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# Comparison of Expert Assessment of Geosites with Tourist Preferences, Case Study: Sub-Tatra Region (Southern Poland, Northern Slovakia)

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**Abstract:** The purpose of this research was to compare the geotouristic potential of the Sub-Tatra Region, expressed in the values of expert assessment of geosites, against the preferences of tourists coming to the area. Tourist preferences were evaluated by a survey in which tourists assessed the attractiveness of the types of geosites that can be admired in the area. The expert valorizations showed high and very high indices for most of the analyzed geosites. The highest of these assessment values show particularly high geotourism values for three geosites: the travertine hill with Spiš castle, the limestone hill with Orava castle and the travertine dome in Gánovce. A comparison of these results against average tourist preferences shows a moderate correlation (r = 0.4). Geosites of low and medium value according to expert assessments are rarely selected as the destination for equipment-intensive tourism. The sites with the highest combined valorization coefficients, i.e., hills with castle ruins, are of moderate interest to the surveyed group of respondents. The largest difference is in the assessment of the cave, waterfall and viewpoint geosites, where there is a great interest among tourist respondents, but the expert assessment index is low or moderate.

**Keywords:** assessment method; tourist preferences; geosites; geotourism; Sub-Tatra Region



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## 1. Introduction

Twenty-seven years after the first definition of geotourism appeared in the scientific literature [1], the interest in this form of educational and equipment-intensive tourism is still growing. The literature features many articles describing selected abiotic natural tourist attractions, like caves [2,3], river valleys and waterfalls [4–6], glaciers [7–9], landslides [10–12], rock outcrops and quarries [13–17], and landscapes [18–20], and their values. There are also many works devoted to geotourist assessment, e.g., [21,22], geodiversity [23–25], geoheritage [26] and geoconservation [27]. Geoparks play a huge role in promoting geotourism, especially those of the highest quality, which are associated in UNESCO's Global Geopark Network [28,29]. Local populations, local governments and people managing geoparks interact very well with scientists conducting research in geoparks, which is constantly improving their scientific and educational importance.

However, neither geoparks nor any other geotourist attractions could exist without visiting tourists. The professional literature contains many articles on motivation, travel goals and travel effects.

The motivation to travel has been widely researched, and many different theories have emerged [30,31]. Many assume that tourists are guided by basic behavioral patterns that lead them to certain destination types. The analysis of such psychological needs can be associated with the hierarchical theory of Maslow [32], as well as later theories of push and pull motivation [33]. According to this theoretical framework, tourists respond to "push" factors (such as the need to rest and escape the routine of everyday life) as intrinsic motivations to travel, while "pull" factors draw them to specific destinations. Seven push factors have been identified (flight, self-knowledge, relaxation, prestige, regression, kinship

enhancement, and social interaction), as well as two cultural or attracting factors (novelty and education) [34], and these have been applied in many studies concerning travel to various places [35]. Nowadays, an important role is also played by the fashion of traveling and uploading personal photos from the most attractive places in the world onto social media [36].

Therefore, the motivations of tourists are influenced not only by personal factors, but also by the characteristics of the destination, which in turn can be promoted in a way that meets the expectations and desires of potential guests. The way information is provided to the tourist and the way the tourist processes it play a key role in building tourist perceptions, which may differ from the "real" attributes of the tourist offer [35,37–39]. Satisfying tourist expectations before the trip and maximizing the real satisfaction with the trip should be business goals, and promoting the physical attributes of a destination along with an objective description of its characteristics and attractiveness for tourists is necessary to increase tourist satisfaction and loyalty to the destination [40].

An important element in creating a tourist product is the analysis of tourists' preferences. The concept of "preferences" comes from the economic sciences, where it was first described in the theory of consumer rights [41]. According to this theory, consumer preferences reflect and define the consumer's taste, not depending on the price of the product or the consumer's budget, but on the satisfaction and contentment or utility they provide [41]. They are especially important when creating specialized products intended for specific groups of recipients. The most important goal of preference research is to understand the motivations and expectations of tourists [42,43]. In preference research, the target group is important, and should represent the tourists visiting a given tourist region, as this will make it possible to prepare an offering tailored to the interests of the appropriate group of recipients [44,45]. To date, research on the preferences of tourists who are particularly interested in geotourism has been rare. More detailed research on this subject was carried out by employees of the University of Montana (USA). Using the Geotraveler Tendency Scale, they selected three groups of tourists who are interested to a low, medium and high degree in abiotic nature [46]. Three groups of recipients (geotourists) were also defined by P. Migoń [47] in the academic textbook "Geotourism", in which a distinction was drawn among professionals, people who are passionate about educational tourism, and people visiting geotourist sites "by the way". The preferences of Slovak (geo)tourists visiting selected geosites in Slovakia were the subject of a publication by L. Štrba [48]. Some kind of comparison between the SWOT analysis and the results of survey research was created by a research team from Turkey [49], comparing the strengths, weaknesses, opportunities and threats for selected geosites against the perception of tourists who visited these places. The (geo)tourist preferences for two geosites in South Africa were also presented by E. Du Preez [50].

Therefore, the most important goal of this article is to fill this gap by comparing the results of expert assessments of the geosites against the results of a survey conducted on a group of tourists who had already expressed interest in abiotic nature.

These studies were carried out in Sub-Tatra—a region with very well-developed tourist functions that is visited by millions of tourists each year (and not only from Poland and Slovakia).

## 2. Materials and Methods

### *2.1. Assessment of the Geosites*

All assessment methods presented in the scientific literature are based on the point valuation method, according to which different weights are assigned to defined criteria. Many different assessment methods based on various criteria have been developed to date, so there is a need to systematize and group them. This challenge has been taken up by researchers [21,22,51] who grouped individual methods according to their criteria, with various modifications. Of the many assessment methods developed to date for various areas, mainly mountains and foothill reliefs, the methods presented by P. and

D. Pereira [52], and Ch. Fassoulass et al. [53] are used in this paper. According to the author, these comprehensively assess geosites in areas of mountain and foothill relief; the first for the Montesinho mountain park in Portugal and the second for the Psiloritis geopark and in the Lasithi Mountains in Crete. The criteria used in those two works were used to present a modified assessment method for Sub-Tatra geosites that also serves as a point valuation method.

The author's method assesses geosites according to two groups of criteria: scientific and educational; and tourist. The assessment criteria were based on those presented by P. and D. Pereira [52] for educational values, and on those of P. and D. Pereira [52] and Fassoulas et al. [53] for tourist criteria (Table 1).

**Table 1.** Assessment criteria for scientific and educational and tourist values of geosites.

| **E** | **Scientific and Educational Values** |
|---|---|
| **r** | **Representativeness of geological, hydrogeological, hydrological, and relief-forming processes and their educational value** |
| 0 | Low representativeness and no educational value |
| 3.3 | Average representativeness and low educational value |
| 6.7 | Site is a good example of natural processes, but difficult to recognize and interpret for non-scientists |
| 10 | Site is a good example of natural processes and has a high educational value |
| **Wg** | **Other features related to abiotic nature in this site or in its immediate vicinity** |
| 0 | No other features |
| 3.3 | Other features (elements) of abiotic nature but not related to the site |
| 6.7 | Other features (elements) of abiotic nature related to the site |
| 10 | Occurrence of other sites within 2 km |
| **w** | **Uniqueness of the site in relation to the Sub-Tatra Region** |
| 0 | More than 5 examples of similar sites in the region |
| 2.5 | 3–5 examples of similar sites in the region |
| 5 | 2–3 examples of similar sites in the region |
| 7.5 | Site is absolutely unique |
| 10 | The only site of its type in the region |
| **PL/SK** | **Uniqueness of the site compared to other similar sites in Poland and Slovakia** |
| 0 | More than 5 examples of the same type of site |
| 3.3 | 3–5 examples of the same type of site |
| 6.7 | 2 examples of the same type of site |
| 10 | No similar sites |
| **l** | **Scientific value of site expressed in scientific publications** |
| 0 | Site not described in the scientific literature |
| 5 | Site described in the national scientific literature |
| 10 | Site described in the international scientific literature |
| **zk** | **Degree of landscape diversity** |
| 0 | Lack of differentiation (1 type of relief process forming the landscape) |
| 2.5 | Low diversity (2 types of relief processes forming the landscape) |
| 5 | Medium diversity (3 types of relief processes forming the landscape) |
| 7.5 | High diversity (4 types of relief processes forming the landscape) |
| 10 | Very high diversity (5 or more types of relief processes forming the landscape) |
| **T** | **TOURIST VALUES** |
| **w** | **Visibility of site** |
| 0 | Difficult to observe, or not visible at all |
| 2 | Can only be observed using special equipment |

**Table 1.** *Cont.*

| | |
|---|---|
| 4 | Visibility restricted by trees or lower vegetation |
| 6 | Good visibility, but can only be seen fully by moving around |
| 8 | Good visibility for all elements (object partially covered with grass) |
| 10 | Perfect visibility for all elements |
| **pw** | **Width of viewing angle from viewpoint** |
| 0 | No viewpoints |
| 2.5 | One viewpoint with a radius of 90° in the direction of S, N, E or W |
| 5 | Viewpoint 180° SE, NE, NW or SW |
| 7.5 | Viewpoint with a radius of 270° |
| 10 | 360° viewpoint |
| **z** | **Degree of degradation (destruction) of site** |
| 0 | Site destroyed by human activity |
| 2.5 | Site destroyed by natural processes |
| 5 | Site damaged, but retains significant geological and geomorphological features |
| 7.5 | Site slightly damaged, but retains significant geological and geomorphological features |
| 10 | Site undamaged |
| **d** | **Accessibility of site** |
| 0 | Site difficult to access; only with special equipment |
| 2 | Site accessible on foot; parking >2000 m away |
| 4 | Site accessible by car and/or bicycle; parking >1000 m away |
| 6 | Site accessible by car and/or bicycle; parking 500–1000 m away |
| 8 | Site accessible by car; parking <500 m away |
| 10 | Site accessible by car and local transport; bus stop <500 m away, parking <100 m away |
| **g** | **Present use as a geosite** |
| 0 | Site is not a geosite and is not endorsed |
| 3.3 | Site described in geotouristic literature; not promoted as a geosite |
| 6.7 | Site described in geotouristic literature; promoted, but not used, as a geosite |
| 10 | Site described in geotouristic literature; promoted and used as a geosite |
| **ot** | **Present use as a tourist attraction** |
| 0 | Site not known in tourist literature; not promoted or used as a tourist attraction |
| 3.3 | Site known in tourist literature; not promoted or used as a tourist attraction |
| 6.7 | Site known in tourist literature; promoted, but not used, as a tourist attraction |
| 10 | Site known in tourist literature; promoted and used as a tourist attraction |
| **o** | **Legal status of site protection** |
| 0 | Strict security; no access to site |
| 3.3 | Partial protection; precise guidelines for access to site |
| 6.7 | No security; full access to site |
| 10 | Partial protection; no additional restrictions on access to site |
| **ud** | **Equipment and additional services (restaurants, souvenir shops)** |
| 0 | Accommodation and additional services >5 km away |
| 2.5 | Accommodation and additional services 2–5 km away |
| 5 | Accommodation and additional services 500–2000 m away |
| 7.5 | Accommodation and additional services 100–500 m away |
| 10 | Accommodation and additional services <100 m away |
| **it** | **Presence of other tourist attractions** |
| 0 | Nearest tourist attraction >5 km away |

**Table 1.** *Cont.*

| | |
|---|---|
| 2.5 | Nearest tourist attraction 2–5 km away |
| 5 | Nearest tourist attraction 500–2000 m away |
| 7.5 | Nearest tourist attraction 100–500 m away |
| 10 | Nearest tourist attraction <100 m away |

In order to adjust the point values used in the method described by Fassoulas et al. [53], the point values in the method of P. and D. Pereira [52] were multiplied by ten. The sums of values related to individual criteria were divided by the maximum possible sum for each, so that all values were in the range from 0 to 1. On this basis, four groups of geosites were distinguished (Table 2). The boundaries between them were adopted based on the suggestions presented by J. Warszyńska [54].

