

# Benefits for visitors provided by protected areas in Bulgaria and willingness to become a conservation volunteer

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**Abstract.** Protected areas in Bulgaria (PAB) provide valuable ecosystem services. Maintaining of ecosystem health is of great importance for human wellbeing. The environmental volunteering is a valuable tool in solving local ecological problems. The main objective of the present research was to identify ecosystem services offered by PAB and attitude to participation in conservation volunteering using online survey and face-to-face interviews. Most respondents regularly use ecosystem services offered by PAB. Being well-informed about significance of maintaining ecosystem health, a lot of them declared willingness to become conservation volunteers. Online surveys could be used not only for data collection, but as also as a tool to involve people in environmental protection.

**Keywords:** ecosystem health, ecosystem services, environmental protection, face-to-face interviews, green areas, online survey.

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## Introduction

Protected areas provide valuable ecosystem services and are essential for biodiversity conservation (Wolf et al., 2017; Lecina-Diaz et al., 2019). Protected areas in Bulgaria (PAB) include 3 National parks, 11 Nature parks, 55 Reserves, 35 Managed reserves, 584 Protected sites, 352 Natural monuments ([https://eea.government.bg/zpo/bg/index\\_download.jsp](https://eea.government.bg/zpo/bg/index_download.jsp)). In the last decades outdoor recreation and use of medicinal plants, as part of healthy lifestyle, are very popular worldwide (Tzoulas & James, 2010; Rossi et al., 2012; Koppen et al., 2014; Dogan & Nedelcheva, 2015; Dragoeva et al., 2015; Rossi et al., 2015; Koleva et al., 2016; Cherneva et al., 2017; Koynova, 2018; Koynova et al., 2019). The potential benefit of healthy lifestyle, that reduce the incidence of chronic diseases, is widely understood (Arena et al., 2017). Activity in green spaces satisfy physical activity requirements (Bedimo-Rung et al., 2005). For people who gather herbs for

personal uses the protected areas are attractive due to the presumption of their ecological purity (Ferreira & Harmse, 2014; Karanikola et al., 2017; Koynova et al., 2019).

Exposure of green areas to anthropogenic pressure can lead to reduction of the quality of ecosystem services. For example, a lot of studies alarm that illegal logging escalated worldwide (Vasile & Iordăchescu, 2022). In changing world appear new ideas, way of communication, points of view and relation to nature. Environmental volunteering is an important resource of manpower in solving local conservation projects (Anderson et al., 2017; Woosnam et al., 2019). As pointed in Leung et al. (2018), the mere presence of tourists in a protected area can reduce illegal activities.

Data about provided benefits for people and attitude to participate in the environmental volunteering in Bulgaria are scarce. This information usually is obtained by face-to-face surveys. In the last years, the Internet and online communication significantly changed society lifestyle.

Scientific methodologies for data gathering also have been influenced. As a consequence, the online surveys have become the leading method of collecting data from the respondents. The advantages of online surveys upon interviews are well known – they are fast, cheap and representative (Braun et al., 2020; Cernat & Revilla, 2020). Recently, online surveys have been used for investigation of motivation to environmental volunteering (Winch et al., 2021). However, there is no comparative study of online and face-to-face survey data on the willingness to volunteer in the conservation programs in Bulgaria.

The aim of the present research was to identify ecosystem services offered by PAB and intention to engage in conservation volunteering using online survey and face-to-face interviews.

## Material and Methods

Two types of interviews were conducted – on-site among visitors to the Shumen Plateau Nature Park and online among users of social network Facebook. The on-site interviews (face-to-face) were conducted as a part of previous study (Koynova et al., 2019). The online questionnaire involved 18 to 65+ aged members of the Bulgarian population.

The demographic features of the people who accepted to participate in the interviews were determined. The

