

Original Research

Forest Managers' Perceptions of the Foremost Forestry Issues and Functions in Turkey

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Received: 20 April 2010

Accepted: 20 September 2010

Abstract

Forestry organization is both the main stakeholder in policy making and the application process, and an important policy instrument in reaching policy objectives. Thus, the managers of national forestry organizations play an important role in achieving the sustainable use and management of forest resources. The main aim of this paper is to determine Turkish forest managers' perceptions of the main forestry issues and the factors that influence these perceptions. In this direction, the opinions of top-level managers of the Turkish Regional Forest Directorates toward forest functions, the problems that occur during the management process, and foremost issues to gain importance in the future were evaluated through a questionnaire. The study covers all 27 regional forest directorates, which conduct their activities all over the country under the General Directorate of Forestry. The results of the study show that forest managers recognize the importance of socio-cultural and environmental-ecological functions of forest resources, similar to international trends. They also strongly emphasized some problems associated with national circumstances such as cadastral and ownership problems, deficiency in personnel motivation, and problems occurring in forest-society relations.

Keywords: forest managers, forestry organization, Turkish forestry

Introduction

Forest policy includes a set of objectives, procedures, principles, rules, and tools that guide the use and management of forest resources based on forest-society relations. Society's expectations from forest resources and forest-society relations can change depending on time and space. For example in the last 20 years, the ecological-environmental and recreational functions of the forests have been gaining importance in the management of forest resources [1-7]. Also, in recent years topics such as participatory management, international cooperation, cross-sectoral interaction and coordination, ecosystem management, sustainable forest management criteria and indicators, international forest products trade and certification, protected forest areas,

biological diversity, and production of non-wood forest products have become increasingly prominent in the forestry agenda.

Socio-economic changes (human population growth and dynamics, economic growth, trade and consumption, poverty and inequality) and biophysical changes (climate change, conversion and fragmentation of natural habitats, hydrological change, biodiversity loss) are the main factors affecting natural resources [8]. In spite of many negative changes such as deforestation, forest degradation, illegal uses, and land conversion, forests continue to provide vital benefits for human life and the earth's health and future through many different uses and services (timber production, recreation, ecotourism, water and soil conservation, carbon sequestration, biodiversity conservation and others). As a result of the related-uses, forest resources contribute both sustainable development and natural conservation. The for-

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est-related issues are given a larger place on the global agenda with the growing environmental awareness and different demands on forests. Thus the importance of forests to ensure sustainability – especially environmental sustainability and biodiversity conservation – is strongly expressed by UN Millennium Development Goals [9] and many international initiatives. This trend highlights the priorities for forest functions and essential issues for today and the future.

Today, forest functions toward non-wood forest products and services have become one of the most important elements of national forestry strategies. Especially forest services, including environmental-ecological functions (mitigating climate change, biodiversity conservation, soil and water conservation, etc.) and tourism-recreation have recently gained more importance in Turkey and the world. On the other hand, FAO [10] states that demand for wood products is one of the main drivers of investment in forest management. Wood energy is already an important energy source for many countries in terms of price and carbon emissions [11]. This fact shows that the wood production-related functions are still important for today's forestry. Forest managers and forestry organizations have to analyze the current development of trends and implement appropriate management strategies that take into account local, regional, and national conditions.

Schelhas [12] categorizes the recent trends in natural resource policy and management, including forestry, as:

- a) simple to multiple interests,
- b) simple ownership to bundles of rights,
- c) deterministic science to multiple knowledge systems, and
- d) public interest to stakeholder groups.

It is also mentioned by Sengupta and Maginnis [13] that poverty reduction, non-timber forest products, community forest management and decentralized governance, forest law enforcement, forest landscape restoration, forest valuation and markets for ecosystem services, forest plantations and wood supply, and new forest technologies will be the key emerging themes in the forest sector in coming years. A comprehensive evaluation and integration of these multiple economic, social, and ecological issues is essential for effective management of forests. But the importance of the issues can vary from one country to another, depending on the participation in international policy processes, national conditions, and forest-society relations.

Parallel to these developments, the foremost issues of Turkish Forestry can be summarized based on the many national documents as follows: cadastre and ownership, forest-villager relations, protected areas and biodiversity, conservation of forest resources, multi-functional utilization of forest resources, supplying non-wood forest products and socio-cultural services (recreation, eco-tourism, landscape, wildlife, education, game, etc.) and supporting rural development. Also, strengthening the institutional capacity, enhancing research and education, participation in global processes, meeting EU standards, raising the awareness of society about forests, improvements in legal arrangements, and sustainability and participation are

emphasized as the other common issues in relation to current forest policy [14-17]. The related issues have different rankings for various regions of the country because of different characteristics of natural, social, and economical conditions of the regions. It is important to clarify these differences at the local level for successful forestry decisions and applications. "Forest managers" is one of the key factors in determining site-specific issues, solving problems, and reaching forest policy objectives.

