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Professional perspectives and expectations of forest engineering students

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Abstract: This study examines the perspectives and professional expectations of forest engineering students in Türkiye. Forest engineering, beyond its technical demands, carries significant responsibility for the sustainable management of natural resources. However, recent shifts in labor market dynamics, declining public sector employment, and the rise of emerging professional fields have influenced students' perceptions and career trajectories. The research is based on survey data collected from 522 students enrolled in forest engineering departments at 12 universities across Türkiye. The questionnaire explored students' views and tendencies across several dimensions: professional identity, gender perception, working conditions, inclination to work in rural areas, perceptions of the public and private sectors, employment anxiety, and professional expectations. Data were analyzed using non-parametric methods, including Spearman's correlation, Kruskal–Wallis, and Mann–Whitney U tests. Results show that students generally hold positive views about the profession. However, concerns about employment and salary expectations increase significantly among students in upper academic years. In addition, students' perceptions vary significantly based on academic year, household income level, parental education, and whether they made a conscious choice of their department. These findings provide critical insight for policymakers seeking to restructure forestry education and develop more student-centered approaches.
Keywords: Career, Employment, Forest engineering, Professional expectation, Student perception

Orman mühendisliği öğrencilerinin mesleki bakış açıları ve beklentileri

Öz: Bu çalışma, Türkiye'deki orman mühendisliği öğrencilerinin mesleğe bakış açılarını ve mesleki beklentilerini analiz etmektedir. Orman mühendisliği, yalnızca teknik bilgi gerektiren bir disiplin olmanın ötesinde, doğal kaynakların sürdürülebilir şekilde yönetilmesinde önemli bir sorumluluk üstlenmektedir. Ancak günümüzde iş gücü dinamiklerindeki değişimler, kamu istihdamının daralması ve yeni meslek alanlarının ortaya çıkması, öğrencilerin bu mesleğe ilişkin algılarını ve kariyer beklentilerini doğrudan etkilemektedir. Araştırma kapsamında, Türkiye'deki 12 üniversitenin orman mühendisliği bölümlerinde öğrenim gören toplam 522 öğrenciden anket yoluyla veri toplanmıştır. Anket, öğrencilerin mesleki kimlik, cinsiyet algısı, çalışma koşulları, kırsalda çalışma eğilimi, kamu ve özel sektör algısı, istihdam kaygısı ve mesleki beklentiler gibi çeşitli konulardaki görüş ve eğilimlerini ölçmeyi amaçlamıştır. Verilerin analizinde Spearman korelasyonu, Kruskal-Wallis ve Mann-Whitney U gibi parametrik olmayan testler kullanılmıştır. Analizler sonucunda, öğrencilerin genel olarak mesleğe karşı olumlu bir tutum geliştirdikleri belirlenmiştir. Bununla birlikte, özellikle üst sınıflarda öğrenim gören öğrencilerde istihdam ve maaş beklentilerine ilişkin kaygıların arttığı gözlemlenmiştir. Ayrıca, öğrencilerin mesleğe ilişkin algılarının akademik sınıf düzeyi, aile gelir seviyesi, ebeveyn eğitim durumu ve bölüm tercihinin bilinçli yapılıp yapılmadığı gibi değişkenlere göre anlamlı farklılıklar gösterdiği tespit edilmiştir. Elde edilen bulguların, ormancılık eğitiminin yeniden yapılandırılmasına ve uygulamaların daha öğrenci odaklı bir yaklaşıma yönlendirilmesine katkı sağlaması beklenmektedir.
Anahtar kelimeler: Kariyer, İstihdam, Orman mühendisliği, Mesleki beklenti, Öğrenci algısı

1. Introduction

A profession is acquired through a specific educational process, based on systematic knowledge and skills. It aims to provide valuable products or services to people, generate financial gain, and operate under specific regulations (TDK, 2018). Individuals' career choices are considered among the most critical decisions, directly influencing their quality of life across biological, psychological, social, and cultural dimensions (Andsoy et al., 2012; Zencir and Eşer, 2016). Indeed, perceptions and expectations regarding professions begin as an individual commences their vocational training, directly impacting their professional development (Çevik et al., 2012; Canbay et al., 2020).

However, researchers have observed that career choices in Türkiye often depend on chance, as many individuals make decisions without adequate knowledge of their selected professions or working conditions (Kerime et al., 2008). As a result, many fail to develop a well-informed professional plan, which leads to unmet career expectations and significant feelings of hopelessness and stress. While stress in professional life frequently arises from the nature of the work itself, studies highlight that it may become chronic and eventually lead to burnout if individuals cannot express themselves or access sufficient support (Çokluk, 2000). Therefore, making suitable career choices and developing positive expectations about one's professional future are critically important for professional success and psychological well-being (Tuncer, 2011).

Students lay the groundwork for adopting their profession and pursuing it with a professional understanding during their academic years. This foundation continues to develop

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throughout their careers. When students enter professional life equipped with sufficient vocational awareness, it contributes to the faster maturation of this awareness and positively influences their professional development (Beydağ et al., 2008).

In this context, professional expectation encompasses gaining prestige, achieving economic independence, contributing to societal benefit, and self-actualisation from one's chosen profession (Özpancar et al., 2008; Kuzgun, 2009). These expectations become particularly distinct and prioritised in professions directly related to natural resource management, such as forestry.

Forestry is a multidimensional and vitally important discipline that extends beyond merely fulfilling society's material and service-oriented needs from forests. It fundamentally involves the sustainable management of forest ecosystems, encompassing a broad spectrum of critical functions, from biodiversity conservation to climate regulation (Gümüş, 2022). In Türkiye, forestry education has a deep-rooted history dating back to the establishment of the first Forest School in İstanbul in 1857. This institution aimed to train forestry engineers who would assume the multifaceted responsibilities of forestry. We know that the foundations of forestry organisation were laid in 1839, and it subsequently evolved into a comprehensive structure in both educational and administrative terms (Özdönmez et al., 1996; Gümüş, 2004; Girgin, 2007; Eryılmaz, 2008).

Despite the long and deep-rooted history of forest engineering education, graduates' employment rates and job satisfaction levels have varied over time due to the sector's changing dynamics. Until the 1980s, forestry faculty graduates quickly found employment in the public sector. However, the shift to a liberal economic system also impacted forest engineering graduates as public sector employment contracted. From the 1990s onwards, the opening of new faculties exacerbated supply-demand imbalances, compelling many graduates to seek work outside the public sector (Özden and Ekici, 2010). This situation significantly influences forest engineering students' professional expectations and post-graduation goals. These multifaceted expectations are not unique to Türkiye; research in other countries also shows that job security, a desire to integrate with nature, and contributing to society are prominent motivations in forestry students' career choices (Kilpatrick and Bound, 2020).

Business sectors today rapidly evolve and diversify due to technological advancements, environmental factors, sustainability demands, and societal needs (Autor, 2015; Frey and Osborne, 2017; FAO, 2022). This transformation has reshaped the forestry profession, creating new specialisations like green jobs, carbon management, ecosystem services, and remote sensing (FAO, 2020; FAO, 2022). With these changes, students' professional expectations are no longer limited to public sector employment; they now encompass diverse alternative fields such as subcontracted forestry services (commonly referred to as the 'private sector' in Türkiye), international organisations, and entrepreneurship.

