

# BOOK OF PROCEEDINGS



*XIV International Scientific Agriculture Symposium  
"Agrosym 2023"  
Jahorina, October 05-08, 2023*



# **BOOK OF PROCEEDINGS**

**XIV International Scientific Agriculture Symposium  
“AGROSYM 2023”**



**Jahorina, October 05 - 08, 2023**

## Impressum

XIV International Scientific Agriculture Symposium „AGROSYM 2023“

### Book of Proceedings Published by

University of East Sarajevo, Faculty of Agriculture, Republic of Srpska, Bosnia  
University of Belgrade, Faculty of Agriculture, Serbia  
Mediterranean Agronomic Institute of Bari (CIHEAM - IAMB) Italy

International Society of Environment and Rural Development, Japan  
Balkan Environmental Association (B.EN.A), Greece  
Centre for Development Research, University of Natural Resources and Life Sciences  
(BOKU), Austria  
Perm State Agro-Technological University, Russia  
Voronezh State Agricultural University named after Peter The Great, Russia  
Tokyo University of Agriculture  
Shinshu University, Japan  
Faculty of Agriculture, University of Western Macedonia, Greece  
Enterprise Europe Network (EEN)  
Faculty of Agriculture, University of Akdeniz - Antalya, Turkey  
Selçuk University, Turkey

University of Agronomic Sciences and Veterinary Medicine of Bucharest, Romania  
Slovak University of Agriculture in Nitra, Slovakia  
Ukrainian Institute for Plant Variety Examination, Kyiv, Ukraine  
National University of Life and Environmental Sciences of Ukraine, Kyiv, Ukraine  
Valahia University of Targoviste, Romania  
National Scientific Center „Institute of Agriculture of NAAS“, Kyiv, Ukraine  
Saint Petersburg State Forest Technical University, Russia  
University of Valencia, Spain  
Faculty of Agriculture, Cairo University, Egypt  
Tarbiat Modares University, Iran  
Chapingo Autonomous University, Mexico

Department of Agricultural, Food and Environmental Sciences, University of Perugia, Italy  
Higher Institute of Agronomy, Chott Mariem-Sousse, Tunisia  
Watershed Management Society of Iran  
Institute of Animal Science- Kostinbrod, Bulgaria  
SEASN- South Eastern Advisory Service Network, Croatia  
Faculty of Economics Brcko, University of East Sarajevo, Bosnia and Herzegovina  
Biotechnical Faculty, University of Montenegro, Montenegro  
Institute of Field and Vegetable Crops, Serbia  
Institute of Lowland Forestry and Environment, Serbia  
Institute for Science Application in Agriculture, Serbia  
Agricultural Institute of Republic of Srpska - Banja Luka, Bosnia and Herzegovina  
Maize Research Institute “Zemun Polje”, Serbia  
Faculty of Agriculture, University of Novi Sad, Serbia  
Institute for Animal Science, Ss. Cyril and Methodius University in Skopje, Macedonia  
Academy of Engineering Sciences of Serbia, Serbia  
Balkan Scientific Association of Agricultural Economics, Serbia  
Institute of Agricultural Economics, Serbia

## **Editor in Chief**

Dusan Kovacevic

## **Technical editors**

Sinisa Berjan  
Milan Jugovic  
Rosanna Quagliariello

## **Website:**

<http://agrosym.ues.rs.ba>

CIP - Каталогизacija u publikaciji  
Nародна и универзитетска библиотека  
Републике Српске, Бања Лука

631(082)(0.034.2)

INTERNATIONAL Scientific Agriculture Symposium "AGROSYM"  
(14 ; 2023 ; Jahorina)

Book of Proceedings [Електронски извор] / XIV International  
Scientific Agriculture Symposium "AGROSYM 2023", Jahorina,  
October 05 - 08, 2023 ; [editor in chief Dusan Kovacevic]. - Onlajn  
izd. - El. zbornik. - East Sarajevo : Faculty of Agriculture, 2023. -  
Ilustr.

