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What affects the choice of forestry profession by Ukrainian students?

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Abstract

Currently, Ukraine is outlining a problem with the recruitment of students to the Faculty of Forestry. The solution to this problem is possible only if the necessity of transformation of the forestry industry and the corresponding transformation of the forestry education system are realised. Based on the study of scientific literature, the main motivating factors, according to which future students decide to become foresters, were identified. These factors were included in a questionnaire offered to first-year forestry students. The results of the questionnaire were compared with the data from the scientific articles. As a result, some aspects to pay attention to in order to increase the attractiveness of forestry as a field of study were identified. It was found that the predominant motivating factors for choosing a forestry profession are enjoyment of nature, recreation in nature, spending time in the fresh air, concern for the environment and interest in forests. Salary of forestry specialists proved to be the strongest factor for hesitation in choosing the profession. The next step of our research will probably be to investigate the opinion of Ukrainian students about the quality of educational programmes.

Key words

first-year students, hesitation factors, motivating factors, transformation of forestry

Introduction

Forests have traditionally been considered a key resource that provides livelihoods for people. According to Zeide (2001), the initial goal of forestry was to provide a stable harvest that would ensure sustainable environment. Today, society's requirements for the forestry sector have changed significantly. Forests are receiving increasing attention as carbon stocks and climate change mitigating factors (de Jong et al. 2021), and forestry are regaining importance in the context of the benefits of natural ecosystems (Jazbec et al. 2019).

Bruce Hull (2011) notes that the political and economic power of traditional forest patronage is declining. He believes that the future of forestry lies in new patrons: environmental non-governmental organisations, housing investors in the forest and existing green infrastructure.

Jegatheswaran et al. (2018) also believe that traditional forestry needs to be transformed as societal perceptions of sustainability, science, communications and global markets change. According to Diemer and Alvarez (1995), new approaches to forestry decision-making are needed that are in line with modern politi-

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cal environment. Contemporary forestry is the science, profession, and art of managing and preserving forest ecosystems for the benefit of man, society, the environment and the economy (Anić 2019).

Cardinal changes in society and globally accelerated urbanisation have led to the need for structural changes in forestry, particularly in Europe (Konijnendijk 2003). In response to these changes, the concept of urban forestry emerged as an innovative approach to natural resource management in the urban environment. For example, China has gone from ignoring significant development of urban forestry (Guan et al. 2021). Currently, urban forestry is an interdisciplinary branch of science and a profession directly concerned with the management of green infrastructure (Dahle et al. 2020). Urban forestry is handled by a variety of professionals, including foresters and other professionals (Konijnendijk and Randrup 2005; O'Herrin et al. 2020). It is important to regulate urban forestry as a profession (Krajter Ostoić et al. 2020). Forestry professionals are expected to be highly qualified, which will contribute to the goal of sustainable development (de Jong et al. 2021).

According to a study conducted in 1929–1933 (Williamson and Darley 1935), 20.7%–39.9% of high school students were undecided about their future profession. In general, the choice focused on a few traditional professions and did not match the respective abilities, interests and opportunities.

The forestry profession is highly valued by society and inspires full confidence in forest management (Horvat 2009), and the portrait of an ideal forester is formed around a rural male identity as a hard-working man who owns nature (Lidestav and Egan Sjölander 2007). The proportion of women in forestry remains low (Storch 2011).

Anić (2019) notes that the crisis in forestry, which has gradually developed over the last 15 years, has led to huge changes and challenges in forestry higher education. Currently, a serious problem is the lower engagement of young people in learning forestry, for which there are no objective reasons. Jegatheswaran et al. (2018) note that young people's interest is waning and consequently, enrolment in forestry institutions is declining.

The purpose of the study was to determine the factors that influence students' choice of forestry professions to counteract declining interest in forestry professions and to promote stable enrolment of students in vocational education.