We observe that interest in forestry engineering has not declined — and may even be growing — when we consider the increase in employment opportunities and the profiles of students aiming for careers in this field. Over the years, data on student numbers in Türkiye's forestry engineering departments reinforce this view. Although the profession enjoyed high popularity 50–60 years ago, it has lost some appeal in recent decades. However, rising environmental awareness, more presentations of the work done about forestry by non-governmental organisations and the Chamber of Forest Engineers, and the Ministry of Agriculture and Forestry's recruitment policies for engineers and technical staff have contributed to a renewed interest in the profession. Despite this resurgence, universities have not yet seen a significant increase in student preferences for forestry engineering. Figure 1 shows annual changes in student enrolment (YÖK, 2025).

As Figure 1 illustrates, graduates decreased by 48.9% between 2013 and 2023. This reduction indicates that interest in the profession has only had a limited impact on student preferences.

Understanding the professional expectations of forestry engineering students in Türkiye is gaining increasing relevance, particularly in light of shifting sector dynamics, the expanding role of the private sector, and the emergence of new employment areas. However, most existing studies have primarily focused on employment processes, public appointment rates (Özden and Ekici, 2010; Öztürk et al., 2014), the identification of sectoral problems (Türker, 2006), and educational issues. In contrast, relatively few studies directly examine students' professional future and development pathways (Türker, 2005; YurdakulErol, 2022), indicating a clear need for a more comprehensive perspective.

The evolving forestry landscape requires a broader understanding of how students perceive their future roles, shape career expectations, and respond to new market demands. In this context, examining the academic and professional orientations of forestry students is critical for aligning education with labour market realities, improving curricular content, and enhancing career guidance.

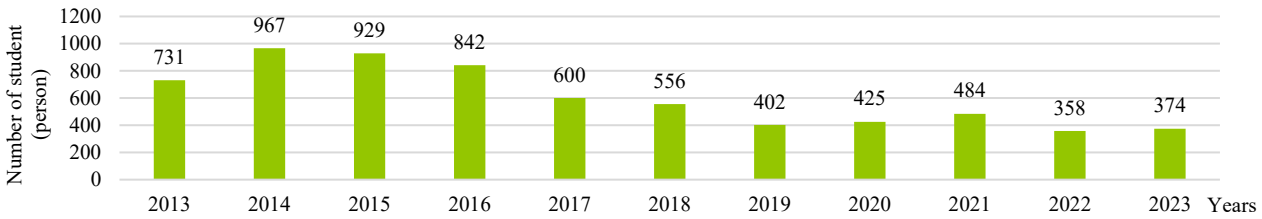

Figure 1. Forest engineering department graduate numbers in Türkiye (2013-2023)

This study aims to address the literature gap by conducting a relational analysis of forest engineering students' professional perceptions, career expectations, and employment-related concerns across a broad sample in Türkiye. In doing so, it explores the influence of demographic variables—such as gender, income level, and academic year—on students' outlook toward the profession. The findings are expected to inform the development of student-centred forestry programs and contribute to institutional strategies aimed at improving employment satisfaction and sectoral alignment.

The study is guided by the following research questions:

(1) How do students perceive the suitability of the forestry profession in terms of gender, working conditions, and sectoral opportunities?

(2) What are the levels and sources of employment anxiety among students at different stages of their academic careers?

(3) To what extent do demographic variables (e.g., gender, income, year of study) influence students' professional outlook?

These questions structure the analysis and are directly addressed in the subsequent results and discussion sections.

2. Material and methods

This study involved forestry engineering departments from 12 public universities across Türkiye, including: Artvin Çoruh University (AÇU), Bartın University (BU), Bursa Technical University (BTU), Çankırı Karatekin University (ÇKU), Düzce University (DU), Isparta University of Applied Sciences (IUAS), İstanbul University-Cerrahpaşa (IUC), İzmir Katip Çelebi University (İKÇU), Kahramanmaraş Sütçü İmam University (KSİU), Karabük University (KRU), Karadeniz Technical University (KTU), and Kastamonu University (KU). These institutions were included to ensure broad disciplinary coverage and national representativeness.

This study employs a relational survey model and a quantitative research method, selected to reveal relationships among variables (Karasar, 2012). Primary data were obtained from surveys designed to explore forest engineering students' perspectives on their profession and post-graduation professional expectations (Table 1), supplemented by secondary data sources. The study targeted the entire population of forestry engineering students in Türkiye rather than a specific institution or region. The questionnaire was distributed to all students enrolled in forestry engineering programs across the country. Participation was voluntary and open to all students, without stratification or quota-based targeting. Therefore, the sampling process followed a non-probabilistic voluntary response model, allowing for broad representativeness within the target discipline.

The survey questionnaire included both demographic items and thematic attitude-based statements. Questions 11–16, 18–23, and 28 were designed to assess students' perceptions of the forestry engineering profession. These items were organized under the following thematic categories: professional identity and satisfaction -PIS- (Q11, Q13, Q14, Q16, Q21), perceptions of gender suitability and discrimination –PGSD- (Q12, Q15), working conditions and wage perception –WCWP) (Q18, Q19, Q20), tendency to work in rural areas –TWRA- (Q28), and public and private sector perception – PPSP- (Q22, Q23). Questions 10, 17, 24–27, and 29 focused on a single theme: students' employment anxiety and occupational expectations (EAOE).

In addition, questions 5, 7, 8, and 9 examined students' educational background and their rationale for selecting their academic department. Specifically, question 5 asked whether students chose the forestry department consciously, unconsciously, or due to external factors. The concept of "conscious choice of department" was considered analytically significant, as prior research suggests that students who made a conscious choice of their academic field tend to exhibit stronger motivation and clearer professional goals. In addition, question 6 was evaluated in the socioeconomic background (SB) thematic group.

The study population consisted of undergraduate students enrolled in forestry engineering departments at public universities in Türkiye during the 2023–2024 academic year. The survey was conducted online using a structured Google Forms questionnaire between October and December 2024.

We developed the questionnaire using existing literature in forestry education, labour market expectations, and gender-related studies in the natural sciences (Moss-Racusin et al. 2012; Serin et al., 2013; Yurdakul-Erol, 2022; Owuor et al., 2023; Bullard et al., 2024). While we did not conduct a formal expert review, we designed the survey by drawing upon the authors' subject-matter expertise and longstanding scholarly experience in forest engineering and socio-professional studies. We assessed the internal consistency of the scale using reliability analysis, which yielded a Cronbach's Alpha coefficient of 0.878. This value indicates a high level of internal reliability for the instrument. Construct validity was evaluated through Exploratory Factor Analysis (EFA), following the guidelines proposed by Williams et al. (2010), Tavakol and Dennick (2011).

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Kaiser-Meyer-Olkin (KMO) values ≥ 0.50 are considered minimally acceptable, while values ≥ 0.90 are classified as "marvelous" (Williams et al., 2010). Further categorize KMO values as follows: 0.60–0.69 as mediocre, 0.70–0.79 as good, and ≥ 0.80 as excellent. In this study, the KMO value was calculated as 0.913, exceeding the threshold for excellent sampling adequacy. Bartlett's Test of Sphericity was statistically significant ($\chi^2 = 5920.997$, $p < 0.001$), supporting the suitability of the data for factor analysis, as recommended in social science research (Tavakol and Dennick, 2011).