**Table 2.** Groups of geosites and their definitions.

| Group | Point Value | Definition |
|---|---|---|
| I | >0.7 | Site of special scientific and educational/tourist values |
| II | 0.4–07 | Site of high scientific and educational/tourist values |
| III | 0.2–0.4 | Site of moderate scientific and educational/tourist values |
| IV | <0.2 | Site of low scientific and educational/tourist values |

The values of individual components were the basis for calculating the final geosite indexation coefficient (VK), which was performed according to the following formula:

$$VK = 0.7VE + 0.3VT$$

where VE—scientific and educational value; VT—tourist value

The final indexation factor of the geosites, calculated on the basis of a weighted average of the two component assessments shown in Table 1, aims to emphasize the importance of scientific and educational values over tourist values. The author believes that it is the scientific and educational values that play the main role in the expert valorization of abiotic nature sites, and the elements related to the tourist attractiveness of the geosites constitute an added value that may change.

Of the features describing the geosites' geotourist value, those that the experts assess most subjectively are the educational aspects. They depend on the knowledge and didactic experience of the person carrying out the assessment. In order to optimize the results of the assessment of the geosites in Sub-Tatra Region, the author used the expert triangulation method [55,56], which involves the same analyses being conducted by several researchers. The valorization was conducted by the author and by 11 experts currently conducting research in the Sub-Tatra Region. Because none of the experts valorized all geosites in Sub-Tatra, they were divided into four subgroups according to their declared regions of preference (Podhale, Orava, Liptov and Spiš).

### *2.2. Quantitative Research on Tourist Preferences*

The author intended to verify the evaluation of the geosites by investigating the preferences of tourist visitors using questionnaire surveys. The questions were designed to collect information on whether tourists were interested in spending their free time among abiotic nature and, if so, what groups of abiotic sites they would like to see and how they thought they should be prepared for sightseeing (see Supplementary File). These survey respondents were tourists belonging to groups created on the social network Facebook called: "Tatromaniacy", "Klub miłośników turystyki pieszej", "Góromaniacy", "Wolontariat TPN" and "Partak na turistiku". These groups were selected for the survey for their declared interest in nature, as expressed by a desire to engage in tourism in a mountain

area. Considering the large size of the respondent groups, the surveys were prepared and conducted online using a survey form available on Google Forms The questionnaires were prepared in Polish and Slovak. The questions were divided into three groups. The first concerned general information on past excursion destinations, trip durations, and the location of visited places. The second group consisted of questions about how important it is to spend free time among abiotic nature and what kind of geosites they would choose to visit. Finally, respondents were asked about the preferences for the type and tourism development of individual sites. Each questionnaire contained a metric related to the respondent's age, education, and other interests.

## 3. Study Area

The Sub-Tatra Region is located in the Western Carpathians, around the highest Carpathian massif—the Tatra Mountains. The borders of the region described in this article were determined based on physical geographical units, which are described in more detail later in the article. However, this area is also within four ethnographic regions lying on the Polish–Slovak border: Podhale, Orava, Liptov and Spiš (Figure 1). The unique highlander culture, which is the most important feature of these ethnographic regions and is manifested in, among other things, the architecture, is also visible directly or indirectly at the analyzed geosites.

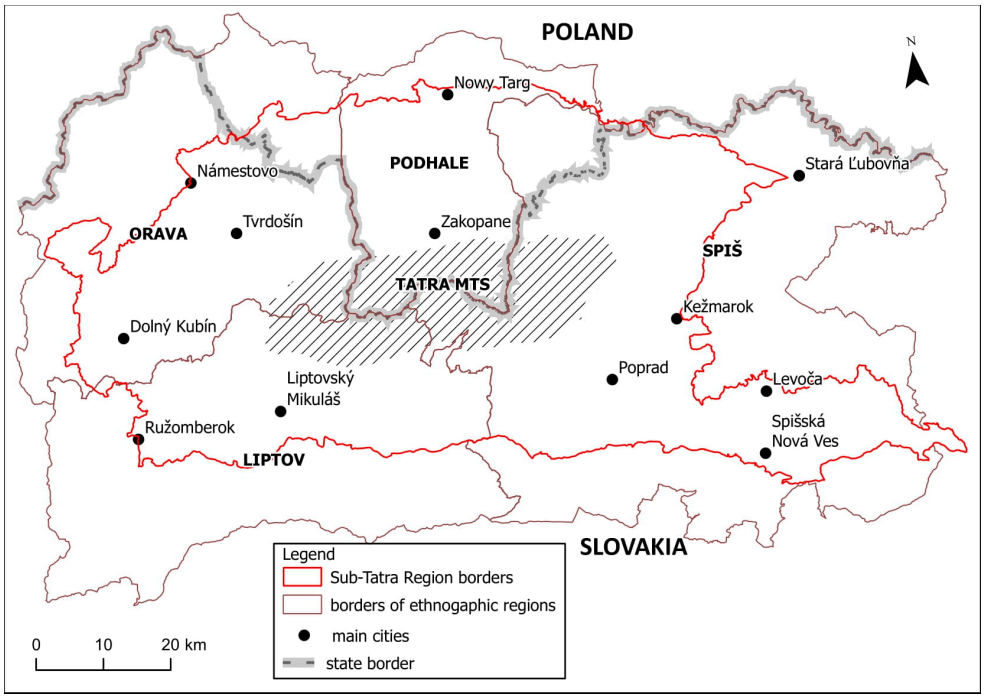


**Figure 1.** Location of the study area. Source: Own study based on administrative map of Poland: www.codgig.gov.pl, administrative map of Slovakia and maps of geographical regions of Poland and Slovakia [57,58].

The Sub-Tatra Region is very diverse in terms of geological structure, relief, and hydrology. Geologically, it is an area that was last shaped during the Alpine orogeny. In terms of individual geological units, various rock types can be distinguished. The Podhale Synclinorium, which is part of the Paleogene of the Central Carpathians, is made of flysch, i.e., alternating layers of sandstones clay shales and mudstones [59–62]. Mesozoic units of the Inner Carpathians, which build, for example, the massif of the Choč Mountains and Kozie Chrbty Ridge, are built of carbonate rocks: various limestones and dolomites [62–65]. Various carbonate rocks also build the structures of the Pieniny Klippen Belt [66–69]. The youngest (Miocene) sedimentary rocks line the Orava–Nowy Targ Basin [70–72]. There are also igneous rocks (andesites and basalts) in the Pieniny Klippen Belt margin as a result of

igneous intrusions that took place in the Miocene [66,73,74]. Finally, the crystalline core of the Tatra Mountains is made of various crystalline rocks such as gneiss, granite, and crystalline shales [62,63,65,75] (Figure 2).

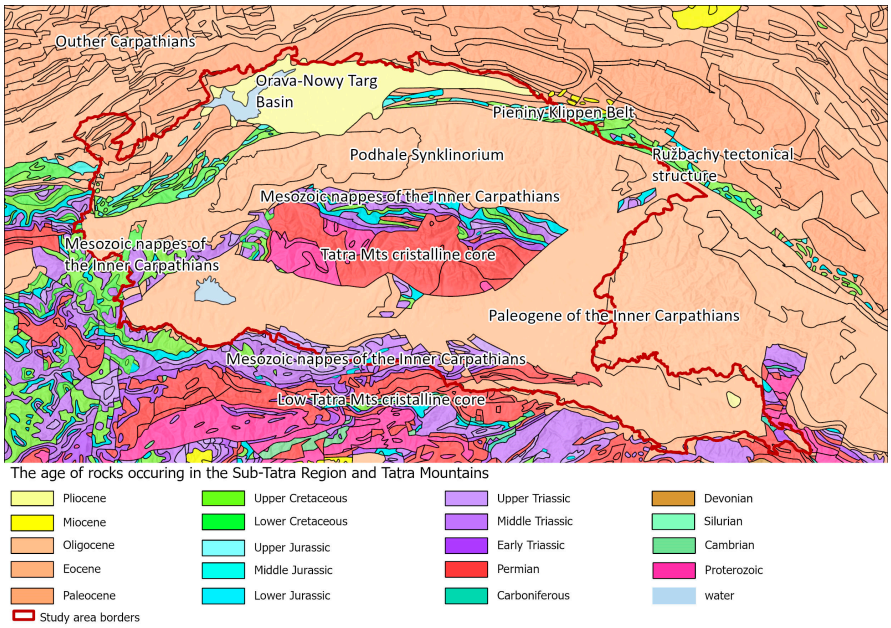


**Figure 2.** Geological background of the study area. Source: own study based on geological map of Western Carpathians [76].

The current relief of the Sub-Tatra Region was affected by exogenous factors related to mountain glaciers [77,78], the destructive activity of water [79–81], mass processes [12,82,83], karst processes [84,85], and now also human activity [86,87]. In the orographic style of the Sub-Tatra Region, parallel morphological units can be distinguished that relate to the geological and tectonic structure of this area. On this basis, the physical and geographical mesoregions were described [57,58,88–92] (Figure 3).