In the context of the global and national agenda it is strongly emphasized that the natural resources managers should pay more attention to include understanding the relationship between natural and social systems, interacting with various societal groups and policy-makers, and accordingly benefiting more from social sciences [18-22]. Also, managers of various levels of forestry units must combine their expertise and experience regarding the characteristics of forest resources and technical applications with knowledge and applications based on social sciences, which can help to understand the social demands and increase communication with the stakeholders. For this reason, a careful monitoring of socio-economic and cultural changes that affect forest resources, improvement of communication with related segments of society and stakeholders, and adoption of proper management approaches related to forest functions that have emerged in recent years are among the important responsibilities of forestry policy-makers. The fulfilment of these responsibilities will enable the forest organization to be more active in the protection and sustainable use of the forests during the forest policy process.

Undoubtedly, while "forestry organizations" is an interest group of prime importance in the determination and implementation of forest policies, it is also an indispensable tool in reaching forest policy objectives. On the other hand the managers of forestry organizations play an important role in achieving the sustainable use and management of forest resources. The objective of this study is to explore and determine the opinions of top-level managers of the Turkish Regional Forest Directorates on the functions of forests, and the foremost issues and the problems facing them in the process of implementing forest policy. In addition, factors that influence these opinions were evaluated. In other words, this study tries to answer the following questions:

- 1) What are the forest managers' opinions on the problems that regional forest directorates face, levels of importance of forest functions, and issues to gain importance in the future?
- 2) Are there statistically significant differences among the answers given by managers, depending on the various characteristics of the forest resources managed by the related regional directorates?

The study is expected to provide guidance to researchers and practitioners for formulating and implementing forest policies with a participatory approach and thus for determining the prominent issues and the problems faced in ensuring multiple forest functions, and developing solutions for these problems.

Materials and Methods

This paper focuses on the Turkish forest managers' perception of the main forestry themes and the factors that influence these perceptions. In this direction, the opinions of top-level managers of the regional forest directorates toward forest functions, the problems that occur during the management process and foremost issues to gain importance in the future were evaluated based on the characteristics of these directorates.

Considering the scope of the study and the available research facilities, the study is confined to the example of the regional forest directorates, the provincial unit of the Turkish national forestry organization with the most widespread and developed nationwide facilities. A questionnaire was conducted between December 4, 2006 and May 31, 2007 among top level managers of the 27 regional forest directorates in Turkey. The regional directors and their deputies were first asked to fill out the questionnaires and, when not available, branch managers were asked to complete the questionnaire. Thus, it was assured that each regional directorate was represented by 3 managers. As a result, 81 questionnaires obtained from 16 regional directors, 32 regional deputy directors, and 33 branch managers were evaluated. The questionnaire was first pilot tested through face-to-face interviews by the researchers of the study and further refined before the collection of the data.

This study mainly addresses the sections of the questionnaire included the problems emerging in conducting the activities during the management process in the beginning, secondly, the importance of forest functions both for today and the future, and lastly the foremost issues that may be placed into the forestry agenda in the future. The questions were formulated through sentences prepared by a five point Likert-type scale. Answers to each question were given as a reflection of choices from the strongest agreement to the strongest disagreement (I strongly agree, I agree, I am neutral, I don't agree, I strongly disagree).

For evaluation of the questionnaire results and related analysis, SPSS (Statistical Package of Social Science) program was used. In the first stage of the evaluation, reliability analysis was conducted in testing scale reliability and the item-total correlation values. As emphasized by Parasuraman et al. [23], the questions that had an item total correlation below 0.3 (4 questions about forest functions, 2 questions about topics that will gain importance in the future) were indicated separately. However, since the Cronbach Alfa Coefficients were not affected seriously and because of the importance of the questions, these questions were not eliminated from the evaluation. According to the results of the reliability analysis, the Cronbach Alfa Coefficients (α) for three question groups were found to be above 0.8, and for one group was 0.63. These values were within the recommended levels for the stability and consistency of the statements included in each questions group.

Analysis of variance (ANOVA) and multivariate analysis of variance (MANOVA) tests were used in order to determine whether there are statistically significant differences among the answers given by managers, depending on

the various characteristics of the forest resources managed by the related regional directorates. In the comparisons made in this context, productive forest area, total forest area, number of forestry directorates, forest village population, total population of the region, size of the protected areas, ecotourism and recreation areas, areas assigned for protection and environmental functions, and forest crimes were all taken as independent variables (some socio-economic variables like gross national domestic product and household income are also planned to be taken into consideration. But the related statistical data toward the boundaries of regional forest directorates are not available). In this line, the ANOVA test was used in the evaluations related to current problems that the directorates face and main topics that will gain importance in the future, whereas MANOVA tests were used in the statements regarding the importance of forest functions for today and in the future. In comparisons using these tests, evaluations were made according to the significance levels of 0.05 and 0.01. When a difference was found between groups mentioned above, Scheffe post hoc test was used to find out which groups were different from each other.

Main Features of Forest Resources and Forestry Organization in Turkey

Turkey has a total of 21,188,746 ha. forest area, 10,621,220 ha. of which is productive and 10,567,526 ha is unproductive. The forest area comprises 27.2% of total territory [17]. A large part of the country's forests are located in the northeastern and southern parts of Turkey. In terms of geographical regions, 24% of the country forests are located in the Black Sea Region, 19% in the Mediterranean Region, 18% in the Aegean Region, 14% in the Marmara Region, 11% in the Central Anatolia Region, 8% in the East Anatolia Region, and 6% in the South East Anatolian Region. Turkey's forests sequester 46 tons/ha. of carbon and release 1.5 tons/ha. of oxygen per year [24].

