DETERMINATION OF FOREST ENGINEER CANDIDATES' FOREST FIRE RISK PERCEPTION WITH THE FRAME OF DISASTER MANAGEMENT: AN EXAMPLE OF DÜZCE UNIVERSITY FOREST ENGINEERING STUDENTS

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Abstract

Disaster risk management is a process in which necessary strategies are implemented to reduce the probability of disaster and the negative effects of hazards. In order for risk management studies to be successful for natural disasters such as forest fires, floods and earthquakes, it is necessary to determine how people perceive risks. Forest engineers are required to respond quickly and effectively in forest fire disasters. After the disaster, it is important to determine the risk perceptions of forest engineers who are in charge of planning, orientation, coordination and support activities. The aim of this study is to determine the forest fire risk perceptions of Düzce University Forest Engineering Department students and to evaluate them within the framework of disaster management. Within the scope of the study, an online questionnaire was applied to a total of 100 forest engineering students. The findings were analyzed with the SPSS 22.0 quantitative data statistics program. In the evaluation of the data, number, percentage, mean and standard deviation values were calculated. In the first part of the questionnaire, there are questions about the class of the students, gender, whether they live in rural or urban areas, and whether they have experienced forest fire disasters. In the second part of the questionnaire, propositions consisting of 31 items and 3 sub-factors for forest fire awareness were presented. In the range of (1) strongly disagree- (5) strongly agree, it was discussed under 3 sub-headings as consciousness before forest fire, false disaster awareness and consciousness after forest fire on a 5-point Likert scale. As a result of the study; It has been determined that forest engineer candidates generally have high consciousness perceptions before forest fire, and moderate perceptions of post-forest fire consciousness and false disaster awareness.

Keywords: *ecological safety, forest fire, forest engineering, disaster management, Düzce*

1. INTRODUCTION

Disaster risk management is a process in which the necessary strategies are implemented to reduce the probability of disaster and the negative effects of hazards. Researchers emphasize the necessity and importance of disaster risk perception studies in order to combat disasters more effectively. It is necessary to investigate the risk perception of people in order to create more resilient societies against disasters and to develop necessary plans, programs and policies (Bronfman vd., 2016; Mızrak 2021). There are different studies in the literature that show that the success of risk management for many natural disasters such as forest fires, flood disasters, earthquakes, hurricanes, landslides, etc. depends on human perception (Xu et al., 2019; Mendonca and Gullo, 2020; Özkılıç and İpek 2021).

Forest fires, similar to other disasters, are one of the disasters that have social, economic, ecological and environmental causes and consequences (Bilgili et al. 2005; Özden et al. 2012). Forestry engineers are required to respond quickly and effectively in forest fire disasters. As stated in the law numbered 5531 and 6831, which includes the job description of Forest Engineers in Turkish national legislation, forest engineers are authorized to "*fight forest fires and pests, plan, study, construct, maintain and control forest roads and forest fire safety roads and strips*" (Anonymous 2022a). After the disaster, it is important to determine the risk perceptions of forest engineers who are in charge of planning, orientation, coordination and support activities.

In the literature, there are evaluations made under the headings of determining the perspectives of university students preparing for the profession, evaluating student perceptions, approach of young individuals and z generation perception studies on natural disasters and disaster preparedness (Karatekin et al. 2014; Ay and Yalçın Erik 2020).

Studies on the determination of global climate change perceptions of forest engineering students, determination of environmental sensitivity of university students, disaster perceptions of students, etc. have significantly increased in recent years in Turkey (Yılmaz et al. 2002; İncekara and Tuna 2010; Güloğlu and Bulut 2016; Uzun 2021). It is directly related with their vocational training that forest engineers, who will take a primary role in forest fires prevention, forest fire extinction and post-fire improvement studies, can predict which disaster hazards exist in their immediate surroundings and how and at what will be the level of the impact of these hazards. For these reasons, the aim of this study is to determine the forest fire risk perceptions of Düzce University Forest Engineering Department students and to evaluate them within the framework of disaster management. The scope of the study consists of consciousness before fire, false consciousness of disaster and consciousness after forest fire. In addition, the possible effects of global climate change and the importance of forest fire risk perception are emphasized in the vocational training of forest engineer candidates in Europe and Turkey.

2. MATERIALS AND METHODS

2.1. Materials

The population of the research consists of 152 students studying at Düzce University, Faculty of Forestry, Department of Forestry Engineering in the 2021-2022 academic year. Within the scope of the study, an online questionnaire form was sent to all forest engineering students and 100 valid questionnaires (survey response rate is 66%) were obtained from those who participated in the questionnaire and analyzed.

2.2. Methods

In this study, it is aimed to determine the forest fire risk perceptions of Düzce University Forest Engineering Department students and to evaluate them within the framework of disaster management. The full count method was used in the research conducted between April and May 2022. Within the scope of the study, the link of the online questionnaire was sent to 152 forest engineering students via e-mail. The results were interpreted based on the responses of 100 students who participated in the survey. The findings were analyzed with the IBM Statistics SPSS 22.0 program. In the evaluation of the data, number, percentage, mean and standard deviation values were calculated. The questionnaire form used in the research was prepared by using the studies of Avcı and Korkmaz (2021), Ayvazoğlu et al. (2020), Zile (2018), Cosgun et.al (2010).

