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Value Chain Analysis and Socio Economic Aspects of Non-Wood Forest Products in Central Serbia

Wertschöpfungskettenanalyse und sozio-ökonomische Aspekte von Nicht-Holz Produkten in Zentralserbien

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Keywords:	value chain analysis, non-wood forest products, socio-economy, trends, market, Serbia
Schlüsselbegriffe:	Wertschöpfungskettenanalyse, Nicht-Holz Produkte, Sozio-Ökonomie, Trends, Markt, Serbien

Summary

The value chain represents a detailed outline of the process that a product or service passes from raw materials, production and distribution to the consumer. The analysis of this process is the core of this research that examines the development opportunities of a sample of small and medium-sized enterprises (SMEs) based on the sustainable use of non-wood forest products (NWFPs) in a specific area of Central Serbia. The research focuses in particular on the dynamics of purchasing and marketing on NWFPs, both in terms of quantities and market value. The subjects of the research are:

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purchased and sold quantities in analyzed companies, as well as the prices of these products in the market. The research included 55 companies engaged in purchasing, processing and sale of NWFPs. The response rate in the research was 87.3%. In this paper, the following NWFPs are considered: mushrooms, medicinal and aromatic plants and forest fruits. All interviews, which were conducted, contained qualitative and quantitative questions and a section of socio-economic questions. The data are divided into those related to the purchase of raw materials, the sale of final NWFPs on the domestic market, and to NWFPs export. The aim of the research (in terms of the analyzed companies) were: income / outcomes, processing facilities, supply, export destination, price (purchase and sale) and distribution channels. The primary use of parametric statistics through regression analysis was to determine the average annual growth rates (AAGR) (in the purchase, sale on the domestic market and exports). The most of the SMEs in NWFPs sector of Central Serbia are situated in rural areas (app. 67.4%) and 63.5% are small and micro enterprises. All of them are privately owned. Most of the SMEs in Central Serbia are engaged in mushrooms and forest fruits business (83.3%). SMEs in NWFPs were only working at 52.5% of capacity. Regarding the quantity of NWFPs that are processed and placed on the domestic and foreign markets in Serbia, fungi were the greatest product in the period examined (1993-2014). In Central Serbia export orientation of NWFPs is higher by 2.57 times, compared to sales on the domestic market. The most common value chain is: supplier-processor-wholesaler-retailers-consumers.

Zusammenfassung

Die Wertschöpfungskette beschreibt die Abfolge von Prozessen, welche ein Service oder Produkt vom Rohmaterial über die Produktion und den Vertrieb bis hin zum Endkonsumenten durchläuft. Ziel dieses Artikels ist es, für die analysierten Betriebe in der Statistikregion Zentralserbien die Kauf- und Verkaufsdynamik sowie den Wert von Nicht-Holz Produkten (NHPs) zu ermitteln. Zweck dieser Studie ist es, die Entwicklungsmöglichkeiten einer nachhaltigen Nutzung von NHP für kleine und mittlere Betriebe (KMU) in ausgewählten Gebieten von Zentralserbien zu untersuchen. Gegenstand der Analyse sind die Einkaufs- und Verkaufsquoten sowie die erzielten Marktpreise in den Untersuchungsbetrieben. Die Studie umfasst 55 Betriebe, die sich mit dem Einkauf, der Verarbeitung oder dem Verkauf von NHPs beschäftigen. Die Rücklaufquote betrug 87,3%. Dieser Artikel betrachtet folgende NHPs: Pilze, Waldfrüchte sowie Heil- und Gewürzpflanzen. Alle durchgeführten Interviews umfassten sowohl qualitative als auch quantitative Fragen sowie einen Abschnitt zu sozio-ökonomischen Aspekten. Die erhobenen Daten werden untergliedert nach dem Einkauf von Rohmaterial, dem Verkauf von veredelten NHPs am heimischen Markt sowie dem NHP Export. Der Schwerpunkt der Studie liegt auf dem Einkommen/Betriebsergebnis, den Verarbeitungstechnolo-

gien, dem Vertrieb, den Exportländern, den Einkaufs- und Verkaufspreisen sowie den Verteilerkanälen der 55 analysierten Betriebe. Der parametrische Statistikansatz der Regressionsanalyse dient dazu, die durchschnittlichen Jahreszuwachsraten (DJZWR) im Einkauf und im Verkauf auf den heimischen Märkten und im Export von NHPs zu bestimmen. Die meisten der KMUs im NHP Sektor befinden sich in ländlichen Gebieten von Zentralserbien (ca. 67,4%) und davon sind 63,5% Klein- oder Mikrobetriebe. Alle Betriebe sind Privatunternehmen. Die meisten dieser KMUs aus Zentralserbien handeln mit Pilzen oder Waldfrüchten (83,3%). Allerdings schöpfen diese KMUs des NHP Sektors nur 52,5% ihrer Kapazität aus. Im Analysezeitraum 1993 – 2014 waren Pilze die dominanten Produkte, sowohl in Bezug auf die verarbeitete Menge als auch gemessen am Inlandsabsatz sowie am Exportvolumen. In Zentralserbien werden 2,57 Mal so viel NHPs exportiert als auf den heimischen Märkten verkauft. Dabei ist die Kette: Lieferant-Verarbeiter-Großhandel-Einzelhändler-Konsumenten vorherrschend.

