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SOCIAL PERCEPTION OF FOREST FUNCTIONS ON THE EXAMPLE OF THE MUNICIPALITY OF CZARNA BIAŁOSTOCKA

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ABSTRACT: Nowadays, forest perception is multi-layered and often very subjective. Forest can have three basic functions: economic, social and protective. These functions are of varying importance for local communities. The paper analyses the significance of particular forest functions for the inhabitants of Czarna Białostocka commune. Factors that motivate respondents to visit the forest were analyzed. The evaluation assessed, among other things, the purpose and frequency of visits to forests, the type of resources extracted from forests and for what purposes they are used. The research tool was a questionnaire consisting of 11 questions. The research was conducted in autumn 2016 among 100 inhabitants of towns and villages adjacent to the forest areas of Czarna Białostocka commune. According to the conducted interviews, for the residents of Czarna Białostocka commune, the forest is used primarily for harvesting ground vegetation such as mushrooms, fruits and herbs. To a lesser degree, it is a place of rest and recreation.

KEY WORDS: functions of the forest, ground vegetation, side forest usage, Czarna Białostocka commune

Introduction

The area of forests in Poland is 105.3 thousand ha. They are primarily public property (81%). Forest land accounts for 30.8% of the country's land area. The forest cover in Podlasie voivodeship is of similar proportions.

At the UNCED conference in Rio de Janeiro (1992) by-products of forest use were considered as a very important component of sustainable development due to their role in forest management. The great diversity of these raw materials has been taken into account, both in terms of their production and their use. It was stressed that the use of these resources, on the one hand, should be a measurable source of revenue, and on the other hand, it should be implemented in accordance with the principles of sustainable forest management.

The document issued by the Ministry of Environmental Protection, Natural Resources and Forestry, which was accepted by the Council of Ministers in 1997 under the title the Forest Policy of the State, indicates, among other things, important features of the social functions of the forest, serving the development and maintaining health, recreation and tourism in society (Polityka Leśna Państwa, 1997). Raw materials that have been sourced from the forest undergrowth for hundreds of years were and are still used by humans as food. In addition, medical properties of some raw materials have enjoyed interest and application in folk medicine. The harvested fruits of the forest served not only their own needs, but also were a source of additional income (Ankudo-Jankowska, Glura, 2013, p. 99). The Forest Law, which guarantees universal access to forest areas, also contains information on logging, the primary and dominant element of forest management. The most difficult to regulate is the side usage of forest, also known as non-timber forest use. The problem arises because harvesting often takes uncontrollable form. Non-timber forest use is also closely related to the forest's recreational function (Staniszewski, Janeczko, 2012, p. 162). Environmental pollution has increased as cities, technology and science have developed rapidly and progressively. As a result, interest in forest areas has increased in our society, especially in places with tourist attractions in the area, and it is tourism, according to Pascalias-Jakubowicz (2009), that is one of the most significant factors influencing forestry in 21st century. Forests are the main natural and landscape values in Poland, thus they constitute tourist destinations and also add attractiveness to areas located in the vicinity of forest stands (Janeczko, Woźnicka, 2014, pp. 40-41). Forests attract both the elderly and the youngest due to their social and economic functions. Everyone uses natural values in a way that suits them the most, from obtaining raw materials to landscape admira-

tion. It is undoubtedly a big advantage of forests, which makes that charming places in them will attract people for a long time.

The aim of the study was to assess what forest benefits, whether tangible or intangible, are most likely to be used by society and what is their importance in everyday life. The above objective was achieved on the basis of the analysis of surveys conducted among the residents of Czarna Białostocka commune.

Forest functions

Forest is one of the most complex terrestrial ecosystems and it is a source of ecosystem services necessary to improve human well-being, capable of meeting different needs, both material and non-material. Over the last three centuries, the global forest land has decreased by about 40% and three quarters of this loss has occurred over the last two centuries. Forest have already disappeared in 25 countries, and further 29 countries have lost more than 90% of their afforestation. Although forest cover in Europe and North America is growing after a dramatic decline in the past, deforestation of natural forests in the tropics remains at an annual rate of more than 10 million hectares per year. It is the area larger than Greece, Nicaragua or Nepal and four times larger than Belgium. In addition, the degradation and fragmentation of forest areas further aggravates the functioning of this ecosystem (MEA, 2005, p. 587). Forests play an important cultural, spiritual and recreational role in many communities. In some cases, they area a factor for the survival of entire cultures and nations.