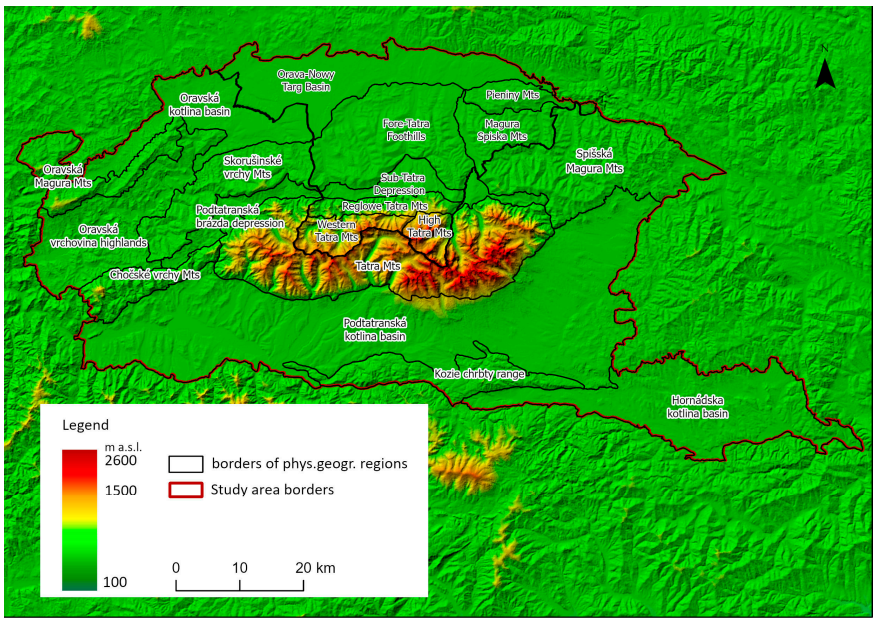


**Figure 3.** Relief of the study area. Source: own study based on physico-geographical maps of Poland and Slovakia [57,58].

The main European watershed separating the catchment areas of the Baltic and Black Seas runs through the Sub-Tatra Region. The longest rivers draining this area are: the Czarny and Biały Dunajec, the Białka, the Poprad, the Hornad, the Váh, the Belá and the Orava [79,93,94]. Due to the diverse geological structure, the occurrence of deep and shallow fault faults, and the topography, there are a large number of thermal and mineral springs in the Sub-Tatra Region [95].

The most unique springs in this area are those associated with travertines, due to their physical and chemical characteristics [96–100] (Figure 4).

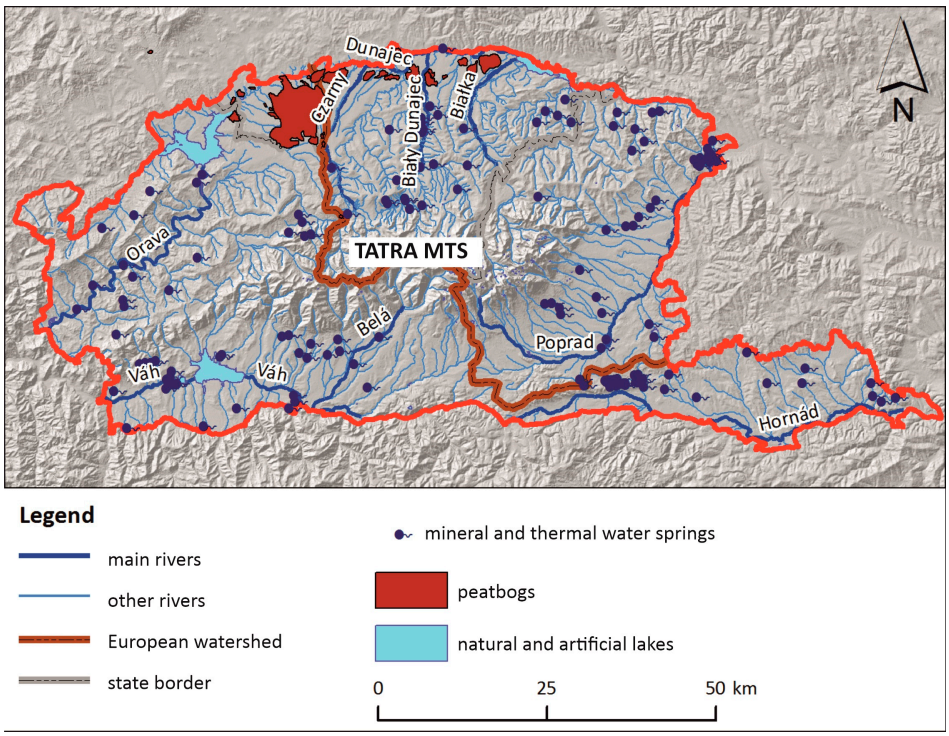


**Figure 4.** Hydrological condition of the study area. Source: own study based on hydrological maps of Poland and Slovakia [101–106].

And finally, the Orava–Nowy Targ Basin is the only intra-mountain basin in the Sub-Tatra Region, where in the Holocene there were favorable conditions for the formation of wetlands and peatbogs [107–110] (Figure 4).

## 4. Results

### *4.1. Inventory and Assessment of Geosites*

An inventory of geological outcrops, relief forms, hydrological objects and viewpoints performed in the Sub-Tatra Region in the years 2012–2016 identified 225 objects. A further, detailed field inventory consisted of collecting observations on their geological, geomorphological and/or hydrological values and in assessing the conservation status and forms of protection, transport accessibility, tourist infrastructure and additional tourist attractions. This led ultimately to 72 geosites being identified, including objects related to natural and anthropogenic geological outcrops (35), various relief forms (12), and, moreover, natural and anthropogenic hydrological objects (10) and viewpoints (15) (Figure 5). Detailed descriptions of these geosites have already been published [111–113].

The characteristics of the physical geographical elements and tourist values presented for the final 72 geosites indicate that Sub-Tatra has high geodiversity and good tourist development, which is reflected in the high values of final assessment coefficients (VK). Fifty-nine of the objects fall into the two highest attractiveness categories, and there is not a single geosite in the fourth, lowest, category (Table 2). However, it should be emphasized here that the author assumed that, in assessing the final attractiveness of the geosites, the

weight of the educational criteria (VE) should be much higher than the weight of the criteria of tourism development (VT) (see Material and Methods). For this reason, the values of the VK coefficient strongly correlate with the values of the VE coefficient (r = 0.94).

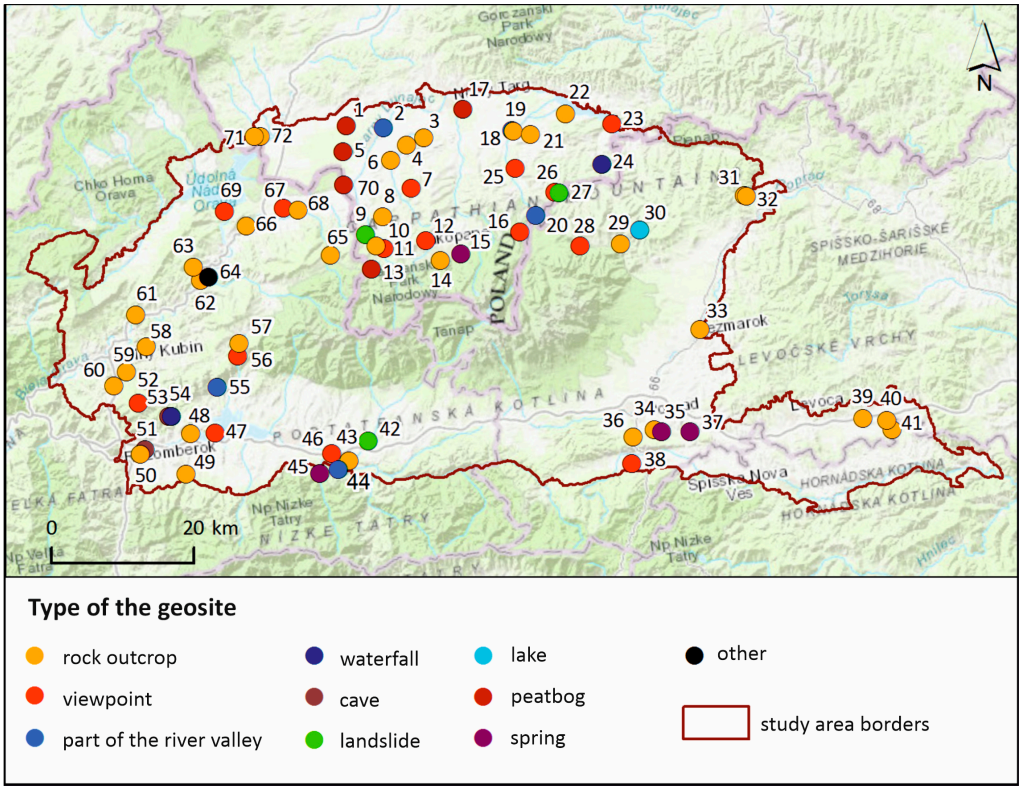


**Figure 5.** Location and types of the geosites. Source: own study.

The highest values of the final assessment coefficient of the geosites in the Sub-Tatra Region (VK; Table 3) shows particularly high geotourism values (Group I) for three geosites: the travertine hill with Spiš castle (No. 40; 53.71 points), the limestone hill with Orava castle (No. 61; 53.69 points) and the travertine dome in Gánovce (No. 34; 48.52 points). The second category of geosites (those of high geotouristic values) contained 56 sites (Table 3). The main features of these are either highly rated or have one very high and one very low rating. Examples of such geosites is the Bór na Czerwonem peatbog and the hydrological–geological–geomorphological object that connects the Białka stream with the Jaworowy stream. Thirteen geosites represent objects of the third category, i.e., sites of moderate geotouristic value (Table 3). The assessment coefficient values for individual features in these groups were either medium and low or they were very diverse with a dominance of low values.