Sistemski zahtjevi: Nisu navedeni. - Način pristupa (URL):  
[https://agrosym.ues.rs.ba/article/showpdf/BOOK\\_OF\\_PROCEEDINGS\\_2023\\_FINAL.pdf](https://agrosym.ues.rs.ba/article/showpdf/BOOK_OF_PROCEEDINGS_2023_FINAL.pdf). - El. publikacija u PDF formatu opsega  
1377 str. - Nasl. sa naslovnog ekrana. - Opis izvora dana 15.12.2023.  
- Bibliografija uz svaki rad. - Registar.

ISBN 978-99976-816-1-4

COBISS.RS-ID 139524097

## **DEMOGRAPHIC OF EMPLOYEES IN PUBLIC FOREST ENTERPRISES AS FACTOR FOR IMPROVEMENT OF FOREST PRODUCT AND SERVICES**

Zoran PODUŠKA \*, Snežana STAJIĆ, Branka PAVLOVIĆ, Vlado ČOKEŠA

Institute of Forestry, Belgrade, Serbia

\*Corresponding author: [zoran.poduska@forest.org.rs](mailto:zoran.poduska@forest.org.rs)

### **Abstract**

Public forest enterprises are required to meet public needs for forest products and services. Some forest products and services must be provided free of charge to society as a whole. From a business perspective, the problem is how to motivate employees to improve products and services when some are provided free of charge. Improvement of product and services is a part of entrepreneurial process known as opportunity recognition and relies inter alia on demographic characteristics. We used attitude approach to describe employees' ability to recognize business opportunity based on demographic characteristics. The improvement of forest products and services results from the proper identification of business opportunities. This research begins with research question whether the demographic characteristics of employees in public forestry enterprises have an impact on improving forest products and services. We conducted a survey to collect employees' attitudes from 4 public forest enterprises in Serbia. The results show that male have more positive entrepreneurial attitudes compared to women. Women give more importance to services such as extension service in private forestry than their male counterparts. Younger employees show more positive entrepreneurial attitudes than older ones. Employees with shorter work experience show more positive entrepreneurial attitudes compared to employees with longer work experience. Positive entrepreneurial attitudes are an important momentum for improving forest products and services. Some of products and services did not recognize as business opportunity.

Keywords: Entrepreneurship, Public Forest Enterprise, Innovations, Diversification.

### **Introduction**

In this paper, we analyzed how demographic characteristics of employees in public forest enterprises (PFE) differentiate the possibility for improving forest products and services. Improvement of forest product and services is a specific entrepreneurial process that takes place through business opportunity recognition (Covin, Slevin, 1991; Morris, Sexton, 1996; Shane, Venkataraman, 2000). Business opportunity recognition is a positive entrepreneurial trait of employees that has implications for offering new and improving existing products and services. In general, offering new and improving existing products and services is considered as a result of employees' ability to recognize business opportunity. This entrepreneurial process consists of identification, discovery, evaluation and exploitation of business opportunity and employees who have ability to identify, discover, evaluate and exploit such business opportunity (Shane, Venkataraman, 2000). However, in large and especially public enterprises (PE), the development of new and improvement of existing products and services is considered unstable. Instability occurs due to two forms in the development of business activities. The first is experimenting with new ideas, and the second is using new ideas and turning them into business opportunities, and finally into new or improved products and services (March, 1991).

A fundamental challenge from the entrepreneurial aspect in large companies is managing the conflict between the new and the old (Dess *et al.*, 2003). With PE, given that the state is the

owner, the situation is even more complex because it is the state administration that fully or partially performs the role of entrepreneur (Paunović, 2007). To analyze the possibility for improving products and services in PFE, it is necessary to take into account that the business activities of PE are usually fulfill the public needs (Robinett, 2006). For some of the business activities and related products and services, the private sector has no economically justified reasons to perform them. Sikorski (1993) indicates that "...even though we use public enterprises every day, we are taught to underestimate their importance and value". There are many reasons for such understandings. In Serbia, PE are characterized by "...low efficiency and high costs compared to the quality of services..." (Veselinović, 2014). This situation is not only characteristic for PE in Serbia. It was noted that the efficiency of the PE is not important for the state as the founder (Veselinović, 2014). Although it seems paradoxical, such views are proved by the Armen Alchain's theory of "property rights". Sikorski (1993), quoting Alchain, indicates that the founder of the PE has no motive to develop the company's activities, because there is no possibility to sell a share of his ownership rights. This is especially important for PFE that are engaged in activities of public interest, where it is difficult or impossible to transfer ownership to another owner. Such attitudes rise up questions such as: how and who should discover new business opportunities and how to create new and improve existing products and services (Shane, Venkataraman, 2000).

