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Changes in the working conditions of forest chiefs over 15 years in a Turkish Regional Forest Directorate

Änderungen der Arbeitsbedingungen von Oberförstern über einen Zeitraum von 15 Jahren in einer Türkischen Regionalen Walddirektion

Seçil Yurdakul Erol^{1*}

Keywords: Forestry, workload, workforce, time-based comparison, pressure factors, job satisfaction, overload

Schlüsselbegriffe: Forstwirtschaft, Arbeitsbelastung, Arbeitskraft, Management des Wandels, Belastungsfaktoren, Arbeitszufriedenheit, Überlastung

Abstract

Worldwide, public forest institutions play critical roles in achieving forest management targets such as developing forest policy, intervention planning, sustainable management, facilitating public access and recreation, and monitoring forest conditions. The efficiency in maintaining these functions interacts with the working conditions in public forest institutions, especially at a local level. In Turkey, almost all forest areas have public ownership and are managed by the public forest agency. Forest Chief Units (FCU) are the smallest organizational units and forest chiefs (FC) work as land managers. This study compared the working conditions of FCs over a 15-year period. Questionnaires were given to FCs working in Regional Forest Directorate (RFD) of Istanbul in 2002 and again in 2017. I managed to get responses from the almost entire population of FCs in both surveys. The questionnaire revealed an improvement in occupational equipment, technology, and communication opportunities. On the other hand, there was no significant improvement in conditions related to workload,

¹ Istanbul University-Cerrahpasa, Faculty of Forestry, Department of Forest Policy and Administration, Istanbul-Turkey

*Corresponding author: Seçil Yurdakul Erol, secily@istanbul.edu.tr

working hours, distribution of work, organizational units, and aspects of administration including participation in decision-making, coordination, and delegation. The results further revealed that political bodies induced the highest level of pressure on working conditions of FCs in both 2002 and 2017. Over 15 years no significant improvement in working conditions of FCs at the local level was achieved, except for some physical working conditions. The results of this study could support decision-making towards job satisfaction and improving working conditions, especially for publicly managed forests.

Zusammenfassung

Öffentliche Forstverwaltungen spielen weltweit eine entscheidende Rolle bei der Erfüllung von Managementzielen, wie Entwicklung von Forstpolitik, Planung von Maßnahmen, nachhaltiges Waldmanagement, Sicherstellung von Zugang und Erholung sowie Monitoring des Waldzustandes. Die Effizienz der Erfüllung dieser Funktionen hängt mit den Arbeitsbedingungen der öffentlicher Forstinstitutionen zusammen, insbesondere auf lokaler Ebene. In der Türkei befindet sich fast das gesamte Waldgebiet in öffentlichem Besitz und wird von öffentlichen Forstbehörden verwaltet. Oberforstämter (OFA) stellen die kleinste Organisationseinheit dar und Oberförster (OF) agieren als Landverwalter. Ziel dieser Studie war es, die Arbeitsbedingungen von OF über eine Periode von 15 Jahren zu vergleichen. Es wurden Fragebogen an die OF, die in der Regionalen Forstdirektion (RFD) von Istanbul arbeiten, im Jahr 2002 und nochmals in 2017 ausgeteilt. In beiden Umfragen konnte eine Erhebung der Grundgesamtheit erreicht werden. Die Analysen zeigten eine Verbesserung hinsichtlich der technischen Ausstattung, verfügbaren Technologie und Kommunikationsmöglichkeiten. Es gab jedoch keine signifikante Verbesserung in der Arbeitsbelastung, Arbeitszeit, Arbeitsverteilung, den Organisationseinheiten und der Verwaltung, wie die Teilnahme an Entscheidungsfindungen, Koordination und Delegierung von Arbeit. Es zeigte sich, dass politische Gremien in 2002 und 2017 den größten Druck auf die Arbeitsbedingungen der OF ausübten. Über 15 Jahre zeigten sich keine signifikanten Verbesserungen der Arbeitsbedingungen von OF auf lokaler Ebene, abgesehen von körperlichen Arbeitsbedingungen. Diese Ergebnisse könnten Entscheidungsprozesse unterstützen, um die Arbeitszufriedenheit zu erhöhen, insbesondere wenn Wälder öffentlich bewirtschaftet werden.

Introduction

Public forest institutions have critical functions in terms of achieving global forestry aims. The functions of public forest institutions can be categorized as policy/regulatory functions, forest planning and management functions, facilitating functions, controlling functions, and socio-economic functions (WB 2008; Buttoud-Kouplevatskaya 2010; FAO 2018). Local forestry units are among the most important components of the public forestry institution and critical actors of public forest administration as decision-makers and also implementers of national policies at the local level. Public

local administrative units (offices) play an effective role in terms of achieving national forest policy aims and the administration of all forest areas by considering local conditions and dynamics (Krott 2005). The role of public authorities can be defined both as the landowner and provider of related materials and services (Liubachyna *et al.* 2017).

Further, technical staff that work as land managers and supervisors in local level services and their working systems and conditions have critical importance in terms of achieving local-level aims and the realization of local organizational units. They have responsibilities and duties regarding maintaining sustainability and ecological management, satisfying the social demands of society, and income generation (Yurdakul Erol 2016). In general, forest experts are responsible for decision-making, planning, and the implementation of decisions (Krott 2005). Further, local-level forestry organizations and forest managers are the main interest groups having major importance because of their direct effectiveness and role in the decision-making and implementation process (Kuvan *et al.* 2010). Multi-level governance trends in forestry administration have strengthened the role of local actors (Wolfslehner *et al.* 2020), including local managers.

