THE ROLE AND SIGNIFICANCE OF SOCIAL FUNCTIONS OF FOREST ECOSYSTEMS

REVIEW SCIENTIFIC ARTICLE

DOI 10.7251/DEFEN4922025G	UDK 316.334.2:[502.131.1:630*1	COBISS.RS-ID 135430657

Prof. Zoran Govedar, PhD[1], academician

Abstract: The paper presents the basic characteristics of the social functions of forest ecosystems. The social functions of forests are not sufficiently affirmed and their value in the overall evaluation of forest functions it is not estimated often. The health-recreational role and the scientific-educational role of special purpose forests are of key social importance. The role and importance of social functions of forests in more developed societies are more promoted in public and have a greater impact on the community and on achieving social consensus on financial subsidies for sustainable forest management and social welfare in order for forest owners to earn other incomes noise function. The productive and public benefit functions of forests can be severely compromised due to risk factors resulting from global warming, fires, pests and diseases. Current generations need to show responsibility for inherited forest ecosystems and care for the sustainable development of all forest functions through a management system.

Keywords: *Social functions, forests ecosystems, sustainable development*

1 Faculty of Forestry, University of Banja Luka
Banja Luka
Contact: zoran.govedar@sf.unibl.org

Introduction

In addition to ecological and economic functions, forest ecosystems provide society with a number of social services such as tourism, recreation, health, education, etc. Forest functions are often divided into production (economic) and public (ecological and social). Until the end of the last century, production functions dominated in our country and in Europe, and they were traditionally given the main importance in forest management. However, due to deforestation and the increasing threat to forest ecosystems due to climate change, and then the emergence of disease and pest gradation, the public benefit functions of forests have become increasingly important. In conditions of endangering the environment due to air pollution, population growth, increasing needs for drinking water, food and energy, the social role and importance of forests are growing. Due to their economic and public benefit functions, forests are presented in various laws of many countries as goods of general social interest that must be taken care of and protected. Namely, the functions of forests provide the social community with common services and benefits that each of its members needs (oxygen production, sequestration of carbon dioxide, filtration and preservation of drinking water sources, creation of phytoncides, etc.). Reference model for diversity, importance and interactions of forest functions of the European Parliament, 1997 clearly defined:

- ecological functions - regulation of climate and air quality, retention and protection of water capacities, preservation of land and biological diversity;
- social functions - recreation (rest, relaxation, health), ecotourism; culture (history, myth, artistic, aesthetic and spiritual values); science and education; health.
- economic functions - activities and services (natural environment for recreation, land reserve, hunting, rest and tourism); production (technical and firewood, game, cork and bark, ornamental plants).

Within the social and cultural functions of forests, there are differences (Velašević and Đorović, 1998; Medarević, 2006): psychological functions (aesthetics, cultural heritage, gene funds), information functions (bioindications, research, education), human-ecological functions (bioclimate, filter and shock absorber, noise protection), rest functions. The development of human society is accompanied by an increase in living standards, but urbanization and industrialization, unfortunately, lead to worsening environmental conditions. In such a situation, generally speaking, people need to return to nature, and thus increases and intensifies the importance of public forest functions. In order for the forest to be able to fulfill such a role, it must have special characteristics, which can only be achieved by special, specific forest management measures. Therefore, such forests are categorized as special purpose forests. However, it should be borne in mind that all forests essentially fulfill production and public utility functions, but the significance of these functions in individual forest complexes is different. There are attitudes that the production function is the main one in the biological sense and that if that function is fulfilled, other forest functions will be fulfilled as well (Nikolić and Stojanović, 1991). However, the social functions of forests are much more important and are given more attention in economically highly developed countries, while the productive function of forests is dominant in underdeveloped countries, although their social role and importance are no less valuable. On the contrary, if we analyze the importance of the forestry sector in the field of employment, it is clear that forests as a resource play a major role in less developed countries that are relatively rich in forests. Thus, within a number of services, social services that are insufficiently affirmed and valued stand out (Govedar and Krstić, 2016). There are a number of methods for evaluating forest functions, but determining the value of ecological and social functions is not yet at the level of determining the value of economic or production functions of forest ecosystems. Subjective assessments of the value of social functions of forests are not of great importance, although their role in society is considered to be enormous and is increasingly reflected in emerging changes and growing uncertainties in forest management (Pintarić, 2004). Exact evaluation of the social

benefits of forests is very difficult, but the evaluation of indirect benefits, apropos income from recreational and tourist activities, is in principle simpler.

Growing needs for products and social benefits from forests, especially in the last two centuries, have influenced the development of the principle of continuity of forest management. Recognizing the importance of forest ecosystems more than two centuries ago, the need for sustainable development of all forest functions was noticed (Carlovitz, 2000). Continuity of forest management is the aspiration and requirement for permanent and optimal satisfaction of all tangible and intangible effects of forests for present and future generations (Peters and Wiebecke, 1983). This definition represents the idea for a modern concept of sustainable forestry development that treats all forest functions evenly. Sustainable development of forestry implies, among other things, such forest management that preserves biodiversity, restores forests, increases productivity, vitality and potential of forests to such an extent that would meet the appropriate environmental, economic and social needs for present and future generations, while they do not endanger or damage other ecosystems (United Nations, 1993).