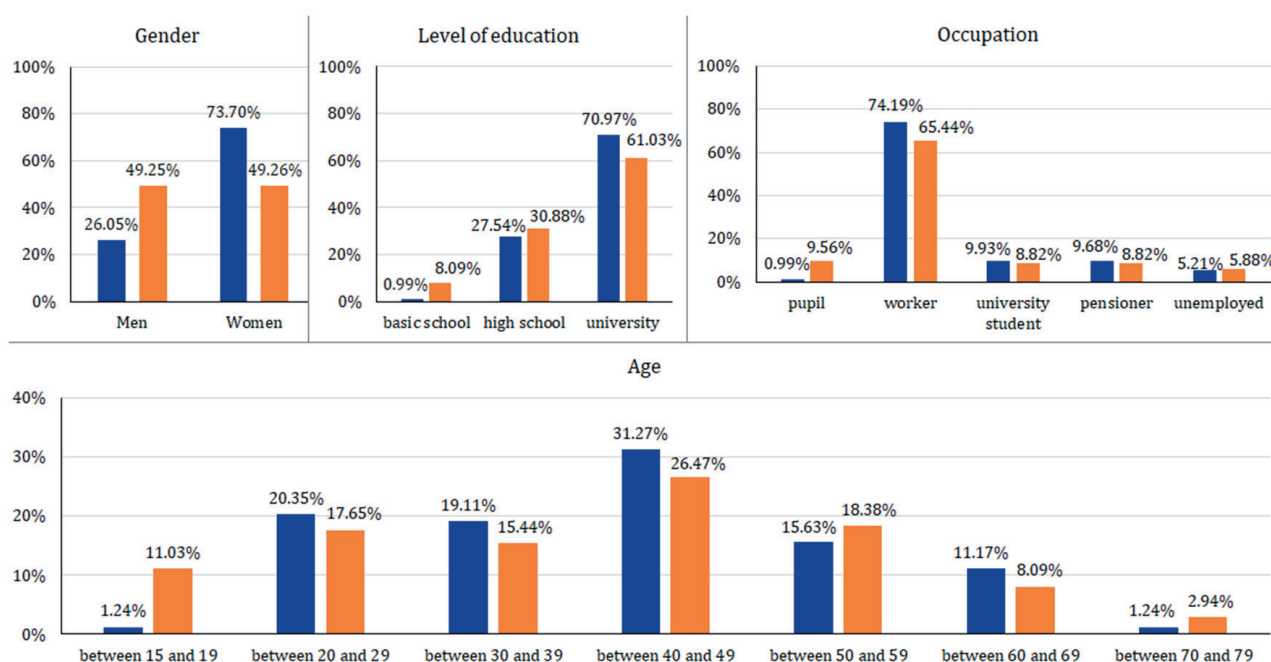
information about ecosystem services provided by PAB was obtained using the following questionnaire: 1) How often do you visit PAB? 2) Do you think visiting the PAB is of importance to your physical/mental health? 3) What is the reason to visit PAB? 4) Do you collect herbs from PAB?

The information about the significance of ecosystem health and the willingness to become an environmental volunteer was obtained using the following questionnaire: 1) In your opinion, is there illegal logging on the territory of PAB? 2) Would you participate in PAB volunteer conservation programs?

Data from each questionnaire were checked for inconsistencies. Questionnaires containing logical errors were excluded from the study. A descriptive statistic procedure like percentage and frequency distribution and Pearson's contingency coefficient were employed for data analysis (Koynova et al., 2019).

## Results and Discussion

The random sample in the present study consists of 539 people: 403 members of the social network Facebook (online group) and 136 visitors in Nature Park Shumen Plateau (on-site group). Both groups involved people who are interested in this topic – park visitors and voluntary online participants. The demographic features of the participants are presented in Figure 1. The ratio “women to men” were 73.70% to 26.05% in



**Figure 1.** Distribution of the respondents according to their demographic features. In blue – online group, in orange – on-site group (the data were published by Koynova et al., 2019). Some of the participants did not indicate demographic characters