1. Introduction

The constant development of forestry has led to an expansion of the traditional framework in which forestry now has the potential for creating a symbiosis with other disciplines, such as economics, sociology, ecology, and statistics. Non-wood forest products (NWFPs) (Arnold, 1995) have increased in importance through the expansion of organic production and are now an integral part of modern concepts of bioeconomy (Jordan et al., 2007; Birch and Tyfield, 2013) and sustainable development (Hopwood et al., 2005). The study finds that value chains as part of the bioeconomy (Kaplinsky, 2000; Gereffi and Fernandez-Stark, 2011), are evolving and vary depending on the actor, but display similarities such as the emphasis on economic output (Donaldson et al., 2006) and a broad, cross-sectoral focus. Various aspects of the bioeconomy have been increasingly explored (McCormick and Kautto N., 2013). One of those important for forestry, is NWFPs, because the trade of commercially important NWFPs is estimated at 11 billion US$·year-1 (Iqbal, 1993; Broad et al., 2003) in the world. The collection, and in some cases the sale, of NWFPs provides one of the most widely accessible livelihood opportunities available to poor rural people in the regions of Africa. Percentage contribution to household income of NWFPs to rural households in Africa varies between 15.0-28.4% (Shackleton and Gumbo, 2010). The value of the commercial trade in NWFPs to regional and national economies can be substantial, although general data are extremely scarce or unreliable.

A significant part of the rural labor force in Serbia (45-50% of the employed rural population) work in agriculture, while agriculture comprises more than 20% of total employment in the Republic of Serbia (Vukmirović and Smith Govoni, 2008). There are app. 6500 people employed in the forestry sector of Serbia. According to the National Pro-

gram of Rural Development, the main reasons for the high dependence on agriculture are reduced employment opportunities and low investment activity, especially in rural areas (Keča et al., 2015).

The total forest area in Serbia is 2.25 million hectares or 29% of the territory, and thus Serbia is ranked as medium wooded land. The total growing stock amounts to 363 million m³, while the annual increment is 9 million m³. NWFPs are very attractive for rural population as an additional source of income (Pepke, 2010; Keča et al., 2013). Countries of South-Eastern Europe are a very attractive area for collecting NWFPs and have a significant role in international trade (Kathe et al., 2003). The current situation in terms of reducing world poverty is a key factor in achieving the double goals of increasing the value of forest resources, by saving wood as a raw material in the forest, and improving the financial condition of the working age population (Gaulli and Hauser, 2011). The increasing global demand for mushrooms has enabled the companies from Serbia, in accordance with their capabilities, to concentrate more and more on the export of final products from mushrooms (Keča et al., 2014). Serbia is known for a rich spectrum and a wide distribution of mushrooms, the country being located in a moderate zone with rich deciduous and coniferous forests. Large number of plant species, diverse soil types and climatic conditions are appropriate for growing a range of commercially important species of mushrooms such as: *Boletus edulis, Chantherellus cibarius, Craterellus cornucopioddes, Lactarius deliciosus, Marasmius oreades, Tuber aestivum* and *Tuber magnatum*. Thousands of families are engaged in collecting NWFPs in Serbia with a total of 120,000–150,000 individuals according to some estimates. In 2007, Serbia exported a little over USD 10 million worth of fresh (chilled) forest mushrooms to the EU 25. In second place was the export of dried forest mushrooms, at about USD 8.5 million, followed by preserved forest mushrooms at USD 3.6 million (Keča et al., 2014, 2015). Forests of Central Serbia are ecosystems containing a large number of medicinal plants of outstanding properties, valued on the market and frequently used by pharmaceutical and cosmetic industries (Keča et al., 2012). Due to the variety of plant species and convenient natural characteristics, the area of Central Serbia is identified as highly suitable for the development of an NWFPs based sector and organic production (Marčeta and Keča, 2014). More intensive use of NWFPs opens a number of possibilities for development of micro, small and medium entrepreneurships, which can foster economic development in rural areas (Marshall et al., 2006; Vuletić et al., 2009) in Western Balkan. Many studies all around the world deal with the concept of NWFPs under different aspects. The bulk of studies lies in the fields of socio-economics and conservation issues and dates back to the 1990-ies (since Earth Summit in Rio de Janeiro, 1992) (Janse and Ottitsch, 2005; Marčeta and Keča, 2014). In addition, first definitions of NWFPs date from this period (Chamberlain et al., 1998).

2. Material and methods

This paper focuses on the use of value chain analysis (VCA) in buyer–supplier relationships (Dekker, 2003) in regard to NWFPs. In the management accounting literature VCA is regarded as a core analytical tool of strategic management accounting (SMA) (Shank and Govindarajan, 1993; Porter, 2008). The concept of the value chain has risen to the fore in recent years to reflect major changes in market conditions (Mitchell et al., 2009).

The VC of NWFPs in Serbia is a "supply driven chain" (Kaplinsky and Morris, 2001; Benton and Maloni, 2005) that is characterised by a horizontally based structure driven by local firms and companies (Sweeney, 2010; Keča et al., 2014) which are dependent mainly on private capital. The phrase "internal supply chain" (Bowersox et al., 2002) is used to describe work aimed at breaking down the barriers between functions within organizations. Most businesses – certainly manufacturing-based business, as NWFPs business – can be described in terms of the five key supply chain activities: buy; make; store; move; and sell. This is what is referred to as the internal (or micro or intra-firm) supply chain (Fawcett and Magnan, 2002). Every product is delivered to the final consumer (the only source of 'real' money in the chain) through a series of often-complex movements between companies, which constitute the complete value chain. In other words, the supply chain is increasingly viewed as a single process, with the various links (i.e. companies) in the chain needing to function in as seamless a manner as possible (Sweeney, 2010). To understand the implications of promoting NWFPs commercialization, it is necessary to understand who and what is involved in the production-to-consumption system (Belcher et al. 1998) or VCA. Intention of VCA is to describe the full range of activities that are required to bring a product or service from conception (Kaplinsky and Morris, 2001).