Turkey's forests are rich in biological diversity. There are 9,000 plant species, 3,000 of which are endemic in the country, and most of the species are found in forest areas [14]. It also has rich biodiversity in terms of fauna, with 160 mammals, 454 bird species, 150 reptile and amphibian species, and over 400 fish species [17]. Forests under the status of protected areas cover 1,026,142 ha. Protected forest areas consist of national parks, nature parks, nature monuments, and nature conservation areas that are designated by National Parks Law No. 2873 of 1983.

The Current Forest law No. 6831 of 1956 categorized the country's forests into three groups in terms of quality: production forests, conservation forests, and national parks. By looking at the forest functions, it can be seen that 47% of Turkey's forests are designated for forest product production, 19% is reserved for nature conservation, 16% is for hydrological functions, 11% is for erosion prevention, and the rest is designated for aesthetic, climate protection, public health, national defense, and scientific purposes. In general, 50% of Turkey's forest serves mainly ecological functions, 47% economic and 3% social functions [24].

It is also necessary to give some general information about the forest villages that are gaining importance in terms of public relations. The number of forest villages in Turkey is 21,218. The population living in these villages is about 7.5 million, which comprises 12% of the total population, and is 47% of the population living in villages [16-25]. Forest villages constitute one of the poorest class of the population and their incomes depend heavily on forests. Some wood and non-wood needs of forest villagers are provided by the country's forestry agencies with employment opportunities.

Forest law No. 6831 defined three categories of forest ownership: state forests, forests belonging to public institutions, and private forests. One of the most prominent features of Turkish forestry is that 99.9% of the country's forests is publicly owned. The Ministry of Environment and Forestry (MoEF) is responsible for making and implementing decisions and policies, and planning and management activities on forest areas, as well as the basic tasks related to protecting and improving the environment. The ministry has central and provincial organizational units around the country to carry out various environment and forestry-related activities.

The main state organizations conducting forestry activities in the central organization of the Ministry of Environment and Forestry are the following:

- 1) The General Directorate of Nature Conservation and National Parks
- 2) The General Directorate of Afforestation and Erosion Control
- 3) The General Directorate of Forest and Village Relations
- 4) The General Directorate of Forestry

The General Directorate of Forestry generally focuses on the production of wood and non-wood forest products, whereas the other directorates carry out activities related to ecological-environmental, recreational, rural development functions. The main task of the General Directorate of Forestry is to protect, develop, and manage Turkey's forests. To fulfill this task it has been organized at both central and provincial levels. Provincial structure of the General Directorate has been constituted by the regional forest directorates, forest enterprises, and field management units. Regional Forest Directorates are the most authorized provincial units that represent the General Directorate of Forestry (GDF). In Turkey there are 27 regional forest directorates and 217 forest enterprises connected to the regional directorates. There are also 1,308 field management units connected to the forest enterprises [26].

Results

In this section the findings obtained through the questionnaire consisting of the items regarding foremost issues and problems facing the directorates, the degree of importance of forest functions today and in the future are introduced. Each of the issues, problems, and functions outlined under the titles of the study have been separately compared according to various features such as productive forest area,

total forest area, forest village population, total population, number of forest enterprises, ecotourism and recreation areas, protected areas, areas assigned for protection and environmental functions, and forest crimes.

Problems that Regional Forest Directorates Face

According to the respondents, the most important problem that the regional forest directorates face while implementing their activities is related to cadastral and ownership ($M=4.44$). Other main problems affecting the activities of the directorates are deficiency of personnel motivation ($M=4.35$), conflicts in forest-public relations ($M=4.15$), and lack of professional staff ($M=4.02$). As shown in Table 1, all items listed in Table 1 create problems for the regional directorates at different levels. The most rated three problems are also widely mentioned in various national documents and studies. For example, since forest cadastre has not been completed yet, ownership problems and associated conflicts among the forestry organization and forest villages are going on in many parts of the country.

Forested lands with a canopy cover of 10 percent and above are accepted as "productive forest" in Turkish forestry. The ratio of productive forest area and the quality of forest resources is one of the most important factors affecting forest functions and the financial structure of regional forestry organizations, and this factor also influences forest managers' many opinions. The results of ANOVA test show that there are statistically important difference among the opinions of forest managers regarding problems related to illegal actions against forests ($P=0.047$, $F=3.192$), insufficiency of legal arrangements ($P=0.031$, $F=3.626$), inefficiencies in forest inventory, and other socio-economical data ($P=0.016$, $F=4.377$), according to productive forest area. In this direction it can be pointed out that there is no difference between the managers' perceptions concerning the technical and managerial issues in terms of productive forest area.

When the current problems are assessed according to the number of forest enterprises, it is seen that statistically significant differences exist among the opinions regarding problems in motivation ($P=0.002$, $F=6.961$), cadastral-ownership problems ($P=0.041$, $F=3.321$), and participation of interest groups ($P=0.015$, $F=4.455$). At this point it can be stated that the level of importance of cadastral-ownership problems decreases in parallel to increasing the number of the enterprises. Similar situations occur in problems regarding participation of interest groups.