Material and methods

Literature sources were selected in the Scopus and Web of Science search databases, as well as in the free Google Search; literature sources were selected and analysed using a case study on the career choices of future forestry students. Both positive and negative factors, which were mentioned in the reference research that influenced the choice of forestry profession, were selected. The factors were included in the online questionnaire, which was offered to first-year students of forestry and landscape/park management (urban forestry) specialties of the National University of Life and Environmental Sciences (NULES) of Ukraine (located in Kyiv), who study together in the first year. In Ukraine, forestry specialists are educated in 16 Ukrainian universities, of which NULES (founded in 1847) is one of the best known and plays a leading role in Ukrainian forestry education. Its Faculty of Forestry was among the prominent faculties of forestry education in Soviet period and supplied specialists for the former Soviet Union. However, if in the 1980s the enrolment of first-year students at the Faculty of Forestry was 175 students and the competition was high, now the number of first-year students (together in forestry and landscape/park management specialties) is about 120, and the number of entrants has decreased significantly. Moreover, the planned enrolment of students in the specialty is becoming increasingly problematic.

As mentioned above, the online questionnaire was developed based on the results of searched scientific articles and included all influential factors that were found in the articles. The online survey was conducted in the spring of 2022. All willing first-year students took part in it anonymously. The questionnaire indicated the gender of respondents and their place of residence (village, city, capital). Students were informed about its purpose. After the data collection was completed, a common data set was created. Based on the questionnaire, we got an idea of the positive and negative factors regarding the admission of first-year students to the Faculty of Forestry.

We adhered to international standards and practices in the development and conduct of our survey and in the

processing of the data collected. To facilitate processing and analysis, the obtained results of the questionnaire were conditionally divided into three parts:

1. The "positive factors" section of the questionnaire aimed to explore the impact and importance of factors that positively influenced students' choice of forestry profession: enjoyment of nature, enjoyment of outdoor recreation, pleasure of being outdoors, job satisfaction, care for the environment, personal interest, interest in the forest, wages, prestige, influence of the media, influence of invited speakers and influence of the family.
2. The section "factors of hesitation" was to help identify the most important negative factors in the choice of forestry profession: remuneration of forestry specialists, controversial political issues and availability of a scholarship.
3. The section "social features" was to show the family and individual characteristics of first-year students that could influence their choice of forestry profession: living in a village, residence in the city, living in the capital, living conditions in childhood, family participation in consumer activities, personal participation in fishing and other personal participation in outdoor nature activities.

We adhered to international standards and practices in the development and conduct of our survey, as well as in the processing of the data collected. Students indicated the important reasons for their choice. Answers indicating positive influence were coded as 1 and answers indicating negative influence were coded as 0. Statistical analyses were performed in STATISTICA v12: Multivariate Exploratory Techniques. We used these data and perform cluster analysis and factor analysis to group factors into clusters and to highlight the most important factors that help explain the choice of forestry specialty by students. Clustering was performed with the help of a complete search of the data (distance matrix). The method of presenting the results of the sequential clustering process was a tree diagram.

The data of the obtained survey results analysed were compared with the data of research articles and outlined a number of aspects that should be paid attention to in order to strengthen the involvement of entrants in the Faculty of Forestry. In this regard, the problems that educational institutions should pay attention to in order to modernise educational programmes are outlined, without which a radical improvement of the situation, in our opinion, is impossible.

Results

The Faculty of Forestry of NULES of Ukraine is attended mainly by boys, but an equal proportion of male and female students took part in the survey. Analysis of the survey results among first-year students majoring in forestry showed that rural youth accounted for 50% of the total number of students: 36.4% among men and 63.6% among women. Among students, 13.8% were from Kyiv, 9.1% among men and 18.2% among women (twice as high as men).

It was not possible to identify any peculiarities of living conditions in childhood and socioeconomic status of the family (students, as a rule, rated living conditions in childhood as good—81.8%). Only 4.5% of all students (9.1% of boys) chose a profession in early childhood. The vast majority (and 100% of girls) chose a specialty in high school or after high school.

It is determined that 63.6% of students' families took part in consumer activities in forests (mushroom and berry picking, fishing, hunting): 54.5% among male and 72.7% among female students. A total of 31.8% of students were regularly engaged in fishing and hunting, mainly among boys (45.5%) and 18.2% among girls.

Prior to entering the university, 54.5% of students took part in outdoor activities. Unfortunately, none of the students took part in the activities of school forestry, which calls into question their vocational guidance activities.