Almost all Turkish forests (except 18 365 ha, less than 1%) have public ownership characteristics and are managed by the General Directorate of Forestry (GDF), which operates under the Ministry of Agriculture and Forestry (GDF 2015; GDF 2020). Although the GDF is connected to the Ministry, it has an autonomous status and has its law of establishment, central and local organizational units, budget, and human resources. The main tasks of the GDF can be defined as follows: (i) ecosystem-based, participatory, and multifunctional planning of forests; (ii) protecting forests and fighting against illegal activities, natural disasters, forest fires, and pest damage; (iii) increasing forest area, enhancing forest services, carrying out silviculture and regeneration activities; (iv) realizing the works and procedures related to the ownership of forests, cadastre, permission, and easement; (v) ensuring sustainable management of forests, carrying out activities regarding the production of goods, transportation, storage, and marketing of products; (vi) operating recreational areas, urban forests, and protecting forests; (vii) managing afforestation, erosion control, pasture improvement, integrated-basin management activities, combatting desertification; (viii) producing seed and seedlings of forest vegetation plants, establishing and operating nurseries; (ix) supporting private entities in terms of afforestation, nursery, management and marketing activities; (x) establishing units, purchasing and providing required buildings, equipment, machinery, and constructing facilities and roads to maintain forestry operations; (xi) conducting training, research and development, inventory management, and public relations practices; (xii) cooperating with private enterprises, non-governmental and occupational organizations and universities, forming collaborative projects; (xiii) and workings on ownership issues, supporting forest villagers, and strengthening forest-society relations. As a result of the excess and variety of the GDF's tasks, it has a wide and tall organizational chart. The central

organization chart of GDF can be seen in Figure 1.

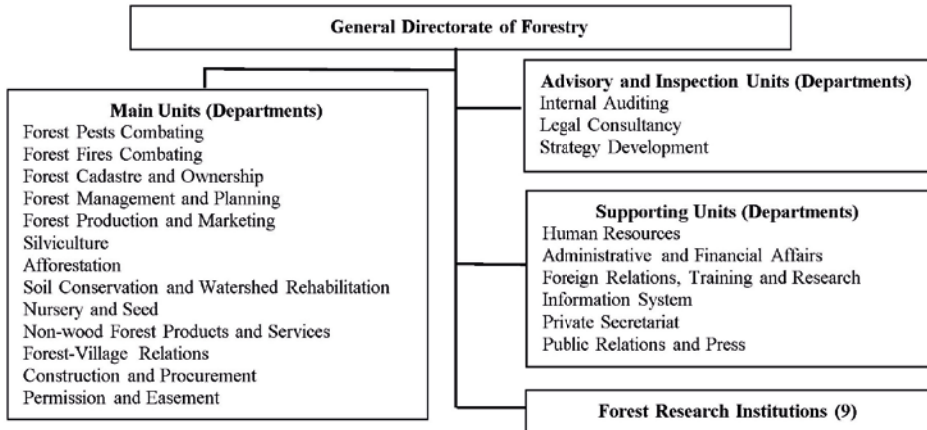


Figure 1: Central organizational chart of the General Directorate of Forestry (GDF).

Abbildung 1: Zentrales Organigramm der Generaldirektion für Forstwirtschaft.

Managing these multi-functional forestry activities locally requires a systematic local forestry organization. Twenty-eight RFDs operate under the GDF as the top-level local unit. There are a total of 263 forest enterprises, and 28 nursery directorates are connected to the regional directorates. Forest enterprises comprise 2140 FCUs and 157 afforestation and soil protection chief units. The provincial organizational chart of the GDF is shown in Figure 2.

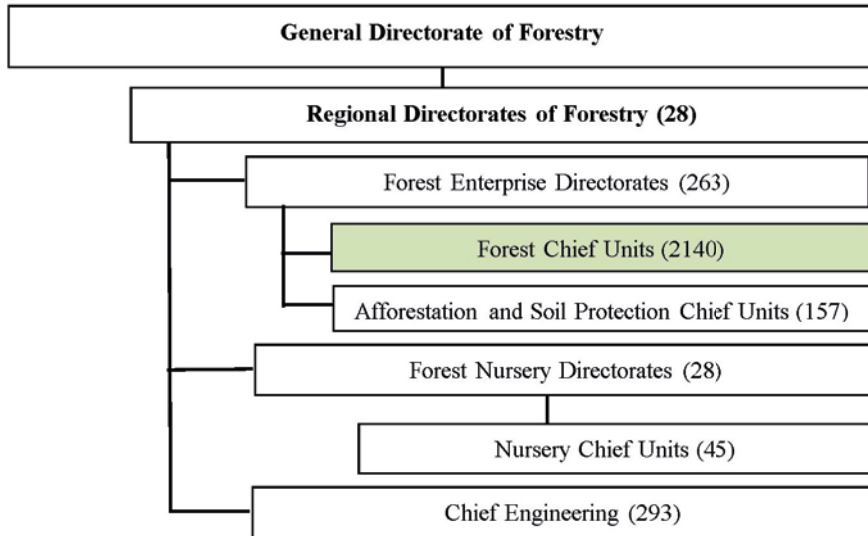


Figure 2: Provincial organizational chart of the General Directorate of Forestry (GDF). Highlighted are forest chief units in Istanbul Regional forest directorate.