The State Forest Policy (1997, Chapter I, p. 4) divides forest functions into ecological (protective), productive (economic) and social functions.

The ecological functions of forest consist in stabilizing the water cycle in nature, protection soils from erosion and the landscape from turning into steppe, shaping the global and local climate, stabilizing the composition of the atmosphere and its purification, creating conditions for maintaining the biological potential, enriching the diversity and complexity of the landscape, as well as improving the conditions for health and life of the population and agricultural production (Miura et al., 2015, p. 36).

Production (economic) functions are based on the fact that forest is a source of certain tangible goods, which are taken from the forest and become material natural benefits of the forest. They are aimed at maintaining the renewable and sustainable use of wood, non-wood products obtained from forests and hunting economy, the development of tourism and its related profits from the sale of aforementioned goods, as well as at creating jobs and

providing tax-funded state budged and local government budgets. Material benefits of the forests are also functions resulting from the production of by-products, that is natural non-timber benefits, such as wild game meat or hunting trophies, mushrooms, forest fruits, herbs, other parts of the undergrowth, needles, brushwood, resin, bark, Christmas trees and stump wood, which satisfy the personal needs of the population and other social, including economic, needs (Pilli, Pase, 2017, p. 82).

Social functions serve to shape favorable health and recreation conditions, enrich the labor market, foster the management of degraded areas and help create various forms of forest management by the local community, as well as contribute to the development of culture, education and science and ecological education of the society. They represent the benefits human populations derive, directly or indirectly, from forest ecosystem functions. Social functions are particularly important for rural communities living closely to forest and coastal ecosystems and for urban dwellers experiencing the impact of urban environment (Lagbas, 2018, p. 2).

All these functions depend on each other. The interest of the public in staying in forests and using their resources depends on the diversity of the forest landscape and the biodiversity of species, and this enhances the development of tourist infrastructure, which is conducive to the creation of new jobs. Studies show that forests account for about 5000 different commercial products and the forest sector brings about 2% of the global GDP (MEA, 2005, p. 588). It is estimated that forests support the livelihood of 1.6 billion people in the world and are a source of their income, for example by harvesting fruit, nuts, mushrooms, honey and medicinal plants, harvesting wood, grazing farm animals and hunting. Forests are also a source of genetic material for garden crops and trees, which can make a significant contribution to household income (www.cpfweb.org). The forest environment is therefore a perfect place not only for relaxation for people craving for contact with nature, but also for the acquisition of fruits of the forest.

The management of forest undergrowth resources is the main direction of side forest use in Poland. It is connected with non-productive forest functions, such as protective, landscape and recreational functions. The development of the recreational function of the forest is mainly related to such side effects of forest use as the collection of mushrooms and forest fruits, which apart from increasing the attractiveness of being in presence of nature, may also constitute an additional source of income (Ankudo-Jankowska, Glura, 2013, p. 100).

Legal bases for the use of forests in Poland

The basic legal act regulating the use of forests in Poland is the Act of 28 September 1991 on Forests (Dz.U. No. 101 item 444). In Poland, forest management is carried out according to a forest management plan or a simplified forest management plan. Forest management is primarily aimed at the preservation of forests and their beneficial effects on climate, air, water, soil, living conditions and human health. It is also intended to contribute to the preservation of natural balance and forest protection.

Proper forest management also leads to the protection of soils and the areas particularly vulnerable to pollution or damage and of special social importance, as well as to the protection of surface and deep-water bodies, and the retention of catchment areas, in particular in watershed areas and groundwater reservoirs. The act also stresses the productive role of forests in relation to the harvesting of wood and raw materials, as well as by-products of forest use.

Forests owned by the State Treasury are mostly accessible to the public. It is possible to harvest the forest undergrowth for own use and for industrial purposes. The harvesting of the forest undergrowth for industrial purposes requires the conclusion of an agreement with the forest inspectorate. The forest inspectorate may refuse to conclude a contract if the harvesting of the forest undergrowth threatens the forest environment. Apiaries can be set up in forests owned by the State Treasury free of charge.

