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Work Accidents, Occupational Diseases, and Lost Workdays in Türkiye's Forestry Sector: Increasing Risks and Improvement Proposals for the 2019-2023 Period

Türkiye'de Ormancılık Sektöründe İş Kazaları, Meslek Hastalıkları ve İş Günü Kayıpları: 2019-2023 Dönemi İçin Artan Riskler ve İyileştirme Önerileri

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Abstract

In this study, data regarding occupational accidents and diseases, as well as workday losses in the forestry sector in Turkey between 2019 and 2023, have been thoroughly analysed using official statistical annual reports from the Social Security Institution. In 2019, there were 27,025 employees in the sector, which increased by 31.42% to 35,517 by 2023. Alongside the rise in the number of employees, occupational accidents in the sector have also increased year by year, peaking in 2022 with 860 accidents, 14 of which resulted in fatalities. Over the five-year period, only one case of occupational disease was reported, indicating significant deficiencies in the identification and reporting of health risks within the sector. The increase in the number of lost workdays due to occupational accidents and diseases reached 11,125 in 2022, particularly during the COVID-19 pandemic, adversely affecting productivity in the sector. Consequently, this study suggests that the forestry sector in Turkey needs to enhance its preparedness for emergencies and develop comprehensive occupational health and safety policies along with crisis management practices.

Keywords: Occupational accidents, Occupational diseases, Forestry sector, Occupational health and safety, Lost workdays

Özet

Bu çalışmada, Türkiye'de ormancılık sektöründe 2019-2023 yılları arasındaki beş yıllık dönem içerisinde meydana gelen iş kazaları ve meslek hastalıkları ile işgünü kayıplarına ait veriler, Sosyal Güvenlik Kurumu'nun resmi istatistik yıllıklarından yararlanılarak analiz edilmeye çalışılmıştır. 2019 yılında sektörde 27.025 çalışan bulunurken, bu sayı %31,42 artışla 2023 yılında 35.517'ye yükselmiştir. Çalışan sayısının artmasına paralel olarak sektördeki iş kazalarının da yıldan yıla arttığı, 2022 yılında 860 kazayla zirveye ulaştığı ve bu kazaların 14'ünün de ölümle sonuçlandığı tespit edilmiştir. Beş yıllık dönemde yalnızca bir meslek hastalığı vakası raporlanmıştır ve bu durum sektörde sağlık risklerinin tanımlanması ve raporlanmasında ciddi eksiklikler olduğunu ortaya koymaktadır. İş kazaları ve meslek hastalıkları nedeniyle kaybedilen işgünü sayısındaki artış, özellikle COVID-19 pandemisi sırasında 2022 yılında 11.125 işgününe ulaşmış ve bu durum sektörde verimliliği olumsuz yönde etkilemiştir. Sonuç olarak bu çalışma, Türkiye'de ormancılık sektörünün acil durumlara karşı daha güçlü bir hazırlık yapması gerektiğini ve kapsamlı iş sağlığı ve güvenliği politikaları ile kriz yönetimi uygulamalarının geliştirilmesini önermektedir.

Anahtar Kelimeler: İş kazaları, Meslek hastalıkları, Ormancılık sektörü, İş sağlığı ve güvenliği, İşgünü kaybı

Abbreviations: OHS, Occupational health and safety; PPE, Personal protective equipment; SGK, Social security institution; ESAW, European statistics on accidents at work.

1. INTRODUCTION

The forestry sector in Türkiye plays a crucial role in the sustainable management of the country's natural resources and economic development. However, this sector carries high risks regarding work accidents and occupational diseases. Forestry activities are physically demanding and hazardous, conducted over vast geographic areas under variable conditions. Therefore, this sector's occupational health and safety (OHS) issues are essential. Workers in the forestry sector are exposed to various climates, topographies, and vegetation types, which increase the risk of accidents and occupational diseases (Akay et al., 2023).

The Occupational Health and Safety Law No. 6331 regulates OHS practices in Türkiye, which imposes significant responsibilities on employers and employees. The law mandates the identification of hazards and risks, the implementation of preventive measures, and the application of continuous improvement processes in workplaces (İnanç & Ağyürek, 2019). However, the unique working conditions and challenges of the forestry sector can limit the effectiveness of OHS practices. For instance, forestry workers are often seasonal labourers, facing low wages and inadequate working conditions (Özden et al., 2011).