The factor extraction using Principal Component Analysis with Varimax rotation revealed four components with eigenvalues greater than 1, which collectively explained 66.40% of the total variance. This level exceeds the average variance commonly reported in factor analysis studies within the social sciences (Costello and Osborne, 2005). The statistical results supporting these findings are presented in Table 2 and Table 3.

Table 1. Structure of the questionnaire used in the study

	Questions	Answers
Q1	Surveyed University	……
Q2	How old are you?	……
Q3	What is your gender?	( ) Woman ( ) Man
Q4	What is your marital status?	( ) Married ( ) Single
Q5	Which year are you in at university?	( ) 1st year ( )2nd year ( ) 3rd year ( )4th year
Q6	What is your family's monthly income?	……..
Q7	What is your mother's education level?	( ) Literate ( ) Primary School ( ) High School ( ) University ( ) Master's-Doctorate
Q8	What is your father's education level?	( ) Literate ( ) Primary School ( ) High School ( ) University ( ) Master's-Doctorate
Q9	Did you consciously choose your department?	( ) Yes ( ) No ( ) Partially
Q10	Which sector do you plan to work in after graduation?	……..

		Strongly agree (5)	Agree	Neither agree nor disagree	Disagree	Strongly disagree (1)
Q11	I would happily work as a forest engineer.					
Q12	The forest engineering profession suits my gender.					
Q13	Forest engineering is a popular and important profession.					
Q14	Working in the forest engineering profession is enjoyable.					
Q15	I perceive that gender-based discrimination does not exist in the forest engineering profession.					
Q16	Forest engineering involves strong social interactions.					
Q17	The forest engineering profession offers career opportunities.					
Q18	The irregular working hours in the forest engineering profession greatly concern me.					
Q19	Salaries in the forest engineering profession are quite adequate.					
Q20	Working as a forest engineer is no more exhausting than other sectors.					
Q21	I am very satisfied with my chosen department.					
Q22	Working as a forest engineer in the public sector offers excellent and sufficient advantages.					
Q23	Working as a forest engineer in the private sector (i.e., subcontractor companies that operate under public forestry contracts in Türkiye) offers excellent and sufficient advantages.					
Q24	I can find a job within my first year after graduation.					
Q25	I can find a job within my first three years after graduation.					
Q26	I will easily find a job upon graduation.					
Q27	I have no concerns because I believe public sector recruitment uses objective criteria.					
Q28	Working primarily in rural areas as a forest engineer is important and professionally beneficial.					
Q29	My anxiety about not finding a job after graduation is very high.					

Table 2. Total variance explained (Rotation sums of squared loadings)

Component	Eigenvalue	% of Variance	Cumulative %
1	5.944	31.28%	31.28%
2	2.764	14.55%	45.83%
3	2.628	13.83%	59.66%
4	1.280	6.74%	66.40%

Table 3. KMO and Bartlett's Test

Test	Value
Kaiser-Meyer-Olkin (KMO)	0.913
Bartlett's Test of Sphericity	$\chi^2 = 5920.997$, $p < 0.001$

Based on the distribution of students enrolled in all forest engineering departments in Türkiye over the past four academic years, we first calculated the total population size. Using a 95% confidence level, 5% margin of error, and assuming maximum variability in the population (P = 0.5), we estimated the minimum sample size required using standard sample size estimation procedures (Orhunbilge, 2000). This resulted in a target sample size of 324 participants. To ensure representativeness, we employed a proportionate stratified sampling strategy (Serper, 2000) we identified each department's share within the national student population and allocated the required number of participants proportionally. This approach ensured that institutions with larger student bodies were accurately represented in the sample, thus enhancing the generalizability and precision of the findings.

Table 4 displays the calculated sample sizes and the number of surveys for each university. To enhance reliability, we collected more responses than the minimum required sample size.

Table 4. Main population, sample sizes and number of surveys conducted

No	University	Number of student in 2021	Number of student in 2022	Number of student in 2023	Number of student in 2024	Number of total student	%	Number of calculated surveys	Number of surveys conducted
1	Applied Sciences University of Isparta	41	41	50	54	186	9	29	32
2	Artvin Çoruh University	31	31	40	42	144	7	23	30
3	Bartın University	31	31	30	32	124	6	20	33
4	Bursa Technical University	52	52	49	54	207	10	33	34
5	Çankırı Karatekin University	21	31	40	42	134	7	21	66
6	Düzce University	31	31	35	42	139	7	22	36
7	İstanbul University-Cerrahpaşa	82	82	79	62	305	15	48	58
8	İzmir Katip Çelebi University	26	26	25	32	109	5	17	41
9	Kahramanmaraş Sütçü İmam University	31	31	30	40	132	6	21	28
10	Karabük University	21	31	30	32	114	6	18	39
11	Karadeniz Technical University	82	82	79	72	315	15	50	60
12	Kastamonu University	31	36	35	32	134	7	21	65
	Total	480	505	522	536	2043	100	324	522

We began our analysis by computing frequencies and percentages for each survey item. For Likert-scale questions, we determined the general trend for each statement by assessing total scores, and we also calculated this trend within each thematic group. Additionally, we used statistical analysis methods to assess whether participants' views and expectations regarding forest engineering differed based on their academic year, family income, parents' education levels, and whether they consciously chose their department. To ensure a comprehensive analysis, we divided participants into various groups based on:

Current academic year refers to the year of study in which the student was enrolled (from 1st to 4th year). Group codes: G1: 1st year, G2: 2nd year, G3: 3rd year, and G4: 4th year.

Families' average monthly income refers to the total monthly income of all household members as reported by the student and was used as an indicator of socioeconomic background. Group codes: G1: <1 Minimum Wage (673 $) (MW), G2: 1 MW, G3: 1.1–5 MW, and G4: 5.1+ MW.

Mothers' and fathers' education levels refers to the highest level of formal education completed by each parent. This variable was included as a proxy for family educational background and its potential influence on students' perceptions and expectations. Group codes: G1: Literate, G2: Primary School, G3: Secondary School, G4: High School, and G5: Higher Education.

Conscious choice of department refers to students' selection of the forestry engineering department based on personal interest, career goals, or informed decision-making. Group codes: G1: Those who answered "Yes," G2: Those who answered "No," and G3: Those who answered "Partially."

Before analysing the collected survey data, we tested it for normality. We evaluated various parameters for normality assessment, including the Shapiro-Wilk value, data distribution, and Skewness and Kurtosis values (±1.5) (Tabachnick and Fidell, 2013; Özdamar, 2002). The analysis determined that the data did not exhibit a normal distribution, leading us to apply non-parametric tests. We performed a Spearman's rho correlation analysis to determine if a relationship existed between the theme groups defined by participants' current academic years, average monthly family incomes, parents' education levels, and conscious choice of their department. After identifying propositions with significant correlations, we used the Kruskal-Wallis test to ascertain whether responses to these propositions showed significant differences across the defined groups.

Based on the research objectives and data structure, the following hypotheses were formulated:

H_1: Forest engineering students'perceptions of professional identity and satisfaction (Q11, Q13, Q14, Q16, Q21) differ significantly based on their current academic year, family income level, parents' education level, and conscious choice of department.

H_2: Forest engineering students'perceptions of gender suitability and gender-based discrimination (Q12, Q15) differ significantly across the aforementioned four independent variables.