**Table 3.** Geosite assessment results.

| Lp. | Geosite Name | Cathegory | VE | VT | VK | Index | Group |
|---|---|---|---|---|---|---|---|
| 1 | Baligówka peatbog | peatbog | 25.87 | 61.50 | 36.56 | 0.53 | II |
| 2 | The braided channel of Czarny Dunajec riverbed in Wróblówka village | riverbed | 25.82 | 47.70 | 32.39 | 0.47 | II |
| 3 | Crinoidal and coquina limestones at Rogoża Klippe | quary | 36.7 | 35.80 | 36.43 | 0.53 | II |
| 4 | "Piaskowcowe kule" sandstones balls outcrop in the Rogoźnik stram | rock outcrop | 19.37 | 42.70 | 26.37 | 0.38 | III |

**Table 3.** *Cont.*

| Lp. | Geosite Name | Cathegory | VE | VT | VK | Index | Group |
|---|---|---|---|---|---|---|---|
| 5 | Puścizna Wielka Peatbog | peatbog | 27.53 | 42.50 | 32.02 | 0.46 | II |
| 6 | Rock outcrop with egravelstnes at Domanski hill | rock outcrop | 36.9 | 43.50 | 38.88 | 0.56 | II |
| 7 | Viewpoint (180°) at the Bachledówka hill | viewpoint | 19.57 | 56.50 | 30.65 | 0.44 | II |
| 8 | Tufa limestone at the Ostrysz hill | rock outcrop | 18.3 | 38.00 | 24.21 | 0.35 | III |
| 9 | "Nad kościołem" landslide | landslide | 27.8 | 52.70 | 35.27 | 0.51 | II |
| 10 | Chochołów beds at a teracce edge along the Czarny Dunajec river | rock outcrop | 17.23 | 45.20 | 25.62 | 0.37 | III |
| 11 | Viewpoint (100°) at the Płazówka hill | viewpoint | 22.32 | 70.20 | 36.69 | 0.53 | II |
| 12 | Viewpoint (180°) at the Gubałówka hill | viewpoint | 27.72 | 65.70 | 39.12 | 0.57 | II |
| 13 | Molkówka peatbog | peatbog | 18.75 | 40.30 | 25.21 | 0.37 | III |
| 14 | Biały creek | riverbed | 17.12 | 42.50 | 24.74 | 0.36 | III |
| 15 | Jaszczurówka thermal spring | spring | 23.33 | 55.50 | 32.98 | 0.48 | II |
| 16 | Viewpoint (270°) at the Głodówka hill | viewpoint | 24.77 | 59.20 | 35.10 | 0.51 | II |
| 17 | Mouth of Jurgów creek into Białka river | riverbed | 37.07 | 45.20 | 39.51 | 0.57 | II |
| 18 | Bór na Czerwonem peatbog | peatbog | 39.47 | 64.80 | 47.07 | 0.68 | II |
| 19 | Białka gorge at the Krempachy village | riverbed | 39.4 | 47.30 | 41.77 | 0.61 | II |
| 20 | Crinoidal limestones at the Kramnica klippe | rock outcrop | 30.2 | 36.80 | 32.18 | 0.47 | II |
| 21 | Lorencowe klippes | rock outcrop | 29.6 | 45.00 | 34.22 | 0.50 | II |
| 22 | Turbidite sediments of Frydman formation along Dunajec river | rock outcrop | 17.77 | 48.50 | 26.99 | 0.39 | III |
| 23 | Viewpoint (360°) from the Niedzica dam | viewpoint | 29.77 | 52.00 | 36.44 | 0.53 | II |
| 24 | "Pod Mynaszką" waterfall in Kacwin village | waterfall | 18.95 | 50.00 | 28.26 | 0.41 | II |
| 25 | Viewpoint (360°) at the Litwinka hill | viewpoint | 27.27 | 69.70 | 39.99 | 0.58 | II |
| 26 | Viewpoint (180°) in the Łapszanka village | viewpoint | 25.45 | 54.70 | 34.22 | 0.50 | II |
| 27 | Osturňa landslide (no. 27) | landslide | 27.5 | 30.30 | 28.34 | 0.41 | II |
| 28 | Viewpoint (360°) in the Ždiar Strednica village | viewpoint | 33.75 | 64.20 | 42.89 | 0.62 | II |
| 29 | Rock outcrop of the flysh layers in the Bachledova valley | rock outcrop | 25 | 48.50 | 32.05 | 0.46 | II |
| 30 | Jezersko landslide lake | lake | 26.4 | 48.00 | 32.88 | 0.48 | II |
| 31 | Pleistocene travertines with dry craters in the Vyšné Ružbachy village | rock outcrop | 42.23 | 40.30 | 41.65 | 0.60 | II |
| 32 | Contemporary forms of relief related to travertines in the Vyšné Ružbachy village | lake | 40 | 58.80 | 45.64 | 0.66 | II |
| 33 | The Paleogene Kežmarok Beds in a stratotype outcrop | rock outcrop | 30 | 46.00 | 34.80 | 0.50 | II |
| 34 | Travertine dome in Gánovce village | rock outcrop | 46.47 | 53.30 | 48.52 | 0.70 | I |
| 35 | Thermal spring at a travertine dome in Gánovce village | spring | 33.35 | 35.70 | 34.05 | 0.49 | II |
| 36 | Permian volcanic rocks outcrop with veins crushed with copper compounds in Poprad | quary | 28.75 | 40.20 | 32.18 | 0.47 | II |
| 37 | Sulfur spring and travertine dome near Hôrka village | spring | 26,7 | 36.80 | 29.73 | 0.43 | II |
| 38 | Viewpoint (180°) in the Hornad basin | viewpoint | 18.75 | 32.20 | 22.78 | 0.33 | III |
| 39 | Sivá brada travertine dome | spring | 42.27 | 53.80 | 45.73 | 0.66 | II |
| 40 | Travertine dome with the Spiš castle | castle | 49.17 | 64.30 | 53.71 | 0.78 | I |
| 41 | Dreveník travertine dome | rock outcrop | 40.62 | 54.80 | 44.88 | 0.65 | II |
| 42 | Sequential slope landslide in the Biała river valley near Vavrišovo village | landslide | 30.62 | 38.20 | 32.90 | 0.48 | II |
| 43 | Castle hill in Liptovský Hrádok as a "Mesozoic island" in Paleogene rocks | castle | 20.83 | 60.20 | 32.64 | 0.47 | II |
| 44 | The mouth of the Belá river into the Váh river at the foot of the Low Tatra Mountains | riverbed | 32.10 | 41.20 | 34.83 | 0.50 | II |

**Table 3.** *Cont.*

| Lp. | Geosite Name | Cathegory | VE | VT | VK | Index | Group |
|---|---|---|---|---|---|---|---|
| 45 | Travertine thermal spring in Liptovský Ján village | spring | 20.42 | 64.60 | 33.68 | 0.49 | II |
| 46 | Viewpoint (180°) on the outlier hills in Podtureň | viewpoint | 17.10 | 50.50 | 27.12 | 0.39 | III |
| 47 | Viewpoint (360°) from the Liptovská Mara dam | viewpoint | 21.22 | 55.70 | 31.57 | 0.46 | II |
| 48 | Travertine cascade, rock formations and mineral springs in Bešeňová village | rock outcrop | 36.67 | 44.50 | 39.02 | 0.57 | II |
| 49 | Travertine domes and craters in the Liptovské Sliače village | rock outcrop | 24.57 | 42.60 | 29.98 | 0.43 | II |
| 50 | Slope dolomite single rock "Skalná Päsť" in the Lisková village | rock outcrop | 17.80 | 39.30 | 24.25 | 0.35 | III |
| 51 | Liskovská jaskyňa cave | cave | 34.42 | 31.50 | 33.55 | 0.49 | II |
| 52 | Viewpoint (360°) at the Veľký Choč peak | viewpoint | 28.1 | 50.30 | 34.76 | 0.50 | II |
| 53 | Holocene travertines in Lučky village | cave | 31.47 | 47.70 | 36.34 | 0.53 | II |
| 54 | Travertine waterfall in the Lučky village | waterfall | 37.53 | 65.00 | 45.77 | 0.66 | II |
| 55 | The estuary section of the Prosiecka Valley in the Choč Mountains | rock outcrop | 32.07 | 52.80 | 38.29 | 0.55 | II |
| 56 | Viewpoint (180°) at the Kvačany valley from the Mal'y Rohač hill | viewpoint | 28.55 | 49.80 | 34.92 | 0.51 | II |
| 57 | Eocene shale-sandstone flysch in a stratotypical outcrop in Huty | rock outcrop | 20.20 | 48.50 | 28.69 | 0.42 | II |
| 58 | Eocene Pucov conglomerates in the Orava Foothills as a result of undersea debris flows | rock outcrop | 34.60 | 42.60 | 37.00 | 0.54 | II |
| 59 | Ostrá and Tupá single rocks in the Vyšný Kubín village | rock outcrop | 27.07 | 42.50 | 31.70 | 0.46 | II |
| 60 | Cretaceous carbonate rocks of an undersea landslide in Jasenová | rock outcrop | 6.10 | 44.70 | 17.68 | 0.26 | III |
| 61 | The limestone rock with the Orava Castle on the Orava River within the Pieniny Klippen Belt | castle | 45.20 | 73.50 | 53.69 | 0.78 | I |
| 62 | Biela Skala (White rock) near the village of Podbiel within the Pieniny Klippen Belt | rock outcrop | 26.05 | 51.00 | 33.53 | 0.49 | II |
| 63 | Jurassic red limestones with fossils near the village of Podbiel in the Pieniny Klippen Belt | rock outcrop | 38.57 | 58.20 | 44.46 | 0.64 | II |
| 64 | Historic ironworks near Podbiel village | other | 21.05 | 42.70 | 27.54 | 0.40 | II |
| 65 | Chochołowskie layers of Podhale flysch in the Oravice village | rock outcrop | 15.22 | 45.20 | 24.22 | 0.35 | III |
| 66 | Halečková quary in the Trstená town | quary | 13.97 | 40.70 | 22.00 | 0.32 | III |
| 67 | Viewpoint (270°) in the Liesek village | viewpoint | 21.67 | 48.70 | 29.78 | 0.43 | II |
| 68 | Neogene brown coals in Čimhová village | rock outcrop | 25.22 | 37.00 | 28.76 | 0.42 | II |
| 69 | Viewpoint (180°) at the Oravská priehrada dam | viewpoint | 39.35 | 52.20 | 43.20 | 0.63 | II |
| 70 | Przybojec peatbog | peatbog | 40.33 | 29.60 | 37.11 | 0.54 | II |
| 71 | Outcrop of Pleistocene/Pliocene sands in the Lipnica Wielka village | rock outcrop | 16.90 | 39.70 | 23.74 | 0.34 | III |
| 72 | Petrified wood outcrop in the Lipnica stream | rock outcrop | 21.50 | 44.70 | 28.46 | 0.41 | II |

Source: own study.

Therefore, taking into account the unequal weightings of the components of the final assessment coefficient (VK), their values should be considered primarily in the context of the distribution of VE coefficient values, which are largely due to the diverse geological structure of this Carpathian region. This is reflected in the descriptions of the geosites, where various elements of the geological structure of the substrate stand out. Such objects prevail heavily in this area (35 geosites). It is worth emphasizing that the largest number of the geosites occurs at the junction of two or three physical geographical units, which in most cases correspond to the boundaries of geological units, i.e., the Podhale Basin with

the Pieniny Klippen Belt, the Orava–Nowy Targ Basin with the Fore-Tatra Foothills, the Orava Foothills and Liptov Basin with the Choč Mountains, the Mala and Velka Fatra and the Tatra Mountains (Figures 6 and 7).