On the other hand, in the evaluation based on the population of forest villages, the results reveal major differences between opinions that the area of responsibility is broader than required ($P=0.005$, $F=5.748$), and deficiencies in communication within the organization ($P=0.032$, $F=3.612$), lack of communication-cooperation with the other public institutions ($P=0.024$, $F=3.898$), cadastral-ownership problems ($P=0.017$, $F=4.264$). In parallel with the increase of forest village population within the boundaries of the regional directorates, problems such as lack of communication within the organization, lack of communication and

Table 1. Problems that the Directorates face and related ANOVA test results*.

Problems	Productive Forest Area (ha)			Number of Forest Enterprises			Forest Village Population			Total Population			Protected Areas (ha)			Total
	0-250,000	250,001-500,000	500,001 and more	1-5	6-10	11 and more	0-200,000	200,001-400,000	400,001 and more	0-1,000,000	1,000,001-2,000,000	2,000,001 and more	0-15,000	15,001-30,000	30,001 and more	
	Mean (M)															
Financial problems	3.90	3.43	3.50	3.22	3.56	3.80	3.36	3.61	4.08	3.11	3.56	3.89	3.71	3.37	3.63	3.57
Lack of equipment and physical opportunities	3.71	3.33	3.28	3.11	3.40	3.67	3.44	3.24	3.83	3.44	3.31	3.56	3.33	3.52	3.40	3.42
Lack of Decentralization	3.86	3.71	3.83	4.44	3.68	3.73	3.56	3.88	4.17	3.56	3.81	3.89	3.62	3.78	3.90	3.78
Insufficiency of personnel	4.14	3.98	4.00	3.67	4.11	3.93	4.08	3.85	4.33	3.83	4.14	4.00	4.46	3.96	3.73	4.02
Problems in communication within the organization	2.67	2.74	3.56	3.33	2.82	2.93	2.50	3.06	3.67	2.56	3.03	2.96	2.50	2.78	3.33	2.90
Lack of communication and cooperation with other public institutions	3.33	3.14	3.56	3.89	3.30	2.87	3.00	3.30	4.08	2.72	3.31	3.63	3.46	2.89	3.50	3.28
Having vast forest areas in responsibility region	3.76	3.67	3.94	4.56	3.70	3.47	3.28	4.06	4.33	3.11	4.00	3.85	3.54	3.74	3.93	3.75
Problems in personnel motivation	4.29	4.36	4.39	4.22	4.53	3.73	4.22	4.36	4.67	4.17	4.42	4.37	4.50	4.30	4.27	4.35
Conflicts in forest-public relations	4.19	4.12	4.17	4.22	4.16	4.07	4.17	4.21	3.92	4.11	4.22	4.07	4.29	4.04	4.13	4.15
Illegal actions toward forest resources	4.10	3.55	3.94	3.78	3.75	3.87	3.61	3.97	3.75	3.50	4.00	3.67	3.88	3.56	3.90	3.78
Bio-physical threats related to forest protection (forest fires, flood, erosion, etc.)	4.05	3.50	3.72	3.67	3.68	3.73	3.44	3.94	3.75	3.39	3.86	3.67	3.75	3.63	3.70	3.69
Cadastral and ownership problems	4.57	4.31	4.61	4.89	4.49	4.00	4.14	4.67	4.75	4.33	4.47	4.48	4.25	4.41	4.63	4.44
Problems related to interpretation-education studies on forestry activities	3.62	3.48	3.83	3.33	3.74	3.20	3.56	3.52	3.92	3.50	3.53	3.74	3.75	3.41	3.63	3.59
Lack of participation of interest groups in decision-making and implementation processes	3.67	3.62	4.06	4.33	3.77	3.20	3.53	3.88	3.92	3.44	3.78	3.85	3.67	3.56	3.93	3.73
Insufficiency of legal arrangements	3.67	3.55	4.11	4.33	3.67	3.47	3.56	3.76	4.00	3.50	3.75	3.78	3.54	3.63	3.90	3.70
Inefficiency of forest inventory and other socio-economical data	3.81	3.21	3.78	3.78	3.46	3.47	3.64	3.24	3.75	3.61	3.28	3.70	3.62	3.33	3.53	3.49
Problems in current planning activities	3.81	3.00	3.39	3.00	3.33	3.33	3.47	3.09	3.33	3.61	3.17	3.26	3.42	3.30	3.20	3.00
Technical problems arising from silvicultural and forest protection activities	3.62	2.95	3.39	2.89	3.28	3.20	3.11	3.24	3.50	3.11	3.14	3.41	3.17	3.22	3.27	3.22

*ANOVA test was also conducted based on total forest area, ecotourism and recreation areas, areas assigned for protection and environmental functions, and forest crimes. However, the related results are not shown in the table as no significant difference was found.

cooperation with other public institutions, and cadastral-ownership problems are recognized as more important.

Total population within the duty boundaries of forestry organizations, including people living in both rural and urban areas, is an important factor affecting the management and use of forest resources. The findings of the study indicate that significant differences exist between forest managers' opinions on the basis of total population within the duty area of regional directorates, concerning the lack of communication and cooperation with other public institutions ($P=0.045$, $F=3.321$) and the directorates' responsibility area being broader than required ($P=0.034$, $F=3.528$). Depending on the increase in the total population level, the degree of importance of the problem related to lack of communication and cooperation with other public institutions is rated higher by the managers.