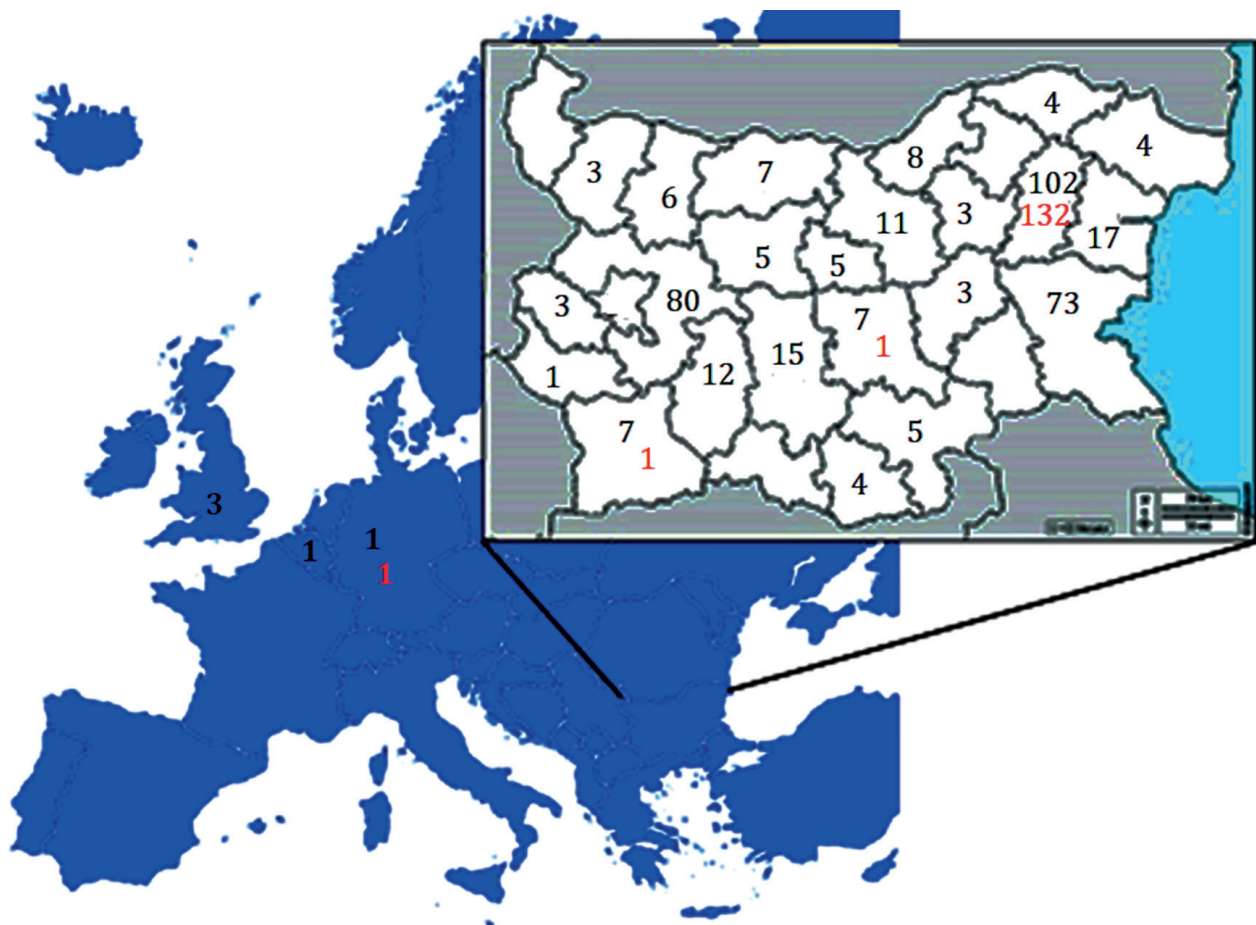
online respondents and about 50% to 50% in on-site group. Most respondents were between 20-60 years old. The 40-49 age group was the predominant. The profile of online and on-site group in terms of the level of education and employment was similar. Most of the participants had a university degree (70.97% and 61.03%) or graduated from high school (27.54% and 30.88%). The majority of respondents were employed (74.19% and 65.44%).

The online respondents were predominantly from Bulgaria – 93.33%. The majority of on-site respondents (97.06%) represent a consistent group of citizens of Shumen city (Fig. 2). Some of the participants did not indicate a settlement but due to the small percentage, it does not affect the results of the study.

Well known is that, in general, the Internet population is demographically skewed relative to the general population. This difference closing each year as more people gain internet access. In industrialized countries, the demographic gap is small (Evans & Mathur, 2005). It should be noted that in present online survey the typical respondent is a working woman with a university degree. According to Garín-Muñoz

et al. (2022), there are differences in the types of activities carried out on the Internet by men and women, as women show a preference for health and social issues. This statement is consistent with the Bimber (2000) study, which showed that the existing gender gap in Internet use is a product of socioeconomic and other factors, rather than gender itself.

The pattern of answers to the question “How often do you visit PAB?” differed between the two groups. It could be predicted by the type of the sample – members of social networks and people interviewed in the park. The largest proportion of online respondents visited PAB every month (46.32%), 18.61% – every week and only 4.96 are daily visitors. Some of the online participants further specify that they visit the parks only few times a year. Interestingly, some respondents (8.34%) of the online group declared that they do not visit PAB. Obviously, these people have different motivation to participate in present voluntary survey. Most of the on-site respondents (46.32%) visited the park every week, about one third (27.94%) – every month and 23.53% – daily (Table 1).