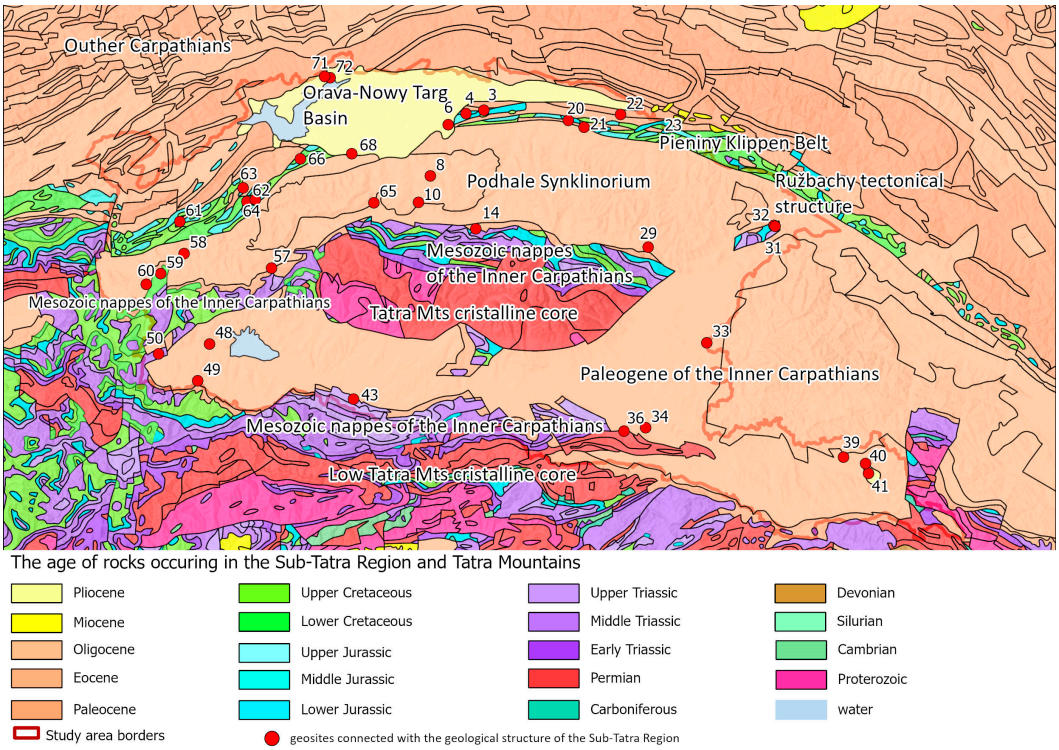


**Figure 6.** Location of geosites on the background of geological units. Source: own study; geological background based on [76].

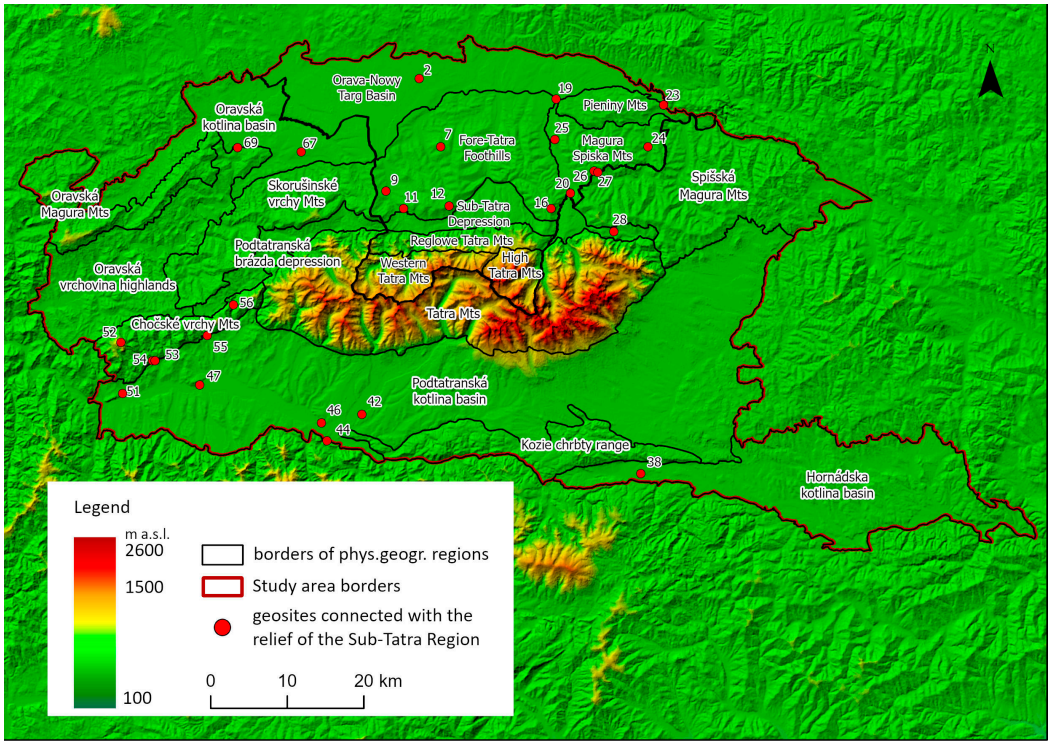


**Figure 7.** Location of geosites on the background of physical geographical units. Source own study; borders of physico-geographical regions based on [57,58].

### *4.2. Tourist Preferences*

During the study, an attempt was made to assess the expectations of tourists coming to the Sub-Tatra Region and Tatra Mountains region in terms of various aspects of the visited places related to abiotic nature. The group of respondents were mountain lovers voluntarily associated in groups created on the Facebook social network called "Tatromaniacy", "Klub miłośników turystyki pieszej" [hiking enthusiasts club], "Góromaniacy", "Wolontariat TPN" and "Partak na hory".

Preferences were analyzed using questionnaires consisting of three groups of questions. The first concerned the frequency of trips to the Tatras, length of stay, main reasons for travelling into Sub-Tatra Region, main places visited during the stay in the Sub-Tatra Region, trip destinations and the main reasons for trips into Slovakia (for Polish tourists accommodated in Poland) or Poland (for Slovak tourists accommodated in Slovakia). In the Polish version, questions were asked about the motives for tourist trips to Podhale, assuming that tourists in most cases come to Zakopane and the surrounding area, rarely visiting the towns of Spiš and Orava. Slovak respondents defined their preferences for trips to the entire Slovak part of the Sub-Tatra Region (Spiš, Liptov and Orava). In the second part of the questionnaire, respondents were asked to rate on a Likert scale how important it is for them to spend their free time "in the bosom of nature" and to explain which of the listed elements of abiotic nature they would most like to see and how they imagined it should be made accessible. The third part included basic questions about age, gender, education, and relationship to abiotic nature.

#### 4.2.1. Age, Gender and Education Structure of Respondents

Of the total number of 95,129 tourists associated with the groups mentioned above (including 74,575 in Polish groups and 20,554 in the Slovak group), 855 people took part in the study, 735 of whom came from Poland and 120 from Slovakia. Referring to the principles of assessing the representativeness of the surveyed populations proposed by W. Cochran [114], a sample of 854 respondents can be considered representative for a population of over 100,000 with a 95% confidence level and a 5% margin of error. Thus, these survey results can be considered reliable.

The largest age group, both among Polish and Slovak respondents, were people aged 21–26, followed by people aged 27–35 and 36–50. The smallest group was of young people aged 15–20 among Slovak respondents and of people over 50 among Polish respondents (Table 4). The majority of respondents were women (PL—69%, SK—57%) (Table 4).

**Table 4.** Characteristics of surveyed tourists in Poland (PL) and Slovakia (SK) in percentages (%).

| | | [%] | | Numbers | |
|---|---|---|---|---|---|
| | | **PL** | **SK** | **PL** | **SK** |
| Gender | Female | 69 | 57 | 509 | 69 |
| | Male | 31 | 43 | 225 | 51 |
| Age | 15–20 | 10 | 2 | 76 | 3 |
| | 21–26 | 38 | 39 | 278 | 47 |
| | 27–35 | 28 | 30 | 203 | 36 |
| | 36–50 | 18 | 16 | 131 | 19 |
| | >50 | 6 | 13 | 46 | 15 |
| Education | Primary | 3 | 1 | 19 | 1 |
| | Secondary | 40 | 37 | 293 | 44 |
| | Higher | 57 | 62 | 422 | 75 |
| Interest in natural sciences | YES | 51 | 75 | 371 | 90 |
| | NO | 49 | 25 | 363 | 30 |
| Travelling | alone | 11 | 12 | 88 | 19 |
| | with family | 34 | 39 | 258 | 64 |
| | with best friend | 24 | 27 | 183 | 45 |
| | with colleagues | 31 | 22 | 234 | 36 |

In the study group, both among Polish and Slovak respondents, the majority of people had higher education (PL—57%, SK—62%) and secondary education (40%: PL—40%, SK—37%). However, when asked about whether they had an interest in the natural sciences, as many as three quarters of Slovakian respondents answered affirmatively, while only half of Polish respondents declaring an interest (Table 4).

Both Polish and Slovak survey participants declared that they usually go on trips with their families (PL—34%, SK—39%) or with a group of friends (PL—31%, SK—22%), but 11% and 12%, respectively, declared that they traveled alone (Table 4).

#### 4.2.2. Frequency of Arrivals, Length of Stays and Destinations

More than half of the surveyed people declared that they come to Sub-Tatra Region several times a year, during long weekends in summer and winter. A significant proportion of the Slovak respondents come twice a year, or once a year in the summer. On the other hand, among respondents from Poland, it is more common to go to the Sub-Tatra Region once a year in the summer than twice a year. Both surveyed groups of respondents very rarely choose this destination once every year but only in winter, and 14% and 10%, respectively, go there less than once a year (Table 5).

**Table 5.** Frequency of arrivals and length of stays of surveyed tourists in Poland (PL) and Slovakia (SK) in percentages (%).

| | | [%] | |
|---|---|---|---|
| | | **PL** | **SK** |
| Frequency of arrival | several times a year | 52 | 59 |
| | twice a year | 12 | 20 |
| | once a year (in winter) | 1 | 1 |
| | once a year (in summer) | 20 | 10 |
| | less than once a year | 14 | 10 |
| | others | 1 | 0 |
| Length of stay | more than a week | 30 | 9 |
| | 3–5 days | 33 | 30 |
| | 1–3 days | 28 | 37 |
| | 1 day | 9 | 24 |

The length of stay in the Sub-Tatra Region for the surveyed group of respondents is also varied. Polish respondents most often choose stays of 3–5 days or a week or longer (63%). A significant proportion of the tourists also come for 1–3 days, and only 9% declare one-day trips. Slovak respondents prefer shorter trips.

Only 9% of the respondents declared that they come to Sub-Tatra for a week or longer (Table 5). This differentiation may be related to Slovak tourists traveling more often due to the shorter distances from their places of residence (Table 5).