The results of ANOVA test also show that there is a statistically important difference regarding only the issue of staff insufficiency in terms of the size of the protected area located in the regional directorates ($P=0.034$, $F=3.546$). However, any significant difference does not exist between the opinions according to the total forest area, recreation and ecotourism areas, areas assigned for protection and environmental functions, and forest crimes.

Levels of Importance of Forest Functions Today and in the Future

Generally, forest managers acknowledge the importance of the non-wood forest products and services both for today and the future in accordance with international trends. They also accept the role of wood production for today. More specifically, ecological-environmental functions (such as water and soil conservation, mitigating climate change, biodiversity conservation), tourism-recreation, and production of non-wood forest products are expected to become important in the future.

In this section forest functions were grouped into three main categories: "forest products production", "socio-economic and cultural functions", and "environmental-ecological functions." Also, the associated functions were separately included in each category. Managers recognize that the function of forest products production has a certain importance both for today ($M=3.54$) and in the future ($M=3.66$). Among forest-products-production-related-functions, managers express that "wood production" is of major importance for today and will have medium importance in the future. They also stated that "production of non-wood forest products" is of medium importance for today and will have major importance in the future (Table 2). It is well known that studies on the non-wood forest products have increased recently at global and national levels. These results can be evaluated as forest managers supporting more effective efforts regarding non-wood forest products and new steps to be taken by the Turkish forestry organization.

It is stated that socio-economic and cultural functions are important for today ($M=3.56$) and will become more important in the future ($M=3.79$). According to the related

opinions, among the individual functions within this group, only the importance of the function of "employment opportunities provision" will decrease in the future compared to today, and the importance of all other functions will increase. At this point, it should be noted that there are about 7.5 million forest villagers living in and near forests in Turkey. Meeting the needs of these people having economic difficulties has been one of the major responsibilities of Turkish forestry organizations.

Turkish forest managers accepted that the use of forests for the purpose of tourism and recreation has gained importance. Among the socio-economic and cultural functions group, the most important function assessed for the future was "tourism and recreation". In general, socio-economic and cultural functions were prioritized for today as follows: employment opportunities provision ($M=3.79$), tourism and recreation ($M=3.60$), supporting rural development ($M=3.57$) and protecting traditional life types-cultural values ($M=3.27$). As for the future, some functions were ranked as tourism and recreation, supporting rural development, protecting traditional life types-cultural values, and employment opportunities provision, respectively.

While environmental-ecological functions are assessed as important today ($M=3.88$), they are expected to become very important ($M=4.62$) in the future. Of the individual functions within this group, the functions of highest level of importance are determined as "water and soil protection" for today and "creating positive impacts on the climate" for the future. In addition to these two functions, the others within this group, "biodiversity conservation" and "protecting natural and cultural resources," are also assessed as important for today, while they are expected to become very important for the future.

Apart from these findings, when the main function groups were prioritized for today, the most important function was recognized as environmental and ecological functions ($M=3.88$). This function group was followed by socio-economic and cultural functions ($M=3.56$) and forest products production ($M=3.54$). The functions were ranked in the same way for the future as well: environmental-ecological functions ($M=4.62$), socio-economic and cultural functions ($M=3.79$) and forest products production ($M=3.66$). It is clearly shown that increased environmental movements and associated demands toward forests affected the managers' opinions.

By looking at the ranking of all individual functions for today in Table 2, it can be seen that water and soil protection ($M=4.10$) was rated as the most important function, and it is followed by wood production ($M=3.91$) and creating a positive impact on the climate ($M=3.86$). As for the future, the first three functions of highest level of importance were rated as follows: creating a positive impact on the climate ($M=4.68$), water and soil protection ($M=4.67$), and protecting natural-cultural resources ($M=4.53$). In light of these results, it should be pointed out that non-wood forest products and services, especially ecological-environmental functions, are perceived as more important than forest product production both for today and the future.

Table 2. Levels of importance of forest functions and related MANOVA test results*.