There were 149 registered and legal small and medium sized enterprises (SMEs) dealing with NWFPs in Serbia in 2014 (Ministry of Agriculture and Environmental Protection, Internal document, 2014). The majority of them (63) are situated in the statistical region of Central Serbia. A statistically valid, representative sample of 55 enterprises, of which 15 were medium sized enterprises, was selected from Central Serbia (Commission Recommendation 2003/361/EC, 2003, Ayyagari et al., 2007). The remaining 40 enterprises were small or micro sized enterprises (staff of 10 to 50). All of the companies are privately owned. The primary criteria for inclusion of enterprises were: 1. SMEs according to Law on Accounting and Auditing of Republic of Serbia (2010), database of Business Registers Agency, 2. more than 10 permanent workers, 3. average annual placement of over 100 t of NWFPs and placement on domestic and/or foreign markets, 4. they are engaged in buying, processing and selling/placement of NWFPs. The response rate was 87,3%; in that way the research has the census research (Pinsonneault and Kraemer, 1993; Bryman and Bell, 2011). In this paper the following NWFPs are considered: mushrooms, medicinal and aromatic plants and forest fruits. The interviews were structured to address standard questions and prior to each interview, the interviewees (owners or general managers of SMEs) were given a full explanation of the

purpose of the questioning (Gachter, 2004, Dul and Hak 2008). Face to face interviews were conducted with the leading companies in the field; in other cases, questionnaires (57 questions) were mailed (open- and close-ended questions). All interviews, which were conducted, contained qualitative and quantitative questions and a part of socio-economic questions (Kothari, 2004). The data are divided into those related to the purchase of raw materials, the sale of final NWFPs on the domestic market, and to NWFPs export. The questionnaire used in the survey-included questions on quantities purchased and placed NWFPs, as well as price of these products and distribution channels.

The aim of the study was to analyze VCs and business relations among the companies engaged in purchasing, processing, and selling NWFPs in Central Serbia (refers to territory of Serbia without of Vojvodina and Kosovo and Metohija). The objectives of the research (in terms of the analyzed companies) were: income / outcomes, processing facilities, supply, export destination, price (purchase and sale) and distribution channels. Parametric statistics in terms of regression analysis was used to determine the average annual growth rates (AAGR) as regards purchase, sale on the domestic market and exports (Altman et al., 2005). Analyses of the results, including t-tests, F-tests, correlations and regression models, were carried out using SPSS 12 (SPSS Inc., Chicago, Illinois). The primary method used is modeling, followed with the statistical methods including trend, regression and correlation analysis. To verify the obtained regression models trend correlation coefficient (R), t – statistics derived estimates of parameters and F – statistics (to assess the significance of the correlation coefficient) were used. For all tests statistical significance was $\alpha = 0.05$.

3. Results and discussion

In the aftermath of the global financial crisis of 2008–2009, there has been an increased interest in the role of small and medium enterprises in job creation and economic growth in the world (Ardic et al., 2011). SMEs in Central Serbia are characrerised by heterogeneous structure with underused capacities and lack of financial support, as well as insufficient information of owners of SMEs in funding possibilities and expansion into new markets (Keča and Bogojević, 2013). The most of the SMEs in NWFPs sector of Central Serbia are situated in rural areas (app. 67,4%) and 63,5% are small and micro enterprises. All of them are privately owned. The majority of the workers are seasonal workers so that the number of engaged labor force varies according to seasons. The NWFPs were found in forest ecosystems and meadows, harvested seasonally, and all of them are wild (Keča et al., 2013). Average number of the workers are 97 workers/year/forest area of Central Serbia in NWFPs sector. The most of them are male, average age of 38. The numbers of pickers in Serbia varies with season, but it is estimated by authors that approximately 1 000 to 3 000 people are involved (Keča et al., 2013). The most of SMEs are engaged in mushrooms and forest fruits business (83.3%) in Central Serbia. External factors negatively influencing business were unfair competition,

undeveloped market and lack of favorable loans and subsidies. The majority of the SMEs in Central Serbia (77%) trade in the domestic and international market and the factors that affect negatively on their businesses are: unfair competition among entrepreneurs in supplying the raw NWFPs, taking the technology innovation, poorly developed markets and the lack of favorable loans and subsidies. Development of NWFPs, therefore, has potential in developing countries, when labor is cheap and in ample supply (Iqbal, 1993). However, SMEs in NWFPs were only working at 52.5% of capacity in Central Serbia, which is insufficient compared to the potential.