H_3: Forest engineering students'perceptions of wage adequacy and working conditions (Q18, Q19, Q20) differ significantly according to their current academic year, family income level, parents'education level, and conscious choice of department.

H_4: Forest engineering students'evaluations of public and private sector employment opportunities (Q22, Q23) differ significantly depending on the four identified independent variables.

H_5: Forest engineering students'employment expectations and job-related anxiety (Q24-Q27, Q29) show significant differences based on their current academic year, family income, parents'education level, and whether they consciously chose their department.

H_6: Forest engineering students'inclination to work in rural areas (Q28) differs significantly based on their current academic year, family income level, parents'education level, and conscious choice of department.

For variables exhibiting differences among groups, we employed the Mann-Whitney U (MWU) test as a post-hoc test to pinpoint which specific groups showed these differences (Orhunbilge, 2000). We applied the Bonferroni correction method for analyses involving three or more groups. The Bonferroni correction was calculated by dividing the 0.05 significance level by the number of pairwise comparisons between groups, which is determined using the formula $n(n-1)/2$, where n represents the number of groups. Our calculations yielded significance values of 0.008 for Current academic year groups, 0.008 for income groups, 0.005 for parental education level groups, and 0.017 for conscious choice of department groups (Cevahir, 2020). We performed all analyses using the SPSS 23 statistical package program.

3. Results

This section presents the findings of the study based on students' responses to the survey items. The results are organized thematically in accordance with the attitudinal categories defined in the methodology and supported by descriptive statistics and group comparisons. Trends in participants' perspectives on specified thematic attitudes are summarized in Table 5. Correlations between participants' responses and demographic variables are presented in Table 6, and group differences based on demographic and academic characteristics are shown in Table 7. Female students represent 38.7% of the participants from 12 forest engineering departments across Türkiye. The age range of students extends from 17 to 45, with 9.9% aged 25 and above. Among all participants, 5.2% are married—3.3% of females and 1.9% of males. The results are presented thematically in the following sections.

3.1. Professional identity and satisfaction

As summarized in Table 5, students generally held a positive view of the forest engineering profession. A substantial majority (74%) reported satisfaction with their field of study (Q11), believed it aligned with their personal interests (Q13), and stated that they enjoyed their education (Q14; M = 4.21). Furthermore, 68% of participants reported being satisfied with their department overall (Q21). Responses to Q16 also indicated that most students perceived forest engineering as a socially respected and meaningful profession.

However, as shown in Table 7, fourth-year students expressed significantly lower levels of job enjoyment (Q14) and departmental satisfaction (Q21) compared to first-year students ($p < 0.01$). This pattern may reflect increased awareness of professional challenges toward graduation. Overall, the results suggest that students' professional identity is initially strong but shows signs of erosion in the later stages of their academic journey.

3.2. Perceptions of gender suitability and discrimination

Table 5 shows that the majority of students (76%) perceive forestry as a profession compatible with their gender identity (Q12). However, responses to Q15 reveal a divided perception regarding gender-based discrimination: while 43% agreed that there is no such discrimination, 38% disagreed, indicating varying levels of awareness or concern.

As presented in Table 7, students whose mothers have a university-level education reported significantly higher sensitivity to gender discrimination (Q15) compared to those whose mothers had lower education levels ($p < 0.01$). These findings reflect differences in perceived gender equality shaped by students' social background and personal experiences. Importantly, these results represent subjective perceptions rather than objective assessments of workplace realities.

Table 5. Trends in participants' perspectives on specified thematic attitudes

Number of question	Tematik tutum	Strongly agree	%	Agree	%	Neither agree nor disagree	%	Disagree	%	Strongly disagree	%	Total frequency	Total %	Total score	Mean
Q11	PIS	396*	75.9	52	10.0	31	5.9	10	1.9	33	6.3	522	100	2334	4.5
Q12	PGSD	408*	78.2	50	9.6	24	4.6	6	1.1	34	6.5	522	100	2358	4.5
Q13	PIS	396*	75.9	60	11.5	23	4.4	13	2.5	30	5.7	522	100	2345	4.5
Q14	PIS	344	65.9	99*	19.0	39	7.5	6	1.1	34	6.5	522	100	2279	4.4
Q15	PGSD	177	33.9	115*	22.0	103	19.7	47	9.0	80	15.3	522	100	1828	3.5
Q16	PIS	333	63.8	109*	20.9	30	5.7	13	2.5	37	7.1	522	100	2254	4.3
Q17	EAOE	261	50.0	135*	25.9	64	12.3	27	5.2	35	6.7	522	100	2126	4.1
Q18	WCWP	102	19.5	116	22.2	106*	20.3	81	15.5	117	22.4	522	100	1571	3.0
Q19	WCWP	74	14.2	144	27.6	151*	28.9	69	13.2	84	16.1	522	100	1621	3.1
Q20	WCWP	74	14.2	111	21.3	122*	23.4	108	20.7	107	20.5	522	100	1503	2.9
Q21	PIS	285	54.6	120*	23.0	56	10.7	22	4.2	39	7.5	522	100	2156	4.1
Q22	PPSP	155	29.7	178*	34.1	99	19.0	46	8.8	44	8.4	522	100	1920	3.7
Q23	PPSP	67	12.8	117	22.4	186*	35.6	81	15.5	71	13.6	522	100	1594	3.1
Q24	EAOE	79	15.1	113	21.6	167*	32.0	76	14.6	87	16.7	522	100	1587	3.0
Q25	EAOE	194	37.2	152*	29.1	100	19.2	42	8.0	34	6.5	522	100	1996	3.8
Q26	EAOE	101	19.3	110	21.1	173*	33.1	63	12.1	75	14.4	522	100	1665	3.2
Q27	EAOE	92	17.6	85	16.3	148*	28.4	77	14.8	120	23.0	522	100	1518	2.9
Q28	TWRA	239	45.8	138*	26.4	72	13.8	34	6.5	39	7.5	522	100	2070	4.0
Q29	EAOE	136	26.1	93	17.8	115*	22.0	89	17.0	89	17.0	522	100	1664	3.2

* Indicates the mean score for each item, reflecting the overall response tendency among participants.

Table 6. Correlation between participants' perspectives on specified thematic attitudes and demographic variables

