

Work Safety and Health Problems of Loggers: A Sample of Alanya Forest Enterprise in Turkey

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Received: May 25, 2008
Accepted: July 25, 2008

Abstract

In Turkish forestry, the use of mechanization in forest harvesting and transportation activities is limited, which leads to considerable amount of animal power and manpower involvement into logging operation. The logging jobs are considered as one of the most dangerous occupation in many parts of the world. Especially felling, moving, sliding, and rolling the logs with massive weights on rough and steep mountainous regions of Turkey result in a significant risk to loggers working in logging operations. Therefore, the current status of work safety and health problems in logging should be defined by using scientific data and methods for ensuring safe and effective logging operations and improving work productivity. In this study, the working conditions of the loggers in the Directorate of Alanya Forest Enterprise in Turkey were investigated and main health and work safety problems were defined based on a questionnaire study.

Key words: Logging operation, workforce, workers' physical conditions, ergonomics

INTRODUCTION

In Turkish forestry, the usage of mechanized harvesting systems is limited due to high purchase prices and high operating costs of the mechanized equipment and negative effects of mechanization on workforce [1]. The logging operations are mostly performed by using traditional methods employing human and animal power [2]. The traditional logging operations are one of the most dangerous forestry activities since the forested areas are mostly located in steep mountainous regions with rough terrain and difficult working conditions in Turkey [3]. Especially manually handling, felling, moving, sliding, and rolling the heavy logs result in a significant risk to loggers health working in the woods. Besides, the loggers may have stress related sickness due to difficult terrain conditions, noise and vibration effects, and extreme weather conditions [4].

For performing forestry activities, forest service employs workers from the nearest villages located inside or near the forested areas. In Turkey, about 7.5 million villagers settled in over 20000 villages possess very low annual income. According to Tunay and Melemez [5], about 65% of the forestry workers have been hired for performing felling, bucking, skidding, and transportation. Thus, the logging activities are major sources of jobs for these villagers. Due to this socioeconomic factor, the applications of mechanized harvesting systems are limited in Turkey even though using logging equipment provides safer work environment. According to Bell [6], using mechanized felling system reduced the injury risk of the loggers by 14.2%.

The difficult working environment during the logging activities may result in adverse effects on work safety and health conditions of the loggers. Besides, other factors such as low wages, insufficient or delayed medical care, telecommunication problems, and being away from social life negatively affects the loggers [7, 8]. Previous studies also indicated that lack of using

adequate protective clothes and gears increase the risk of work related injuries [9].

The logging jobs are still listed as highly dangerous occupations in many parts of the world as well as in Turkey. To ensure safe and effective logging operations, current working conditions of the loggers should be evaluated. Scientific data and methods should be used in defining status of work safety and health problems in logging activities. In this study, the working conditions of the loggers were investigated in the Directorate of Alanya Forest Enterprise in Turkey and main health and work safety problems were defined based on a survey study.

MATERIALS AND METHODS

The questionnaire was applied on total of 76 loggers employed in seven forestry enterprises in Alanya Forestry Directorate of Antalya Regional Forestry directorate. These forestry enterprises include Alanya (5), Alara (16), Söğüt (4), Demirtaş (18), Dim (10), Kargı (6), and Güzelbağ (17). The area of the Alanya Forestry Directorate is about 180000 ha with average ground slope of 40%. Alanya has very rich forests which are 0.5% of the total forested areas in Turkey.

To investigate the work safety and health problems of the loggers, total of 30 questions were prepared and listed on the questionnaire forms. To determine the health problems, social and physical status, work safety, and habits of the loggers, 11, 9, 7, and 3 questions were asked, respectively (Table 1). The questions were directed to loggers with personal communications. Then, the results obtained from the forms were recorded into the computer for further analysis.

Table 1. The question groups directed to the loggers in questionnaire.

Health Problems	Social and Physical Status	Work Safety	Habits
Blood Pressure	Work Experience	Protective Clothes and Gears Safety Knowledge	Smoking
Tiredness/Exhaustion	Age Groups	Work Adaptation	Alcohol
Allergy	Body Condition	Work Organization	Tea and Coffee
Varicose veins	Education	Working lodge	
Bronchitis/Cold	Marital Status	Adequate Nutrition	
Stomachache	Family Members	First Aid Stuff	
Dust Related Sicknesses	Extra Income		
Noise and Vibration Related Sicknesses	Motivation		
Heavy Load Related Sicknesses	Exercise		
Injuries			
Psychological Problems			

RESULTS AND DISCUSSION

The results from the questionnaire indicated that 24% and 5% of the loggers suffered from high and low blood pressures,

respectively, while 71% has normal blood pressures (Table 2). Tiredness and exhaustion problems were reported by 88% of the loggers. This was because of using human power based logging techniques in the difficult working environment. In more than half of the loggers, allergic sicknesses were encountered especially during the spring and summer seasons due to pollens and beetles. About 37% and 22% percent of the loggers suffered from varicose veins and stomachache problems, respectively. Besides, bronchitis and cold were very common health problems among the loggers (74%) as a result of frequently altering weather conditions during the logging activities.