The concept of modern forestry was defined at the V World Congress in Seattle (Seattle, USA) in 1960. This concept is based on the multifunctionality of forest ecosystems and confirms the idea of equal priority of all forest functions and multipurpose use of forests and forest land, in order to preserve and improve the environment and use many values provided by forests. At the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro, June 1992. Agenda 21 was adopted, which refers to the activities of maintaining the multiple role and function of all types of forests and forest land. Also, the Forestry Development Strategy of Republika Srpska (2011-2021), as the basic planning document of forestry in accordance with the Law, recognizes and defines the basic premises of modern forestry: division into production, environmental and social (with emphasis on recreational) functions within multifunctional forest management resources and sustainable development (Karadzic et al. 2011). This approach is necessary if forestry policy is

created for countries moving towards European integration, because the guidelines set through the European Union Strategy for Forests (European Commission, 2013) define the principle of sustainable development of social and recreational functions of forests.

Forest condition and threatening factors

The total area of forests in the world, according to the report on the state of the world's forests (The State of the World's Forests, SOFO) is 4.06 billion hectares, which is 31% of the total land area or 0.52 ha per person (SOFO 2020). It is estimated that 13 million hectares of forests are lost annually. More than 54% of the world's forests are in only five countries: the Russian Federation, Brazil, Canada, the United States and China. Africa had the highest annual net forest loss rate in 2010-2020. year (3.9 million hectares), followed by South America (2.6 million hectares). On the other hand, Asia had the highest net growth of forest areas in the period 2010-2020. years, followed by Oceania and Europe. However, in Europe and Asia, significantly lower rates of net returns were found in the period 2010-2020. years than in the period 2000-2010. years. Forest area in Europe has been steadily declining over the last 5,000 years as a result of deforestation, based on paleoecological and historical sources (Bradshaw and Hannon 2004). The beginning of declining forest cover based on analyzes of pollen diagrams of trees and cereals is related to the time-progressive expansion of agriculture in Europe from the southeast to the northwest (Roberts 1998). In addition, the analysis of genetic material from rainforests (Piovesan et al. 2005), as well as the chemical composition of water from glacial lakes (Bradshaw and Mitchell 1999), also indicate these processes. According to reports relating to European forests (Forest Europe), the forest area in Europe is about 227 million hectares or about 35% of the total area of the continent (Table 2.1) and has increased by 9.0% since 1990 (FE 2020).). The rest of the forest land occupies 27 million hectares. Of these, predominantly coniferous forests account for about 104 million hectares (46%), predominantly deciduous forests for about 84 million hectares (37%), while mixed forests represent about 39

million hectares (17%). The total area of forests and forest land in the Republic of Srpska according to the data from the Forest Management Basis (SPO) is 1,352,031 ha or 54.3% of the total area of the Republic of Srpska (Republic Statistical Office of the Republic of Srpska 2020). The Republic owns 1,044,939 ha (77.3%) and privately owns 307,092 ha or 22.7%. Over the last 30 years (1990-2020) the volume of forests in Europe to 78% of the analyzed area (FE 2020) has increased by 10.4 billion m^3, or an average of 347.4 million m^3 per year, which corresponds to an annual rate of change of 1, 37%. The total wood volume of the forests of the Republic of Srpska is about 250 million m^3, and the forests owned by the Republic account for about 200 million m^3 (78%), and the private ones about 50 million m^3 or 22%. The volume of high forests with natural regeneration as well as the volume of forest crops in the two analyzed periods (2000–2009 and 2010-2019) increased on average in high forests with natural regeneration by 23.6 m^3 ha^{-1}, and in forest crops by 46.3 m^3 ha^{-1}. According to the International Union for Conservation of Nature (IUCN), changes in the state of the forest fund occur as a result of deforestation but also afforestation, which was very intense during the 1960s and 1970s (Wildburger 2004).

According to reports from the International Food and Agriculture Organization (FAO) and the Intergovernmental Panel on Climate Change (IPCC), the main threat to forest ecosystems is the interconnectedness of threatening factors. They are the interaction between the probability of occurrence, the sensitivity of forests and the degree of exposure of forests to the influence of factors (Kron 2002). Climate warming is thought to be the primary cause of a number of phenomena (Seidl et al. 2017; Brack 2019) such as extreme droughts, forest fires, strong winds, diseases and pests (FAO 2013; IPCC 2019). Under these impacts, Europe accounts for about 6.0% of the total forest area or about 10 million hectares per year, and felling has affected about 8.1% of the annual volume (FAO 2007. Regional climate models in the Western Balkans show that Temperature rise in this region faster than average global temperature in general Using the associated atmospheric-oceanic global model (Roeckner et al. 2003) developed in Germany (Max Planck Institute for Meteorology), the first national report on climate change predicted an increase in air temperature