**Figure 2.** Place of residence of the participants. In black is represented the online group. In red is represented the on-site group (data published by Koynova et al., 2019)

**Table 1.** Ecosystem services provided by PAB

Questions	Responses	Online group n (%)	On-site group n (%)
1. How often do you visit PAB?	Every day	20 (4.96%)	32 (23.53%)#
	Every week	75 (18.61%)	63 (46.32%)#
	Every month	171 (42.43%)	38 (27.94%)#
	1 to 3 times a year	33 (8.19%)	-
	4 to 6 times a year	9 (2.23%)	-
	When I have a chance	33 (8.19%)	-
	During the summer	6 (1.49%)	-
	I do not visit	34 (8.34%)	-
2. Do you think visiting the PAB is of importance to your physical/mental health?	Yes, to mental health	335 (83.13%)	114 (83.82%)#
	Yes, to physical health	318 (78.91%)	131 (96.32%)#
3. What is the reason to visit PAB?	To avoid the city	184 (45.66%)	48 (35.29%)#
	Relaxing	245 (60.79%)	59 (43.38%)#
	Picnic in the park	100 (24.81%)	43 (31.62%)#
	Contact with nature	308 (76.43%)	88 (64.71%)#
	Meeting with friends	117 (29.03%)	44 (32.35%)#
	Walking with the kids	140 (34.74%)	33 (24.26%)#
	Walking with pets	47 (11.66%)	15 (11.03%)#
	To practice sport	66 (16.38%)	79 (58.09%)#
4. Do you collect herbs from PAB?	Yes	44 (10.92%)	21 (15.44%)
	Sometimes	63 (15.63%)	21 (15.44%)
	No	291 (72.21%)	94 (69.12%)

n – number; The percent differs from 100% since more than one response was marked or was no marked response. # – data presented in Koynova et al. (2019).

Preferred ecosystem services were determined (Table 1). Most of the respondents declared that the visiting of PAB is of great importance both for their physical and mental health. As can be seen, the results showed a similar statement of participants about the positive effect on their mental health. Recently a lot of studies have been focused on the positive impact of green spaces on mental health and well-being (McCracken et al., 2016; Nutsford et al., 2013; Crawford et al., 2008; Pikora et al., 2003). The result revealed some differences between two groups about the influence on the physical health – most of the on-site group (96.32%) and 78.91% of the online respondents gave a positive answer. A possible reason could be the existence of other type of physical activity achieved by social network members connected with their lifestyle.

The analysis of our results allowed us to determine which ecosystem services were attractive to visitors to the PAB. Results revealed as main motivation to visit the PAB that force all of the respondents is the contact with nature. The second reason for the online respondents is relaxing and for on-site respondents – to practice sport. As a third reason the online group have pointed “to avoid the city” and on-site respondents – “relaxing”.

As can be seen, the contact with nature is among the most preferred ecosystem services. This statement is closely connected with positive answers to other two questions – relaxing and avoiding the city. In modern society more and more people are coming familiar with healthy lifestyle. Concerning this aspect, our results are consistent with data published in other studies (Rossi et al., 2012; Rossi et al., 2015; Koynova, 2018; Koynova et al., 2019; Tisma et al., 2020; Quinta-Nova & Ferreira, 2022).

Interestingly, results revealed differences in practicing sport in PAB. Only small proportion of the online group (16.38%) have given a positive answer. More than the half of the on-site group considered that park visiting ensure sport activity. These results are consistent with the abovementioned difference in the responses about the influence of park visiting on the physical activity. Outdoor recreation involves an individual engaging in a preferred activity in natural environment (Csirmaz & Pető, 2015; Boman et al., 2013). Taking into account that respondents are predominantly well educated and, consequently, familiar with the importance of physical activity, it can be speculated that two groups of respondents practice different type of sports – outdoor or indoor.



The herbs in protected areas are attractive due to the presumption of ecological purity of ecosystems (Ferreira & Harmse, 2014; Karanikola et al., 2017; Koynova et al., 2019). About one-third of the respondents in both groups gave a positive answer to the question “Do you collect herbs from PAB?” (Table 1). The respondents from both groups appreciate the benefits obtained from ecosystems, without causing damages to the potential of the ecosystems. They are familiar with the legislation and collect only for their own needs. This could be due to high education of respondents.