Following this finding, we started with research question: whether the demographic characteristics of employees in PFE have an impact on improving forest products and services. Improving forest product and service here is understood as ability to recognize business opportunity through introduction of new or improvement of existing product and services. Therefore, it is necessary to analyze the demographic characteristics of PFE employees as a factor in the business opportunity recognition process. As demographic characteristics, the authors use: gender, age, work experience (Hornsby *et al.*, 2002; Autio, 2005; Minniti *et al.*, 2006; Hisrich *et al.*, 2011). Ability to recognize business opportunities is most pronounced for people aged 25 to 45 (Hisrich *et al.*, 2011), and according to global research, this range is somewhat narrower and relates to the age between 24 and 35 years of age. After the age of 35, entrepreneurial motivation and potential decline rapidly (Minniti *et al.*, 2006). Work experience have a negative impact on the readiness to recognize business opportunities. Research results about gender and opportunity recognition indicate that men and women have different approaches and use their specific characteristics to generate new ideas as a part of process of improving product and services (Filser *et al.* 2023). Greater proportions of women in the company creates more favorable conditions for the development of new products and services, but women less often decide to participate in new businesses (Aldrich, Cliff, 2003). In a process of business opportunity recognition, it is noticed that employees hold different beliefs about the value of resources that they manage (Shane, Venkataraman, 2000) what could be important in research of PFE.

### **Materials and methods**

In this research we used demographic approach which assumes that employees' behavior is influenced by demographic characteristics (Robinett, 2006). The survey method was chosen for data collection. The data were collected using the structured questionnaire named Forestry Intrapreneurship Innovativeness Instrument (FIII) (Poduska *et al.*, 2020). The questionnaire consists of 10 groups of questions: 1) demographics (4 items); 2) ability for business opportunity recognition (14 items); 3) professional training (6 items); 4) business environment (8 items); 5) flow of information (7 items); 6) entrepreneurial attitudes and motives (5 items); 7) managerial support (10 items); 8) work autonomy (7 items); 9) rewards system (7 items); 10) work time availability (3 items). For the purposes of this research, we

analyzed respondents' attitudes on two groups of questions: demographics with 4 items (gender, age, work experience and work experience on current position) and attitudes on ability to recognize business opportunity with 14 items representing existing product and services from portfolio of PFE and some new ones. Direct interviews included 137 employees from PFE enterprises in Serbia. The description of the sample is given in the table 1. The survey was conducted from July 2014<sup>th</sup> to October 2015<sup>th</sup>. The time required to fill out the questionnaire was an average of 40 minutes, which was assessed as satisfactory, and in this regard, it was concluded that the questionnaire was of appropriate scope.

Table 5. Description of sample.

	N		Mean	Median	Mode	Std. Deviation	Min.	Max.
	Valid	Missing						
Gender	135	2	/	/	/	/	/	/
Age	135	2	44,39	44,00	40	8,445	26	64
Work experience	135	2	16,53	15,00	15	9,062	1	38
Work experience on current position	132	5	9,58	8,00	3	7,215	1	30

source: Authors calculation based on questionnaire survey results

Employees' attitudes were tested by the *Mann-Whitney U* test to compare differences between groups of employees based on variable - demographic characteristics. The following criteria were selected for classifying respondents into independent groups. For the variable "Gender", the division was made into two groups - men and women. For the variable "Age", the division was made by median of the sample (44), into younger (<44 years) and older (>44 years). For the variable "Work experience", the division was made by median of the sample (15), into respondents with more (>15 years) and less (<15 years) work experience. For the variable "Work experience on current position", the division was made by the median of the sample (8), into respondents with more (>8 years) and less (<8 years) work experience in the current position.

### Results and discussion

The results are presented for demographic variables: gender, age, work experiences and work experiences on current position and variable ability to recognize business opportunity. Tests of differences between groups of employees were interpreted and analyzed in text.