Regarding the quantity of NWFPs that are processed and placed on the domestic and foreign markets in Serbia (Fig. 1) fungi were the greatest product in the period examined (1993-2014). Fluctuations in annual processed volumes and placements are evident regarding other products, which are affected by several factors including (un)favorable natural factors, and political and economic conditions in the country. In addition, The NWFPs trade in Central Serbia is characterized by fluctuations in supplies. Secondary processing and finalization of the product are relatively higher in larger companies that are mostly export-oriented, while smaller companies are reduced to primary processing, largely due to the lack of adequate equipment (Keča et al., 2015), as well as unfair competition that prevails in the market (79.1% of respondents). In addition, external negative influencing factors are undeveloped market and sometimes-unfavorable climate conditions (17.3% of respondents).
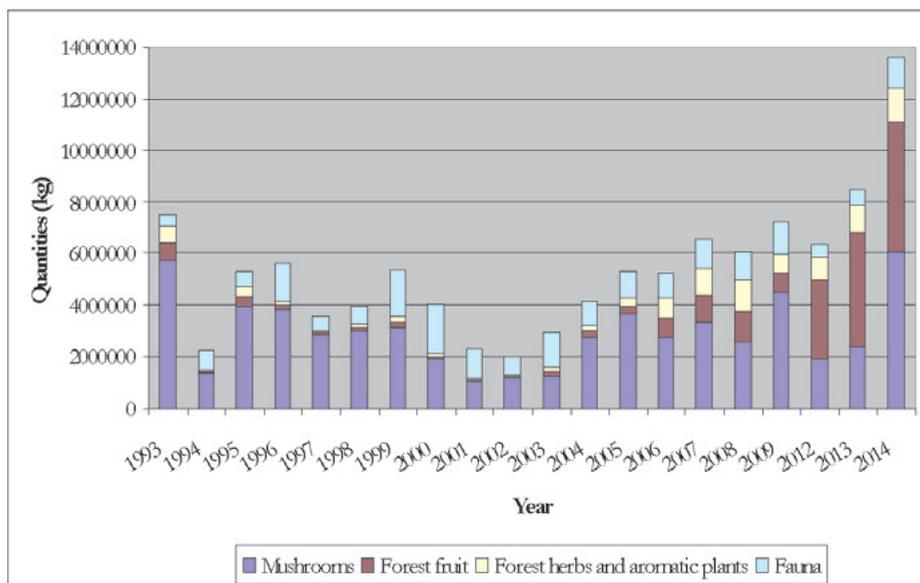

Figure 1: The quantities of processed and placed NWFPs in the market in the period (1993-2014).
Abbildung 1: Mengen verarbeiteter und am Markt abgesetzter NHP in der Periode 1993-2014.

The quantities of purchased raw NWFPs in Central Serbia at 284 purchase stations are unified and based on the total level expressed through a linear trend with strong correlations, significant parameters, and an AAGR of -10.6% (see Table 1). Products covered by the purchase are: herbs, forest berries, honey and mushrooms.
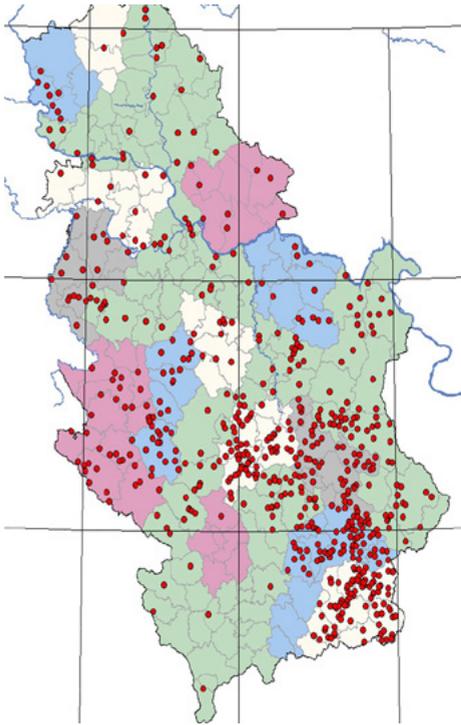
Map 1: The main purchase stations of NWFPs in Serbia

Karte 1: Die hauptsächlichen Einkaufsstationen für NHP in Serbien

It is important to mention that mushroom pickers in Serbia sell products to the "purchase stations", which are usually located near the SME's (92.5%) (Map 1) (Keča et al., 2013) or directly sell the products to the firms, which organised several truck collecting lines and immediately pay in cash for product (Keča and Marčeta, 2014). The results show that overall across Central Serbia a picker can pick 20-50 kg of different NWFPs, 43.1 kg berries and 21.5 kg mushrooms per ha.

Table 1: Elements of regression analysis of purchase of NWFPs

Tabelle 1: Elemente der Regressionsanalyse für den Einkauf von NHP

Parameter		t	R	F		
a	525399,77	3,00	0,748	8,944	Y= -260,15x + 525400	
b	-260,15	-2,99			AAGR (%)	-10,6

Placement of NWFPs (in tons) on the domestic market also exhibited a negative trend, with an AAGR of -16.0%, and a linear trend, with strong correlation (see Tab 2).

Table 2: Elements of regression analysis of placement of NWFPs

Tabelle 2: Elemente der Regressionsanalyse für den Verkauf von NHP

Parameter		t	R	F		
a	136121,55	3,94	0,829	15,475	Y= -67,509x + 136122	
b	-67,50	-3,93			AAGR (%)	-16,0

Export of NWFPs (in tons) was also negative, with AAGR of -14.1%, a linear trend, strong correlations and significant parameters (see Table 3). Comparing to other parts of Serbia, it can be concluded that the highest growth rates of mushrooms are: for dry Boletus in Belgrade statistical region and dry Chanterelles in Šumadija and Western Serbia (Keča et al., 2014).