#### 4.2.3. Destinations and Places of Stay in Sub-Tatra Region

Most of the surveyed respondents, both from Poland and Slovakia, declared that their purpose of staying in Sub-Tatra Region was mountain trips (Figure 8), although in the case of Polish tourists, this answer was chosen by fewer than 50% of people. A quarter of Polish respondents also declared rest and recreation as the main purpose of their stay. Other destinations were rarely chosen, and tourists the next most frequently chosen was that they come to Sub-Tatra Region to commune with highlander culture and folklore (9%). Slovak respondents, after mountain trips, declared that skiing or snowboarding and visiting friends and family are equally important goals of their trips to the Sub-Tatra Region. They also go there to learn about the local culture and folklore and to practice mountaineering (Figure 8). The surveys show that, for Slovaks, Sub-Tatra is less a holiday and recreation region, and more often a place of active tourism.

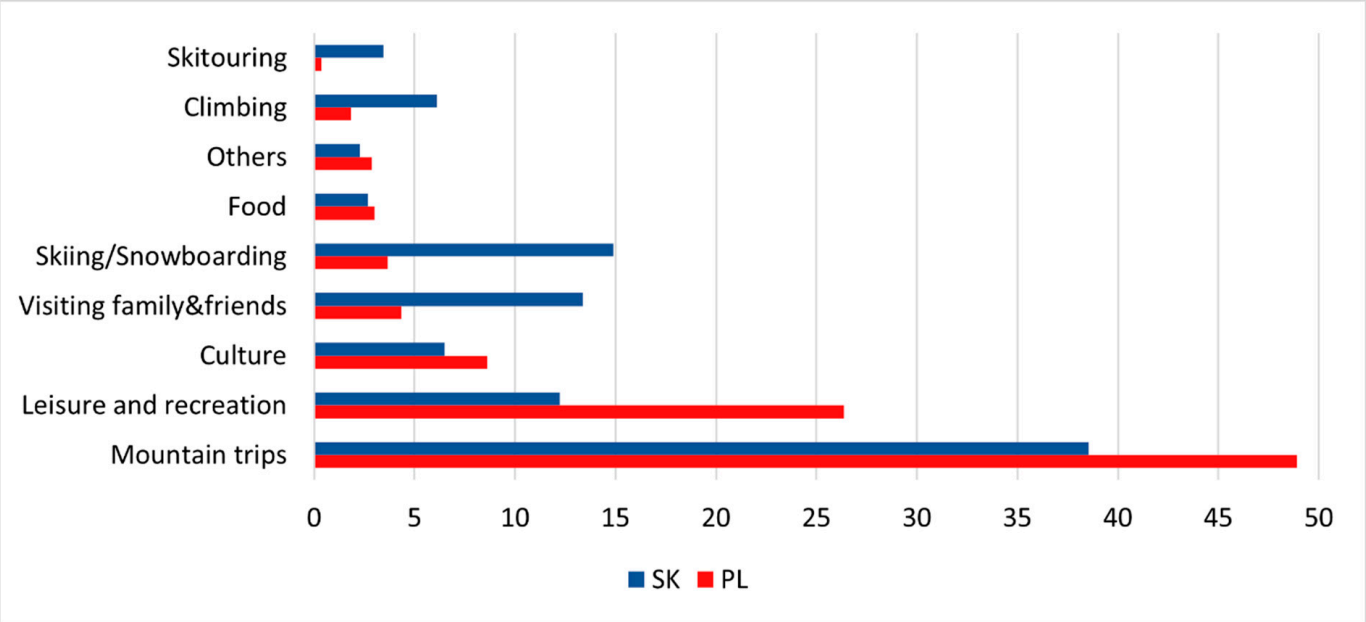


**Figure 8.** Main reasons for respondent trips to the Sub-Tatra Region.

For logistical reasons, accommodation differs between Polish and Slovak respondents visiting the study area. Among Polish respondents, the largest number of people declared that they choose accommodation in Zakopane (52%), while 27% stay in the surrounding villages, 18% stay in mountain shelters in the Tatra Mountains, 1% stay in Nowy Targ, and 2% stay with family or do not stay overnight (Figure 9). Slovak respondents declared that most often (30%) they chose towns of the High Tatras (towns along the Road of Freedom from Štrbské Mountain Lake to Tatranská Kotlina, including Starý Smokovec, Stará Lesná or Tatranská Lomnica). A similar number of people (23%) stay overnight in towns and villages in Liptov, 15% choose to stay in towns and villages in Orava, 12% stay in towns and villages in Spiš, 4% (mainly skiers) stay in Demänovská Dolina and in Jasná, and 5% do not use accommodation or choose places outside the Sub-Tatra Region, e.g., Donovaly and Vratna (Figure 9).

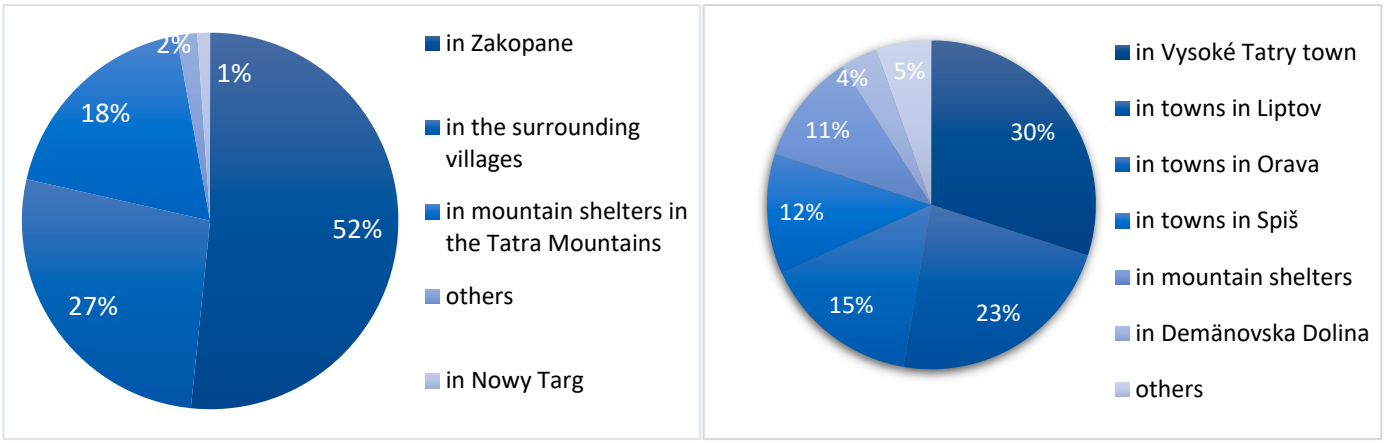


**Figure 9.** Main places to stay for Polish respondents (**left**) and Slovak respondents (**right**).

The ultimate destination for respondents from Poland is the Tatra Mountains (70%). Twelve percent of the surveyed tourists rest and relax in Zakopane on Krupówki Street (the most famous place in Zakopane). For the remaining group (20%), tourist attractions in Zakopane and thermal aquaparks in various places in the Sub-Tatra Region are the main purpose of their stay. A very small group of people chooses the Pieniny Mts (6%), Gorce Mts (3%) or Babia Góra Peak (1%; Figure 10). Among the surveyed people, 47% additionally visit the Slovak part of the Sub-Tatra during their stay in Podhale (Figure 11). The main purposes of these trips are shopping, mountain trips, thermal aquaparks, skiing, etc.

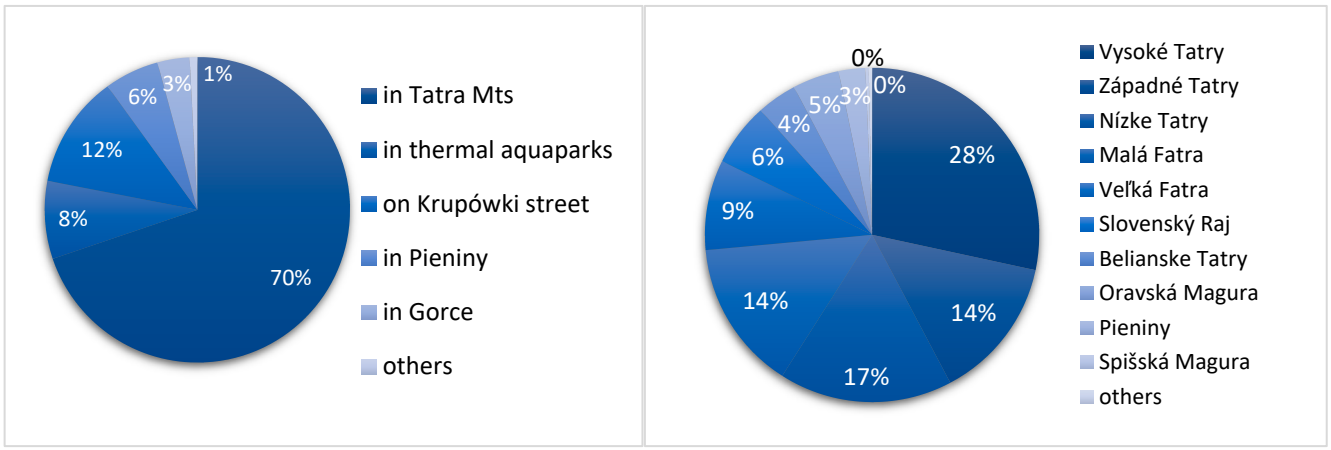


**Figure 10.** Preferred places of rest and recreation in the Sub-Tatra Region for surveyed tourists (PL, **left**; SK, **right**).

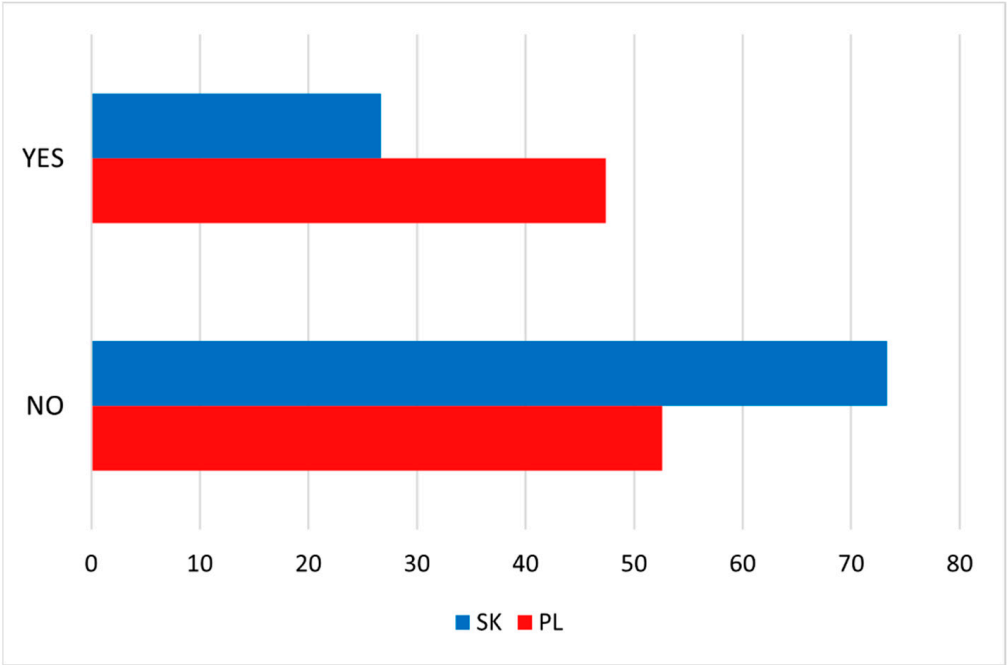


**Figure 11.** Trips by Polish respondents to Slovakia and Slovak respondents to Poland during their stay in Sub-Tatra Region.