The ratio of men to women in the sample is 74% to 26%. This ratio indicates that there are more men in the selected sample, which is expected considering that there are more men than women in the population of employees in PFE. The youngest respondent is 26 years old, and the oldest is 64. The most frequent age of respondents in the sample is 40 years old (7,4%). The distribution of respondents according to the work experience reveals that the shortest work experience is 1 year, and the longest is 38 years. The most frequent work experience is 15 years (8,9%).

Distribution of employees by work experience on current position reveals that the most frequent is three years of experience in the current position.

Business opportunity recognition is analyzed based on employees' attitudes toward improvement of product and services in PFE. The mean value for 14 potential business opportunities are presented in figure 1.

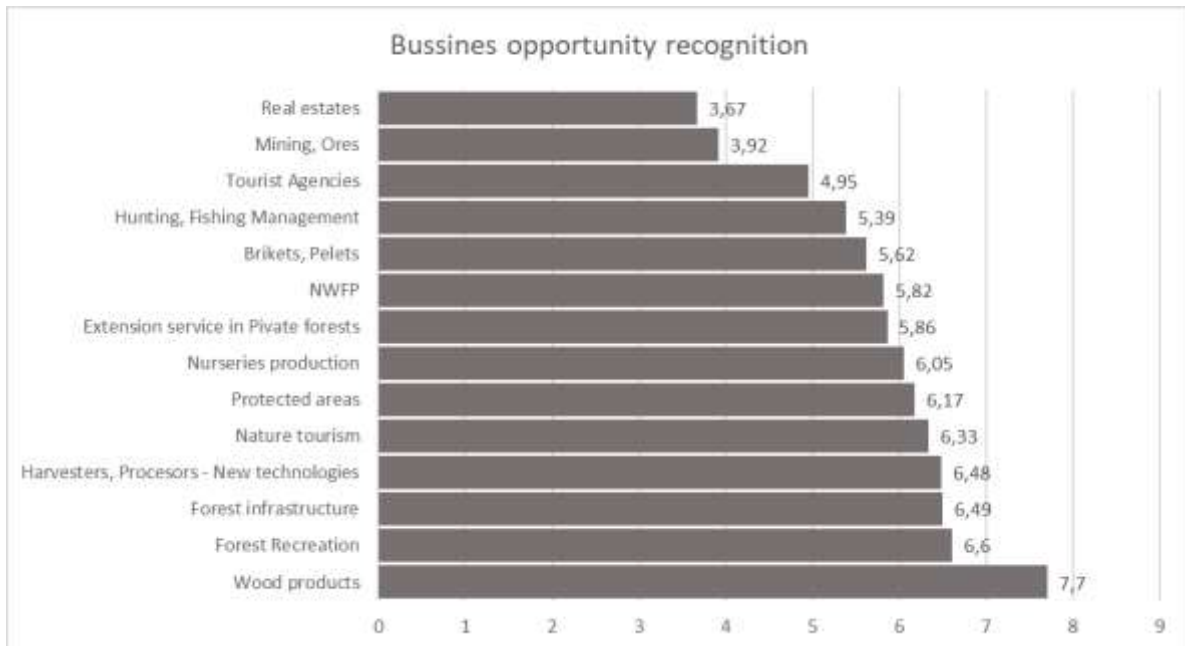


Figure 1. Employees' attitudes on possibility to improve product and services

Results indicate that wood production is the activity recognized as highly ranked (7,7 out of 10) business opportunity. This is expected because it is the main business in PFE. Top five best ranking bussines activity are: forest recreation (6,6), then bussines activities with forest infrastructure (6,49), introduction of new technologies (6,48) and tourism in nature (6,33). This indicate that diversivication of bussines activities need to be in focus on other than wood products. For improvement of forest recreation and tourim in nature should be take into account climate and meteorological factors (Poduška *et al.*, 2014). Management of protected areas is business activity dependent from government subsidies while offering variety of ecosystem services (Poduška *et al.*, 2013). Impelmentation of new technologies is forest sector is highly ranked (6,48) and it is closely conencted with need for inovation in forestry companies (Poduška *et al.*, 2011). Business with pelets and briquets are not highly ranked in spite of variety in potential areas for establishing forest plantations for satisfaction of energy needs (Spasojević, et al., 2019). According to the mean value less that 5,5 the next bussines are not recognised as opportunities for improving product and services: hunting and fishing management (5,39), tourist agencies (4,95), mining and ores (3,92), business with real estates (3,67).