Table 3: Elements of regression analysis of export of NWFPs

Tabelle 3: Elemente der Regressionsanalyse für den Export von NHP

Parameter		t	R	F		
a	513828,68	3,475	0,794	11,980	Y= -254,7x + 513829	
b	-254,69	-3,461			AAGR (%)	-14,1

In summary, the AAGRs decreased for purchases, placements and export of NWFPs from Central Serbia (Fig. 2). Conversely, some products demonstrated a very high market potential (in purchase: Pleurotus osteatus, Cornus mas; in placement on domestic market: Forest honey, Forest fruits, Rosae pseudofructus; in export: vinegar of Malus communis, Rubus ideaus). However, some new NWFPs are also being identified and commercially developed. On the other hand, it is necessary to strengthen strategy of the products such as: Rubus ideaus, Cahtharellus cibarius, Rosae pseudofructus (in purchase), Boletus edulis, Cantharellus cibarius, Rubus ideaus (in placement), dry, brined and frozen Boletus edulis, fresh Cantharellus cibarius (in export).
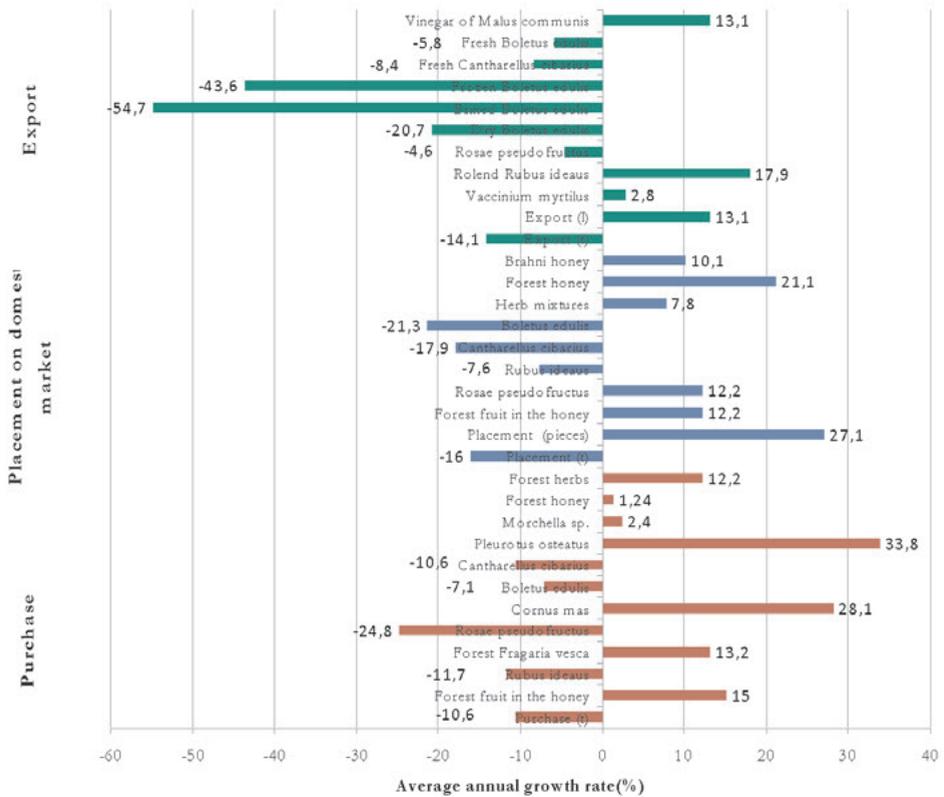

Figure 2: AAGR in purchase, placement and export of NWFPs from Central Serbia

Abbildung 2: DJZR von Einkauf, Verkauf und Export von NHP aus Zentralserbien

This study analysed products, companies, and structural elements of VCAs (Fig. 3), using a production-to-consumption system approach (Belcher and Schreckenberg, 2007), which was focused on the range of activities and transfers involved in the production, transport, distribution and promotion of particular commodities.
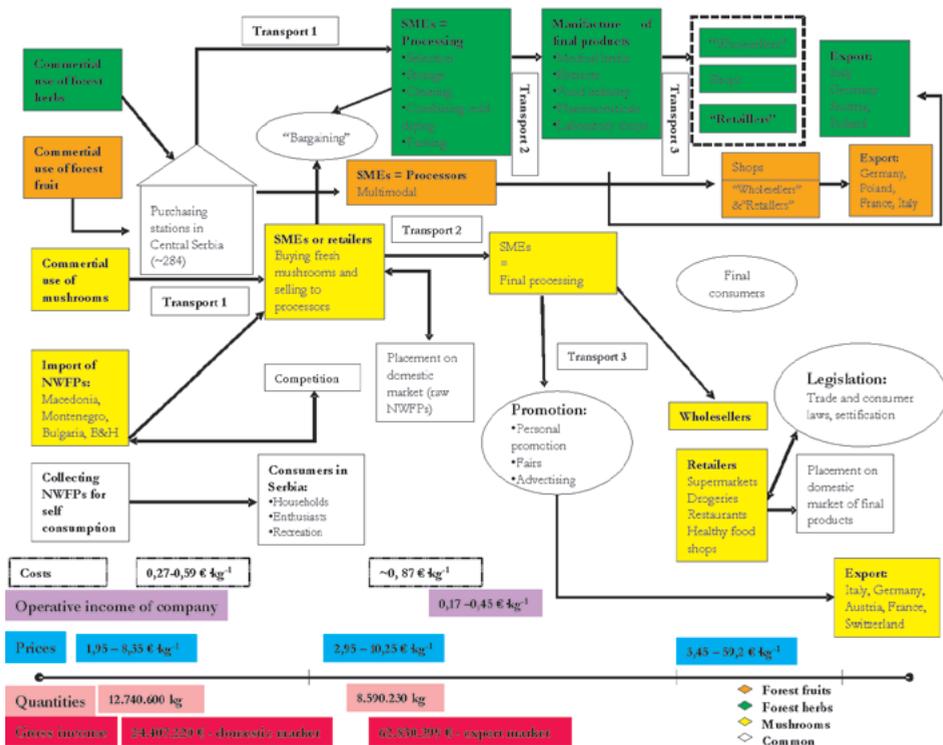