The diversity of preferences of Slovak respondents in choosing a trip destination in the Sub-Tatra Region was much greater, probably due to the greater geodiversity of the southern part of the region. Almost half of the respondents (46%) choose the Tatras (High Tatras 28%, Western Tatras 14% and Belianske Tatras 4%), and 17% of respondents go to the Low Tatras. Many people travel to Mala Fatra (14%), Veľká Fatra(9%), Slovak Paradise (6%), Oravská Magura(5%), Pieniny (3%) and Spišská Magura and the Choč Mountains (1%) (Figure 10). Only about a quarter of the surveyed respondents (27%) come to the Polish part of the Tatra Mountains, but the main reason for trips is shopping, followed by mountain trips (Figure 11).

The choice of equipment-intensive tourism in the Sub-Tatra Region by Polish and Slovak respondents was confirmed by them in the declaration that the form of recreation in the "womb of nature" is very important (5) and important (4) for them (on a 5-point Likert scale; Figure 12). This is the opinion of 95% of the people surveyed, both from Poland and Slovakia.

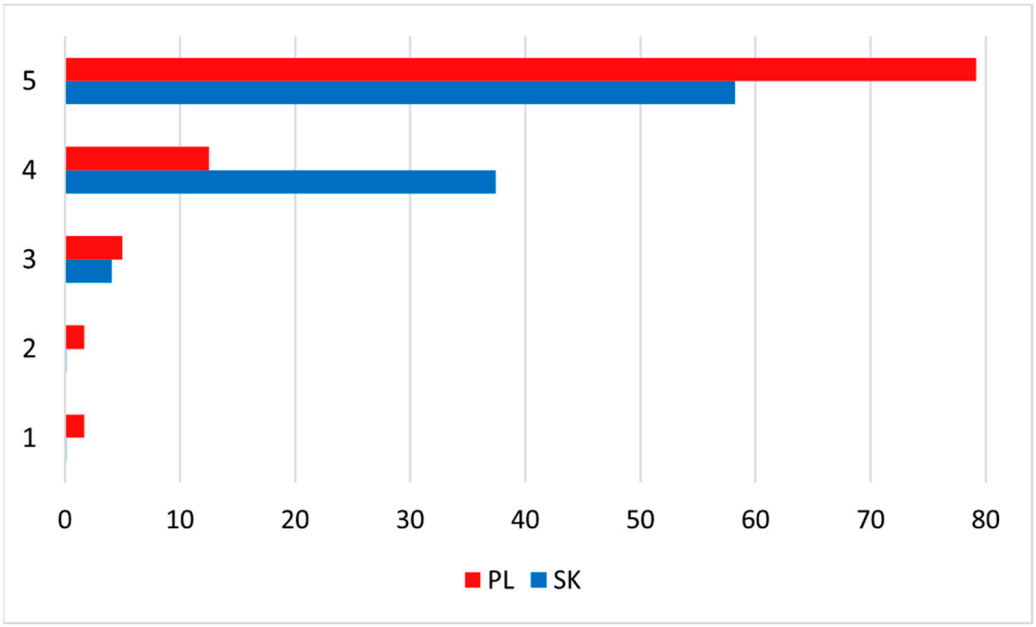


**Figure 12.** The importance of spending free time "in the bosom of nature" among the respondents.

4.2.4. Tourist Preferences Regarding Particular Abiotic Natural Attractions

The main purpose of this survey was to analyze the respondents' preferences relating to the degree of attractiveness of various features of abiotic nature. It was possible to select more than one object. In this ranking, among people declaring trips to the "womb of nature", the diversity of answers was large, ranging from 15% (landslide) to 85% (viewpoint). Details are summarized in Figure 13. Waterfalls, viewpoints, caves, hills with castle ruins, river gorges and lakes were the most frequently chosen objects visited by the tourists, which were more than 50% more popular than other types of objects. Landslides, quarries, and peatbogs were the least frequently selected. There are differences between the answers of Polish and Slovak respondents for waterfalls, viewpoints, river gorges, and lakes, with Slovak tourists choosing these attractions between 5% and 24% more often than Polish tourists. On the other hand, respondents from Poland prefer interesting sections of river valleys, rock outcrops with fossils, mineral springs, peatbogs, quarries, and landslides. For features such as caves, hills with castle ruins and thermal aqua parks, the preferences of both Polish and Slovak respondents are similar (Figure 13).

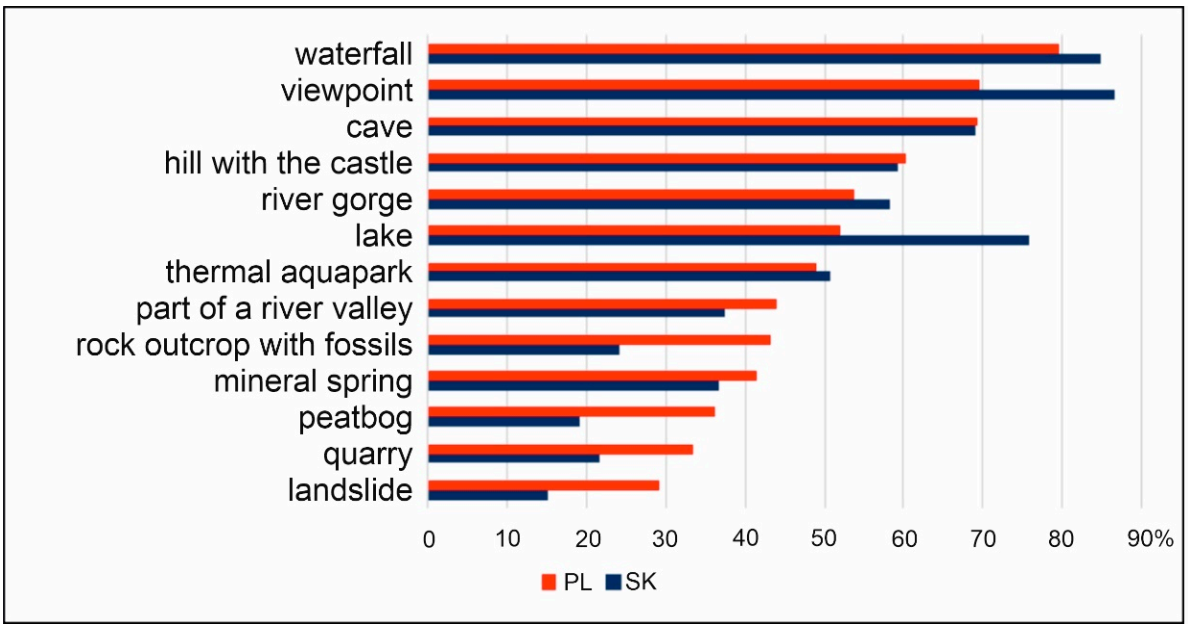


**Figure 13.** Tourist preferences for particular abiotic natural attractions.

4.2.5. Respondent Expectations Regarding the Form of Geosite Development

Tourist expectations regarding the development of various types of geosites were analyzed based on survey questionnaires only for those respondents who travel to the Sub-Tatra Region at least once a year and for whom such a trip related to abiotic nature is important or very important.

The answers of Polish and Slovak respondents were summed up, and this section presents a collective analysis of the expectations of tourists participating in the study in the field of geosite development. The questions posed to the respondents were aimed at evaluating the extent to which additional stimuli that attract people to various types of geosites are important for tourists. As expected, there is a difference in expectations in this regard, but it is not large. Among the various objects, there are those that are in and of themselves a "magnet" for this type of tourism. In the opinion of over 50% of respondents, these include hills with castles, viewpoints, interesting sections of river valleys, and rock outcrops with fossils in quarries (Figure 14). Only a few types of geosites, according to the surveyed respondents, require various forms of development to motivate them to travel to such places. These include caves, mineral springs, and lakes (Figure 14). Comparing the opinions of Polish and Slovak tourists regarding the expectations of additional incentives (appropriate development) for travel in the "womb of nature" there are no major differences. The exceptions are preferences relating to the development of peatbogs, landslides, rock outcrops in quarries and sections of river valleys. In the case of peatbogs, landslides and sections of river valleys, Slovak respondents prefer developed facilities that offer additional attractions, in contrast to Polish tourists, who are satisfied with a description of the path marked out through a peatbog, a description of a landslide or a passive rest by a river. On the other hand, in the case of rock outcrops in quarries, almost a quarter of Slovak respondents did not consider them worth visiting, and most would visit them provided they could participate in additional attractions, e.g., a concert. For Polish respondents, such places were interesting in and of themselves, and they would be happy to visit them just to see interesting rocks and fossils, and preferably to find and collect them on their own.