Cluster analysis divided the social characteristics of students and their families into two clusters (Fig. 1). Cluster 1 includes living in the village and in the capital. Cluster 2 was formed by the following: living in the city, living conditions in childhood, participation in outdoor activities, family participation in consumer activities and personal participation in fishing and more.

According to the results of factor analysis (Fig. 2), three factors contain about 73.6% of the total variance, and the first two, i.e., the strongest (living conditions in childhood and family participation in consumer activities)—58.1%. The share of variance explained by the first factor (living conditions in childhood) was 38.1%. The second factor (family participation in consumer activi-

ties) contains about 20.1% of the variance, and the third (personal participation in outdoor activities)—15.5%.

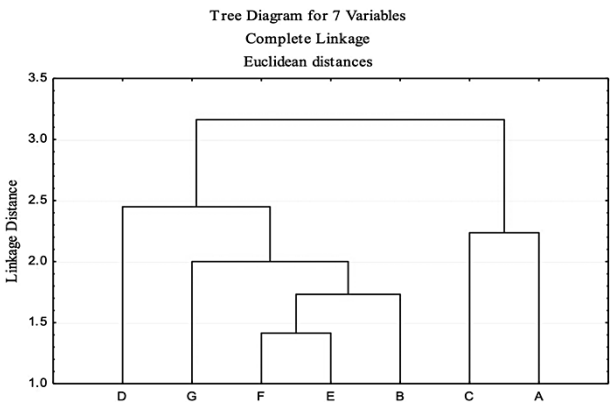

Figure 1. Dendrogram of the influence of the peculiarities of social status on the choice of forestry profession: A – living in a village; B – residence in the city; C – living in the capital; D – living conditions in childhood; E – family participation in consumer activities; F – personal participation in fishing and others; G – personal participation in outdoor nature activities

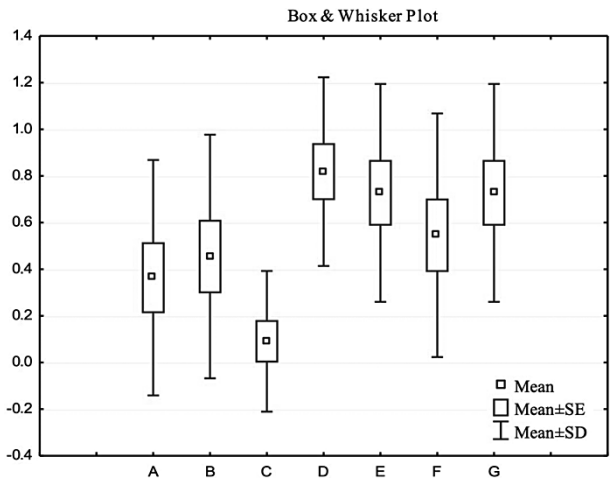

Figure 2. Diagram of the swing values of social features of students' families. Labels of factors are similar to Figure 1

The factor "living conditions in childhood" is highly correlated with the factor "family participation in consumer activities" (r = 0.849), and with factors "living in the city" and "living in the capital"; the factor "family participation in consumer activities" is highly correlated with the factor "personal participation in outdoor activities" (r = –0.950); while the factor "personal participation in outdoor activities" is correlated with the factor "living in a village" (r = 0.956).

The predominant motivating factors for choosing a forestry profession were enjoyment of nature (81.8%), outdoor recreation (50%, with 54.5% for men and 45.5% for women), being in the fresh air (59.1%: respectively, 72.7% and 45.5%), care for the environment (68.2%: respectively, 63.6% and 72.7%) and personal interest (50%: respectively, 36.4% for men and 63.6% in women). Interest in the forest was only 36.4%, while job satisfaction and prestige gained 22.7% equally. Wages were equally rated by men and women (at 18.2%). For women, the influence of the media, invited speakers and family did not matter at all, and for boys, the first two factors were 18.2% and the influence of family only 9.1%.

Cluster analysis of the obtained results allowed dividing the factors influencing the choice of students of the forestry profession into three clusters (Fig. 3).