Figure 3: Value chain of NWFPs from Central Serbia

Abbildung 3: Wertschöpfungskette von NHP aus Zentralserbien

The value chain for the analyzed group of products (Fig. 3) (mushrooms, forest fruits, forest herbs) was broken down into individual activities, such as collection, processing, storage, transport, marketing, etc. It can be observed that some amounts of raw NWFPs are imported from neighboring countries (FYR of Macedonia, B&H, Montenegro, Croatia, Bulgaria, etc.). In addition, an amount of approximately 15% of berries and mushrooms are collected for self-consumption in Central Serbia. It has been observed very often, especially in Southern and Eastern Serbia, a number of pickers who collected amount of NWFPs placed by the so-called "local dumping prices" and thus present a problem to pickers with permission. Implementation of Act about control of using and trade of wild flora and fauna in Serbia (Official Gazette of Republic of Serbia 09/10, 2010) protect and maintain wild fund of flora and fauna, including NWFPs. Permits and quotas are determined by the number of collected NWFPs last year and production needs of producers or entrepreneurs (issued by the Institute for Nature Protection) (Keča et al., 2013). It can be observed that the different processing activities are represented dependent of the group of the product. For forest herbs, the most significant phases are, so called secondary processing: selection, storage, cleaning, combining cold drying, and packing. In mushrooms processing dependent on final products the phases are: freezing, brining, drying, packing, etc. Final products are placed in the most cases (92.7%) through wholesalers and just 7.3% by retailers (supermarkets, drug stores, healthy food shops, restaurants, etc.). Dependent on the product, export destinations are: Germany, Italy, Austria, France, Switzerland, Poland, Western Balkan countries.

Gross income from placement on domestic market of final NWFPs is app. 24.4 mil. € and by exports approximate income is of 62.8 mil. €. It can be concluded that in Central Serbia export orientation of NWFPs is higher by 2.57 times compared to sales on the domestic market.

Prices of raw NWFPs are 0.27-0.59 €/kg, final products placed on domestic market are in a range 2.95-10.25 €/kg, and export products prices are in a range 3.45-59.20 €/kg. Top five products that have achieved the highest revenue in the domestic market are: Forest raspberry jam, sweet and jam, blueberries, and bee and honey products. Products that have earned the most revenue sales on foreign markets from the Central Serbia are: chanterelles, herbs, boletus, jam, marmalade and sweet and dry boletus.

Price is variable depending on the balance of supply and demand through the year, but also on: the purchase prices of NWFPs, costs of raw materials, followed by the cost of cleaning, processing, packaging and transportation of products, as well as the costs of promotion and the time of year when NTWPs are harvested (Keča et al., 2015). According to the database of the Institute for Nature Conservation was established price list of wild flora, fauna and fungi that can be collected each year. The highest fluctuations are present in mushrooms and the lowest in wild fruit in 2015. The most expensive raw materials are: *Tuber magnatum, Gentiana sp., Vaccinium sp.*, while the cheapest are: *Craterelluss cornucopioides, Betula pendula* and *Crategus sp*. Almost all enterprises in-

dicated that the price at which they sold was decided on a "cost plus" (Duvemo et al., 2014) basis.

The most common channel is the supplier-processor-wholesaler-retailers-consumers, particularly in the case of mushrooms and honey products in Central Serbia (Fig. 3), where it is obvious 3 types of transport (Purchase station -> Processors -> Wholesalers). Approximately 68.5% of the interviewed entrepreneurs had their own transport to facilitate rapid distribution to final consumers. For successful business in the NWFPs it is crucial that enterprises have quality physical distribution (stock management, warehousing, transport, and stock control) (Lambert et al., 1998).

This "system" of VCA of NWFPs is sensitive to numerous factors such as the nature and characteristics of a product, the markets into which they are sold, demand and supply factors (Barnes, 2002; Keča et al., 2013), risks and uncertainties, and how to cope with the possibility of over harvesting.

Wood processing industry of Serbia is export oriented and it is continually recording profit from export of app. 502 mil. €, comparing to NWFPs business of 62.8 mil. € in Central Serbia. There is app. 2 170 SMEs mostly privately owned in wood processing industry and furniture, and in NWFPs sector 146.

Table 4: Enterprises and employees in the forestry sector of Serbia

Tabelle 4: Unternehmen und Beschäftigte im Forst- und Holzsektor in Serbien

Active enterprises	Number of enterprises	Number of employees
Forestry	121	5 331
Wood processing and wood products	1 508	8 653
Furniture	662	13 226
NWFPs SMEs	146	n.a.