Abbildung 2: Provinziales Organigramm der Generaldirektion für Forstwirtschaft. Hervorgehoben sind die Oberforstämter, die hier untersucht werden.

FCUs are the most important and the lowest-level administrative departments of the Turkish forestry organization. Also, FCs have very important roles as land managers and lower-level managers. Thus, they are the main implementer and decision-makers at the local level and have approximately 370 different tasks and responsibilities (Yurdakul 2003). Şafak and Göksu (2016) performed a detailed categorization with consideration of all documents, forms, and tables, revealing that there were 2263 types of work that had to be done by forest enterprises. These tasks and duties can generally be categorized as follows: (i) forest protection and forest fire fighting, (ii) cadaster and ownership, (iii) business and marketing, (iv) reforestation and silviculture, (v) construction and transportation, (vi) human resources, (vii) administrative and financial affairs, (viii) research and planning, (ix) law, (x) relations with forest villagers, and (xi) non-wood forest products.

In terms of their functional diversity, the variability of their tasks and responsibilities makes them the core of Turkish forestry as an essential actor of local decision-makers and implementers of national and local level policies and strategies. Thus, their problems have critical importance regarding increasing the efficiency of FCs, which have direct interaction with local and national level forest management problems.

The study aimed to examine the problems related to working conditions in the historical process and compare the results of a 15-year period, thereby making it possible to analyze the change in working conditions of FCs at the local level. The results of this research could make it possible to analyze the effects of the decisions and applications made over the 15-year period, and to make future decisions that will positively impact the related outcomes. Parallel to this approach, it is important for forestry organizations to analyze the long-term change of the FCs' approaches. It should be stated that the core of the research was not about the evaluation of the GDF *per se*, rather it focused on analyzing a case of local management units. Thus, the literature will be extended with a time-based comparative case study of forest areas that are almost entirely publicly owned and technical staff working as public officers and unique land managers of the forests.

Methods

In the first stage of the study, the sample case was selected as the RFD of Istanbul. The multifunctional forestry structure of the RFD and the characteristics of community and forest relations in the region were some of the criteria. Further, another factor in the selection of the sample was the ability to establish results in an area where there is high interaction between forestry and urbanization, where the effect of political pressures is more intense, and the perception of society is different from rural areas. The RFD of Istanbul was one of the 28 RFDs that operate under the GDF. The RFD of Istanbul has central and provincial units and the organizational chart, which includes the number of staff in the organizational units, can be found in Figure 3. However, legal or organizational changes can be made to the units over time.

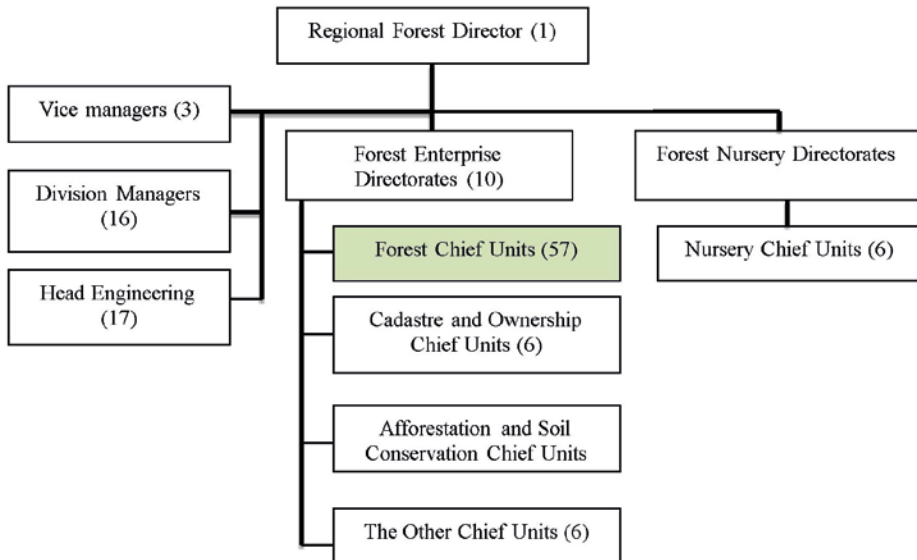


Figure 3: Organizational chart of the Regional Forest Directorate (RFD) of Istanbul. Highlighted are forest chief units, that are studied here.

Abbildung 3: Organigramm der Regionalen Forstdirektion von Istanbul. Hervorgehoben sind die Oberforstämter, die hier untersucht werden.

The analyzed data were obtained from questionnaires that were administered to FCs who were working for the RFD of Istanbul on two occasions in the research period. The questionnaires were first administered in 2002, and the second time in 2017, with an interval of 15 years, and 45 and 44 chiefs participated, respectively. The participants were not the same people necessarily, but each time they were the people who served in the same position in the years that were compared. Total population sampling was made in both surveys; however, there were six empty forest chief positions in 2002 and five in 2017 FCUs where a forest engineer was not appointed. Thus, the ratios of chiefs who participated in the survey were 91% and 85% and the confidence levels are 99% and 98%, respectively, for the 2002 and 2017 surveys (according to the confidence levels accepted, the sample sizes (n) are calculated as $n_{2002} \geq 41$, $n_{2017} \geq 43$). The frequency and percentage of the participants in terms of their general features can be found in Table 1. The distribution of employees of the RFDs within the 15 years can also be seen in Figure 4.