The logging operations produced large amount of dust and smoke due to felling and skidding activities and intensive usage of chainsaws, which resulted in various health problems including shortness of breath (59%), respiration and lung sickness (13%), heart diseases (21%), and redness and itchiness in eyes (62%). When the loggers worked with chainsaw for a long time, noise and vibration related sicknesses occurred such as deafness (28%), white hand sickness (20%), weakness on arms (62%), and circulation problems (26%).

Since human power based felling, bucking, and skidding operations require intensive use of muscle power, the loggers generally suffer from heavy load related sickness. The results from the questionnaire indicated that muscle injuries (26%),

Table 2. The results from the questionnaire indicating the health problems of the loggers.

Questions	Alternative Responses	Forestry Enterprises (Number of Loggers)							
		ALANYA	DEMİRTAŞ	DİM	SÖĞÜT	ALARA	KARGI	GÜZELBAĞ	TOPLAM
Blood Pressure	Low	1	-	1	-	-	-	2	4
	Normal	3	11	7	3	13	5	12	54
	High	1	7	2	1	3	1	3	18
Tiredness/Exhaustion		4	16	9	4	13	6	15	67
Allergy		2	8	5	2	9	3	10	39
Varicose veins		-	8	2	-	9	1	8	28
Bronchitis/Cold		3	16	8	2	11	2	14	56
Stomachache		1	6	1	-	4	-	5	17
Dust Related Sicknesses	Shortness of Breath	2	13	5	1	8	2	14	45
	Respiration and Lung Sickness	-	4	1	-	3	-	2	10
	Heart Diseases	-	3	3	-	4	1	5	16
	Redness and Itchiness in Eyes	3	12	7	-	10	2	13	47
Noise and Vibration Related Sicknesses	Deafness	-	5	3	1	7	-	5	21
	White Hand Sickness	-	4	1	-	5	1	4	15
	Weakness on Arms	3	10	7	2	14	2	9	47
	Circulation Problems	-	6	2	-	7	-	5	20
Heavy Load Related Sicknesses	Muscle Injuries	1	5	3	-	6	-	5	20
	Backache	5	17	10	4	13	6	14	69
	Neck and Shoulder Sickness	4	10	9	3	9	4	12	51
	Arm and Leg Pains	5	15	10	3	15	5	16	69
Body Injuries	Twisted Joints	1	7	3	2	6	4	9	32
	Broken Arms and Legs	-	2	1	-	2	1	3	9
	Back Injuries	-	1	-	1	2	-	1	5
	Brain Damage	-	-	-	-	-	-	1	1
Psychological Problems	Distraction	-	4	3	1	2	-	3	13
	Anger	2	15	6	3	12	5	12	55
	Headache	2	12	8	3	11	5	12	53
	Sleeplessness	1	3	-	-	3	-	1	10

Table 3. The results indicating social and physical status of the loggers.

Questions	Alternative Responses	Forestry Enterprises (Number of Loggers)							
		ALANYA	DEMİRTAŞ	DİM	SÖĞÜT	ALARA	KARGI	GÜZELBAĞ	TOPLAM
Work Experience	1-5 years	4	-	-	-	-	-	-	4
	5-10 years	-	3	1	1	1	-	2	8
	10-20 years	1	13	6	3	6	4	8	41
	>20 years	-	2	3	-	9	2	7	23
Age Groups	15-25	3	-	-	-	-	-	-	3
	25-35	1	3	2	1	1	-	2	10
	35-45	1	12	5	2	9	5	10	44
	>45	-	3	3	1	6	1	5	19
Body Condition	Large	-	6	3	-	5	2	6	22
	Medium	4	11	7	4	10	4	10	50
	Weak	1	1	-	-	1	-	1	4
	Very Weak	-	-	-	-	-	-	-	-
Education	Illiterate	-	-	-	-	-	-	-	-
	Primary	2	16	10	4	15	6	16	69
	Elementary	3	2	-	-	1	-	1	7
	High School	-	-	-	-	-	-	-	-
Marital Status	Married	4	18	10	4	15	5	15	71
	Single	1	-	-	-	1	1	2	5
Family Members	1-3	3	6	1	1	2	-	3	16
	3-5	2	9	5	3	8	4	9	40
	5-7	-	3	4	-	6	1	4	18
	>7	-	-	-	-	-	1	1	2
Extra Income	Farming-Stockbreeding	3	15	8	4	12	6	14	62
	Fishing	1	1	-	-	-	-	-	2
	Other	-	-	-	-	-	-	-	-
Motivation	Motivated	3	16	9	4	16	6	15	69
	Motivated by Time	1	1	1	-	-	-	2	5
	Unmotivated	1	1	-	-	-	-	-	2
Exercises	Regularly	2	6	-	-	7	-	4	19
	Irregularly	2	3	1	3	4	1	-	14

Table 4. The results from the questionnaire indicating work safety of the loggers.