in the Republika Srpska from 0.7 to 1.6 ° C between 1.0 and 2.0 ° C in the south, and between 2.0 and 3.0 ° C in the interior zone with certain species of plants and animals to the north and to higher altitudes (Kadović and Medarević 2007) According to the data of the Republic Statistical Office, in the period 2000–2019 in forest fires in the Republic of Srpska a total area of 144,006 ha, while the wood mass felled after the fire was 789,500 m^3. According to satellite images in Europe, 3,864 forest fires were registered in 2019, and each had an area of more than 30 hectares and 789,730 hectares of forests and forest land were burned (European Commission 2020). Extensive research around the world indicates that future disturbances caused by drought, wind, and snow will be stronger and temperature local intraannual changes will vary widely (Seidl et al. 2017). However, in the future, the greatest negative effects for forests will have the climate variable that determines the wind disturbance. The trend of global negative impact of stormy winds is expected to increase with the trend of climate change (Knutson et al. 2010; Seidl et al. 2014). Catastrophic damage in the forests of Central Europe occurred in 1990 (Schönenberg 2002; Schönenberg et al. 2002) and in 1999 in France, Germany and Switzerland from the stormy wind "Lothar" when 165 million cubic meters of wood were destroyed (Angst et al. 2004). During 2005, in Sweden, the wind "Gurdun" destroyed 75 million cubic meters, and in 2007 in Germany and the Czech Republic, the wind "Cyril" destroyed 49 million cubic meters. Winds "Klaus" and "Xintia" during 2009 and 2010 in France and Spain damaged 45 million cubic meters (Gardiner et al. 2010), and in 2018 in Italy the wind "Vaia" damaged 8.5 million cubic meters. These quantities correspond to the one-year estimate for these areas of Europe (FAOSTAT 2019). It is characteristic of Southeast Europe that stormy winds in forest complexes create a mosaic of damage to a set of stands with individual remaining trees that are not broken or felled (Nagel and Diaci 2011). In Europe (mostly in Germany, the Czech Republic, Austria and Slovakia) of the total volume destroyed due to various negative impacts of biotic and abiotic nature, an average of about one million or about 3.0% cubic meters of wood are destroyed annually (Schelhaas et al. 2003). Snow damage is more characteristic of boreal forests (Fisher et al. 2020).

In addition, if forests are not managed in accordance with habitat conditions, bioecology of tree species and stand conditions, then anthropogenic impacts such as illegal activities in the forestry sector accelerate forest degradation. In the Republika Srpska, a significant area of forests and forest land is endangered by mines and explosives, so the actual productive area managed is much smaller than the potential. Under the mines are the high forests with natural regeneration, 30,837 hectares, followed by 3,489 hectares of high degraded forests, 2,974 hectares of forest crops, and 13,314 hectares of coppice forests. More than 8,000 hectares of land suitable for afforestation have also been mined, as well as 5,710 hectares unsuitable for afforestation (Govedar et al. 2014). The population of rural areas is more likely to encounter mined areas, and their existence is most endangered precisely because of the need to access forest areas (84%), and then on pastures. All these disturbances and endangerment of forests affect not only the ecological but also the social function of forests, and the degree of these influences depends on the demographic structure of the population and the spatial distribution of forest vegetation.

Social functions of forests

In the ancient past, man's stay in the forest is explained as a state of balance in balance. Man as a terrestrial being is much closer to the homeostatic system in nature (forest) with the known laws of ecosystems, its overall heat and water regime, as well as all plants and animals in it, so man can live and rest in such conditions (Seliškar 1970). Given the many benefits and functions, forest ecosystems are natural resources for multipurpose use. Today, the role of forests in the context of social interaction and integration is increasingly emphasized. This is closely related to the increasing importance of free time (leusure, franc. Lousur) and is directly correlated with working time. Therefore, the theoretical definition of the social function of forests, and within that recreation in forests, usually begins with the consideration of cause-and-effect relationships and relations between work and leisure, as basic social categories that determine the

function, place and importance of recreation within the social division of labor (Trkulja and Došenović 2020). The notion of free time is defined as a time in which there is a limited choice of certain aspirations of people for pleasure and fulfillment of experience in accordance with social norms and values that improve individual and social development (Jenkins and Pigram 2003). When choosing recreation, many human leisure activities reflect a preference for the natural environment (e.g. forest ecosystems), as urban environments are hard to live in and less suitable for relaxing residents, especially in large cities (Takano et al. 2002). It was found that children have higher self-esteem and improved cognitive function as a result of contact with the forest (Maas et al. 2006), and whether a particular forest complex will be planned for recreation or as a protective corridor, cultural landscape or green structure of polyvalent character depends on a number of factors. Therefore, when arranging space near large cities, the establishment of urban forests and forests of special importance (Forest Amenity Planning) is planned. In these plans, the sociological needs of the population are put in the center of the plan before the economic needs, ie enjoyment before the profit, through the satisfaction of health, aesthetic, recreational and cultural needs. Namely, the development of human society follows the growth of living standards, but urbanization and industrialization lead to worsening environmental conditions and people need to return to nature, where they find conditions for physical or mental recovery (Reh, 1999). The recreational function of forests is provided through the impact on the psycho-physical health of forest users, and the effects of recreation in the forest can be divided into (Seliškar 1970):

Primary benefits (increase of productivity as a consequence of recreation, general improvement of health status of the population, and reduced payment of social and health insurance costs, creation of new creative abilities and organized recreation and inclusion of socially weaker sections of the population and

Secondary benefits (value of services provided to visitors of recreational areas, hotel services, food, camping, heating, etc., income of the industry that produces recreational equipment, municipal and other taxes that should in principle be reinvested in recreational facilities and

all-round engagement of all types of services, ie tertiary activities).