Source: Chamber of commerce of Republic of Serbia (2015)

Contribution of export of wood processing industry to Serbian economy is 5.7% and NWFPs is 0.7%. In future, it should use Serbian favourable geographical position and good transport communication with surrounding markets to promote and market NWFPs with higher degree of finalization. Tradition in the production of NWFPS and

good quality-price relationships for products are also the strengths of products from Central Serbia.

The paper has examined the role of entrepreneurship in NWFPs commercialisation through the lens of value chains in Serbia. As such, VCA is a way of understanding markets and marketing of commodities (Kaplinsky and Morris, 2001). This analysis of NWFPs commercialisation has shown that entrepreneurship and promotion strategies (Porter, 2008) are important for the development of innovative marketing schemes.

4. Conclusions

All of the analysed processing companies in Central Serbia are privately owned. On average they used their production capacities only at a level of app. 52.5%. The main products in Central Serbia are fungi and forest fruit in purchase. In placement on domestic market these are honey and forest fruit and in export forest fruit and final products of them. Linear regression model of trend of growth of final production on domestic and foreign market shows negative average annual growth, with high correlation coefficients. The export markets are mainly countries of the EU. There is a broad range of trade-related instruments that impact on the trade in NWFPs. Trade liberalization appears to benefit NWFPs-export, as well as some sort of certification and labeling schemes. Also the suggestions are: providing a guaranteed minimum price to producers, improving social and working conditions of producers and the provision of financial incentives to all the actors in the value chain related to NWFPs.

Almost all enterprises benefit a pricing strategy using the "cost plus" method and purchase and placement prices in markets vary, dependent on supply and demand during the year and climate conditions. Gross income from placement on domestic market of final NWFPs is app. 24.4 mil. € and by exports approximate income is of 62. 8 mil. €. from Central Serbia. In the future, it is necessary to increase the level of finalization of products, improve the efficiency of organizational activities, working on financial subsidies of state to SMEs in this sector and simplify licensing procedures for business in NWFPs. These results can be used as a basis for further research on VCA of SMEs and possibilities of improvement of entrepreneurship in NWFPs sector. In the future, serious attention should be paid to ensure a stable supply base, while planning development of NWFPs in Central Serbia.

Acknowledgements

References

Altman, E. I., Brady, B., Resti, A., Sironi, A., 2005. The link between default and recovery rates: Theory, empirical evidence, and implications. Journal of Business-Chicago, 78(6), 2203.

Ardic, O. P., Mylenko, N., Saltane, V., 2011. Small and medium enterprises: A cross-country analysis with a new data set. World Bank Policy Research Working Paper Series, Vol. 2011, 32.

Arnold, J. E. M., 1995. Socio-economic benefits and issues in non-wood forest products use. Non-Wood Forest Products FAO, Rome, 89-123.

Ayyagari, M., Beck, T., & Demirguc-Kunt, A. 2007. Small and medium enterprises across the globe. Small Business Economics, 29(4), 415-434.

Barnes, S. J., 2002. The mobile commerce value chain: analysis and future developments. International journal of information management, 22(2), 91-108.

Belcher, B., 1998. A Production-to-consumption systems approach: Lessons from the bamboo and rattan sectors in Asia. In Wollenberg, E., Ingles, A. (eds) Incomes from the Forest: Methods for the development and conservation of forest products for local communities. Bogor, CIFOR and IUCN, 57-84.

Belcher, B., Schreckenberg, K., 2007. Commercialisation of non-timber forest products: A reality check. Development Policy Review, 25(3), 355-377.

Benton, W. C., Maloni, M., 2005. The influence of power driven buyer/seller relationships on supply chain satisfaction. Journal of Operations Management,23(1), 1-22.

Birch, K., Tyfield, D. 2013. Theorizing the Bioeconomy Biovalue, Biocapital, Bioeconomics or... What?. Science, Technology & Human Values, 38(3), 299-327.

Bowersox, D. J., Closs, D. J., Cooper, M. B., 2002. Supply chain logistics management, Vol. 2. New York, NY: McGraw-Hill.

Broad, S., Mulliken, T., Roe, D., 2003. The nature and extent of legal and illegal trade in wildlife. The trade in wildlife: regulation for conservation, 3-22.

Bryman, A., Bell, E. 2011. Bussiness reseach Methods, 3rd Editions, Oxford University Press Inc., New York (172-269).

Chamberlain, J.L., Bush, R.J., Hammett, A.L., 1998. Non-timber forest products - the other forest products, Forest Products Journal 48(10), 10-19.

Dekker, H. C., 2003. Value chain analysis in interfirm relationships: a field study. Management accounting research, 14(1), 1-23.

Donaldson, K. M., Ishii, K., Sheppard, S. D., 2006. Customer value chain analysis. Research in Engineering Design, 16(4), 174-183.

Dul, J., Hak, T. 2008. Case Study Methodology in Business Research. Butterworth-Heinemann, Oxford, UK. 302 pp.

Duvemo, K., Lämås, T., Eriksson, L. O., & Wikström, P., 2014. Introducing cost-plus-loss analysis into a hierarchical forestry planning environment. Annals of Operations Research, 219(1), 415-431.

Fawcett, S. E., Magnan, G. M., 2002. The Rhetoric and Reality of Supply Chain Integration, International Journal of Physical Distribution & Logistics Management, Vol. 32,

No. 5, 339-61.