Questions	Alternative Responses	Forestry Enterprises (Number of Loggers)							
		ALANYA	DEMİRTAŞ	DİM	SÖĞÜT	ALARA	KARGI	GÜZELBAĞ	TOPLAM
Protective Gears	Adequate	-	-	-	-	-	-	-	-
	Inadequate	5	18	10	4	16	6	17	76
Safety Knowledge	Sufficient	2	13	6	-	9	6	12	48
	Normal	3	3	4	3	6	-	3	22
	Insufficient	-	2	-	1	1	-	2	6
Work Adaptation	Sufficient	4	14	7	4	10	6	11	56
	Insufficient	1	4	3	-	6	-	6	20
Work Organization	Adequate	5	16	9	4	12	6	15	67
	Inadequate	-	2	1	-	4	-	2	9
Working Lodge	Cabin	5	18	10	4	16	6	17	76
	Tent	-	-	-	-	-	-	-	-
	Daily	-	-	-	-	-	-	-	-
	Caravan	-	-	-	-	-	-	-	-
Adequate Nutrition	Available	-	3	1	-	3	-	5	12
	Unavailable	5	15	9	4	13	6	12	64
First Aid Stuff	Sufficient	-	4	2	-	4	-	6	16
	Insufficient	5	14	8	4	12	6	11	60

Table 5. The results from the questionnaire indicating habits of the loggers.

Questions	Alternative Responses	Forestry Enterprises (Number of Loggers)							
		ALANYA	DEMIRTAS	DİM	SÖGÜT	ALARA	KARGI	GUZELBAG	TOPLAM
Smoking	Non-smoker	3	3	2	-	11	-	3	22
	Smoking (1 packet/day)	2	13	8	3	5	5	13	49
	Smoking (1 packet/day)	-	2	-	1	-	1	1	5
Alcohol	Non-drinker	1	8	6	1	12	3	9	40
	Drinker	4	10	4	3	4	3	8	36
Tea and	Non-drinker	-	-	1	-	1	-	3	5
	Drinker	1	2	3	-	10	5	3	24
Coffee	Addicted	4	16	6	4	5	1	11	47

backache (91%), neck and shoulder sickness (67%), and arm and leg pains (91%) were common health problems.

The rough terrain conditions and slippery forest ground resulted in several body injuries including twisted joints (42%), broken arms and legs (12%), back injuries (7%), and brain damages (1%). The loggers also reported that most of the injuries occurred during felling activities. The loggers also suffered from psychological problems such as distraction (17%), anger (72%), headache (70%), and sleeplessness (13%).

The results indicated that 54% of the loggers had the work experience of 10 to 20 years while 30% worked for more than 20 years in logging jobs (Table 3). Rest of the loggers had the work experiences of less than 10 years. The most of the loggers were in the age group of 35-45 (58%), and 25% of the loggers were older than 45 years old. In terms of body conditions, 66% of the loggers were in medium size, while 29% were well-build.

The most of the loggers (91%) were primary school graduates, which indicated that education level of the loggers were quite low. The loggers were mostly married with children. The family members of the loggers were 1-3 (21%), 3-5 (53%), 5-7 (24%), and more than 7 (2%). The loggers receive extra income from farming and stockbreeding (97%) and fishing (3%). The results also showed that 91% of the loggers were highly motivated, while rest was either got motivated by time or unmotivated at all. Among the loggers who exercise, it was found that 58% were regularly exercising.

Table 4 shows the results indicating the work safety status of the loggers. The loggers were not fully equipped with adequate protective clothes and gears. Thus, the loggers work under great risks in a case of work related accidents. The workers were rarely provided with protective helmet and goggles during felling and bucking operations. The loggers claimed that they had the knowledge of safer logging (63%) based on their experiences. About 75% of the loggers toughed that they went through a sufficient work adaptation process. They were highly motivated loggers with 10 to 20 years of work experiences. The most of the loggers (88%) were satisfied with work organization.

During the logging operations, the loggers stayed in cabins. Almost 84% of the loggers toughed that they could not had adequate nutrition due to staying in the cabins. About 80% of the loggers indicated that first aid stuff was not sufficient.

The results indicated that 65% of the loggers smoke a packet of cigarette per day, while 7% some more than a packet per day (Table 5). The half of the loggers drinks alcohol. More than 90% regularly drink tea and coffee, while 62% of the loggers were addicted.

CONCLUSIONS

A the working conditions of the loggers employed in seven forestry enterprises in Alanya Forestry Directorate of Antalya

Regional were investigated and main health and work safety problems were defined based on a questionnaire study. The results indicated that the major health problems were tiredness and exhaustion, bronchitis and cold, noise and vibration related sicknesses, and anger and headache related problems. In terms of work safety, it was found that usage of protective clothes and gears were not adequate. Besides, the loggers could not have enough nutrition to perform effective logging activities. In order to ensure safe and effective logging operations and to improve the work productivity, forest service should properly organize and plan the logging operations by considering the health and safety problems listed above. Besides, increasing the usage of mechanized harvesting equipment in felling and skidding activities may reduce the work related accidents.

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