Differences between the groups of employees was tested by Mann-Whitney U test based on attitudes of 4 groups: gender, age, work experience and work experience on current position. The statistically significant differences<sup>2</sup> between male and female was found for extension services in private forests ( $Z=-2,303$ ) with value of median (Md) for men 5,0 and for women 7,0. Differences about business opportunities between men and women indicate that women are more oriented towards service activities like extension service in private forests, which is fully in line with previous research, that women tend towards service activities, and men towards production (Hisrich *et al.*, 2011).

The statistically significant differences between the groups based on age are found for non-wood forest product ( $Z=-2,454$ ; Md for younger employees is 6,0 and Md for older is 5,0), tourist agency ( $Z=-2,652$ ; Md for younger is 5,0 and Md for older is 4,5); extension service in private forests ( $Z=-2,487$ ; Md for younger old is 6,0; Md for older old is 5,0), recreation in nature ( $Z=-2,188$ ; Md for younger is 7,0 and Md for older is 6,0), nursery production

<sup>2</sup> \* $p<0,05$

( $Z=-2,459$ ; Md for younger is 7,0 and Md for older is 5,0); forest infrastructure ( $Z=-2,327$ ; Md for younger is 7,0 and Md for older is 6,0).

The statistically significant differences between the groups based on work experiences (WE) are found for NWFP ( $Z=-2,075$ ; Md value for less WE is 7,0 and Md for more WE is 5,0), hunting and fishing ( $Z=-2,319$ ; Md for less WE is 6,0 and Md for more WE is 4,0), tourist agency ( $Z=-2,953$ ; Md for less WE is 5,0 and Md for more WE is 4,0), recreation in nature ( $Z=-2,473$ ; Md for less WE is 8,0 and Md for more WE is 6,0), nursery production ( $Z=-2,330$ ; Md for less WE is 7,0 and Md for more WE is 5,0).

The statistically significant differences between the groups based on work experiences on current position (WECP) are found for NWFP ( $Z=-2,284$ ; Md value for less WECP is 7,0 and Md value for more WECP is 5,0) and for forest recreation ( $Z=-2,140$  Md value for less WECP is 8,0 and Md value for more WECP is 6,0).

Values of median less than 5,5 indicate that employees did not recognize business opportunity as possibility for improvement forest product and services. Possible reasons for opposed attitudes regarding NWFP could be found in high impact from climate factors (Ranković, *et al.*, 2016; Ranković *et al.*, 2017). The similar attitudes associated with median less than 5,5 older employees and employees with more work experience give to NWFP, tourist agencies, extension service to private forest owners, nursery production. Declining entrepreneurial potential with age can be interpreted as a lack of persistence among employees. Persistence is one of the key characteristics for employee entrepreneurship (Hisrich *et al.*, 2011). Some of business did not recognize as business opportunity because of possible conflicting activity in management in protected areas (Poduška *et al.*, 2018).

### **Conclusion**

Improvement of products and services derived from employees' ability to recognize business opportunity is crucial moment in PFE when public needs should be fulfilled even in situation when consumers and end users do not need to pay for it directly. In our research we found that demographic characteristic can be factor to differentiate employees with positive entrepreneurial attitudes like ability to identify and recognize business opportunity. According to the results of this research we can recommend to management of PFE to use younger teams during the project of improvement business with NWFP, extension service for private forest owners, forest recreation and tourism, nursery production. Women give greater importance to services and should be a core part in business like extension services in private forests. In addition, it was pointed out the activities that cannot improve the business of the company. All of the above indicates that the correct choice of business activities is important for improvement of forest product and services in portfolio of PFE.

### **Acknowledgement**

This research was realized by support of Ministry of science, technological development and innovations of Republic of Serbia. Contract N<sup>o</sup> 451-03-47/2023-01/ 200027.

### **References**

- Aldrich, H. E., Cliff, J. E. (2003). The pervasive effects of family on entrepreneurship: toward a family embeddedness perspective. *Journal of Business Venturing*, 18(5), 573-596.
- Autio, E. (2005). *Global Entrepreneurship Monitor*. London Business School & Babson College.