Work accidents and occupational diseases in the forestry sector are commonly caused by working with cutting tools and machinery. Injuries from tools like chainsaws and axes are among the most frequent work accidents. Furthermore, the low use of personal protective equipment (PPE) makes it challenging to prevent severe and fatal accidents (Top et al., 2016; Yoshimura & Acar, 2004). Working with high-noise-producing machinery, such as chainsaws, adversely impacts health and reduces both productivity and safety on the job. Additionally, the development of occupational diseases poses a significant financial burden not only for the worker but also for the employer and the state (Albayrak et al.,2023). Job satisfaction among workers is also low, which increases the risk of work accidents and occupational diseases (Top et al., 2016).

The COVID-19 pandemic has again highlighted the importance of OHS issues in the forestry sector. A study on the perceptions of OHS among workers in the forest products industry during the pandemic revealed that workers' awareness of OHS issues increased, but this awareness needs to be sustained. Being prepared for crises like the pandemic and implementing new practices are essential for the continuous improvement of OHS in the forestry sector (Kırklıkçı & Bayram, 2024).

In Türkiye's forestry sector, occupational health and safety are critical for workers' safety and well-being and enterprises' productivity and sustainability. Effective management of OHS practices is necessary to prevent work accidents and occupational diseases and to enhance workers' job satisfaction. In this context, further research and improvement of OHS in the forestry sector are paramount for the future of workers and businesses (Küçükarslan et al., 2023).

This study aims to examine work accidents, occupational diseases, and lost workdays in Türkiye's forestry sector and its sub-activities—forest cultivation (silviculture) and other forestry activities, logging, the gathering of non-wood forest products, and support activities for forestry—using data from the Social Security Institution (SGK). Studies on the prevalence of work accidents and the risk factors causing these accidents in Türkiye's forestry sector reveal the dangerous nature of the industry. In a survey conducted within the boundaries of the Trabzon Forest Directorate, the annual accident frequency rate was 30.4%, with an accident incidence of 2052.9. Factors such as hook use, smoking, and the number of breaks taken were identified as increasing the risk of work accidents (Enez et al., 2014). Another study in the Western Black Sea region indicated that personal and organisational factors were the primary

contributors to fatal work accidents. The study found that being in a dangerous area, negligence, and irregular behaviour led to deadly accidents (Melemez, 2015).

The results of work accidents in the forestry sector are striking compared to other industries. An analysis of the 2008-2018 period revealed that the incidence rate and frequency rate of work accidents in the forestry sector accounted for 41.1% and 40.8% of all sectoral values, respectively. These rates are more favourable than the metalworking, mining, and construction sectors but more unfavourable than the textile industry (Akay et al., 2023).

Research on the causes and consequences of work accidents in the forestry sector shows that many of these accidents stem from personal and organisational factors. For instance, the leading causes of fatal work accidents in forest harvesting operations in Türkiye include being in a dangerous area, negligence, irregular behaviours, and improper worker selection (Melemez, 2015).

This situation demonstrates the need for further measures regarding occupational safety and health in the forestry sector. Work accidents and occupational diseases not only threaten the health of workers but also lead to lost workdays, which represent a significant economic burden for both workers and employers. To prevent lost workdays and occupational diseases in the forestry sector, it is necessary to increase safety training, promote the use of appropriate equipment, and conduct regular health check-ups.

Examining work accidents, occupational diseases, and lost workdays in the forestry sector and its sub-activities in Türkiye is essential for improving safety in the industry and protecting workers' health. This study will evaluate the industry's current situation based on SGK data and discuss the necessary measures for improving occupational safety. Through this analysis, it aims to contribute to the creation of safer and healthier working conditions in the forestry sector.

2. MATERIALS and METHOD

According to the Social Insurance and General Health Insurance Law No. 5510, work accidents and occupational diseases cover only insured individuals (SGK, 2006). Therefore, this study utilises data from the statistical yearbooks of the Turkish Social Security Institution (SGK) as its primary data source. The study examines the statistics related to “work accidents and occupational diseases,” “statistics on periods of incapacity for work,” and “statistics on insured employees and workplaces” from the five years between 2019 and 2023, aiming to analyse work accidents, occupational diseases, and days of incapacity for work in Türkiye’s Forestry

and Industrial Wood Production sector among insured employees. After 2017, due to the classification of employees under Law No. 5510 into two categories, 4a and 4b, the data for the five years from 2019 to 2023 includes the total for these two groups. The definitions of the concepts examined in this study are provided below.