In the context of the development of social services of forest ecosystems and "working with nature", principles have been developed that include naturalness, equilibrium, integrity, variety and contrast, pattern, honesty, plesantness. These principles have been developed in the United Kingdom and are considered universally applicable (Table 1).

Table 1. Some parallel principles „working with nature"

Price and Thomas (2001)	Lucas (1993); Bell (1998)	Kaplan and Kaplan (1989)
Naturalness	Visual force	Naturalness
Equilibrium	Visual force	
Integrity: - harmony - unity - dialogue	Shape, scale Unity, genius loci	Legibility
Variety and contrast	Diversity	Complexity; mystery
Pattern		Coherence
Honesty		Visual access
Pleasantness	Rule of thirds	

Nature facilitates spiritual experiences of fascination, inspiration, and experiences of peace, joy, and great security (Jenkins and Pigram 2003). These facts are constantly being confirmed as more and more people seek peace, quiet, privacy and rest in the natural world, especially in the forest. Aesthetically, the natural environment provides an opportunity for the recreational user to experience visual, auditory and other sensory reactions, and testifies to the sensory effects from the immediate environment (Vujković 2018). That is why the forest provides many forms of aesthetic pleasure, and recreation in the forest becomes an integral part and element of the spatial development of the region. Population growth in developed countries, intensive communication, endangerment of the environment and human health, increase the general interest in recreation

and rest in the forest, which is an inexhaustible source of services for overcoming the existing social circumstances.

Scientific evidence confirms that the effect of forest recreation as a natural therapy is multiple (Chen et al. 2018). In Japan, the term forest bath is defined as the balance of forest and human health, including improving the immune system, cardiovascular disease and mental health (Chen et al. 2018). Forest bath is used as a method of treatment with the aim of relaxation and stress management, and stress is a set of non-specific reactions of the human body to harmful factors from the work and living environment. Harmful factors from the human environment in cities activate the adaptation mechanism of each organism in order to protect itself by establishing a balance with the environment (Ulrich-Lai et al. 2017). Stress, whether psychological or biological, is the body's response to stressors such as the urban environment. Recreation in the forest significantly reduces stress and thus prevents a number of diseases that it causes such as headaches, high blood pressure, heart problems, diabetes, skin diseases, asthma and arthritis. Analysis of heart rate variability showed that the forest environment significantly increases parasympathetic nerve activity and decreases the sympathetic activity of participants compared to the urban environment. Cortisol levels and heart rate decreased significantly in the forest compared to the urban environment (Chen et al. 2018). In psychological tests, noise increased the intensity of positive feelings and significantly reduced negative ones after stimuli compared to urban stimuli. Physiological data from this study provide important scientific evidence on the health benefits of the forest environment, and scientists from Mie University in Japan (Department of Psychiatry) found that walking in the woods is more effective than conventional antidepressant treatment. It is believed that most of today's diseases come from too little time outdoors, in forests and nature, which is the original habitat of all living beings. The main benefits of the forest are that it provides opportunities for physical activity, recovery from stress and fatigue, and easier social contact. Some of the symbiosis activities that can take place in the forest are outdoor recreation, including hiking, horseback riding, cross-country skiing, snowmobiling, camping, hunting, fishing and other forest-related recreational activities.

Urban forests are very important in the context of their social role because they can be places for numerous activities of different age, social and cultural groups (Došenović et al., 2017; Došenović and Trkulja 2019). That is why in European forestry, urban forests have become an important part of political agendas, which indicates the recognition of their importance for the realization of other (non-productive) forest functions. Forest Recreation Monitoring and European Perspective (Forest Recreation Monitoring and European Perspective 2008), indicates the needs of human life in relation to the primary importance of protective and social functions of forests. The 2008 survey on "Forest for recreation and nature tourism" (COST Action E33 Forest for recreation and nature tourism, FORREC) was related to the level of knowledge about recreation and its effects for the purposes of planning and practical forest management. The Ministerial Conference on the Protection of Forests in Europe (MCPFE) conducted pan-European Indicators for Sustainable Forest Management (SFM). It is concluded that recreational values of forests are estimated indirectly through indicators of actual use of forests by purpose, by area or by number of users per area or by determining through evaluation through research their conceptual value instead of actual market value. The results of monitoring these indicators should correct the imbalance that exists in the valorization of market values (wood), and non-market services and recreation (Novak and Dwyer 2010). Research on the general useful functions of forests in the area of the city of Banja Luka shows that management must be carried out multi-purposely, respecting first the protective, but immediately afterwards the social function. It is necessary to provide a functional and sustainable model of financing special purpose forests and educate the population about the importance of forests, and in this context responsible forestry, and clearly point out all the positive effects that forests and forestry provide to the community (changing public awareness of forestry) (Dragomirović, 2017) . Also, visitors to forests of specific structure and purpose, such as national parks, have special requirements related to forest social services and are related to nature protection and public awareness of areas rich in natural beauty and public services. In the Plitvice Lakes National Park, based on a survey

of visitors, 71% of whom are foreigners and with a balanced ratio of male and female population, it was shown that forests in the national park have the most important impact on fauna, climate and environment (Posavec et al., 2011). Research in special purpose forests indicates that tourism can be very profitable thanks to their social functions.