Further, the attitudes of respondents toward the illegal logging were evaluated (Table 2). Nowadays people are well informed about the significance of ecosystem health. Illegal logging consequences include deforestation, biodiversity loss, habitat destruction and climate change. Analysis of the results revealed that majority of the online (77.42%) and about a half of the on-site (53.67%) respondents state to have information regarding existence of illegal logging on the territory of PAB. This statement is closely connected with environmental volunteering. Worldwide the visitors in protected areas are involved in different conservation projects (Leung et al., 2018). Conservation volunteering is a vital key for the preservation of ecosystems and the services they offer. In present survey, about 50% of respondents declared the willingness to participate in particular conservation programs (Table 2). The statement of the online and the on-site group was similar. However, the number of people who are not sure about participation in such programs is not small (indication of the answer “I would not participate” or “I can not decide”).

The willingness of both groups is not connected with the frequency of park visiting. This may be related to the impact of social factors like education and worldview which formed the characters of the modern people (Brody, 1995; Schlesinger, 2004). Increased initial motivation may lead

**Table 2.** Willingness of respondents to become conservation volunteers

Questions	Responses	Online group n (%)	On-site group n (%)
1. In your opinion, is there illegal logging on the territory of PAB?	Yes, I have personal observations	156 (38.71%)	48 (35.29%)
	Yes, I have information from acquaintances	156 (38.71%)	25 (18.38%)
	There is no illegal logging	1 (0.25%)	8 (5.88%)
	I have no information	89 (22.08%)	58 (42.65%)
2. Would you participate in PAB volunteer conservation programs?	Yes, of plant species	216 (53.60%)	71 (52.21%)
	Yes, of animal species	197 (48.88%)	69 (50.74%)
	Yes, in habitats	163 (40.45%)	57 (41.91%)
	I would not participate	12 (2.98%)	11 (8.09%)
	I can not decide	67 (16.63%)	30 (22.05%)

n – number; The percent differs from 100% because more than one response was marked or there was no marked response.

to greater satisfaction from the mission for the volunteer (Meneghini, 2016). Our results are in accordance with these trends – a large proportion of participants in the survey declare their willingness to volunteer for conservation programs.

Surveys generally contain two types of questions: topic-based and demographic. Generally, in present study demographic variables weakly contributed to the choice of answers (Table 3). Only two values from the Pearson's contingency coefficient indicated a significant correlation ( $P \leq 0.05$ ): between the age and employment of the on-site respondents and their answers to the question “Do you collect herbs from PAB?”. The percentage of people who collect medicinal plants increases with the age of the

**Table 3.** Relationship between demographic features of the respondents and their answers to the questions

Questions	Gender (r)		Age (r)		Level of Education (r)		Occupation (r)	
	Online group	On-site group	Online group	On-site group	Online group	On-site group	Online group	On-site group
1. How often do you visit PAB?	0.25	0.32 <sup>#</sup>	0.45*	0.40 <sup>#</sup>	0.37*	0.30 <sup>#</sup>	0.38*	0.38 <sup>#</sup>
2. Do you think visiting the PAB is of importance to your physical/mental health?	0.21	0.01 <sup>#</sup>	0.30*	0.16 <sup>#</sup>	0.09	0.10 <sup>#</sup>	0.25	0.15 <sup>#</sup>
What is the reason to visit PAB?	0.20*	0.22 <sup>#</sup>	0.30*	0.31 <sup>#</sup>	0.14	0.21 <sup>#</sup>	0.20*	0.29 <sup>#</sup>
4. Do you collect herbs from PAB?	0.20	0.23	0.38*	0.56*	0.36	0.22	0.23	0.50*
5. In your opinion, is there illegal logging on the territory of PAB?	0.13	0.39	0.25	0.31	0.16	0.20	0.16	0.39
6. Would you participate in PAB volunteer conservation programs?	0.19*	0.22	0.19	0.27	0.19	0.11	0.16	0.27

\* –  $P \leq 0.05$ ; r – Pearson's contingency coefficient:  $0 < r < 0.3$  weak correlation,  $0.3 < r < 0.5$  moderate correlation,  $0.5 < r < 0.7$  significant correlation,  $0.7 < r < 0.9$  strong correlation,  $0.9 < r < 1$  very strong correlation. # – data presented in Koynova et al. (2019).

participants. In the online group, almost 60% of the retired people answered that they collect herbs from the PAB, while for the whole on-site sample the percentage is 15.44.