Work Accident: A work accident is defined as an event that occurs while the insured person is present at the workplace and causes immediate or later physical or mental harm to the insured. It also includes events that occur outside the workplace while the insured is performing tasks assigned by the employer or working independently on behalf of themselves and cause immediate or later physical or mental harm. Additionally, a work accident can occur if an insured employee, under the orders of the employer, is sent to another location for work-related duties and, during the time not engaged in their primary task, experiences an event that causes immediate or later physical or mental harm. This also includes accidents occurring during the time provided to nursing mothers to breastfeed their children and accidents that happen while the insured is commuting to and from work using transportation provided by the employer (5510 Sayılı Kanun, 2006).

Work Accident Frequency Rate: This indicates how many insured employees out of 100 full-time workers experience a work accident. The formula is as follows:

$$Work\ Accident\ Frequency\ Rate\ =\ IAF\ /\ (Total\ Working\ Hours)\ *\ 225.000$$

In this formula, IAF refers to the number of insured employees who have experienced work accidents. In contrast, Total Working Hours refers to the product of the total number of employees and 2.250 hours, assuming a full-time employee works 45 hours per week for 50 weeks a year. The factor of 225.000 is the calculated coefficient for 100 insured full-time employees working 45 hours per week for 50 weeks in a year (Akyüz et al., 2016; Aritan & Ataman, 2017).

Fatal Work Accident: According to the definition adopted by the European Statistics on Accidents at Work (ESAW) project, “fatal work accidents are accidents that result in the death of an insured worker within one year following the accident” (Erginel & Toptancı 2017).

Occupational Disease: An occupational disease refers to any temporary or permanent illness, physical, or mental disability resulting from repeated exposure or working conditions specific to the nature of the insured's job (5510 Sayılı Kanun, 2006).

Incapacity for Work: Incapacity for work refers to when an injured employee cannot work due to a work accident. Temporary incapacity for work refers to the number of days the

insured cannot work, as indicated by medical reports from doctors or health boards authorised by SGK, due to work accidents, occupational diseases, illness, or maternity. Permanent incapacity for work refers to the number of insured individuals who, due to a work accident or occupational disease, have been found to have lost at least 10% of their earning capacity, as determined by medical boards of SGK-authorized health institutions, based on reports issued by these boards (5510 Sayılı Kanun, 2006).

3. RESULTS and DISCUSSION

In 2019, there were 3.367 workplaces in the forestry sector in Türkiye, both public and private. By 2023, this number decreased by approximately 0.65%, falling to 3.345. Table 1 shows the number of workplaces in the forestry and industrial wood production sector annually (SGK, 2024).

Table 1. Number of workplaces in the forestry sector by year

Year	Permanent	Temporary	Public	Private	Total
2023	1.222	2.123	454	2.891	3.345
2022	709	3.959	472	4.196	4.668
2021	1.044	3.369	449	3.964	4.413
2020	957	3.298	442	3.813	4.255
2019	886	2.481	433	2.934	3.367

Parallel to this decrease in the number of workplaces, the total number of insured employees in the forestry sector, which was 27.025 in 2019 (3.416 women and 23.609 men), increased to 35.517 in 2023 (3.931 women and 31.586 men), showing an increase of approximately 31.42% over the five years. Table 2 shows the number of employees in the forestry and industrial wood production sector by year (SGK, 2019; SGK, 2020; SGK, 2021; SGK, 2022; SGK, 2023).

Table 2. Number of employees in the forestry sector by year

Year	Permanent	Temporary	Public	Private	Men	Women	Total
2023	22.367	13.150	24.049	11.468	31.586	3.931	35.517
2022	26.705	19.036	29.896	15.845	40.173	5.568	45.741
2021	19.792	18.513	22.406	15.899	33.064	5.241	38.305
2020	17.794	16.785	20.023	14.556	30.048	4.531	34.579
2019	13.541	13.484	14.696	12.329	23.609	3.416	27.025

Between 2019 and 2023, 3.375 work accidents occurred in the forestry sector, 60 of which resulted in death. The highest number of work accidents during these five years occurred in 2022, with 860 work accidents, 14 of which resulted in death. Table 3 shows the number of work and fatal accidents per year in the forestry and industrial wood production sector (SGK, 2019; SGK, 2020; SGK, 2021; SGK, 2022; SGK, 2023).