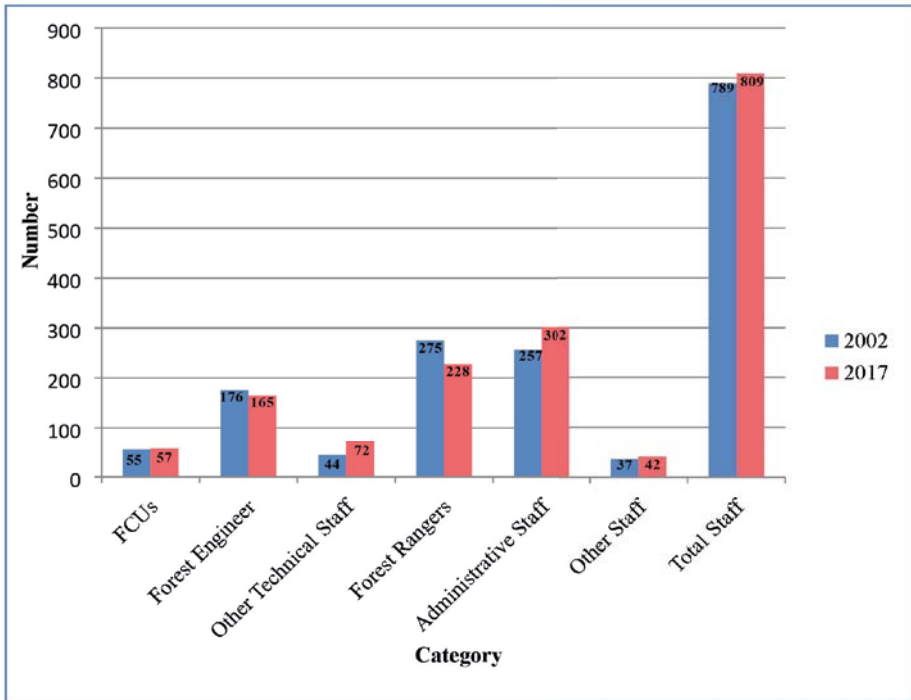


Figure 4: Number of employees in RFD of Istanbul in 2002 and 2017.

Abbildung 4: Anzahl der Mitarbeiter in der Regionalen Forstdirektion von Istanbul in den Jahren 2002 und 2017.

Table 1: Summary of managed area and human resources in the FCUs with completed questionnaires.

Tabelle 1: Zusammenfassung der betreuten Flächengröße und personellen Ressourcen für die Oberförstereinheiten mit ausgefüllten Fragebogen.

Features of FCUs		Year			
		2002		2017	
		Number	Share (%)	Number	Share (%)
Total Area of FCU	0- 5,000 ha.	2	4.4	2	4.5
	5,001-10,000 ha.	7	15.6	11	25.0
	10,001-20,000 ha.	13	28.9	14	31.8
	20,001-30,000 ha.	3	6.7	2	4.5
	30,001 ha. +	9	20.0	9	21.4
	No response	11	24.4	6	13.6
Forest Area of FCU	0- 5,000 ha.	3	6.7	5	11.4
	5,001-10,000 ha.	12	26.7	11	25.0
	10,001-20,000 ha.	12	26.7	6	13.6
	20,001-30,000 ha.	3	6.7	4	9.1
	30,001 ha.+	-	-	1	2.3
	No response	15	33.3	17	38.6
Number of Technical Staff	0-1 staff	30	66.7	37	84.1
	2-5 staff	1	20.2	1	2.3
	No response	14	31.1	6	13.6
Number of Administrative Staff	0-1 staff	-	-	2	4.5
	2-5 staff	20	44.4	26	59.1
	5-10 staff	17	37.8	10	22.7
	10+ staff	2	4.4	-	-
	No response	6	13.3	6	13.6
Number of Forest Workers	0-1 worker	1	2.2	8	18.2
	2-5 worker	23	51.1	13	29.5
	5-10 worker	4	8.9	5	11.4
	10+ worker	9	20.2	12	27.3
	No response	8	17.8	6	13.6

The questionnaire consisted of three groups of questions. The first group was related to the resources that the chiefs managed and FCU staff (9 questions). The second group comprised 24 questions about education, the main working conditions, and some administrative aspects, and the last group was related to difficulties in working conditions and pressure factors (13 questions). A five-point interval scale was used for the second and third groups of questions, where a value of 5 corresponded to "strongly agree" and a value of 1 corresponded to "strongly disagree." Except for the mentioned questions, two questions were asked about the existence of tasks that FCs had to perform beyond their job descriptions, which were yes/no questions, and the percentage of these tasks.

The responses were analyzed using the Statistical Package for the Social Sciences (SPSS). First, Cronbach alpha (α) reliability analysis was conducted to assess the reliability of the scale and to estimate the correlation coefficient. The estimates of

Cronbach's alpha (α) for the three groups of questions were $\alpha = 0.71$, $\alpha = 0.85$, and $\alpha = 0.82$, respectively. The results revealed that all groups of questions had high reliability. Differences between rural and urban populations were analyzed using the t-test. Comparisons were made based on time (between 2002 and 2017). Using this test, evaluations were made according to the significance levels (p) of 0.01 and 0.05. Rank order questions were analyzed using Friedman's test.