Public roads in the forest can be used by motor vehicles, harnessing vehicles and mopeds. As for forest roads, road traffic is permitted only if they are marked with road signs allowing it on these roads. Horse riding in the forest is permitted only on forest roads designated by the forest inspectorate.

On the other hand, in a forest that is not our property it is forbidden:

- extracting resin or birch sap, picking cones, stripping the bark, cutting a tree or otherwise damaging it,
- collecting moss or litter,
- collecting branches, bark, wood shavings, grass, heather, cones or herbs, as well as stripping turf,
- picking mushrooms or forest fruit where it is prohibited.

In accordance with the Offences Code, a person who does not comply with these prohibitions is subject to a fine of up to 250 PLN or a reprimand. Wood in the forest may not be taken out without the consent and knowledge of the forester.

Research methods

The area of research was Czarna Białostocka commune, located in Białystok county, Podlasie voivodeship (figure 1).

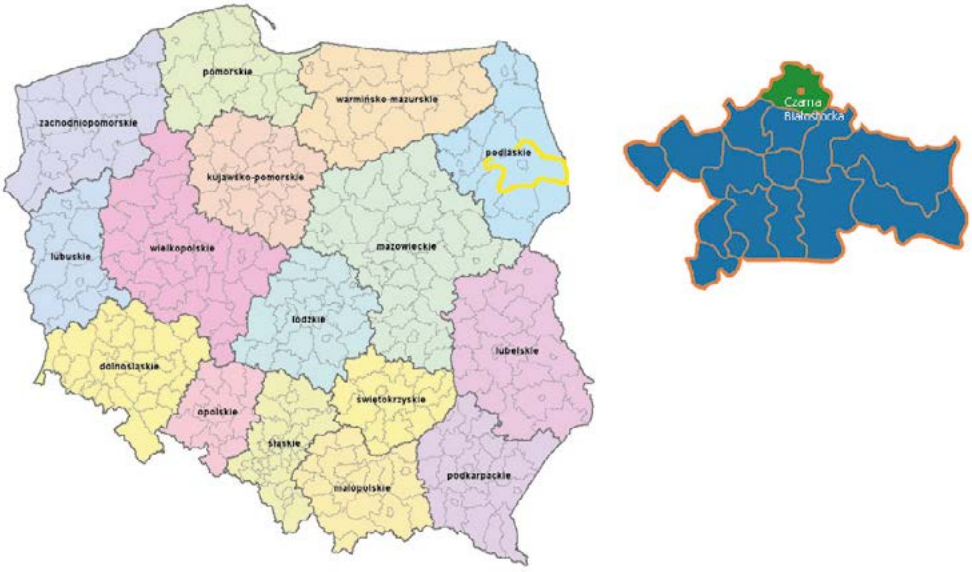

Figure 1. The location of Czarna Białostocka commune in Białystok county and on the map of Poland

Source: e-podlasie.pl, gis-support.pl [31-10-2017].

The area of the commune is 206 km^2.There are 42 localities in the commune. The population of the commune is around 12,000 people, of whom woman make up about 6,000. The largest age group are women aged 55-59. Among men the largest age group is that of those who are aged 25-34. In the commune there are many natural tourist attractions, including famous Czapielówka dam, an old guerilla camp, and the narrow-gauge railway. The commune is located in Knyszyn Forest, with nature reserves such as Budzisk, Jesionowe Góry, Karczmisko, Taboły and Krzemianka (the Central Statistical Office, data from 2014-2016).

In order to obtain data for the research, a questionnaire was conducted at the turn of September and October 2016 among the inhabitants of Czarna Białostocka commune. The research tool was a survey questionnaire consisting of 11 questions. The research was conducted using a direct interview method, in which the interviewer contacted the respondent, gave instructions to the respondent, could also supplement the questionnaire and ask supplementary questions. Open and closed questions provide information

on the reasons why respondents visit the forest, the forms of activity and the significance of forest functions in the functioning of the household. The research was conducted in the localities adjacent to forest areas such as Czarna Białostocka, Złota Wieś, Czarna Wieś Kościelna, Horodnianka, Wólka Ratowiecka, Klimki, Złotoria and Krzyżyk. 100 people participated in the survey, 58% of whom were women and 42% men.