Functions	Features	Total Population				Ecotourism and Recreation Areas (ha)			Protected Areas (ha)			Total	
		0-1,000,000	1,000,001-2,000,000	2,000,001 and more	Mean (M)	0-1,000	1,001-2,000	2,001 and more	0-15,000	15,001-30,000	30,001 and more		
Forest products production	Wood Production	T	4.33	3.81	3.78	4.13	3.78	3.92	4.08	4.19	3.53	3.91	
		F	3.17	2.75	3.07	3.20	2.78	2.97	3.33	3.15	2.47	2.95	
	Non-wood forest product production	T	2.83	3.42	3.04	3.13	3.19	3.15	3.38	2.89	3.23	3.16	
		F	4.44	4.25	4.48	4.47	4.63	4.15	4.37	4.41	4.33	4.37	
	Total	T	3.58	3.62	3.41	3.63	3.49	3.45	3.73	3.54	3.38	3.54	
Socio-economical and cultural functions			$P=0.042 / F=2.537$							$P=0.007 / F=3.654$			
		F	3.81	3.50	3.78	3.84	3.71	3.56	3.85	3.78	3.40	3.66	
	Tourism and recreation	T	3.56	3.75	3.44	3.87	3.19	3.79	3.83	3.30	3.70	3.60	
		F	4.56	4.25	4.44	4.40	4.63	4.21	4.38	4.48	4.30	4.38	
	Supporting rural development	T	3.78	3.33	3.74	3.87	3.33	3.62	3.83	3.33	3.57	3.57	
		F	3.89	3.64	3.81	4.00	3.74	3.67	3.63	3.81	3.80	3.75	
	Protecting traditional life types-cultural values	T	3.39	3.11	3.41	3.53	3.04	3.33	3.33	3.33	3.26	3.23	3.27
		F	3.83	3.58	3.81	4.07	3.81	3.51	3.88	4.00	3.33	3.72	
	Employment opportunities provision	T	4.00	3.61	3.89	4.33	3.67	3.67	4.08	3.85	3.50	3.79	
		F	3.39	3.17	3.41	3.67	3.19	3.23	3.17	3.52	3.20	3.30	
Environmental-ecological functions	Total	T	3.68	3.45	3.62	3.90	3.31	3.60	3.77	3.44	3.50	3.56	
			$P=0.045 / F=2.044$										
	Biodiversity conservation	F	3.92	3.66	3.87	4.04	3.84	3.66	3.77	3.95	3.66	3.79	
		T	3.56	3.75	3.74	4.13	3.56	3.64	3.92	3.59	3.63	3.70	
	Protecting natural and cultural resources	F	4.44	4.47	4.67	4.67	4.70	4.36	4.50	4.70	4.40	4.53	
		T	3.50	4.00	3.93	4.20	3.67	3.87	3.92	3.85	3.83	3.86	
	Water and soil protection	F	4.67	4.53	4.67	4.73	4.74	4.46	4.58	4.74	4.50	4.60	
		T	3.72	4.25	4.15	4.47	3.96	4.05	4.29	4.04	4.00	4.10	
	Creating a positive impact on the climate	F	4.61	4.64	4.74	4.73	4.89	4.49	4.62	4.81	4.57	4.67	
		T	3.56	4.03	3.85	4.27	3.59	3.90	3.96	3.89	3.77	3.86	
Total		F	4.67	4.69	4.67	4.80	4.89	4.49	4.62	4.85	4.57	4.68	
		T	3.59	4.01	3.92	4.27	3.70	3.87	4.02	3.84	3.81	3.88	
		F	4.60	4.58	4.69	4.73	4.81	4.45	4.58	4.78	4.51	4.62	
		T	4.60	4.58	4.69	4.73	4.81	4.45	4.58	4.78	4.51	4.62	

T – Today, F – Future

* MANOVA test was also conducted based on forest village population, number of forest enterprises, productive forest area, total forest area, areas assigned for protection and environmental functions, and forest crimes total. However, the related results are not shown in the table as no significant difference was found.

Apart from the findings given above, managers' responses to the questions regarding the degree of importance of "forest products production," "socio-economic and cultural," and "environmental-ecological" functions were compared with MANOVA test based on various criteria. In this scope, an analysis of the MANOVA results show that significant differences exist between the opinions on the levels of importance of forest products production, based on the total population ($P=0.042$, $F=2.537$), and the size of protected areas ($P=0.007$, $F=3.654$). On the other hand, it appears that significant differences exist regarding socio-economic and cultural functions according to ecotourism and recreation areas ($P=0.045$, $F=2.044$). As shown in these results, non-wood forest services related-forest areas and their qualities affect the opinions on the functions.

Issues to Gain Importance in the Future

A ranking of the mean scores of the responses for the issues to gain importance in the future presented in Table 3 reveals that an absolute majority of forest managers identified "sustainability" as the foremost issue for the future of Turkish forestry ($M=4.83$). "Environmental problems-forest interactions" was another issue that received a high score ($M=4.52$) among the issues related to the country's forestry agenda in the future. In this manner, the managers recognize that effective implementation of sustainable forest management and environmentally sensitive approaches are vital to maintaining and enhancing the economic, social and environmental functions of forests, for the benefit of present and future generations. Public demand for greater conservation of forests and associated international/national/local pressures from environmental groups and civil society have prompted forestry organizations to adopt a much stronger commitment to effective forest conservation and sustainable use of all types of forests throughout the world.

The other primary issues to gain importance in the future were ranked as the following: participation ($M=4.43$), improving functional management of forests ($M=4.43$), conservation forestry ($M=4.38$), public relations ($M=4.37$), certification ($M=4.36$), plantation and regeneration activities ($M=4.33$), and transparency in management ($M=4.33$). As stated before, they also most emphasized issues in the global and national forestry agenda. However, industrial forestry ($M=3.41$) was placed in the last rank. It should be taken into account that forest managers also stated that the importance of wood production would decrease in the future. Industrial forestry is essentially based on wood production process and the use of wood products.

On the other hand, a series of ANOVA tests were performed in order to examine if differences existed between the responses to the main issues listed Table 3 based on various characteristics of the regional directorates. Statistically significant differences were found between the comments regarding the importance of the issues for the future according to productive forest area, total forest area, the number of forest enterprises, ecotourism and recreation areas, and protected areas. These variables are also prominent factors

that influence managers' many opinions evaluated in the scope of this study. It is obvious that many forestry issues and related problems are generally related to the area and qualities of forest resources managed by forestry organizations and social demands for the use of these resources.