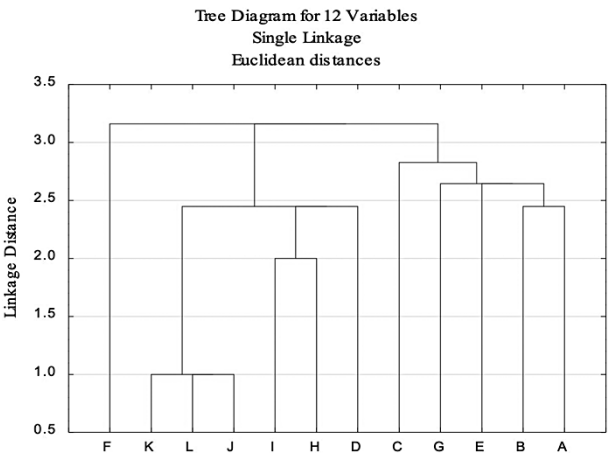

Figure 3. Dendrogram of the influence of 12 motivating factors on the choice of forestry profession: A – enjoyment of nature; B – enjoyment of outdoor recreation; C – pleasure of being outdoors; D – job satisfaction; E – care for the environment; F – personal interest; G – interest in forests; H – wages; I – prestige; J – influence of the media; K – influence of invited speakers; L – influence of the family

The first cluster included less influential factors: the influence of family, invited speakers and the media; interest in forests; prestige and job satisfaction. The second cluster was formed by the most influential factors: enjoyment of nature, recreation in nature, being in the fresh air, care for the environment and interest in forests. The third cluster contains only one factor: personal interest.

According to the results of the factor analysis (Fig. 4), the five factors contain about 76.7% of the total variance, and the first two, i.e., the strongest (enjoyment of nature and care for the environment), 45.9%. The proportion of variance due to the first factor (enjoyment of nature) was 25.2%. The second factor (care for the environment) contains about 20.7% of the variance, while the third factor (being in the fresh air) contains 12.3% of the variance. Each of the other factors explains less than 10% of the variance (the fourth factor explains 9.5% and the fifth factor explains 9.1% of the variance).

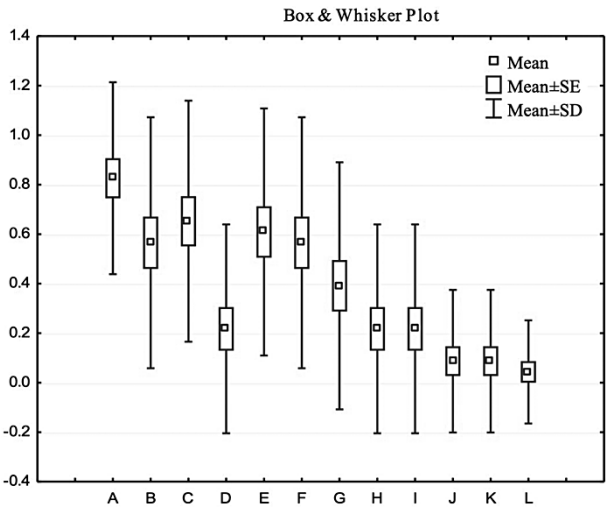

Figure 4. Diagram of the range of values of motivating factors for the choice of forestry profession by Ukrainian students. Labels of factors are similar to Figure 3

The strongest factor of hesitation in choosing a profession was the remuneration of forestry specialists—63.6% (45.5% for men and 81.8% for women). A total of 31.3% are related to controversial political issues (45.5% and 27.3%, respectively). The availability of a scholarship was important for 27.2% of students. Among other factors of hesitation, doubts about the relevance of such a specialty were singled out.

Discussion

According to O'Herrin et al. (2018), the perception of the forestry profession was not influenced by gender, living conditions in childhood and socioeconomic status. Instead, personal acquaintance and communication with professional foresters on forestry and conservation had a strong positive impact on the choice of potential forestry students (Searle and Bryant, 2009). An integral part of career guidance work is modern school forestry, common in urban and rural schools (Radetskaya 2020). Unfortunately, in our study, school forestry students were not found among freshmen.

According to studies by Dokes et al. (2020), forestry students were mostly from rural areas. According to the results of our research, half of such students came from rural areas, and among women, that quantity was twice as high. The results of the research by Jazbec et al. (2019) reported that about one-third of students were from the capital, which was in contrast to our research of only 13.8% were from the capital, and the quantity twice as many among female students.