Comparison between two groups in present survey contributes to other data that online surveys will attract more attention in the future (Duffy & Smith, 2005). Internet-based methodologies can be used not only for data collection, but also for motivation of social activity. According to Winch et al. (2021) "Environmental volunteering can benefit participants and nature through improving physical and mental well-being while encouraging environmental stewardship".

## Conclusion

Results of present study revealed that protected areas in Bulgaria offer valuable ecosystem services. Park's visitors are well informed about the necessity of maintaining ecosystem health and declared willingness to become environmental volunteers. Online surveys could be used not only for data collection, but as also as a tool to involve people in environmental protection.

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## References

- Anderson L.G., Chapman J.K., Escontrela D. & Gough C.L.A., 2017, The role of conservation volunteers in the detection, monitoring and management of invasive alien lionfish. *Management of Biological Invasions* 8(4): 589–598.
- Arena R., Bond S., O'Neil R., Laddu D., Hills A., Lavie C. & McNeil A., 2017, Public Park Spaces as a Platform to Promote Healthy Living: Introducing a HealthPark Concept. *Progress in Cardiovascular Diseases* 60: 152–158.
- Bedimo-Rung A.L., Mowen A.J. & Cohen D.A., 2005, The significance of parks to physical activity and public health: a conceptual model. *American Journal of Preventive Medicine* 28(2): 159–168.
- Bimber B., 2000, Measuring the Gender Gap on the Internet. *Social Science Quarterly* 81: 868–876.
- Boman M., Fredman P., Lundmark L. & Ericsson G., 2013, Outdoor recreation – A necessity or a luxury? Estimation of Engel curves for Sweden. *Journal of Outdoor Recreation and Tourism* 3–4: 49–56.
- Braun V., Clarke V., Boulton E., Davey L. & McEvoy Ch., 2020, The online survey as a qualitative research tool. *International Journal of Social Research Methodology* 24(6): 641–654.
- Brody M., 1995, Development of a Curriculum Framework for Water Education for Educators, Scientists, and Resource Managers. *The Journal of Environmental Education* 26(4): 18–29.
- Cernat A. & Revilla M., 2020, Moving from face-to-face to a web panel: impacts on measurement quality. *Journal of Survey Statistics and Methodology* 9(4): 745–763.
- Cherneva D., Yaneva G. & Ivanov D., 2017, Ethnobotanical study of the attitudes towards herbal remedies and conventional medicines among local population of the North Black Sea Coast. *Scripta Scientifica Pharmaceutica* 4(1): 29–32.
- Crawford D., Timperio A., Giles-Corti B., Ball K., Hume C., Roberts R. & Salmon J., 2008, Do features of public open spaces vary according to neighbourhood socio-economic status? *Health Place* 14: 889–893.
- Csirmaz É. & Pető K., 2015, International trends in recreational and wellness tourism. *Procedia Economics and Finance* 32: 755–762.
- Dogan Y. & Nedelcheva A., 2015, Wild plants from open markets on both sides of the Bulgarian – Turkish border. *Indian Journal of Traditional Knowledge* 14(3): 351–358.
- Dragoeva A., Koleva V., Nanova Zh., Koynova T. & Jordanova P., 2015, A study on current status of herbal utilization in Bulgaria: Part 1 – Application of herbal medicines. *Scientific Research and Essays* 10(5): 168–176.
- Duffy B. & Smith K., 2005, Comparing data from online and face-to-face surveys. *International Journal of Market Research* 47(6): 615–639.
- Evans J.R. & Mathur A., 2005, The value of online surveys. *Internet Research* 15(2): 195–219.
- Ferreira S. & Harmse A., 2014, Kruger National Park: Tourism development and issues of social carrying capacity in the management of large numbers of tourists. *Journal of Ecotourism* 13: 16–34.
- Garín-Muñoz T., Prez-Amaral T. & Valarezo Á., 2022, Evolution of the internet gender gaps in Spain and effects of the Covid-19 pandemic. *Telecommunications Policy* 46: 102371. [https://eea.government.bg/zpo/bg/index\\_download.jsp](https://eea.government.bg/zpo/bg/index_download.jsp) [Accessed: 22.03.2023]
- Karanikola P., Panagopoulos T. & Tampakis S., 2017, Weekend visitors' views and perceptions at an urban national forest park of Cyprus during summertime. *Journal of Outdoor Recreation and Tourism* 17: 112–121.
- Koleva V., Dragoeva A., Nanova Zh. & Koynova T., 2016, A study on current status of herbal utilization in Bulgaria: Part 2 – Safety concerns. *Journal of Ethnopharmacology* 183(13): 123–127.
- Koppen G., Sang A.O. & Tveit M.S., 2014, Managing the potential for outdoor recreation: Adequate mapping

