanih područja i ublažavanje ruralnog siromaštva.

Ključne riječi: nedrvni šumski proizvodi, ruralna područja, dinamička analiza, Srbija