In the first part of the survey, there are questions about the class of the students, their gender, whether their living areas are rural or urban, and whether they have experienced forest fire disasters. In the second part, in order to determine the forest fire awareness level of the students; A total of 31 propositions and statements prepared on a 5-point Likert scale (1-Strongly Disagree; 5-Completely Agree) are included under 3 headings: consciousness before fire, false disaster awareness and consciousness after forest fire.

3. RESULTS

In the findings section of the study, the answers of 100 students from Düzce University Faculty of Forestry Department of Forest Engineering who participated in the survey in the spring semester of 2021-2022 were analyzed and interpreted with the IBM Statistics SPSS 22.0 program.

Of the forest engineering students participating in the research, 65 (65%) are female and 35 (35%) are male. 53 of them are 4th year students (53%), 23 are 3rd year students (23%), 17 are 2nd year students (17%) and 7 are 1st year students (7%). 47 of the students live in the city center (47%), and 53 of them live in rural areas (53%). Of the students who participated in the survey, 84 stated that they had seen a

forest fire before (84%), while 16 (16%) stated that they had never seen a forest fire. Thirty-four of the students state that Turkey is prepared for forest fires (34%), 23 students are undecided about this (23%), and 43 of them think that Turkey is unprepared for forest fires (43%) (Table 1).

Features of participants	**Frequency**	**Percentage (%)**
Female	65	65
Male	35	35
Total	**100**	**100**
Class 1	7	7
Class 2	17	17
Class 3	23	23
Class 4	53	53
Total	**100**	**100**
Urban	47	47
Rural	53	53
Total	**100**	**100**
Seeing a forest fire nearby	84	84
Not seeing a forest fire nearby	16	16
Total	**100**	**100**
Prepared for forest fires	34	34
Not sure	23	23
Not prepared for forest fires	43	43
Total	**100**	**100**

Table 1. Frequency and percentage analysis

In the second part of the questionnaire, statements consisting of 31 propositions and prepared on a 5-point Likert scale (1-Strongly Disagree; 5-CompletelyAgree) were included. In order to evaluate the perceptions of the students participating in the survey regarding the concepts of consciousness before forest fire, false disaster awareness and consciousness after forest fire, average analyzes were applied (Table 2).

	Statements	**Mean**	**SD**
1	I think the fire preparedness of students is sufficient.	3,2200	±1,26794
2	In-service training is required when I start the profession	4,5000	±0,50252
3	I know which units to ask for support in case of a forest fire.	3,5600	±1,25786
4	I think the lessons I have taken are enough for me to be ready for a forest fire.	2,6100	±0,85156
5	I know the conditions that increase the risk of forest fire.	4,1200	±0,68579

6	I think that forest villagers are sufficiently informed about the risk and effects of fire.	2,6300	±0,90626
7	The social responsibility activities carried out before the forest fire are sufficient.	2,4000	±0,58603
8	I know what needs to be applied first during a forest fire.	4,4600	±0,98903
9	The training I have received in responding to forest fires is sufficient.	2,0600	±0,85067
10	I decide the way of responding to a forest fire by looking at the size of the fire.	2,9100	±0,68306
11	I know how forest fire extinguishing equipment works.	3,2200	±0,93830
12	I know the tactics and strategies in responding to forest fires.	2,8200	±0,92529
13	The most effective extinction to forest fire is made from the air.	4,0300	±0,82211
14	It is the forest engineer's job to coordinate forest workers during a forest fire.	3,2800	±0,93290
15	The counterfire method is definitely used for extinguishing every forest fire.	2,5800	±1,04621
16	The fire extinction method should be decided by evaluating the wind, topography, climatic conditions, and the flammability of the forest cover.	3,7100	±0,76930
17	It is the duty of the forest engineer to participate in post-fire cooling studies.	3,6700	±0,83430
18	It is the duty of the forest engineer to make observations in case of a forest fire.	3,8200	±0,65721
19	I know cooling methods after forest fire.	3,0825	±0,77285
20	Other species that are completely different from fire insensitive should be planted in place of the burned species.	2,2300	±1,08110
21	The area exposed to forest fire should be completely left to itself.	1,6400	±0,67450
22	By preserving the genetic diversity and taking into account the climate change, forests should be re-established with the natural species of the fire area.	4,4400	±0,74291
23	Responsible institutions inform the public sufficiently about the fate of the burned areas after forest fires.	2,3600	±1,00020
24	If you are fatalistic to be harmed by a forest fire, it is unnecessary to act cautiously.	1,1500	±0,35887
25	Responding to forest fires is only the responsibility of the fire department in the municipalities.	1,4300	±0,65528
26	Causes of forest fires, fire prevention and response issues are directly related to the forest engineering department.	4,6500	±0,47937
27	My level of knowledge on forest fires is higher than that of the public.	4,1100	±0,64971
28	It is more accurate to talk about the consequences of forest fires rather than the precautions to be taken.	1,7200	±0,63691