Organized recreation in the accessible area of forest complexes enables to strengthen health abilities and expand education in a relatively easy, accessible, and at the same time efficient way. This to some extent contributes to the reduction of social disparities, especially among children and young people, because it provides the possibility of a more rational and uniform way of using free time. Enjoying nature is one of the most significant experiences of recreationists, and urban forests, due to their location in urban areas, are almost always the main resource for recreation (Jones and Davies 2017). Motivation to participate in forest recreation is conditioned by the desire to satisfy a certain psychological need, and the natural environment plays a key role in achieving the results and satisfaction required of participating in outdoor recreation (Jenkins and Pigram 2003). The use of forest for recreation depends on the development of society, tradition and population, and its attractiveness for recreation is defined by climatic characteristics, the degree of industrialization and urbanization, cultural level of the population, etc. Functionally and spatially arranged recreational forests have a functional zone, recreation center and functional area (Govedar and Krstić, 2016). Forest parks are a special category of forests in the immediate vicinity of settlements, in which the recreational function is a smaller part of its overall social function (Vyskot and Reh, 1983). They contain various facilities or devices for recreation: roads, paths, bridges and logs, facilities for staying and resting in the woods, facilities for intensive recreation, facilities for refreshments, information facilities, sanitary and hygienic facilities and water facilities. In countries with developed recreational purposes, forests are considered to be the most favorable mixed deciduous-coniferous forests, as well as pure coniferous forests of heliophilous tree species, which under normal overgrowth allow the appearance of shrubby species and ground flora in the underlying floor. These forests are managed in such a way as to enable

active rest of people in nature. Management is aimed at forming healthy trees, which will better fulfill the aesthetic and recreational function. Of great importance are the tallest, dominant trees, which are especially attractive. In lowland forests, these are pedunculate (Quercus robur L) and field ash (Fraxinus angustufolia L) trees, in the middle zone other oaks (Quercus sp.), Beech (Fagus sylvatica L) and pine (Pinus sp.), and at higher altitudes fir (Abies alba Mill), spruce (Picea abies L / H Karst.) and larch (Larix decidua Mill).

In addition to the recreational function, forests within social functions play an important role in scientific research (Vyskot and Reh, 1983). This role of forests has an international dimension, so in 1902 the International Union of Forestry Research Organizations (IUFRO) was formed. All research within forestry is collected and monitored within the IUFRO organization. Therefore, forests for scientific research and education, which also have a social function, stand out in the category of forests of special importance. They conduct scientific research on forest ecosystems and management measures that should be applied in order to develop all forest functions, ie that will enable sustainable use of all tangible and intangible, so-called. public forest functions. These are permanent and temporary experimental surfaces on which static and dynamic research is conducted according to the previously determined methodology of experiment planning. Long-term research in the field of forestry is carried out in school forests and forests of teaching and research bases, and at the same time these are important facilities for holding symposiums and seminars at the international and national level, not only in forestry but in all contact areas, especially environmental protection. , biology, sports, ecology, pharmacology, etc. Forests provide a good, close environment for educational activities but have a special role in the creative work of many artists. They can be located near art centers where many cities are located and thus make a suitable "inspirational setting" for artists. Many use forests as an environment for their work. Nature can help to better understand the sense of space, attachment to a place and use of natural areas for mental stimulation and design, and such positive experiences can lead to deep-rooted ideals, morals and natural values (Jones and Davies 2017).

In addition to the mentioned social functions of forests, it is quite clear that the health function of forests is closely related to the recreational role. Namely, investing in affordable quality forest recreational space could have significant benefits in reducing health care costs. There is a growing commitment to the so-called "Health practices", which proves the connection between nature and general health and well-being of people.

Areas around spas and natural health resorts, from the point of view of providing health:

Spa park which covers the area of the park structure, which is not part of the existing forest fund;

Spa forests are typical forest areas with the role of fulfilling the function of treatment, rehabilitation and recovery, with a different way of management than in production forests;

Forests in the protection zones of the health resort are forests with a primary water protection function and a specific management method aimed at protecting the health resort or the climatic influences of the forest;

Forests in the infiltration zone, ie the zone of water accumulation in the vicinity of the health resort, in which management is aimed at protecting the water accumulation necessary for the functioning of the health resort.

In forests that are sources of natural mineral and thermal waters, in the vicinity of spas and natural spas, the primary protective and recreational function. In "spa forests", it is important to incorporate the structure, composition and mixture of different types of trees so as to emphasize the visual and aesthetic effect, but in such a way that everything is in the function of spa tourism and health and recreational role for tourists or patients. Therapeutic center (garden) is established using plant and gardening materials in order to properly select and apply occupational therapy activities to enable people with special needs but also other healthy people to acquire new knowledge and develop motor, perceptual, sensory, cognitive, psycho- physical and other characteristics. Staying in the center and dealing with plants have an impact so that users recover much faster in a productive and creative way after hospital therapies. During the recovery,