The most rated issues showing differences can be listed as certification, population increase and social pressures, international relations, and the EU membership process. The results reveal that the opinions regarding the "population increase and social pressures" issue are influenced by variables such as "productive forest area" ($P=0.004$, $F=5.966$) and "the number of forest enterprises" ($P=0.021$, $F=4.043$). In particular, the regional directorates with a productive forest area of 500,000 hectares give higher priority to this issue for the future. In addition, managers of the directorates with 11 and more forest enterprises accept the same issue as more important. That is, it is recognized that social pressures impacting forest conservation and management depend on the size and conditions of rural populations living near or within the country's productive forests. A substantial amount of forest villager or forest-dependent rural population and their economic difficulties/interactions with forests are typical of Turkish forestry.

Turkish regional forest directorates have forest enterprises of different numbers, depending on the forest area and local conditions. ANOVA results also show that the number of forest enterprises has significant associations with the issue related to "organizational structure and staff" ($P=0.016$, $F=4.364$). Meanwhile, another significant difference has occurred between the responses to the "certification" issue based on total forest area ($P=0.046$, $F=3.212$). The managers of the directorates with a forest area of 500,000-1,000,000 hectares assessed this issue more importantly compared to the others.

Conclusion and Discussion

It is widely accepted in forestry and natural resources management that greater emphasis should be placed on the participation of all interest groups (stakeholders) in the decision-making and implementation activities and the determination of the attitudes of these groups. On the other hand, the number of public and private sector representatives, non-governmental organizations, and researchers who want to participate in forest and other natural resources-related policy making and management processes is continuously increasing [7, 27-34]. At this point, 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 processes. This study recognizes that forest managers' attitudes and actions play a key role in establishing a high level of communication and interaction with all interest groups, determining site-specific issues and reaching the forest policy objectives by associating on-the-ground management activities with contemporary approaches (sustainable forest management, ecosystem management, forest certification, participatory management, etc.).

Table 3. Issues to gain importance in the future and the related ANOVA test results*.

Issues	Productive Forest Area (ha)			Total Forest Area (ha)			Number of Forest Enterprises				Ecotourism and Recreation Areas (ha)			Protected Area (ha)			Total
	0-250,000	250,001-500,000	500,001 and more	0-500,000	500,001-1,000,000	1,000,001 and more	1-5	6-10	11 and more	0-1,000	1,001-2,000	2,001 and more	0-15,000	15,001-30,000	30,001 and more		
Certification	4.14	4.50	4.28	4.27	4.49	4.00	4.11	4.39	4.40	4.47	4.37	4.31	4.33	4.48	4.27	4.36	
Participation	4.67	4.26	4.56	4.60	4.39	4.40	4.33	4.46	4.40	4.67	4.33	4.41	4.46	4.48	4.37	4.43	
Sustainability	4.90	4.79	4.83	4.93	4.76	4.93	5.00	4.81	4.80	4.93	4.85	4.77	4.75	4.85	4.87	4.83	
Financial problems	3.71	3.69	3.94	3.73	3.78	3.67	3.89	3.79	3.53	4.00	3.52	3.82	3.75	3.89	3.63	3.75	
Population increase and social pressures	3.71	3.69	4.33	3.60	3.92	3.80	3.44	4.05	3.27	4.27	3.52	3.90	3.75	3.93	3.83	3.84	
International relations and EU process	4.14	4.21	4.39	4.40	4.18	4.27	4.33	4.21	4.27	4.53	4.26	4.10	3.96	4.48	4.23	4.23	
Changes in forest product trades	3.62	3.71	4.06	3.87	3.80	3.53	3.67	3.84	3.53	4.13	3.48	3.82	3.83	4.04	3.47	3.77	
Technological innovation in forest resource management	4.24	4.31	4.44	4.40	4.35	4.13	4.11	4.35	4.33	4.67	4.26	4.23	4.17	4.52	4.27	4.32	
Plantation and regeneration activities	4.67	4.07	4.56	4.07	4.39	4.40	4.44	4.35	4.20	4.73	4.04	4.38	4.54	4.22	4.27	4.33	
Rural development	4.05	3.71	4.17	3.87	4.00	3.60	3.67	3.98	3.73	4.20	3.70	3.92	4.04	4.00	3.70	3.90	
Improving multi-functional management of forest resources	4.43	4.50	4.28	4.40	4.51	4.20	4.00	4.53	4.33	4.60	4.44	4.36	4.46	4.67	4.20	4.43	
Transparency in management and knowledge sharing	4.33	4.29	4.44	4.27	4.37	4.27	4.44	4.35	4.20	4.53	4.26	4.31	4.29	4.33	4.37	4.33	
Conservation forestry (Protected areas, bio-diversity, etc.)	4.62	4.29	4.33	4.33	4.43	4.27	4.11	4.46	4.27	4.67	4.37	4.28	4.33	4.48	4.33	4.38	
Measures related to forest conservation (for forest fires, insects, etc.)	4.52	4.10	4.33	4.60	4.22	4.07	4.11	4.26	4.33	4.60	4.19	4.18	4.25	4.41	4.13	4.26	
Urban Forestry	3.57	3.64	3.72	3.80	3.71	3.27	3.22	3.65	3.87	4.13	3.48	3.56	3.54	4.00	3.40	3.64	
Industrial forestry	3.43	3.29	3.67	3.60	3.39	3.27	3.00	3.49	3.33	3.80	3.11	3.46	3.50	3.52	3.23	3.41	
Cooperation and interaction between the related-sectors	3.71	3.67	4.00	3.67	3.78	3.73	3.89	3.75	3.67	4.20	3.56	3.72	3.71	3.93	3.63	3.75	
Issues regarding organizational structure and personnel	4.14	4.31	4.33	4.00	4.39	4.13	4.22	4.42	3.73	4.53	4.26	4.18	4.33	4.41	4.10	4.27	
Watershed-based integrated planning	4.38	4.12	4.22	4.00	4.25	4.27	4.11	4.21	4.27	4.47	4.15	4.15	4.17	4.22	4.23	4.21	
Productivity	4.33	4.21	4.28	4.00	4.31	4.33	4.44	4.30	4.00	4.27	4.15	4.33	4.38	4.26	4.17	4.26	
Public relations	4.62	4.26	4.33	4.20	4.35	4.60	4.67	4.39	4.13	4.60	4.37	4.28	4.38	4.26	4.47	4.37	
Environmental problems-forest interactions	4.71	4.45	4.44	4.40	4.47	4.80	4.67	4.56	4.27	4.67	4.48	4.49	4.50	4.63	4.43	4.52	