Gächter, S., Herrmann, B., Thöni, C., 2004. Trust, voluntary cooperation, and socio-economic background: survey and experimental evidence. Journal of Economic Behavior & Organization, 55(4), 505-531.

Gauli, K., Hauser, M., 2011. Commercial management of non-timber forest products in Nepal's community forest users groups: who benefits?. International Forestry Review 13 (2), 35-45.

Gereffi, G., Fernandez-Stark, K., 2011. Global value chain analysis: a primer. Center on Globalization, Governance & Competitiveness (CGGC), Duke University, North Carolina, USA.

Hopwood, B., Mellor, M., O'Brien, G., 2005. Sustainable development: mapping different approaches. Sustainable development, 13(1), 38-52.

Iqbal, M., 1993. International Trade in Non-wood Forest Products: An Overview. FAO Miscellaneous Documents 95/11. FAO, Rome.

Janse, G., Ottitsch A., 2005. Factors influencing the role of Non-wood Forest Products and Services. Forest Policy and Economics 7(3), 309-319.

Jordan, N., Boody, G., Broussard, W., Glover, J. D., Keeney, D., McCown, B. H., Pansing, C., 2007. Sustainable development of the agricultural bio-economy. Science-New York then Washington, 316(5831), 1570.

Kaplinsky, R., 2000. Globalisation and unequalisation: What can be learned from value chain analysis?. Journal of development studies, 37(2), 117-146.

Kaplinsky, R., Morris, M., 2001. A handbook for value chain analysis. Report prepared for IDRC. 113 pp.

Kathe, W., Honnef, S., Heym, A., (2003). Medicinal and aromatic plants in Albania, Bosnia-Herzegovina, Bulgaria, Croatia and Romania: A study of the collection of and trade in medicinal and aromatic plants (MAPs), relevant legislation and the potential of MAP use for financing nature conservation and protected areas, Bundesamt für Naturschutz (BfN), by WWF - Germany and TRAFFIC Europe - Germany, Bonn, 29-229.

Keča, Lj., Bogojević M., 2013. Komercijalizacija i marketing nedrvnih šumskih proizvoda na području centralne Srbije, Glasnik Šumarskog fakulteta 107, Univerzitet u Beogradu - Šumarski fakultet, Beograd, 101-126.

Keča, Lj., Keča, N., Marčeta, M., 2015. Non-wood forest products, Socio-economic and ecological aspects, University of Belgrade, Faculty of Forestry. (262).

Keča, Lj., Keča, N., Rekola, M., 2013: Value chains of Serbian non-wood forest products, International Forestry Review 15(3), 315-335.

Keča. Lj., Marčeta. M., Keča. N., 2014. Value chain analysis of forest mushrooms in Serbia, Proceedings of II International Congress "Food Technology, Quality and Safety", Novi Sad, 236-241.

Kothari, C. R., 2004. Research methodology: Methods and techniques. New Age International (401).

Lambert, D. M., Cooper, M. C., Pagh, J. D., 1998. Supply chain management: implementation issues and research opportunities. The international journal of logistics management, 9(2), 1-20.

Marčeta, M., Keča Lj., 2014. Value chain of important commercial species of non-wood forest products within the statistical region of Vojvodina, Proceedings of II International Congress "Food Technology, Quality & Safety", Novi Sad, 230-236.

Marčeta, M., Keča, Lj., 2014. Analysis of Sale of Non-Wood Forest Products from Northern Serbia on the Domestic and Foreign Markets, Baltic Forestry, 20(1), 115-130.

Marshall, E., Schreckenberg, K., Newton, A. C., 2006. Commercialization of non-timber forest products: factors influencing success: lessons learned from Mexico and Bolivia and policy implications for decision-makers. Cambridge, UNEP World Conservation Monitoring Centre, (140).

McCormick, K., Kautto, N., 2013. The bioeconomy in Europe: An overview. Sustainability 5(6), 2589-2608.

Mitchell, J., Keane, J., Coles, C., 2009. Trading up: How a value chain approach can benefit the rural poor. Overseas development institute (ODI), (94).

Pepke, E. 2010. Forest Products Annual Market Review 2009-2010, Geneva Timber and Forest Study Paper 25, UNECE/FAO, ECE/TIM/SP/25. (188).

Pinsonneault, A., Kraemer, K., 1993. Survey research methodology in management information systems: an assessment. Journal of management information systems, 10(2), 75-105.

Porter, M., 2008. On competition. Harvard Bussiness School Publishing Corporation. (544).

Shackleton, S., Gumbo, D., 2010. Contribution of non-wood forest products to livelihoods and poverty alleviation. EN Chidumayo and DJ Gumbo, ed., 63-92.

Shank, J.K., Govindarajan, V., 1993. Strategic Cost Management. The Free Press, New York. (272).

Sweeney, E., 2010. Supply Chain Change Management: an Internal and B2B Relationship Perspective. Supply Chain Perspectives, the Journal of the National Institute for Transport and Logistics, Vol. 11, Issue 1, 18-21.

Vukmirović, D., Smith Govoni, R., 2008: Studija o životnom standardu: Srbija 2002-2007. Republički zavod za statistiku Srbije (287).

Vuletić, D., Krajter, S., Mrazek, M., Ćorić, A., 2009. Non Wood Forest Products and Services – Are we using them enough? Journal of Forestry Society of Croatia, 133 (3-4), 175-184.

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