Thematic attitudes	Spearman's rho	Q10	Q11	Q12	Q13	Q14	Q15	Q16	Q17	Q18	Q19	Q20	Q21	Q22	Q23	Q24	Q25	Q26	Q27	Q28	Q29
Current academic year	Correlation Coefficient	0.150**	-0.045	-0.071	-0.012	0.007	-0.133**	0.086*	-0.039	0.036	-0.016	-0.086*	-0.027	-0.044	-0.045	Q24	Q25	Q26	Q27	-0.105*	0.148**
	Sig. (2-tailed)	0.001	0.300	0.103	0.783	0.880	0.002	0.049	0.380	0.418	0.708	0.049	0.543	0.316	0.302	-0.196**	-0.135**	-0.185**	-0.072	0.017	0.001
Families' average monthly income	Correlation Coefficient	0.194**	-0.051	-0.030	-0.022	-0.103*	-0.093*	-0.017	-0.118**	0.062	-0.119*	-0.057	-0.034	-0.085	0.016	0.000	0.002	0.000	0.101	-0.069	-0.081
	Sig. (2-tailed)	0.000	0.249	0.496	0.618	0.018	0.033	0.697	0.007	0.157	0.006	0.190	0.439	0.054	0.720	0.008	-0.006	0.020	-0.001	0.116	0.063
Mother's education level	Correlation Coefficient	0.165**	-0.011	-0.080	0.057	-0.077	-0.109*	0.019	-0.059	0.070	-0.017	-0.071	-0.039	-0.057	0.020	0.856	0.899	0.653	0.989	-0.156**	-0.132**
	Sig. (2-tailed)	0.000	0.796	0.070	0.197	0.078	0.012	0.671	0.175	0.111	0.694	0.107	0.375	0.191	0.650	0.044	0.006	0.063	0.044	0.000	0.003
Father's education level	Correlation Coefficient	0.122**	-0.077	-0.009	0.001	-0.090*	-0.058	-0.054	-0.043	-0.003	-0.002	-0.036	-0.062	-0.025	0.002	0.317	0.892	0.151	0.315	-0.071	-0.009
	Sig. (2-tailed)	0.005	0.080	0.839	0.984	0.040	0.186	0.220	0.331	0.948	0.957	0.413	0.160	0.576	0.967	-0.016	0.019	0.053	0.014	0.105	0.841
Conscious choice of department	Correlation Coefficient	0.120**	-0.169**	-0.088*	-0.152**	-0.202**	-0.119**	0.010	-0.195**	0.102*	-0.119**	-0.140**	-0.295**	-0.097*	-0.163**	0.714	0.668	0.227	0.755	-0.130**	0.092*
	Sig. (2-tailed)	0.006	0.000	0.045	0.001	0.000	0.006	0.811	0.000	0.020	0.007	0.001	0.000	0.027	0.000	-0.134**	-0.077	-0.091*	-0.165**	0.003	0.035

**Correlation is significant at the 0.01 level (2-tailed) *Correlation is significant at the 0.05 level (2-tailed).

Table 7. Group differences in participants' perspectives based on demographic and academic variables

		Kruskal-Wallis Test			Mann-Whitney Test				
Demographic variable groups	Groups	Chi-Square	df	Asymp. Sig.	Groups	Mann-Whitney U	Wilcoxon W	Z	Asymp. Sig. (2-tailed)
Current academic year	Sector	13.876	3	0.003	G1-G4	6856.500	11512.500	-2.760	0.006
					G2-G4	10213.500	20366.500	-3.010	0.003
	Q15	11.454	3	0.010	G2-G4	9847.000	24553.000	-2.969	0.003
	Q20	8.332	3	0.040	G1-G3	4213.000	10654.000	-2.847	0.004
	Q24	22.191	3	0.000	G1-G3	4247.500	10688.500	-2.784	0.005
					G1-G4	6107.000	20813.000	-3.579	0.000
					G2-G3	6439.500	12880.500	-2.782	0.005
					G2-G4	9227.500	23933.500	-3.754	0.000
	Q25	11.786	3	0.008	G1-G4	6682.500	21388.500	-2.634	0.008
	Q26	18.736	3	0.000	G1-G4	6213.500	20919.500	-3.390	0.001
					G2-G4	9517.500	24223.500	-3.388	0.001
	Q28	17.923	3	0.000	G1-G3	4290.500	10731.500	-2.734	0.006
					G2-G3	5775.500	12216.500	-4.087	0.000
Families' average monthly income	Q10	13.191	3	0.004	G1-G3	13653.500	17056.500	-2.692	0.007
	Q14	10.409	3	0.015	G2-G3	3605.000	79850.000	-2.924	0.003
					G2-G4	204.500	504.500	-2.793	0.005
	Q18	5.994	2	0.050	Differences between groups could not be calculated.				
	Q19	10.192	3	0.017	G1-G4	613.000	913.000	-2.863	0.004
Mother's education level	Q10	20.252	4	0.000	G1-G4	1552.000	2372.000	-3.043	0.002
					G1-G5	638.000	1458.000	-3.728	0.000
					G3-G5	1707.000	5712.000	-2.848	0.004
	Q15	10.332	4	0.035	G1-G5	663.000	1938.000	-2.823	0.005
	Q28	13.027	4	0.011	G1-G4	1491.500	6951.500	-2.782	0.005
	Q29	15.838	4	0.003	G1-G4	1302.000	6762.000	-3.553	0.000
Father's education level	Q10	15.006	4	0.005	G3-G5	4395.500	10390.500	-3.592	0.000
Conscious choice of department	Q10	8.113		0.017	Differences between groups could not be calculated.				
	Q11	18.112	2	0.000	G1-G2	12858.500	15939.500	-4.245	0.000
	Q12	8.901	2	0.012	G1-G2	14212.500	17293.500	-2.794	0.005
	Q13	11.979	2	0.003	G1-G2	13953.000	17034.000	-3.036	0.002
	Q14	22.708	2	0.000	G1-G2	12022.000	15103.000	-4.643	0.000
	Q15	7.409	2	0.025	G1-G2	13830.000	16911.000	-2.432	0.015
	Q17	21.146		0.000	G1-G2	11725.000	14806.000	-4.478	0.000
	Q19	7.533	2	0.023	Differences between groups could not be calculated.				
	Q20	10.837	2	0.004	G1-G2	13736.000	16817.000	-2.488	0.013
	Q21	45.654	2	0.000	G1-G2	9899.500	12980.500	-6.290	0.000
	Q23	18.034	2	0.000	G1-G2	11761.000	14842.000	-4.245	0.000
	Q24	11.405		0.003	G1-G2	12749.000	15830.000	-3.359	0.001
	Q27	14.284		0.001	G1-G2	12913.500	15994.500	-3.207	0.001
	Q28	9.177	2	0.010	G1-G2	13422.000	16503.000	-2.879	0.004

Groups of current academic year: G1: 1st year, G2: 2nd year, G3: 3rd year, G4: 4th year. Groups of families' average monthly income: G1: <1 Minimum Wage (MW), G2: 1 MW, G3: 1,1-5 MW, G4: 5,1 + MW. Groups of Mothers' and fathers' education levels: G1: Literate, G2: Primary education, G3: Secondary education, G4: High school, G5: Higher education. Groups of Conscious choice of department: G1: Those who answered "Yes,", G2: Those who answered "No,", G3: Those who answered "Partially."

3.3. Working conditions and wage perception

As presented in Table 5, students expressed relatively low levels of satisfaction with working conditions and expected wages within the forestry profession. The average scores for Q18 (job anxiety), Q19 (satisfaction with expected wages), and Q20 (perceived physical difficulty of the job) were among the lowest across all items (Mean < 3.2). Notably, 61% of students reported concern regarding job-related stress and uncertainty (Q18).

According to Table 7, first-year students had significantly more optimistic views about wages and working conditions than their fourth-year peers (Q19, $p < 0.05$). These findings suggest that as students advance in their studies, their perceptions become more cautious or critical, possibly due to increased exposure to sector realities. Nonetheless, the findings reflect subjective expectations and should not be interpreted as objective assessments of actual employment conditions.

3.4. Tendency to work in rural areas

According to Table 5, a substantial proportion of students expressed a willingness to work in rural areas (Q28), with 72% of respondents agreeing or strongly agreeing. This may reflect a positive disposition toward nature-oriented working environments and a sense of professional purpose.