Results

Changes in FCUs' Responsibility Areas and Human Resources between 2002 and 2017

Total areas and forest areas that FCUs managed were close to each other as size in both years. In general, the total area was between 10,000 and 20,000 ha, and the forest area was about 5001 and 10,000 ha (Table 1). These sizes were considered as large for one chief (Table 2).

Table 2: Change areas and human resources in the FCUs between 2002 and 2017.

Tabelle 2: Änderung der Flächengröße und personellen Ressourcen der Oberförstereinheiten zwischen 2002 und 2017.

Adequacy / Effectiveness Level of Expression	Year	Descriptive Statistics			t-test Results			
		Sample size (N)	Mean (M)	Standard deviation (SD)	t value (t)	Degree of Freedom (df)	Sig. level (p)	Mean Difference (MD)
Total Area of FCU	2002	34	3.29	1.24	-0.55	70	0.58	0.16
	2017	38	3.13	1.23				
Forest Area of FCU	2002	30	2.50	0.82	-0.21	55	0.82	0.05
	2017	27	2.44	1.08				
Number of Technical Staff	2002	31	1.03	0.18	-0.14	67	0.88	0.00
	2017	38	1.03	0.16				
Adequacy of Technical Staff	2002	43	1.16	0.37	0.99	85	0.32	-0.08
	2017	44	1.25	0.43				
Number of Administrative Staff	2002	39	2.54	0.60	-2.54	75	0.01	0.32
	2017	38	2.21	0.52				
Adequacy of Administrative Staff	2002	43	1.37	0.48	-0.75	85	0.45	0.07
	2017	44	1.30	0.46				
Number of Forest Workers (Temporary & Permanent)	2002	37	2.57	0.89	-0.06	73	0.95	0.02
	2017	38	2.55	1.15				
Adequacy of Temporary Worker	2002	41	1.46	0.50	-3.18	83	0.00	0.30
	2017	44	1.16	0.37				
Adequacy of Permanent Worker	2002	42	1.48	0.50	-3.03	84	0.00	0.29
	2017	44	1.18	0.39				

There was no change in the number of technical staff by years, and generally, one technical staff worked per FCU, meaning that FCs were the only technical staff that worked per FCU. The assessment of the adequacy of the technical staff was also considered inadequate (Table 2). Besides, the number of administrative staff, including the forest ranger, was also decreased at a significant level [$t_{75} = -2.54$, $p \leq 0.01$]. The adequacy of the administrative staff was evaluated as insufficient for both 2002 and 2017 (Table 2). The evaluation regarding adequacy levels of the temporary workers [$t(83) = -3.18$, $p = 0.00$] and permanent workers [$t_{84} = -3.03$, $p < 0.01$] was also decreased at a significant level. It can be stated that the total and forest area of the FCUs did not change, and the borders and areas could be considered large. Also, the number and adequacy of the staff working for FCUs were evaluated as insufficient (Table 2).

Assessment of FCs about education, working conditions, and administrative aspects and change between 2002 and 2017

The evaluations of all of the aspects regarding education were increased. These aspects were regarding graduate education, pre-service and in-service training, and educational publications. Based on t-test results, it was revealed that the FCs' education opportunities were developed regarding pre-service training [$t_{86} = 3.79$, $p < 0.01$], in-service training [$t(86) = 2.77$, $p < 0.01$], and publications and educational documents [$t_{84} = 4.22$, $p < 0.01$].

The convenience of working hours, participation of forest enterprise-level decision-making, authority delegation, coordination, and organizational communication were evaluated as moderate in both years. There were statistically significant differences in the evaluations of the distribution of tasks [$t_{86} = -2.84$, $p < 0.01$] and the evaluation level decreased from moderate to low (Table 3). It was revealed that the administrative aspects especially related to the leading function was not improved at a satisfactory level.

Differences can be evidenced among FCs' evaluations regarding the adequacy level of promotion [$t_{86} = 2.62$, $p \leq 0.01$], appropriation [$t_{86} = 3.88$, $p < 0.01$], social benefits [$t_{87} = 4.38$, $p < 0.01$], and time left out of work [$t_{87} = 3.76$, $p < 0.01$]. Although an increase was determined, it is evident that the related expressions were evaluated as low after 15 years (Table 3). There was no improvement in creating better working conditions for FCs.

Table 3: Assessment of FCs regarding education, working conditions, administrative aspects, and change between 2002 and 2017. Please see table 2 for abbreviations.

Tabelle 3: Bewertung der Oberförster in Bezug auf Ausbildung, Arbeitsbedingungen, administrative Aspekte und Änderungen zwischen 2002 und 2017. Die Abkürzungen sind in Tabelle 2 erklärt.