- and measuring of accessibility to urban recreational landscapes. *Urban Forestry & Urban Greening* 13: 71–83.
- Koynova T., 2018, Comparative analysis of Nature Park Shumen Plateau and Shumen City Park as green spaces. *Acta Scientifica Naturalis* 5(2): 57–67.
- Koynova T., Koleva V., Dragoeva A. & Natchev N., 2019, Peri-urban National Parks as Green Spaces for Recreation: A Case Study of Nature Park Shumen Plateau. *International Journal of Social Ecology and Sustainable Development* 10(1): 46–58.
- Lecina-Diaz J., Alvarez A., De Cáceres M., Herrando S., Vayreda J. & Retana J., 2019, Are protected areas preserving ecosystem services and biodiversity? Insights from Mediterranean forests and shrublands. *Landscape Ecology* 34: 2307–2321.
- Leung Y.-F., Spenceley A., Hvenegaard G. & Buckley R., 2018, Tourism and visitor management in protected areas: Guidelines for sustainability. Gland, Switzerland.
- McCracken D.S., Allen D.A. & Gow A.J., 2016, Associations between urban greenspace and health-related quality of life in children. *Preventive Medicine Reports* 3: 211–221.
- Meneghini A.M., 2016, A Meaningful Break in a Flat Life. *Nonprofit and Voluntary Sector Quarterly* 45(6): 1214–1233.
- Nutsford D., Pearson A.L. & Kingham S., 2013, An ecological study investigating the association between access to urban green space and mental health. *Public Health* 127: 1005–1011.
- Pikora T., Giles-Corti B., Bull F., Jamrozik K. & Donovan R., 2003, Developing a framework for assessment of the environmental determinants of walking and cycling. *Social Science & Medicine* 56: 1693–1703.
- Quinta-Nova L. & Ferreira D., 2022, Analysis of the suitability for ecotourism in Beira Baixa region using a spatial decision support system based on a geographical information system. *Regional Science Policy and Practice* 2022: 1–21.
- Rossi S.D., Byrne J.A. & Pickering C.M., 2015, The role of distance in peri-urban national park use: Who visits them and how far do they travel? *Applied Geography* 63: 77–88.
- Rossi S., Pickering C. M. & Byrne J., 2012, Differences among hikers, runners and mountain bikers in a peri-urban park. *Proceedings of 6-th International Conference on Monitoring and Management of Visitors in Recreational and Protected Areas*, Stockholm, Sweden 174–175.
- Schlesinger W.H., 2004, Environmental Education for a sustainable future. *Applied Environmental Education & Communication* 3(2): 75–77.
- Tisma S., Boromisa A.-M., Farkas A. & Tolic I., 2020, Socio-economic evaluations of nature protected areas: health first effect. *European Journal of Geography* 11(1): 108–123.
- Tzoulas K. & James P., 2010, Peoples' use of, and concerns about, green space networks: A case study of Birchwood, Warrington New Town, UK. *Urban Forestry & Urban Greening* 9: 121–128.
- Vasile M. & Iordăchescu G., 2022, Forest crisis narratives: Illegal logging, datafication and the conservation frontier in the Romanian Carpathian Mountains. *Political Geography* 96, 102600.
- Winch K., Stafford R., Gillingham P., Thorsen E. & Diaz A., 2021, Diversifying environmental volunteers by engaging with online communities. *People and Nature* 3: 17–31.
- Wolf I.D., Ainsworth G.B. & Crowley J., 2017, Transformative travel as a sustainable market niche for protected areas: a new development, marketing and conservation model. *Journal of Sustainable Tourism* 25(4): 1–24.
- Woosnam K.M., Strzelecka M., Nisbett G.S. & Keith S.J., 2019, Examining Millennials' Global Citizenship Attitudes and Behavioral Intentions to Engage in Environmental Volunteering. *Sustainability* 11, 2324.