However, Table 7 indicates that first-year students were significantly more inclined toward rural work than fourth-year students ($p < 0.01$). This difference may reflect changing expectations or concerns related to work-life balance, infrastructure, or social opportunities as graduation approaches. As with other results, these responses reflect subjective preferences rather than actual behavior or professional outcomes.

3.5. Conscious choice of department and educational background

Analysis of students' responses showed that 81.6% reported consciously selecting the forestry engineering department. As seen in Figures 2 and 3, the rate of conscious selection remains consistently high—around 80%—across

all parental education levels, from primary to postgraduate. A correlation analysis (Table 8) confirmed that there was no statistically significant relationship between students' conscious choice and their parents' educational background ($p > 0.75$). These findings indicate that students' decision-making appears to be relatively independent of family education level.

3.6. Socioeconomic background

To assess students' socioeconomic status, we examined their reported monthly family incomes, which ranged from 5,000 TL to 40,000 TL. Figure 4 presents the distribution of participants based on household income levels expressed in multiples of the national minimum wage. The majority of students (74.7%) reported incomes between 1.1 and 5 times the minimum wage, while only 4.6% exceeded 5.1 times the minimum wage.

Although no direct statistical relationship was found between income level and most survey items, socioeconomic background was considered in the interpretation of certain differences in students' professional satisfaction and employment expectations. These income-based variations, while not always statistically significant, may reflect broader disparities in perception shaped by material conditions.

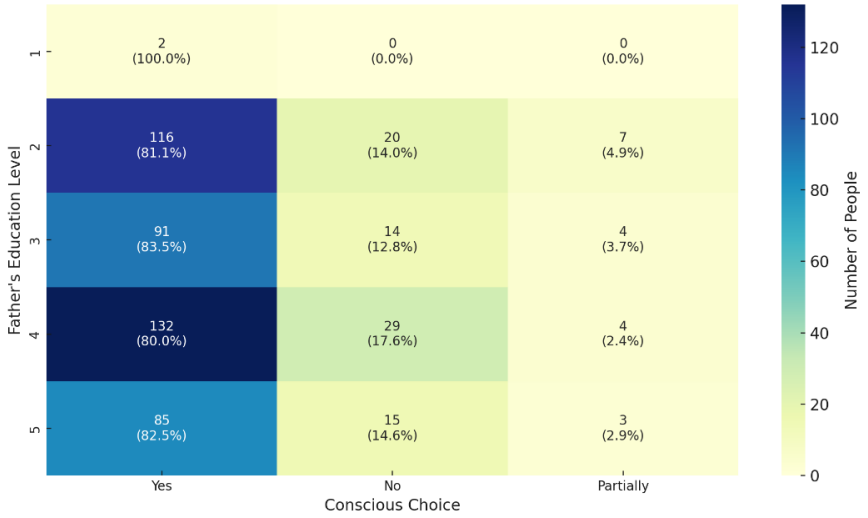

Figure 2. Distribution of students' conscious department choices by father's education level

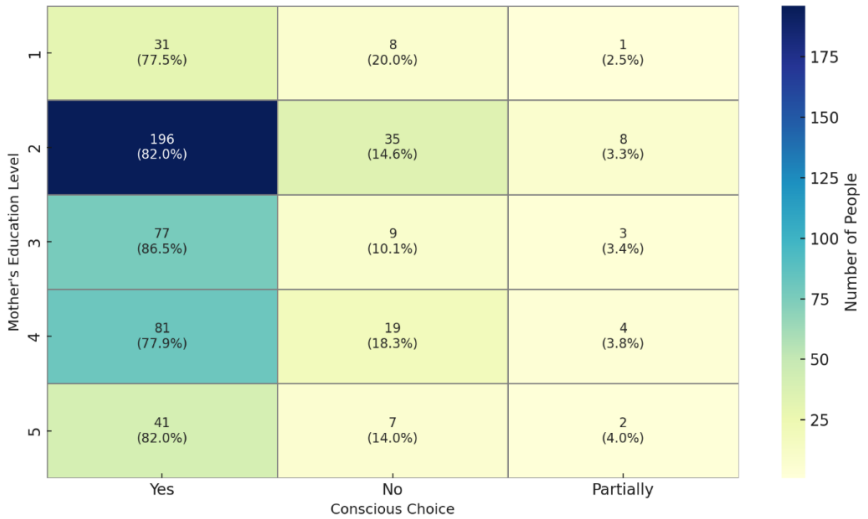

Figure 3. Distribution of students' conscious department choices by mother's education level

Table 8. Correlation between students' conscious department choice and parental education levels

	Spearman's rho	Mother's education level	Father's education level
Conscious choice of department	Correlation Coefficient	0.011	-0.014
	Sig. (2-tailed)	0.807	0.751

**Correlation is significant at the 0.01 level (2-tailed) *Correlation is significant at the 0.05 level (2-tailed)

3.7. Public and private sector perceptions

As presented in Table 5, students showed a clear preference for public sector employment. Specifically, 66% of participants agreed or strongly agreed that the public sector offers better advantages than the private sector (Q22), while only 38% agreed that the private sector provides more professional opportunities (Q23).

According to Table 7, final-year students and those who made a conscious departmental choice expressed significantly stronger preferences for the public sector compared to other groups (Q22, $p < 0.01$). These differences may reflect perceived job security, benefits, and social status associated with public employment. However, these views reflect subjective beliefs and should not be interpreted as evaluations of the actual performance of either sector.

3.8. Employment anxiety and occupational expectations

As shown in Figure 5, the majority of students (74.1%) indicated a desire to work in the Ministry of Agriculture and Forestry after graduation. Preferences for the private sector (8.8%), academia (8.2%), working abroad (5.2%), and other fields (3.6%) were relatively low.

According to Table 5, while students reported moderately positive perceptions of professional opportunities in forestry (Q17; M = 4.1), responses to items related to employment expectations (Q24–Q27) and anxiety (Q29) reflected uncertainty and concern. For instance, 64% of students expressed worry about potential unemployment (Q29), and the average scores for short-term employment confidence remained below 3.5.

As shown in Table 7, fourth-year students were significantly more anxious about unemployment (Q29) and reported lower expectations for securing a job shortly after graduation (Q24–Q26) compared to first-year students ($p < 0.01$). They also expressed more doubts about fairness in public sector recruitment (Q27).

Socioeconomic differences also influenced perceptions. Students from lower-income households were more likely to prefer public sector jobs, while those from higher-income and more educated families reported lower anxiety and more diverse preferences. Additionally, students who consciously chose their department showed clearer career goals but also demonstrated more skepticism about meritocracy in public recruitment.