Table 3. Number of work accidents and fatal work accidents in the forestry sector by year

Year	Number of Work Accidents	Number of Fatal Work Accidents
2023	792	12
2022	860	14
2021	705	12
2020	508	13
2019	510	9

The work accident frequency rate, calculated per 100 full-time employees, was lowest in 2020 at 1.47 and highest in 2023 at 2.23. Figure 1 shows the work accident frequency rates in the forestry and industrial wood production sector by year (SGK, 2019; SGK, 2020; SGK, 2021; SGK, 2022; SGK, 2023).

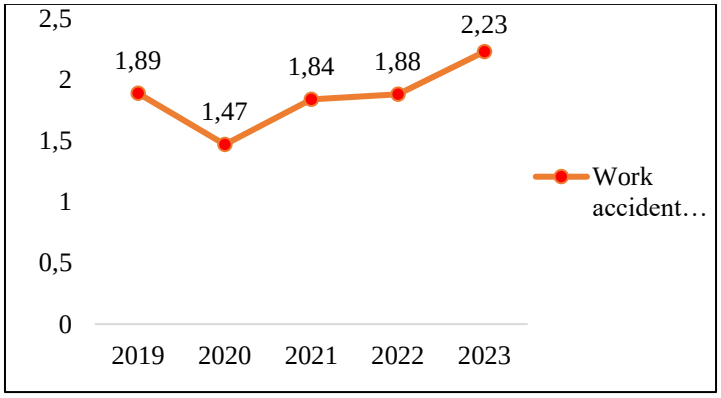

Figure 1. Work accident frequency rates in the forestry sector by year

Between 2019 and 2023, only one occupational disease was reported in the forestry sector, which did not result in death. Table 4 shows the number of occupational and fatal diseases per year in the forestry and industrial wood production sector (SGK, 2019; SGK, 2020; SGK, 2021; SGK, 2022; SGK, 2023).

Table 4. Number of occupational diseases and fatal occupational diseases in the forestry sector by year

Year	Number of Occupational Diseases	Number of Fatal Occupational Diseases
2023	0	0
2022	0	0
2021	0	0
2020	1	0
2019	0	0

Between 2019 and 2023, forestry sector employees took 38.218 temporary incapacity leave due to work accidents, including 35.867 days treated as outpatients and 2.351 days spent as inpatients. The highest number of days of incapacity was recorded in 2022, with 10.377 days, mainly due to the impact of the COVID-19 pandemic. Table 5 shows the number of days of temporary incapacity due to work accidents in the forestry and industrial wood production sector by year (SGK, 2019; SGK, 2020; SGK, 2021; SGK, 2022; SGK, 2023).

Table 5. Number of days of temporary ıncapacity due to work accidents in the forestry sector by year

Year	Outpatient Treatment	Inpatient Treatment	Total
2023	7.566	595	8.161
2022	10.377	748	11.125
2021	7.218	465	7.683
2020	5.728	265	5.993
2019	4.978	278	5.256

In Türkiye, a total of 2.590.007 work accidents occurred between 2019 and 2023, resulting in the deaths of 7.275 employees. Additionally, 5.168 employees were diagnosed with occupational diseases, and 48 employees lost their lives due to occupational diseases during this period (SGK, 2019, 2020, 2021, 2023). Considering only 2023, in which 681.655 work accidents and 1.972 fatal ones were recorded, the SGK data suggests that a work accident occurs approximately every 46 seconds in Türkiye, and five employees lose their lives each day due to work accidents.

This study examined data related to occupational health and safety (OHS) in the agricultural sector in Türkiye between 2019 and 2023, and the current situation in the Forestry and Industrial Wood Production Sector was evaluated based on the findings. The results indicate that OHS practices in this sector are inadequate and need improvement.

The data reveals an increasing work accident over the years. The 3.375 work accidents between 2019 and 2023 show that employees in this sector face significant risks. Sixty of these accidents resulted in death, with the highest number of accidents (860) and fatalities (14) recorded in 2022. On average, 1.86 out of every 100 forestry sector employees experienced a work accident during the five years. The rising trend in work accidents highlights the insufficiency of OHS measures in the forestry and industrial wood production sectors. It emphasises the need for more comprehensive policies in this area.