The results of the research

The basic material benefits, which the forest gives to the inhabitants of Czarna Białostocka commune, is obtaining food, i.e. the collection of mushrooms, forest fruits and herbal raw materials. These raw materials are obtained by as much as 95% of the respondents. Mushrooms are collected by 82%, fruits by 78%, and herbs by 31% of the respondents. The inhabitants of the commune are not limited to collecting only one raw material. Depending on the season, they pick mushrooms as well as fruit and herbs. The results of these studies differ from the results obtained in the Forest Promotion Complex of Beskid Sądecki, which showed that the main motive of visits to the forest was the willingness to interact with nature, and only in the second place to obtain crops of the forest undergrowth (Janusz, Pochopień, www.humanitas.edu.pl/resources/upload/dokumenty/.../janusz%20pochopien.pdf, p. 67). The aim of the visits changes with age. Surveys conducted in Mazowiecki Landscape Park indicate that over 65 years of age, the proportion of respondents who prefer picking mushrooms is increasing (Janeczko, Woźnicka, 2014, p. 41). In the case of studies in Czarna Bialostocka commune, the age groups most likely to use this form of spending their free time are those under 20 years of age – 23% of respondents and over 60 years of age – 25% of respondents. To a large extent, the interest in picking fruits of the forest undergrowth is related to the low income in the local community. Monthly income below 1000 PLN was declared by 52% of respondents. 61% of people participating in the survey are inactive, and they are mainly pensioners. Most of the respondents use the collected raw material for their own purposes. Of the 92% of respondents who declare that they use crops of forest undergrowth for their own subsistence, 28% admit that they sell some of them. Andrzej Grzywacz in his article wrote about the utilization purpose of the mushroom picking. It turns out that individual collection and for their own use of mushrooms is carried out by 59% of pickers, and only less than 10% of them sell the gathered mushrooms at roads and in market places (Grzywacz, 2015, p. 76). This is also in line with research done in the area of Bory Tucholskie (Janeczko, Woźnicka, 2014).

According to the survey, 34% of respondents indicate that apart from the main purpose of visiting the forest, that is to pick the crops of forest undergrowth, they eagerly take advantage of attractiveness of the forest landscape and the possibility of resting in nature. Every day the forests of Czarna Białostocka commune are visited by 22% of its inhabitants. Most of them are people over 51 years of age. Twice a week the number of the inhabitants visiting forest even reaches 46%. They are people aged between 10 and over 60 years of age.

The preferences for the use of services provided by forests are also dependent on the level of education. In the group of people surveyed in Czarna Białostocka commune, 48% have primary education, 13% vocational education, 31% secondary education, and only 8% have higher education. The perception of forest functions for the group of respondents with primary, vocational and secondary education is mainly to obtain the crops of forest undergrowth – 47% in the group of people with primary education, 12% with vocational education and 30% for people with secondary education. All people with higher education indicated that the main motivating factor for them to visit the forest environment was the need for relaxation and desire to relax. On average, they use these forest benefits once or twice a week. The gender of respondents is not negligible in the perception of forest functions. The recreational function of the forest is more often used by men – 48%, than women – only 28%. On the other hand, the collection of forest undergrowth goods is carried out by both women (91%) and men (100%).

The occurrence and the possibility of obtaining of mushrooms and forest fruits also contributes to the increase of the significance of non-productive functions, and in particular of recreational function of forests. According to the survey, 38% of respondents combine the function of obtaining the crops of forest undergrowth with the recreational function provided by forest areas.

Current legal conditions guarantee the right to obtain to harvest all subsistence forest goods free of charge (the Law of 28 September 1991 on forests, article 27). One of the questions in the questionnaire concerned the opinion on the introduction of restrictions on the use of forest undergrowth resources. More than half of the respondents, as much as 68% believe that the tightening the law in that direction would lead to systematic breaking of them and public expression of dissatisfaction. For people selling those goods, the introduction of restrictions on obtaining forest undergrowth goods would limit the possibility of obtaining additional or sometimes the only possibility to earn money, as stated by 34% of respondents. A smaller part, 25% of respondents believe that it would not change anything, and people would continue to harvest forest resources they need, regardless of the current law, which could have a negative impact on the condition of forests.