29	There is no need for human intervention to extinguish a forest fire, it should be left alone.	1,1600	±0,36845
30	Not every forest fire can be described as a disaster, it is necessary for the continuity of natural processes.	3,6000	±0,87039
31	Entry and exit into the forest should be prohibited, if necessary, during the dry seasons when the risk of fire rises.	4,1900	±0,80019

Table 2. Descriptive analysis

When Table 2 is evaluated, it is seen that the students in the survey are undecided about their professional knowledge preparing them for forest fires, they need vocational training on forest fires when they start the forestry engineering profession, they think that the courses they take in university education are insufficient on forest fires, and forest fire response training, were undecided about whether to take responsibility as a fire chief when there is no authorized person in the event of a fire, they do not know the fire tactics and strategies, they do not know the counterfire method, they are undecided about coordinating the forest workers during the forest fire, the most effective fire extinguishing intervention can be done from the air is insufficient. But the factors increasing the causes of the fire that they stated that they had knowledge about the subject. When an evaluation is made on the title of consciousness before fire, it is seen that the forest engineering students participating in the survey evaluate themselves as inadequate and undecided in the stated statements.

In the post-fire awareness title, forest engineers should make observations against the possibility of resumption of forest fires, that it is possible to re-establish forests with the natural species of the fire region by preserving genetic diversity and taking into account climate change, that they will not prefer fire-resistant species that are not suitable for the climate and soil conditions of the region, They stated that instead of leaving the areas alone, improvement studies should be carried out with expert intervention, and that the studies on how the burned areas were planned in Turkey after the fire should be shared with the public.

When the students participating in the survey are evaluated in terms of having false awareness of forest fires, they do not show a fatalistic approach, they are aware of the necessity of conscious fire extinguishing, they think that their level of knowledge about forest fires is high when compared to the individuals who do not have forestry engineering education, and they think that the forest fire risk is high in the summer months. It is seen that they think that the entrance and exit of local people and tourists to the areas should be prohibited, and that they think that fires can have positive effects if they are of natural origin as a part of ecological processes.

4. DISCUSSION

In studies on forest fire disaster; many different topics such as prevention of forest fires, response during fire, fire behavior, land characteristics, climate, soil, fauna, flora, water, forest fires and human relations, socio-economic effects of forest fires, etc. Forestry engineers, who have duties and responsibilities in forest fire disaster prevention, combating and post-fire improvement studies, should receive versatile training during their vocational training.

The measurement of success or failure in forest fires is very important. Knowing the area well by the fire chief and the team, knowing the access roads and water resources, adequacy of the road network, maintenance status, the situation of the fire team, the ability to coordinate the fire workers, good and correct management of the fire response team can be listed as success criteria in responding to forest fires (Avcı and Korkmaz, 2021). In addition, non-governmental organizations and all other stakeholders, especially public institutions and organizations directly related to forest fires, should be carefully planned and coordinated in terms of fire management.

5. CONCLUSIONS

In the results of working; It can be said that forest engineer candidates generally have high consciousness perceptions before forest fire. The forest engineer candidates who participated in the survey find the factors that increase the fire, the level of determining the soil and climate characteristics of the fire area sufficient. However, they find the number and scope of courses related to forest fires insufficient during their vocational training and state that they need in-service training on forest fires in their professional life. The students who participated in the survey think that they are inadequate and undecided about fire tactics and strategies, effective intervention methods, duties and responsibilities of forest engineers during a forest fire, and using fire extinguishing and cooling equipment. After the forest fire, they think that they have knowledge about the improvement and afforestation activities in accordance with the land conditions.

Within the scope of the study, some suggestions were presented in order to evaluate whether the students participating in the survey, regardless of their vocational education, have a false consciousness in responding to forest fires in connection with their place of residence, whether they have experienced forest fires in their immediate surroundings, and their socio-cultural structures. In the evaluation, it was determined that the students did not have a false consciousness about the forest fire disaster, on the contrary, they were aware of the necessity of conscious fire extinguishing activities. It can be said that the vocational training they received contributed to this issue.

It was determined that forest fire disaster perceptions and awareness levels of 4th grade students, who took management and policy courses, were higher. Forest engineers who will work in the field should be able to foresee which disaster hazards exist in their immediate environment and how and at what level the impact of these hazards will be. Within the forest engineering education programs, fire behavior, disaster risk perception and management, crisis management, planning, management and organization courses should be included in the curriculum. Since the causes and characteristics of forest fires and their scope may change at different times and in different regions, the risk perception and management of forest engineers should also be determined temporally and spatially during their professional work. Forest fires; Engineers, Ecologists, Climate scientists, Geographers, Soil scientists, Biologists, Hydrologists, Botanists, Sociologists, Economists and Landscape planners, etc. It is a type of disaster that needs to be dealt with interdisciplinary. Studies on forest fire risk perception and awareness should be implemented for all occupational disciplines related to the subject, and data to be obtained on fire risk reduction and management should be utilized.

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