Adequacy / Effectiveness / Level of Expression	Year	Descriptive Statistics			t-test Results			
		N	M	SD	t	df	p	MD
Graduate education	2002	44	2.89	1.49	0.80	86	0.42	-0.22
	2017	44	3.11	1.14				
Pre-service training	2002	44	1.80	1.23	3.79	86	0.00	-0.93
	2017	44	2.73	1.06				
In-service training	2002	45	2.42	1.39	2.77	86	0.00	-0.74
	2017	43	3.16	1.09				
Reached publications and educational documents	2002	44	2.41	1.58	4.22	84	0.00	-1.23
	2017	42	3.64	1.05				
Convenience of working hours to job	2002	45	2.80	1.70	-0.76	87	0.44	0.23
	2017	44	2.57	1.10				
Participation of forest enterprise level decision making	2002	45	3.42	1.21	-0.14	87	0.88	0.03
	2017	44	3.39	1.08				
Authority delegation in provincial organization	2002	45	2.69	1.52	1.97	87	0.05	-0.56
	2017	44	3.25	1.12				
Coordination in provincial organization	2002	42	3.24	1.26	-1.13	84	0.25	0.30
	2017	44	2.93	1.22				
Organizational communication in provincial organization	2002	45	3.84	1.38	-0.98	86	0.32	0.26
	2017	43	3.58	1.09				
Distribution of task to staff in provincial organization	2002	44	3.34	1.49	-2.84	86	0.00	0.81
	2017	44	2.52	1.19				
Promotion	2002	44	2.64	1.44	2.62	86	0.01	-0.68
	2017	44	3.32	0.93				
Appropriation	2002	45	1.84	1.22	3.88	86	0.00	-0.99
	2017	43	2.84	1.17				
Social benefits	2002	45	1.44	1.09	4.38	87	0.00	-1.10
	2017	44	2.55	1.26				
Time left out of work	2002	44	1.45	1.13	3.76	86	0.00	-0.88
	2017	44	2.34	1.07				
Enterprise building in terms of forestry activities	2002	44	3.77	1.50	-1.20	86	0.23	0.34
	2017	44	3.43	1.12				

Adequacy / Effectiveness/Level of Expression	Year	Descriptive Statistics			t-test Results			
		N	M	SD	t	df	p	MD
Existence of organizational units and distribution of staff	2002	45	2.84	1.67	-3.16	87	0.00	0.93
	2017	44	1.91	1.03				
Occupational equipment	2002	44	2.36	1.54	4.15	86	0.00	-1.15
	2017	44	3.52	1.02				
Opportunities to access the forest area	2002	45	3.84	1.44	0.45	87	0.65	-0.11
	2017	44	3.95	0.71				
Use of technology	2002	45	2.93	1.51	3.59	87	0.00	-0.93
	2017	44	3.86	0.82				
Communication opportunities	2002	45	3.16	1.56	3.45	87	0.00	-0.91
	2017	44	4.07	0.78				
Overtime	2002	45	4.22	0.99	0.91	85	0.36	-0.18
	2017	42	4.40	0.85				
Overtime payment	2002	45	1.91	0.55	0.56	87	0.57	-0.11
	2017	44	2.02	1.21				
Work has to be done at weekends	2002	45	4.42	1.09	-2.16	87	0.03	0.49
	2017	44	3.39	1.04				
Belief in realization of their occupational expectations	2002	44	2.55	1.21	0.55	86	0.58	-0.13
	2017	44	2.68	1.09				

There was a decrease in evaluations regarding the existence of organizational units and the distribution of staff to these units. It is understood that the adequacy level was decreased from moderate to low and a significant difference was revealed [$t = -3.16$, $p < 0.01$]. Besides occupational equipment [$t_{86} = 4.15$, $p < 0.01$], use of technology [$t_{87} = 3.59$, $p < 0.01$] and communication opportunities [$t_{86} = 2.77$, $p < 0.01$] were the expressions in which the adequacy levels were increased from moderate to high. Although the physical conditions were improved, the organizational related aspects were not developed towards the FCUs' requirements.

One of the remarkable results of this research was dealing with overtime. There was no significant difference between the years, but overtime was evaluated as close to very high for both years (Table 3). Similarly, FCs mentioned that they often had to work on weekends. Although t-test results showed that there was a difference between the years, the current situation was still close to high [$t_{87} = -2.16$, $p < 0.05$]. The other finding related to this aspect was about the adequacy of overtime payment; it was revealed that the adequacy of payment level was low in both years. Overtime

and insufficient payment were considered among the components that mostly affected the working conditions of FCs.

FCs expressed that they had to perform work beyond their job descriptions. They also mentioned that the percentages of these tasks were between 30% and 50% for both years and there was no change during the 15-year period. Thus, it is possible to state that this situation makes the increases the workload levels of FCs excessively. Under these circumstances, the beliefs of FCs in terms of realization of their occupational expectations were quite low for both 2002 and 2017 (Table 3). This result gives a negative signal in terms of future personal and organizational problems.

Factors that Create Pressure and Affect Working Conditions of FCs

The most striking results of the research were about the evaluations of FCs regarding political impacts. This factor was considered as the most pressing factor on FCs for both years, with their means close to the full score (Table 4). Local governments were also ranked as the second most affected factor that created pressure for both 2002 and 2017. The evaluations of the FCs regarding the pressure of non-governmental organizations (NGOs) and public institutions were at a low level. In addition, there was no significant difference between the ranking of FCs over the years (Table 4). This means decisions and implementations were not made towards reducing or eliminating the pressure of political bodies and local governments.

Table 4: Factors that create pressure and affect working conditions of FCs and how they change between 2002 and 2017. Please see table 2 for abbreviations.