Conclusions

The side use of forest, i.e. the extraction of non-wood raw materials from forests, is the most common among people living near forest areas. They extract practically everything: the crops of the forest undergrowth, animals and wood. The survey conducted in Czarna Białostocka commune, located near the forests, showed that the inhabitants visit the forest mainly in order to obtain raw materials. As much as 95% of respondents declared this form of the forest use. Only 34% of respondents use forest for purely recreational purposes. It can therefore be said that the local community by visiting forests is focused mainly on obtaining raw materials. The purely recreational function is only an added value. Due to such a high percentage of people who procure raw materials, legal restrictions on forest use become important. 34% of respondents said that this would limit the possibility of additional or sometimes the only possibility to earn money. However, 25% of respondents believed that people would continue to use the forest the same way, regardless of the fact that it is illegal.

It is therefore important that the forest use is truly sustainable. The protection of forest environment should be in line with the needs of local communities. Restrictions on forest use should be implemented in a reasonable way that allows for the coexistence of nature and humans.

The contribution of the authors

Małgorzata Rauba – conception – 100%; literature review – 50%; analysis and interpretation of data – 70%
Szymon Wysztygiel – acquisition of data – 100%; literature review – 50%; analysis and interpretation of data – 30%

Literature

Ankudo-Jankowska A., Glura J. (2013), *Znaczenie produktów ubocznego użytkowania lasu dla gospodarki narodowej*, „Prace KomisjiNauk Rolniczych i Komisji Nauk Leśnych" Tom 104, Poznań, p. 99, 100

Ecosystems and Human Well-Being, Millennium Ecosystem Assessment (2005), p. 587, 588

Główny Urząd Statystyczny (2016), *Leśnictwo*, Warszawa

Grzywacz A. (2015), *Prawne aspekty zbioru grzybów w lasach*, „Studia i Materiały CEPL w Rogowie" R. 17. Zeszyt 45/4, p. 76

Janeczko E., Woźnicka M. (2014), *Użytki leśne w zagospodarowaniu rekreacyjnym* lasu, „Studia i Materiały CEPL w Rogowie, R. 16" zeszyt 38/1, p. 40-41

Janusz A., Pochopień J. *Funkcje lasu w świetle preferencji konsumentów*, www.humanitas.edu.pl/resources/upload/dokumenty/.../janusz%20pochopien.pdf, p. 67 [31-10-2017]

Lagbas A.J. (2018), *Social valuation of regulating and cultural ecosystem services of Arroceros Forest Park: A man-made forest in the city of Manila, Philippines,* "Journal of Urban Management", https://doi.org/10.1016/j.jum.2018.09.002

Ministerstwo Ochrony Środowiska, Zasobów Naturalnych i Leśnictwa (1997), *Polityka Leśna Państwa* Warszawa, p. 4

Miura S. et al. (2015), *Protective functions and ecosystem services of global forests in the past quarter-centur, "*Forest Ecology and Management" No. 352, p.36

Paschalis-Jakubowicz P. (2009), *Leśnictwo a leśna turystyka i rekreacja. Turystyka w lasach i na obszarach przyrodniczo cennych*, „Stud. i Mat. CEPL w Rogowie" No. 23(4), p. 29-35

Pilli R., Pase A. (2017), *Forest functions and space: a geohistorical perspective of European forests, "*iForest – Biogeosciences and Forestry" No. 11, p. 82

Staniszewski P., Janeczko E. (2012), *Problemy udostępniania lasów w kontekście użytkowania zasobów runa*, „Studia i Materiały CEPL w Rogowie, R. 14" zeszyt 32/3, p. 162

Ustawa z dnia 28 września 1991 r. o lasach, Dz.U. nr 101 poz. 444

www.cpfweb.org, SFM and the multiple functions of forests [31-10-2017]