the feeling of relaxation and relaxation was especially emphasized precisely because of the content located in the center. The modern therapy center should have facilities for users throughout the year, therefore also in the winter period. That is why closed facilities are being built in them for the needs of planting, cultivation, transplanting, preparation and use of fruits, because that is how the user develops knowledge about production useful for the wider community. The health function of forests is reflected in the latest effects of Corona-19 disease (Coronavirus disease) caused by coronavirus (lat. Corona - crown), which was discovered in China in late 2019, and which is the World Health Organization (WHO) called SARS-CoV-2 (SARS-coronavirus 2), and 12.03.2020. years, the disease was declared a pandemic. This pandemic has had negative effects on the forestry workforce, resulting in reduced productivity. However, the importance of the social functions of forests related to the health-recreational role has increased especially in the countries of Western Europe and in urban areas. The services provided by forests during the post-war recovery period were of great importance (FAO 2020). The role and importance of social functions of forests has an increasing impact on achieving social consensus on financial subsidies for sustainable forest management and social welfare with the aim that forest owners, in addition to wood assortments, earn other income from public forest functions.

Conclusion

In addition to ecological and economic functions, forest ecosystems provide society with a number of social services such as tourism, recreation, health, education, etc. socially increasingly important. The development of human society, urbanization and industrialization, lead to deteriorating environmental conditions. That is why people need to return to nature, and thus the importance of the social functions of forests increases and intensifies. They are given more attention in economically highly developed countries, while the production function of forests is dominant in underdeveloped countries. Exact evaluation of social benefits from forests is very difficult, but the evaluation of indirect benefits,

ie income from recreational and tourist activities, is in principle simpler. Forest disturbances and endangerment affect the social function of forests and the degree of these influences depends on the demographic structure of the population and the spatial distribution of forest vegetation.

The role of forests in the context of social interaction and integration is increasingly emphasized, and therefore the establishment of urban forests and forests of special importance is planned in the arrangement of space near large cities. In these forests, it is primarily planned to meet the sociological needs of the population before the economic needs. In the context of the development of social services of forest ecosystems and "working with nature", principles have been developed that include naturalness, equilibrium, integrity, variety and contrast, pattern, honesty, plesantness.

It is believed that most of today's diseases come from too little time outdoors, in forests and nature, which is the original habitat of all living beings. The main benefits of the forest are that it provides opportunities for physical activity, recovery from stress and fatigue, and easier social contact. Some of the symbiosis activities that can take place in the forest are outdoor recreation, including hiking, horseback riding, cross-country skiing, snowmobiling, camping, hunting, fishing and other forest-related recreational activities. It is necessary to provide a functional and sustainable model of financing special purpose forests and educate the population about the importance of the forest and clearly point out all the positive effects that the forest provides to the community.

Demands from the wider community are reduced to ensuring the optimal use of the total potential of forests and forest land, and creating conditions for multipurpose use of forests and their sustainable development. The social functions of forests are becoming more recognized and include not only recreation, but the quality of life in much broader aspects, so that they become an integral part, among other things, of life in rural areas. Due to the increased importance and complexity, as well as potential conflicts with other functions, the potential of social functions of forests must be considered much more explicitly than in the past. Namely, the assessment of the potential of the world's forests for social and

cultural functions indicates their increase, but it is difficult to quantify, so additional research and information are needed. The role and importance of social functions of forests has an increasing impact on achieving social consensus on financial subsidies for sustainable forest management and social welfare with the aim that forest owners, in addition to wood assortments, earn other income from public forest functions. Current generations need to show responsibility for inherited forest ecosystems and care for the sustainable development of all forest functions through a management system.

References

1. Angst, C., Bürgi, A., Duelli, P., Egli, S., Heiniger, U., Hindenlang, K., Kuhn, M., Lässig, R., Lüscher, P., Moser, B., Nobis, M., Polomski, J., Reich, T., Wermelinger, B., Wohlgemuth, T. (2004): Waldentwicklung nach Windwurf in tieferen Lagen der Schweiz 2003–2004: Schlussbericht eines Projektes im Rahmen des Programms « Lothar Evaluations und Grundlagenprojekte. Eidgenössische Forschungsanstalt für Wald, Schnee und Landschaft, Birmensdorf, Switzerland
2. Bell, S. (1998): Forest Design Planning. The Forestry Authority, Edinburgh, p 76
3. Carlowitz, H.C. (2000): Sylvicultura Oeconomica – Naturmäßige Anweisung zur Wilden Baum-Zucht. Leipzig 1713 (Reprint [ISBN 3-86012-115-4]: TU, Bergakademie Freiberg, Akademische Buchhandlung Freiberg 2000) pp 248
4. Chen, H.T., Pin, C, Lee, H.Y. (2018): The effects of Forest Bathing on Stress Recovery: Evidenc from middle- aged females of Taiwan, Forests 9(7):403
5. Došenović, Lj. Trkulja, T. (2019): Rekreativna funkcija šumskih kompleksa Banje Luke kao element prostornog i urbanog planiranja. Šumarski fakultet, Banja Luka
6. Došenović, Lj., Trkulja, T., Sekulić, M. (2017): Recreation function of forest complexes as an element of urban planning: a view from