Tabelle 4: Faktoren, die bei OF zu Belastung führen und Arbeitsbedingungen beeinflussen und deren Änderungen zwischen 2002 und 2017. Die Abkürzungen sind in Tabelle 2 erklärt.

Factors		Year	Mean / Rank		t-test Results			
			Mean	Mean Rank	t	df	p	MD
Factors That Create Pressure	Political Bodies	2002	3.60	1	1.23	68	0.22	-0.22
		2017	3.82	1				
	NGOs	2002	2.00	3	-0.70	58	0.48	0.18
		2017	1.82	4				
	Local Government	2002	3.00	2	0.00	64	1.00	0.00
		2017	3.00	2				
Public Institutions	2002	1.94	4	0.38	56	0.70	-0.10	
	2017	2.04	3					
Factors That Affect Working Conditions	Land Conditions	2002	4.03	6	1.44	59	0.15	-1.07
		2017	5.04	7				
	Social Impact	2002	6.19	1	1.07	62	0.28	-0.62
		2017	6.82	2				
	Legal Issues	2002	4.95	8	0.95	56	0.34	-0.68
		2017	5.63	5				
	Adequacy of Education	2002	3.52	7	3.41	55	0.00	-2.11
		2017	5.63	6				
	Lack of staff	2002	6.16	3	3.48	69	0.00	-1.66
		2017	7.82	1				
	Organizational structure	2002	5.53	4	2.16	69	0.03	-1.21
		2017	6.74	4				
	Lack of occupational equipment	2002	4.95	9	-1.33	65	1.87	0.70
		2017	4.25	8				
	Bureaucratic obstacles	2002	6.80	2	-0.30	64	0.76	0.14
		2017	6.65	3				
Financial problems	2002	5.37	5	-3.12	61	0.00	1.91	
	2017	3.45	9					

Social impact and bureaucratic obstacles were also close to each other over the years, ranking in first place for 2002 and 2017. On the other hand, it was found that land conditions, legal issues, and the lack of occupational equipment were factors that did not greatly impact on working conditions of FCs (Table 4).

The effect levels of the factors related to the adequacy of education, lack of staff, and organizational structure were significantly increased over the years. In particular, the evaluation level regarding the adequacy of staff improved from 3rd place to 1st after 15 years. However, the evaluation level of financial problems in terms of their effects on working conditions was decreased significantly [$t_{61} = -3.12, p < 0.01$] (Table 4).

Discussion

Main Problems

The total area and forest area managed by FCs were very large and there was no improvement in the 15-year period. This problem was also stated as a finding of some recent case studies from Turkey (Akyüz *et al.* 2011; Alkan and Uğur 2016; Yılmaz *et al.* 2019). Moreover, the size of the area managed by FCs and workload were described as the core of the managerial problems (Daşdemir and Çakmak 2018). The forest area and employee numbers were also considered among the indicators of the forest management evaluation process in China (Chen *et al.* 2020). The Chinese case showed that forest area makes the most important contribution to timber harvest and a moderate (0.67-3.3 ha) scale of forestland ownership was suggested for increasing profit (Zhu *et al.* 2020). The research results of Croatian forestry units revealed that a higher level of efficiency was achieved by forest offices with an area from 10 to 15,000 ha (Šporčić *et al.* 2009). It is understood that the size of the managed area by a forestry unit should be considered regarding the local characteristics.

The findings also revealed that the lack of staff in all categories was still an important problem regarding the local-level management of forests. This problem is also considered an effective problem in some country-level and regional studies (Yurdakul Erol 2017; Gümüş and Ayaz 2020). Kenya's case showed that except for the number of human resources, improving capacity and informing policy on human resources needs were of importance (Mukolwe *et al.* 2016).

Further, political actors have a great pressure factor on FCs, harming local-level forest management. Parallel findings were also expressed in some other related studies (Gümüş 2014; Özden 2020). The findings of this research and parallel results of related articles revealed that the aspects regarding the size of the managed area, lack of personnel, and pressures of political actors were the key problems of the local-level forest management system in Turkey. These issues also have general characteristics. The FAO (2015) determined a lack of interface with administrative goals and higher-level political demands as a common problem. Also, the negative impact of conflicts, self-maximizing schemes, and political power on local forestry was expressed (Diaw 2005). The weaknesses of developing countries in terms of forestry are defined as insufficient investments regarding human resources. Further, it was determined that many public agencies were not able to develop the human resources needed in terms of managing forests, utilizing forest resources in a sustainable way, and setting and implementing forest plans in a complex environment (FAO 2009; Wieland and Dedeurwaerdere 2010).

Organizational System and Human Resources related Aspects

The findings showed that the evaluated adequacy level of graduate education, pre-service and in-service training, and also publications and educational documents had increased. However, these issues have to be developed more, especially regarding pre-service education. It is also necessary to focus on training and staff development activities for FCs. Ray (1995) defined education and training as the center of adaptation of the changing scenario of forestry and achieving forest policy goals. The need for a regional perspective for forestry education was also expressed by Temu *et al.* (2006). This approach could also be the basis of in-service training.

The suitability of working hours for the job, participation in forest enterprise-level decision-making, coordination, task distribution, the existence of organizational units, and distribution of the staff were the expressions in which the evaluation level regarding their adequacy was decreased. The time availability of working hours, autonomy of employee in decision-making and organizational culture were also considered among the important factors of innovativeness in Serbian public forest policy enterprises (Poduška *et al.* 2020).