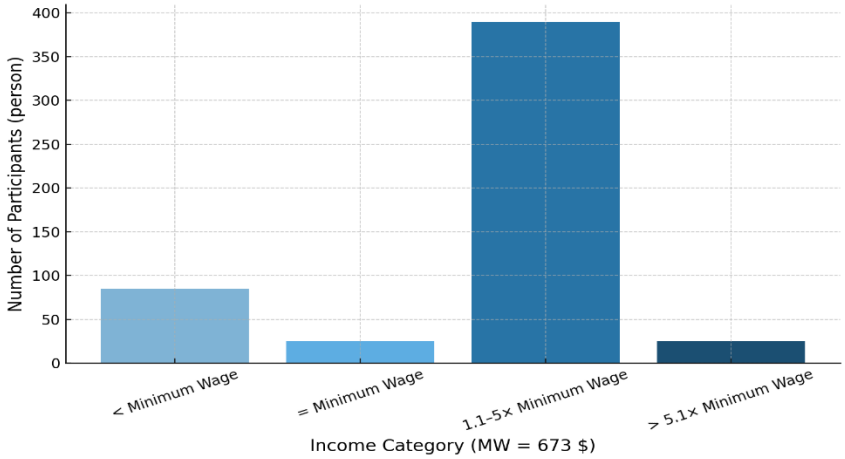

Figure 4. Distribution of monthly family income based on multiples of the minimum wage

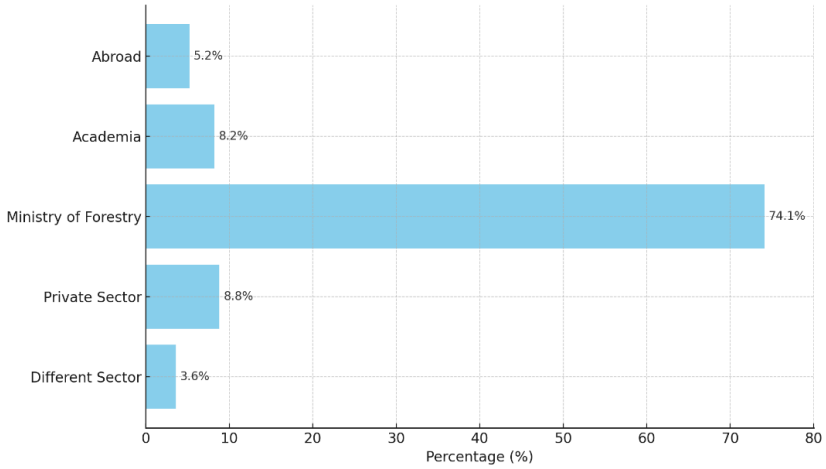

Figure 5. Post-graduation work preference distribution

4. Discussion

The findings of this study enabled a comprehensive evaluation of forest engineering students' professional perceptions and expectations across multiple thematic dimensions. These themes were interpreted in light of existing literature, and the analysis addressed students' views and concerns from sociocultural, economic, and educational perspectives.

4.1. Professional identity, satisfaction, and perceptions of gender suitability and discrimination

The findings of this study reveal that a substantial proportion of students express positive attitudes toward the forestry engineering profession. Many participants selected "Strongly Agree" for items related to job satisfaction and the perceived relevance of the profession in today's context. These results indicate that students embrace their professional identity and report high levels of satisfaction with their chosen field. However, this optimistic outlook tends to decline in later academic years, reflecting growing concerns about employment security and economic stability after graduation.

A strong association also emerged between students' professional outlook and whether they consciously chose their academic department. This is consistent with global studies indicating that intrinsic motivations—such as a desire to do beneficial work, achieve job satisfaction, and engage with nature—are key drivers in choosing forest-related education, often outweighing extrinsic concerns like salary or employment guarantees (Owuor et al., 2023). Students who reported making a conscious choice demonstrated higher levels of satisfaction and engagement with their field. This aligns with previous studies: Boni and Walker (2013) found that a sense of belonging in nature-oriented professions positively correlates with job satisfaction, while Ethier and DeWitt (2022) emphasized that developing a strong professional identity enhances student engagement and perceived competence.

Although the current study did not directly measure "professional belonging," the results show that a conscious departmental choice significantly aligns with more positive professional attitudes. In parallel, the literature highlights that professional belonging is a critical determinant of long-term career commitment, particularly in applied fields such as forestry (Kilpatrick and Bound, 2020).

When examining gender-related perceptions, we found that female students view the forestry profession more positively than their male counterparts and consider it well-suited to their gender. However, real-world evidence shows that even faculty in science disciplines may unconsciously favor male students over equally qualified female candidates when evaluating identical credentials, affecting perceptions of competence, hireability, mentorship opportunities, and salary offers (Moss-Racusin et al., 2012). This suggests that while student-level perceptions may appear positive, gender-based biases can still persist throughout academic and professional processes, starting from education and extending into employment decisions. These findings are supported by Owuor et al. (2023), who noted that female forestry students globally tend to rank meaningful work and environmental impact more highly, although this does not always translate into a preference for specific forest-related career fields. However, they exhibit lower levels of confidence regarding gender equality within the field. A significant portion of respondents indicated that gender-based discrimination persists in forestry, suggesting that gender role stereotypes continue to influence professions perceived as physically demanding. Research has shown that female engineers are particularly sensitive to perceived discrimination in nature-based and field-oriented careers (Yurdakul Erol, 2022).

Although female students perceive the profession as personally suitable, their trust in broader gender equality remains limited. This contrast between personal alignment and systemic concern aligns with findings from Lidestav and Egan Sjölander (2007), who reported that forestry has traditionally maintained male-dominated structures, resulting in reduced visibility for women. Similarly, Larasatie et al. (2020) and Elias et al. (2023) emphasised the structural barriers that hinder the professional advancement of female students in the sector. This is also supported by Bullard et al. (2024), who noted that female representation in undergraduate forestry programs in the U.S. remains below 30%, despite broader increases in STEM diversity. In light of these findings, Park et al. (2025) recommend the integration of gender equality-focused courses and institutional practices into forestry education curricula to promote inclusivity and balanced representation.

4.2. Socioeconomic status and conscious choice

Students' academic year, income status, and the extent to which they made a conscious choice of department significantly influence their attitudes toward the profession. Regarding educational background and departmental selection, the majority of participants reported consciously choosing forest engineering. Higher parental education levels and students' personal interest in the discipline appear to increase the effectiveness of their academic engagement. Boni and Walker (2013) and Mak and Chen (2022) argue that environmentally conscious youth are more likely to make deliberate decisions when selecting forestry programs. In addition, interdisciplinary and applied education models have been shown to enhance student engagement (Ethier and DeWitt, 2022).

Students who made a conscious choice of department reported higher levels of satisfaction with their academic experience. Globally, students pursuing forest-related programmes frequently cite passion for nature, environmental impact, and working outdoors as core motivational factors (Owuor et al., 2023), supporting the view that intrinsic drivers increase academic commitment. This finding is consistent with the literature, which suggests that conscious academic choices are positively associated with both academic satisfaction and professional commitment (Zencir and Eşer, 2016; Korkmaz and Duman, 2019). These results underscore the need for stronger career guidance mechanisms during the university selection process.

Moreover, forest engineering students often report a loss of motivation due to irregular working hours, low wages, and the physically demanding nature of the profession. According to an FAO (2024) report, improving the financial and social rights of forestry workers is essential to ensuring long-term workforce sustainability. Similarly, Köse et al. (2020) and Owuor et al. (2023) emphasise that inadequate wages and harsh working conditions deter new entrants to the profession. These concerns highlight the need to revisit long-

term employment strategies in the sector. Supporting this, a study by Park et al. (2025) in Korea found that forestry students consider not only their interests and skills but also economic returns, work-life balance, and workplace conditions when making career decisions. The findings of the present study similarly demonstrate that forest engineering students' professional expectations are shaped by multiple factors, particularly job security, public recruitment fairness, wage levels, and working conditions.