Republic of Srpska. FACTA UNIVERSITATIS, Series: Architecture and Civil Engineering 15(1), pp 103–115
7. Dragomirović, A. (2017): Opštekorisne funkcije šuma u normativno-planskim aktima i u praksi: primjer šuma na teritoriji grada banjaluke. Glasnik Šumarskog fakulteta Univerziteta u Banjoj Luci 27, 2017, 51–65
8. EC (2020): Advance EFFIS Report on Forest Fires in Europe, Middle East and North Africa 2019. Luxembourg: Publications Office of the European Union pp 1–33
9. FAO (2007): State of the Worlds forests. Electronic Publishing Policy and Support Branch Communication Division, Rome, pp 157
10. FAO (2013): Climate change guidelines for forest managers, FAO Forestry Paper No. 172. Rome, Food and Agriculture Organization of the United Nations. FAO Forestry Paper 172, pp 123
11. FAO/ECE/ILO (2000): Joint Committee Team of Specialist on Participation in Forestry Public Participation in Forestry in Europe and North America, ILO, Geneva
12. FAOSTAT (2019): Forestry Production and Trade. http://www.fao.org/faostat/ en/#data/FO/visualize. Last access: 24 October 2019
13. FE (2020): State of Europe's Forests 2020. United Nations Economic Commission for Europe. Food and Agriculture Organization, Oslo, pp 392
14. FAO (2020): Impacts of COVID-19 on wood value chains and forest sector response: Results from a global survey 2020. Rome
15. FE (2020): State of Europes Forests, pp 12–27
16. Fisher., J.T., Burton, A.C., Nolan, L., Laurence, R. (2020): Influences of landscape change and winter severity on invasive ungulate persistence in the Nearctic boreal forest. Sci Rep 10:8742
17. Gardiner, B., Blenno, K., Carnus, J.M., Fleischer, P., Ingemarson, F., Landmann, G., Lindner, M., Marzano, M., Nicoll, B., Orazio, C., Peyron, J., Schelhaas, M.J., Schuck, A., Usbeck. T. (2010): Destructive Storms in European Forests: Past and Forthcoming Impacts Final Report to European Commission - DG Environment, Brussels
18. Govedar, Z., Krstić, M. (2016): Gajenje šuma posebne namjene.

Univerzitetski udžbenik, Banja Luka, str 308
19. Govedar, Z., Stanivuković, Z., Keren, S., Marković, B. (2014): Mine i požari – faktori ugrožavanja bezbjednosti u šumama Republike Srpske. Zbornik radova, Međunarodna naučno-stručna konferencija Suzbijanje kriminaliteta i evropske integracije s osvrtom na ekološki kriminalitet, Trebinje, str 245-257
20. IPCC (2019): Summary for Policymakers. In: Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems [Shukla PR, Skea J, Calvo Buendia E, Masson-Delmotte V, Pörtner HO, Roberts DC, Zhai P, Slade R, Connors S, van Diemen R, Ferrat M, Haughey E, Luz S, Neogi S, Pathak M, Petzold J, Portugal Pereira J, Vyas P, Huntley E, Kissick K, Belkacemi M, Malley J (eds)] pp 874
21. IPCC (2019): The Intergovermental Panel on Climate Change. http://www.ipcc.ch/
22. IUCN (2000)_ Guidelines for Protected Area Management Categories – Interpretation and Application of the Protected Area Management Categories in Europe. Europarc and WPA, Grafenau Germany, pp 1–48
23. Jenkins, J.M., Pigram, J.J. (2003): Encyclopedia of Leisure and Outdoor Recreation. London, Routledge, pp 111–126
24. Jones, N., Davies, C. (2017): Linking the Environmental, Social and Economic Aspects of Urban Forestry and Green Infrastructure. In: Pearlmutter D, Calfapietra C, Samson R, O'Brien L, Krajter Ostoić S, Sanesi G, del Amo RA (eds) The Urban Forest: Cultivating Green Infrastructure for People and the Environment Switzerland. Springer, pp 305-314
25. Kadović, R., Medarević, M. (2007): Šume i promene klime. Zbornik radova**,** posebno izdanje, MPŠV, Uprava za šume Srbije i Šumarski fakultet Univerziteta u Beogradu, Beograd, str 85
26. Kaplan, R., Kaplan, S. (1989): The Experience of Nature: a Psychological Perspective. Cambridge University Press, New York, p 340
27. Karadžić, D., Ljubojević, S., Medarević, M., Mihajlović, Lj.,