Human resources should be developed quantitatively and qualitatively. Also, scientific job definitions, fair and balanced job distribution, improving cooperation and coordination are the core aspects. The Indian case indicated the structure of human resources like rules, norms, and cultural cognitive affect the success of forestry staff's performance (Nurtjahjawilasa *et al.* 2015). Career management, the creation of an institutional approach by employee identification, providing individual incentives to improve performance, and improvement of transparency have been mentioned as the core human resources reforms for forest organizations (WB 2005).

In an organization where provincial units spread widely such as in forestry, these aspects have critical importance in terms of solving administrative and managerial problems, parallel to the findings that there was no meaningful improvement regarding authority delegation and participatory management in local management issues. Authorization of local governments and empowerment was revealed as the core implementation of national policy, and regional level management of forests have a critical role in terms of achieving sustainable forestry (Turyahabwe *et al.* 2007; Yamada 2018). Improvement of these aspects may help expedite the solutions. Besides, these aspects would have direct relations with work efficiency, morale and motivation, and organizational commitment of FCs. Thus, these issues should also be the essential points of the solution mechanisms. The United States of America (USA) case showed that improved communication, forest staff efforts, and effective leadership were identified as the essential components of promoting organizational change (Schultz *et al.* 2016). The historic investigation of the Australian forestry organization demonstrated the vital role of leadership, innovation, and entrepreneurship in terms of institutional development (Summerfield and Keenan 2017). An innovative, agile,

flexible, and encouraging organizational culture, non-hierarchical top management, and inspiration of employees were seen among the key components of a successfully managed organizational transition for Finnish forest-based companies (Näyhä 2020). Providing autonomy for work teams and being open to employee ideas for improvement were found as the key components of capturing employee creativity in the USA and Finland forest sectors (Laukkanen *et al.* 2017).

On the other hand, the evaluations regarding the adequacy levels on occupational equipment, opportunities to access the forest area, technology use, and communication opportunities increased. All these aspects were the most highly evaluated issues for 2017. For the current situation, it can be highlighted that the problems experienced in these issues are not on a large scale. These factors were also considered as the important factors of the operational decision-making management process (Rönqvist *et al.* 2015) and organizational success in general. The importance of the aspect can be seen in the European State Enterprises case. Except for the number of employees, the social metrics of sustainability include employee motivation, working conditions, training, occupational health and, human resources strategies in some countries (Liubachyna *et al.* 2017).

Pressures and Factors Affecting Working Conditions

Public forest institutions face some political, financial, organizational, technical, and social problems while adapting to changes in socioeconomic and political issues (FAO 2015). It was stated that public forestry administrations were generally under the interference of high-level political demands. The Turkish case results revealed that the political impact was the factor that created pressure on FCs at the highest level, followed by local governments for both years. NGOs and governmental organization effects were not evaluated at a high level. The Uganda case revealed that the staff of the Forest Department was under pressure from local politicians and local government (Turyahabwe *et al.* 2015). The case study from Boliva and Guatemala showed that NGOs exerted pressure on local governments in pursuit of their goals (Cook *et al.* 2017). The pressure of the forest market and timber demand had a direct effect on Chinese forest policy change (Démurger *et al.* 2009).

Özdönmez *et al.* (1998) expressed the importance of keeping technical staff away from unnecessary pressure as one of the essential principles of public forestry organization. At this point, the elimination of political pressure and local administrations can be seen as one of the main conditions for the successful implementation of forest policies and achieving aims. Further, the most influencing factors of FCs are bureaucratic obstacles, lack of staff, and social impact. These issues ranked as the first three factors that affected working conditions for both 2002 and 2017. It is possible to determine that these issues are the main problems that have to be solved urgently. The decrease in the number of employees and excessive bureaucratization are also among the weaknesses of the Italian forest sector (Falcone *et al.* 2020). Top-down sty-

le communication, target-based incentive systems, rigid rules and regulations, and a lack of leadership to reverse this hierarchical culture were considered as the main factors that affected organizational transition in India (Matta *et al.* 2005). The Croatian case revealed the negative effects of unbalanced focus in organizational culture, formally directive management style, and lack of a reward system in terms of improvements in forest company performance (Landekić *et al.* 2015).

Conclusion

Political pressure was very high on FCs, and working conditions had been affected mostly by social impact, bureaucratic obstacles, and a lack of staff during the 15 years. The 15-year challenge showed that there was no significant improvement in the working conditions of FCs at the local level, except for some physical aspects. Also, it was revealed that improving physical conditions was not enough to support the working conditions of land managers because their jobs were too complicated to have a multidimensional structure.

The comparison of the working conditions over the 15-year period revealed some critical points that would strengthen local working conditions: (1) support local units (FCUs) beyond only physical conditions; (2) improve working conditions, especially related to workload, distribution of staff, task distribution, delegation, and the managerial process; (3) avoid political pressures, especially at local-level units and managers, (4) plan human resources qualitatively and quantitatively; and (5) define the authority and responsibility of the FCs clearly.

The working conditions and pressure factors on land managers should be considered by national-level decision-makers in general, and head of local forestry units under region-specific conditions. Also, this kind of time-based comparative analysis could be useful in terms of considering the effects of decisions and applications and help raise awareness among decision-makers to measure the effects and results of their decisions and applications in time.

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