- Covin, J. G., Slevin, D. P. (1991). A Conceptual Model of Entrepreneurship as Firm Behavior. *Entrepreneurship Theory and Practice*(Fall), 7-25.
- Filser, M., Tiberius, V., Kraus, S., Zeitlhofer, T., Kailer, N., Müller, A. (2023). Opportunity Recognition: Conversational Foundations and Pathways Ahead. *Entrepreneurship Research Journal*, 13, 1, pp. 1-30. <https://doi.org/10.1515/erj-2020-0124>.
- Hisrich, D. R., Peters, P. M., Sheperd, D. A. (2011). *Poduzetništvo*. Zagreb: Mate.
- Hornsby, J. S., Kuratko, D. F., Zahra, S. A. (2002). Middle managers' perception of the internal environment for corporate entrepreneurship: Assessing a measurement scale. *Journal of Business Venturing*, 17, 253-273.
- March G., J., (1991). Exploration and exploitation in organizational learning. *Organization Science*, 2 (1), 71-87.
- Minniti, M., Bygrave, W. D., Autio, E. (2006). *Global Entrepreneurship Monitor: Executive Report 2005*. Global Entrepreneurship Monitor.
- Morris, M. H., Sexton, D. L. (1996). The concept of entrepreneurial intensity: Implications for company performance. *Journal of Business Research*, 36(1), 5-13.
- Paunović, B. (2007). *Ekonomika preduzeća: preduzeće, okruženje i ulaganja*. [Business economics: business, environment and investments] Beograd: Centar za izdavačku delatnost Ekonomskog fakulteta.
- Poduška, Z., Bilibajkić, S., Gagić-Serdar R, R., Češljarić, G., Đorđević, I., Stefanović, T. (2011). Impact of innovativeness on new technology implementation in forestry companies. *Sustainable Forestry: Collection*, 63-64, 161-170.
- Poduška, Z., Čokeša, V., Živanović, I. (2018). Attitudes of employees about conflicts in the forestry sector. *Sustainable Forestry: Collection*, 77-78, 123-133. doi:<https://doi.org/10.5937/SustFor1877123P>
- Poduška, Z., Đorđević, I., Bilibajkić, S., Gagić Serdar, R., Češljarić, G., Stefanović, T. (2013). Possibilities for improvement of the management of protected natural areas. *Sustainable Forestry: Collection*, 67-68, 175-186.
- Poduška, Z., Keča, L., Ranković, N. (2014). Influence of selected factors on number of visitors in national park "Đerdap". *Agriculture and Forestry, University of Montenegro, Agricultural Faculty*, 60(3), 123-136.
- Ranković, N., Nedeljković, J., Poduška, Z., Nonić, D. (2016). Determination of collected porcini and chanterelle quantities depending on different climate change scenarios. *Glasnik Šumarskog fakulteta*, 113. [doi: 10.2298/GSF1613077R](https://doi.org/10.2298/GSF1613077R).
- Ranković, N., Poduška, Z., Nonić, D., Nedeljković, J., Stanišić, M. (2017). Determination of collected quantities of wild strawberry, blueberry and juniper in Serbia in relation to different scenarios of climate change. *Glasnik šumarskog fakulteta*, 116, 189-213. doi:[10.2298/GSF1716189R](https://doi.org/10.2298/GSF1716189R).
- Robnett, D. (2006). *Held by the Visible Hand: The Challenge of SOE Corporate Governance for Emerging Markets*. Corporate Governance Department, World Bank, Washington, DC.
- Shane, S., Venkataraman, S. (2000). The promise of entrepreneurship as a field of research. *Academy of Management Review*, 25(1), 217– 226.
- Sikorski, D. (1993). A General Critique of the Theory on Public Enterprise: Part I. *International Journal of Public Sector Management*, 6(2), 17-40.
- Spasojević, B., Čokeša, V., Jović, Đ., Živanović, I., Jovanović, F. (2019). Selection of potential areas for establishing forest plantations for satisfaction of energy needs – the case of Lazarevac municipality. *Sustainable Forestry - Collection*, 79-80. <https://doi.org/10.5937/SustFor1979079S>
- Veselinović, P. (2014). Reforma javnog sektora kao ključna determinanta uspešnosti tranzicije privrede Republike Srbije. [Public sector reform as a key determinant of the

success of the transition of the economy of the Republic of Serbia] *Ekonomski horizonti*, 16(2), 137-155.