Todorović, Z., Govedar, Z. (2011): Strategija razvoja šumarstva Republike Srpske 2011–2021. Ministarstvo poljoprivrede, šumarstva i vodoprivrede, Banja Luka, str 73
28. Knutson, T.R., McBride, J.L., Chan, J., Emanuel, K., Holland, G., Landsea, C., Held. I., Kossin, J.P., Srivastava, A.K., Sugi, M. (2010): Tropical cyclones and climate change. Nat Geosci 3:157–163
29. Kron, W (2002): Flood Risk = Hazard × Exposure × Vulnerability. In: Wu BS, Wang ZY (eds.) Flood Defence, 1, Proceedings of the international symposium on Flood Defences, Beijing/New York: Science Press, pp 82–97
30. Lucas, O.W.R. (1991): The Design of Forest Landscapes. Oxford University Press, p 381
31. Maas, J., Verheij, R.A., Groenewegen, P.P., de Vries, S., Spreeuwenberg, P. (2006): Green space, urbanity, and health: how strong is the relation? Journal of Epidemiol Community Health 60(7):87–592
32. Nagel, T., Diaci, J. (2011): Intermediate wind disturbance in an old-growth beech-fir forest in southeastern Slovenia. Canadian Journal of Forest Research 6(3):629–638
33. Novak, D.J., Dwyer, J.F. (2010): Understanding the Benefits and Costs of Urban Forest Ecosystems. pp 25-43, In: Ed Kuser J.E. Urban and Community Forestry in the Northeast, 2nd ed. The Morton Arboretum, Lisle, Illinois
34. Pintarić, K. (2004): Značaj šume za čovjeka i životnu sredinu. Udruženje šumarskih inžinjera i tehničara Federacije Bosne i Hercegovine (UŠIT), Sarajevo
35. Posavec, S., Čaklović, L., Lovrić, M., Stavljenić, V. (2011): Rezultati vrednovanja općekorisnih funkcija šuma u NP Plitvička jezera // Znanstveno-stručni skup Nacionalnog parka Plitvička jezera povodom 60 godina od osnivanja i 30 godina od upisa na UNESCO-vu Listu svjetske kulturne i prirodne baštine: Zbornik radova / Šutić, Branislav i dr. (ur.). Plitvička jezera: Javna ustanova «Nacionalni park Plitvička jezera», str. 129-137
36. Price, C., Thomas, A.L. (2001): Evaluating the impact of farm woodland on the landscape: a case of blending perspectives. in: Sievanen,

T., Konijnendijk, C.C., Langner, L. and Nilsson, K. (eds). Forest and Social Services the Role of Research; Research Paper of Finnish Forest Research Institute, Vantaa, 815, 191-203
37. Reh, J. (1999): Pestovanie účelových lesov. Technická univerzita vo Zvolene, Zvolen
38. Republički zavod za statistiku Republike Srpske (2020): Statistika šumarstva, Statistički bilteni za šumarstvo (2005–2020)
39. Roeckner, E., Bäuml, G., Bonaventura, L., Brokopf, R., Esch, M., Giorgetta, M., Hagemann., S, Kirchner., I, Kornblueh, L., Manzini., E, Rhodin, A., Schlese, U., Schulzweida, U., Tompkins, A. (2003): The atmospheric general circulation model ECHAM5. Part I. Max-Planck Institut für Meteorologie, 349, pp 127
40. Schönenberg, W., Fischer, A., Innes, J.L. (2002): Vivian's Legacy in Switzerland - Impact of Windthrow on Forest Dynamics. Special Issue of Forest Snow and Landscape Research 77:1–2
41. Schönenberger, W. (2002): Windthrow research after the 1990 storm Vivian in Switzerland: objectives, study sites, and projects. Forest Snow Landscape Research 77:9–16
42. Seidl, R., Schelhaas, M.J., Rammer, W., Verkerk, P.J. (2014): Increasing forest disturbances in Europe and their impact on carbon storage. Nat Clim Change 4:806–810
43. Seidl, R., Thom, D., Kautz, M., Martin-Benito, D., Peltoniemi, M., Vacchiano, G., Wild, J., Ascoli, D., Petr, M., Honkaniemi, J., Lexer, M.J., Trotsiuk, V., Mairota, P., Svoboda, M., Fabrika, M., Nagel, T.A., Reyer, C.P.O. (2017): Forest disturbances under climate change. Nat Clim Change 7:395–402
44. Seliškar, A. (1970): Gozd in rekreacija. Ljubljana
45. Shaw-Lin, L.O., Huang, Y.L. (2007): Construction of social and economical criteria and indicators offorest ecosystem management in Taiwan. In: Social and cultural values of forests – benefit for today's society news of forest history nr. iv/(38)/2007 12th IUFRO world congress – proceedings, p 90
46. SOFO (2020): The State of the World's Forests. www.fao.org/publications/sofo/en/

47. Takano, T., Nakamura, K., Watanabe, M. (2002) Urban residential environ-ments and senior citizens' longevity in megacity areas: the importance of walkable green spaces. Journal of Epidemiol Community Health 56(12):913–918
48. Trkulja, T., Došenović, Lj. (2020): Sistem urbanog zelenila u procesu razvoja održivog i otpornog grada, Banja Luka: Arhitektonsko-građevinski-geodetski fakultet, pp 220–265
49. Ulrich-Lai, Y., Herman, J.P. (2017): Neural Regulation of Endocrine and Autonomic Stress Responses. Nature Reviews Neuroscience 10(6):397–409
50. Velašević, V., Đorović, M. (1998): Uticaj šuma na životnu sredinu. Šumarski fakultet, Beograd, str 162–185
51. Vujkovuć, Lj. (2018): Planiranje i projektovanje u pejzažnoj arhitekturi. Šumarski fakultet, Beograd
52. Vyskot, M., Reh, J. (1983): Pesteny učelovych lesu – prednašky. Vysoka škola zemedelska v Brne, Brno
53. Wildburger, Ch. (2004): Aforestation and Reforestation for Climate Change Mitigation: Potentials for Pan-European Action. Inernational Union for Conservation of Nature, The World Conservation Union and Foundation IUCN Poland (IUCN Programme Office for Central Europe) Warsaw, pp 13

Received: 15/12/2021.
Accepted: 12/01/2022.