4.3. Inclination to work in rural areas

The average scores for the thematic group concerning the willingness to work in rural areas indicate that most students express a highly favourable attitude toward such employment. This tendency reflects a strong affinity for nature-based professions like forest engineering. However, students' willingness to pursue rural careers is significantly shaped by their academic year level, socioeconomic background, and whether they consciously chose their department.

Notably, survey results indicate that final-year students reported lower motivation for pursuing rural careers compared to first-year students. This may reflect a shift from idealistic motivations—such as nature affinity and outdoor work, which are globally common among forestry students (Owuor et al., 2023)—toward more pragmatic concerns about infrastructure and job quality in rural areas. This difference may reflect evolving perceptions during the course of study. This trend aligns with the findings of Sowl et al. (2022), who note that young professionals working in rural areas frequently encounter challenges such as limited social amenities, infrastructure deficiencies, and concerns about personal safety.

To sustain students' early motivation, it is essential to implement targeted spatial and regional development policies. Without such support, persistent uncertainties regarding job security and the limited appeal of private sector opportunities may erode students' willingness to work in rural areas—despite their initially positive attitudes.

4.4. Public and private sector perceptions

The findings on public and private sector perceptions reveal a general dissatisfaction among students toward both employment domains. Students' limited trust in private sector opportunities may stem from the subcontractor-based structure of private forestry services in Türkiye, which often lack long-term career prospects and job security. Students' evaluations appear to be more strongly influenced by whether they made a conscious choice of department than by demographic characteristics. Those who reported having consciously selected forestry as their field of study demonstrated more critical views of the private sector. However, this conscious engagement does not appear to result in significant variation in perceptions of the public sector.

Consistent with these findings, Küçükarslan et al. (2024) emphasise that job security remains the primary reason why individuals continue to prefer public sector employment, while low wages and employment instability reduce the attractiveness of the private sector. Additionally, Bullard et al. (2024) indicate that the lack of institutional diversity and inclusion initiatives in the forestry profession may further discourage women and minority students from pursuing careers in the private sector. International sources, such as FAO (2024) and Elias et al. (2023), similarly underline the necessity of strengthening private sector opportunities in forestry.

Drawing on Bourdieu's (1986) theory of capital, students with limited economic resources may experience reduced educational motivation and constrained employment aspirations. Accordingly, students from lower-income households are more inclined toward public sector jobs, particularly due to the perceived promise of long-term security and social protection (Yurdakul Erol, 2022).

4.5. Employment and professional expectations

The findings indicate that forest engineering students generally experience moderate levels of employment anxiety and maintain cautiously optimistic professional expectations. Although many students express a preference for employment in the public sector, their confidence in securing short-term job opportunities remains low. This parallel concerns raised by Bullard et al. (2024), who observed that underrepresented students in the U.S. forestry sector often experience similar career uncertainties due to limited mentorship, unclear advancement pathways, and weak institutional support systems. Final-year students report significantly lower levels of employment optimism and higher concerns about job security and long-term professional prospects compared to lower-year students. These group differences suggest heightened uncertainty in post-graduation planning among upper-year students.

Notably, final-year students and those who made a conscious choice of department report higher levels of employment-related anxiety and adopt a more critical outlook on the profession. These trends suggest that deeper engagement with the field may heighten awareness of systemic challenges in the labour market.

The results further underline the need for academic programs to support students not only in technical competencies but also in building confidence, adaptability, and a broader understanding of green employment opportunities. Given that gender-based biases can manifest even in academic evaluations and mentorship processes (Moss-Racusin et al., 2012), it is essential for educational programs to foster inclusive mentoring environments, raise awareness of implicit bias, and offer gender-sensitive career support. Owuor et al. (2023) emphasize the necessity of diversifying forest-related education by integrating topics such as climate change, ecosystem services, and international forestry governance to align curricula with students' evolving career aspirations. While socioeconomic and familial factors show relatively weak correlations with employment expectations, important patterns emerge. As family income and parental education levels increase, students are more likely to consider alternative employment pathways beyond the public sector, and report lower levels of unemployment anxiety. Interestingly, students who consciously selected their department acknowledge the profession's career potential but express less confidence in the fairness and transparency of public sector recruitment.

Our findings align with previous studies by Durusoy and Bahçeci (2022) and Legilisho-Kiyiapi (2004), which highlight that employment security plays a decisive role in shaping students' career choices. Similarly, concerns about

the lack of meritocracy in public sector recruitment significantly diminish students' trust in institutional employment processes (Küçükarslan et al., 2024). This study attributes students' declining motivation to actively pursue post-graduation job opportunities to broader structural and policy-related issues (FAO, 2024; Park et al., 2025). The perception that public sector hiring lacks transparency and fairness is widespread among respondents.

Legilisho-Kiyiapi (2004), in the African context, observed that forestry education was traditionally dominated by tree-centric curricula, which created a misalignment between training and real-world career demands. Similar patterns emerge in this study: Turkish forestry students express doubts about employment opportunities, evolving sector dynamics, and the overall credibility of recruitment mechanisms.

Furthermore, socioeconomic background appears to compound these anxieties. Approximately 20% of participants come from households with monthly incomes at or below the minimum wage, and the majority live within 1 to 5 times that threshold. This financial vulnerability likely reinforces the preference for stable public sector jobs and heightens concern over job security.

Overall, the findings suggest that forest engineering students hold complex, multidimensional perspectives on their future careers. While they generally report strong professional identification with the field, concerns related to employment conditions, gender equity, rural placements, and limited trust in the private sector reflect both psychosocial and structural challenges. These insights underline the need to complement technical forestry education with enhanced career counselling, motivation-focused strategies, and increased sectoral awareness to better prepare students for the evolving realities of the profession.

5. Conclusion

This study investigated the professional perceptions, career expectations, and employment-related anxieties of undergraduate forestry engineering students in Türkiye, based on data collected from 12 public universities. Students generally expressed strong initial motivation toward the profession. However, final-year students reported lower levels of optimism, which may be associated with their heightened awareness of job insecurity, challenging working conditions, and perceived inequalities. Conscious selection of the department and socioeconomic background were found to significantly influence their professional satisfaction and future outlook.

In light of these findings, the following recommendations are proposed:

Enhancing transition support mechanisms. Universities should implement career counseling, mentorship programs, and job placement initiatives to help final-year students manage employment-related anxiety.

Encourage informed decision-making at entry. Forestry faculties and high school counselors should collaborate to provide realistic and engaging information about the profession, helping students make conscious academic choices.

Integrate gender awareness into forestry education. Curricula should include gender equality training and inclusive practices to address perceptions of structural inequality in the sector.

Address declining rural interest. Targeted policies, such as rural internships and region-specific career incentives, are needed to maintain students' willingness to work in remote areas.

Broaden international opportunities. Expanding participation in EU-funded mobility programs (e.g., Erasmus+) can increase students' global competencies and career readiness.

Foster public–private partnerships. Closer collaboration between universities and forestry stakeholders can help align educational content with actual labor market demands.

Ultimately, forestry engineering students begin their academic journey with strong professional enthusiasm. To preserve and build upon this motivation, institutions must adopt student-centered, inclusive, and future-oriented strategies that bridge educational experience with evolving sectoral realities.

Acknowledgements

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