* ANOVA test was also conducted based on total forest area, ecotourism-recreation areas, areas assigned for protection and environmental functions and forest crimes. However, the related results are not shown in the table as it is not found any significant difference.

By looking at the findings of the study, in the evaluation regarding forest functions, Turkish forest managers think that the importance of wood production for today remains high but it will decrease in the future. However, it is stated that the importance of non-wood forest products will gain more importance in the future. Managers also emphasize the current importance of socio-cultural and environmental-ecological functions and point out that these functions (except the function of the employment opportunities provision) will become much more important in the future. These evaluations comply with international and national trends showing forest services based on socio-cultural and environmental functions receiving priority. Scientific research made in a sample area have also revealed similar findings. For example, in the case study carried out in the Black Sea region by Öztürk [35], it was found that the interest groups surveyed identified that preventing floods, avalanches and erosion as the most important forest function, while they secondly rated wood production. Besides, the same study revealed that the functions of forests except wood production were determined as more important than wood production. In another study conducted in the Balıkesir Region in Turkey, Erol [36] found that the functions of protecting a community's health, preventing flood and erosion and regulating the climate were ranked by the stakeholders as the most important functions for the future. In this study, the wood production function was ranked as one of the least important. Similarly, the Turkish National Forestry Program emphasized that socio-cultural services and protective-environmental forest functions have gained much more importance recently.

On the other hand, the managers point out that the main issues for the future will be "sustainability," "environmental problems-forest interactions," "participation," "improving multi-functional forest management," "protected areas – biodiversity," "public relations," and "forest certification." The findings are consistent with the highlighted issues in the 9th Development Plan/Forestry Expert Commission Report [17] that confirms the importance of the listed items for Turkish forestry with regard to participation, sustainable forest management, and meeting the community's current and future demands. By looking at the emerging problems, cadastral-ownership problems, staff motivation deficiency, problems in forest-public relations are considered prominent problems. That all of them are interested in socio-economic issues calls for special attention. In this context, it is important to take into account these problems and take necessary measures throughout the policy-making and management processes.

Besides, based on criteria like productive forest area, recreation and ecotourism areas, forest crimes, areas designated for protection and environmental functions, etc., there are no significant differences among the managers' responses regarding the foremost issues, problems, and forest functions. In contrast, there are significant differences among the managers' responses in terms of forest village population, total regional population, protected areas, and number of forest enterprises of forestry district characteristics. Differences regard deficiency of staff, communication

within the organization, lack of communication and cooperation with other public institutions, staff motivation, and cadastral and ownership issues. As seen in the findings of the study, while statistically significant differences related to existing issues and problems are rarely seen, the differences regarding future issues are both more in number and various in characteristics.

The results summarized and underlined above should be evaluated by decision-makers and implementing bodies in order to enable the regional forest directorates to take a more efficient role in the forest policy making and application processes. Particularly accelerating the forest certification activities in the context of sustainable forest management criteria and indicators is essential to maintaining the long-term protection and sustainable utilization of the country's forests. Additionally, in light of this article's findings and similar studies, special attention should be given to the ecological-environmental services of forest resource by improving multi-functional forest management, developing solutions to cadastral-ownership problems, better motivation of staff, and enhancing forest-society relations to a more positive level in order to increase mutual support and interaction. These listed priorities also coincide with the listed priorities of Outlook study for Turkey Toward the 100th Anniversary of the Republic of Turkey [15].

Some previous studies emphasize the insufficiency of the participation in Turkish forestry sector [31, 37-40]. It is obvious that Turkish forestry needs a more participatory structure and a mechanism within a legal-managerial framework that will constitute the core of this structure. All units of forestry organizations should take a more active role in fulfilling this requirement. In particular determining expectations, problems and priorities of different interest groups and then working for their harmonization will also form appropriate circumstances for realizing sustainable forest management. In this direction, further studies focusing on examining the perception of different stakeholders and forestry departments on forest-related issues and uses will have an important contribution to ensure the sustainable use and conservation of forest resources by considering the related demand and expectations.

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