Studies of Moreno et al. (2020) have shown that women choose a profession in early childhood and men in high school or later. In contrast, according to results of our research, the vast majority of students (and all women) chose a specialty in high school or after high school. In contrast to the data (Moreno et al. 2020), according to our research, on the choice of profession for women, the influence of the media, invited speakers and family did not matter at all, and for men, the influence of these factors was insignificant. Similar to previous research, the decision to enrol in the Faculty of Forestry depended on the connection with nature and care for the environment. Similarly, data (Jazbec et al. 2019) on students showed that their main motivation was personal interest, not family. Moreover, this factor was also almost twice as high among female students.

As in the study by Bal et al. (2020), the most important motivating reasons for deciding to enter the forestry educational programme were enjoyment of nature, job satisfaction, outdoor activities, care for the environment and interest in the subject matter. According to our data, the strongest motivating factors for choosing forestry profession for men were enjoyment of nature, care for the environment (especially for women) and being outdoors. On the other hand, interest in the forest was important to only one-third of the students. According to O'Herrin et al. (2018), pleasure from jobs was even more important when choosing a profession, even more important than pay and prestige. According to our research, job satisfaction and prestige were important for a quarter of students.

Studies by Dokes et al. (2020) found that more than half of students have family involvement in consumer activities and outdoor activities. Among Ukrainian students, most of their families also participated in consumer activities in the forest, especially among female students' families. One-third of students (mostly men) were regularly engaged in fishing and hunting.

Similar to the study by Bal et al. (2020), potential earnings, presence of scholarships and controversial political issues were important factors in the choice of forestry profession. According to the results of our research, the strongest factor for hesitation in admission to training programmes was the remuneration of forestry specialists. At the same time, more fluctuations were also observed on the part of women (this quantity is twice as high for women as for men). Fluctuations in controversial political issues among women, by contrast, were half as low. The availability of a scholarship in our study was important for less than one-third of the students.

In contrast to the factors indicated in the scientific articles (Jazbec et al. 2019), among other factors of hesitation, Ukrainian students expressed isolated doubts about the relevance of such a specialty, hence, the importance of a stable or predictable political situation for the successful choice of the forestry profession.

According to research by Wilkinson and Hoxley (2005), the reasons for the decline in the number of geodesy students in the UK, including women, were low starting salaries for graduates, lack of publicity and career awareness, and poor public image. However, we found out from the literature that the forestry profession has a good image, but the salaries of graduates are indeed low. O'Herrin et al. (2018) believe that urban forestry may appeal to a more diverse population than is currently represented in the profession, and lack of awareness may be a significant obstacle to recruiting not only more students, but also more diverse students.

Similar to global trends, Ukrainian forestry education is experiencing times of reformatting and the still unrealised need to abandon the traditional consumerist attitude towards forests. Even the location of the Forest Resources Agency within the Ministry of Agrarian Policy (and not the Ministry of Environmental Protection and Natural Resources of Ukraine) illustrates that attitude. In accordance with such changes, associated with the need for further greening of all processes, educational standards should be revised. Only then will the perception of the profession and its conscious choice become acceptable. Under the current situation, hopes for an increase (or even not a decrease) in the number of people wishing to choose the forestry profession, in our opinion, seem unfounded.

Conclusions

Like the situation all over the world, forestry in Ukraine is on the verge of reform, which is not yet well recognised. The severity of the situation is probably due to more inert processes and political indecision. Currently, there is a problem with the admission of students in forestry education. The solution to this problem is possible only if there is awareness of the need to transform the forestry industry and the corresponding transformation of the forestry education system.

Currently, there is a drastic difference in the choice of specialty by gender: forestry is chosen by about 75% of males, and urban forestry is chosen by about 80% of females. The predominant motivating factors for choosing a forestry profession were enjoyment of nature, recreation in nature, being in the fresh air, care for the environment and interest in forests.

The strongest factor of hesitation when choosing this profession turned out to be the salary of forestry specialists. For one-third of students, existing controversial political issues were an important factor. Among other factors of hesitation, doubts regarding the relevance of such a specialty were singled out.

The next step of our research will probably be the analysis of the priorities of the existing educational programmes and the study of the view of their quality by Ukrainian students of Faculty of Forestry.

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