Common accidents in the forestry sector include operator errors or technical malfunctions when using dangerous machinery such as chainsaws, tractors, and cranes, falls from heights during tree felling, pruning, or transportation, trees falling on workers, slips, trips, and falls on uneven, slippery, or muddy terrain in forested areas, and machinery overturning or workers being crushed during the transport of cut trees or wood. Workers' education levels should be improved, safety protocols should be tightened, and modern equipment should be encouraged to reduce such accidents.

Regarding occupational diseases, only one case was reported during the five years. Based on the literature, the expected reporting rate for occupational diseases ranges from 0.4 to 1.2 per thousand annually. Still, the average reporting rate for occupational diseases in Türkiye is around 0.04 per hundred thousand (Keçeci, 2020). The low number of reported cases suggests that occupational diseases are not being adequately diagnosed or reported. Forestry sector employees are exposed to various health risks, including dust exposure, biological agents, and heavy physical workloads. Therefore, regular health screenings and training programs are crucial for the early detection and prevention of occupational diseases.

An analysis of temporary incapacity periods shows that employees took 38.218 days of temporary incapacity leave during the five years. The highest number of days (11.125) was recorded in 2022, mainly due to the impact of the COVID-19 pandemic. This indicates the sector's vulnerability to unexpected events such as pandemics and highlights the need to strengthen emergency response plans and health measures. Developing and effectively implementing emergency management plans is essential to mitigate global health crises' effects on sector employees like the pandemic.

4. CONCLUSION

This study thoroughly analysed occupational accidents, diseases, and lost workdays in Türkiye's forestry sector between 2019 and 2023, revealing the occupational health and safety (OHS) challenges the sector faces and the necessary measures to address these challenges. The data show a year-over-year increase in work accidents, peaking in 2022 with 860 accidents, 14 of which were fatal. This trend, combined with the inherently high-risk nature of the sector, clearly indicates that current OHS measures are insufficient and that more comprehensive policies need to be developed in this area.

The fact that only one case of occupational disease was reported over the five-year period highlights serious deficiencies in the identification and reporting of health risks. Compared to the expected reporting rate for occupational diseases, this figure is significantly low, suggesting that health risks such as dust, biological agents, and heavy physical labor faced by sector employees may be overlooked.

Moreover, the increasing number of workdays lost due to work accidents and occupational diseases has negatively impacted sector productivity. In particular, the COVID-19 pandemic resulted in 11,125 lost workdays in 2022, underscoring the sector's vulnerability to crises. The pandemic period emphasized the need for stronger preparedness for emergencies and the importance of enhancing OHS policies to include crisis management components.

One of the reasons for occupational accidents is the lack of a desired level of safety culture. It is anticipated that employing workers with higher education levels, increasing training activities, improving management’s attitudes and behaviors, eliminating the notion of fatalism, taking measures to enhance awareness and competence, ensuring active employee participation in safety, establishing effective communication, and developing a reporting culture through a strong reporting system will contribute to reducing workplace accidents. Additionally, the effective implementation of occupational health and safety (OHS) practices is expected to foster a positive safety culture within organizations and facilitate its dissemination among all employees (Albayrak & Tuna, 2021).

In light of these findings, several policy recommendations can be developed to improve occupational health and safety in the forestry sector. First, there is a need to increase OHS training for workers and promote modern and safe equipment use. Training programs should include the safe operation of dangerous machinery and emergency response procedures. In addition, steps should be taken for regular health screenings and the early diagnosis of

occupational diseases, ensuring that workers are better protected against health risks. To reduce work accidents and occupational diseases, stricter enforcement of OHS regulations and increased inspections are also crucial.

These improvements will protect workers' health and safety and contribute to the sector's sustainability. Improving the working conditions of seasonal forestry workers, such as providing adequate accommodation and hygiene facilities, is also essential from an occupational health and safety perspective.

In conclusion, occupational health and safety in the forestry sector are vital for protecting workers' health and well-being and ensuring the industry's sustainability. The findings of this study highlight the necessary measures to be taken and the areas that need improvement in OHS in Türkiye's forestry sector, providing insight into future research in this area. Future studies that use more extensive data sets and examine the sector's various subfields in more detail will contribute to developing more comprehensive and effective OHS policies.

DECLARATIONS

There is no conflict of interest between the authors.

AUTHORS' CONTRIBUTIONS

The author contributes the study on his/her own.

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