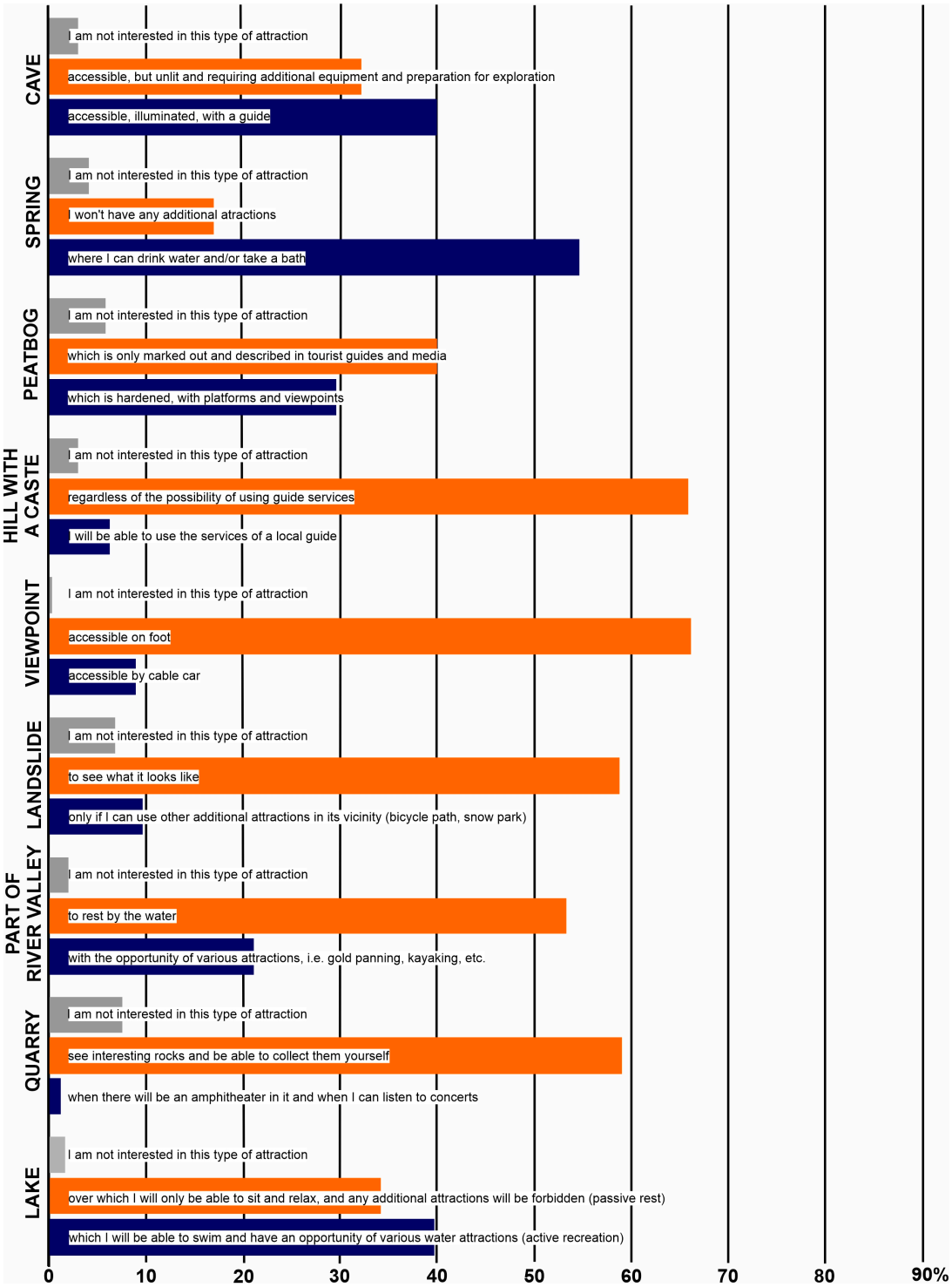


**Figure 14.** Respondent preferences regarding the development of selected objects of abiotic nature.

## 5. Discussion

### *5.1. Assessment Results: General Comments*

The Sub-Tatra Region is characterized by moderate and high geodiversity and good tourist development, which is reflected in high values of final assessment coefficients (WK). The high geodiversity of this area has also been presented using geodiversity maps in publications by Zwoliński et al. [115–117], Chrobak et al. [118], Najwer et al. [119] and Jankowski et al. [120]

Analyzing the assessment methods for geosites in various regions [22,52,53,121–129], there is a discrepancy in the weightings of individual components between different authors. An important role is also played by the degree of subjectivity of the assessment of geosites, primarily with respect to educational values, which require the greatest knowledge and experience of the assessing experts. However, the valorization of geosites by experts method can be made more objective using the triangulation method [55,56,130], in which a group of experts simultaneously evaluates the educational values of geosites according to predefined criteria. However, in this case, there is still a certain probability of subjectivity in the assessment of these criteria, because the expert assessment method requires a somewhat subjective selection of experts. Their scientific discipline (sub-discipline) significantly affects the final assessment result [112].

According to the author, the assessments of geosite accessibility can be made more precise and objective by adding criteria commonly used in such analysis procedures [52,53,123–129], based on measuring the distance of the object from the nearest car park, bus stop, accommodation and other tourist attractions. For geosites in the Sub-Tatra Region, this allowed for a more objective assessment of the degree of tourist development.

The geosites that received the highest values of the final assessment index (Travertine dome with the Spiš castle [No. 40; 53.71 points], the limestone hill with Orava castle [No. 61; 53.69 points] and the travertine dome in Gánovce [No. 34; 48.52 points]) are well-known and described in scientific and tourist literature [121,131–137].

The publications also take into account the specific values of other geosites that also received high valorization results here, e.g., Dreveník, Sivá brada [121,132] and Kacwin waterfall [138].

The assessment method used here also confirms the statements that some groups of geosites, such as waterfalls or viewpoints, are unique places of special natural values, where the processes that created the forms can be comprehensively explained [138–140].

However, it is worth paying attention to the point discrepancies in various assessment methods, which somehow prove the statement made at the beginning of this subchapter that all this kind of methods are subjective and depend on the knowledge and experience of the person who assess the geosite and on how the point scale for each criterion is described in detail.

### *5.2. Expert and Final Assessment Results vs. Tourist Preferences*

Tourists preferences have been the subject of research in many aspects. They have been studied in relation to selected tourist regions [45,141,142] or tourist attractions [143], or in terms of the structure of travelers [144–146]. Surveys of geotourist preferences have very rarely been performed to date [46,48]. This study of the preferences of tourists who declared that they come to the Sub-Tatra Region at least once a year was aimed at assessing which types of tourist attractions related to abiotic nature would attract the largest number of tourists and how they should be made accessible. The results of the surveys showed that, according to the respondents, the most often visited types of geosites in the Sub-Tatra Region would be waterfalls (60%), viewpoints (53%), caves (52%), hills with castle ruins (46%), river gorges (40%) and lakes (40%). Comparing the results of tourist preferences against the values of the general valorization coefficient (VK) for the analyzed geosites in the Sub-Tatra Region, it was found that they correlated at a moderate level ($r = 0.4$) (Figures 15 and 16). Geosites with low and medium values of the general assessment coefficient, such as rock outcrops, springs, fragments of river valleys, peatbogs, lakes and landslides, are rarely chosen by tourists as attractive and worth visiting. On the other hand, geosites with the highest average values of the general assessment, i.e., hills with castle ruins, are of great interest to the surveyed group of tourists.

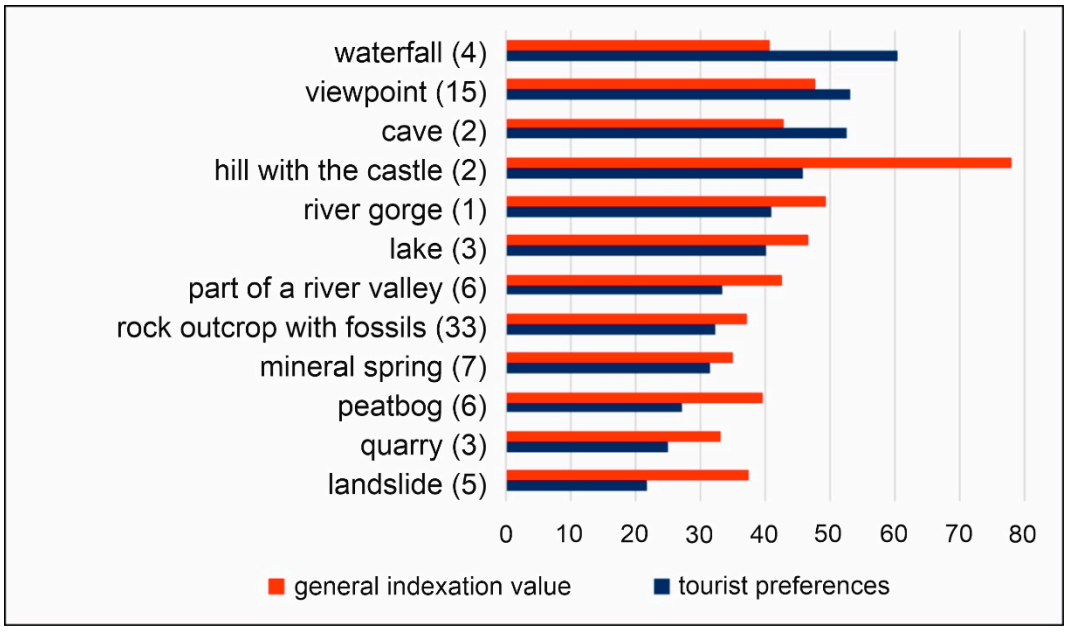


**Figure 15.** Summary of general assessment value of geosites and tourist preferences.

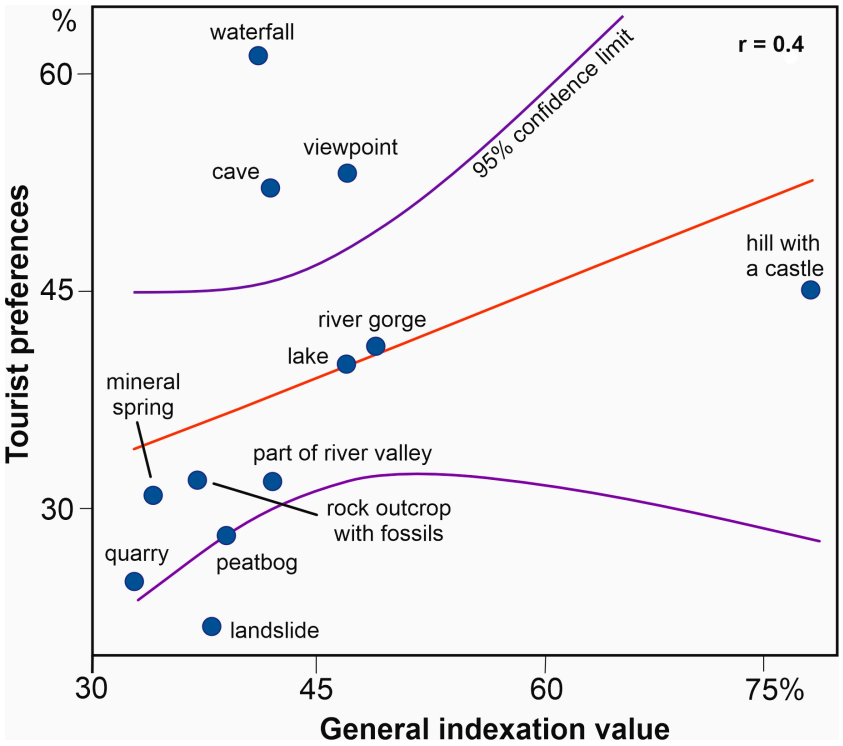


**Figure 16.** Correlation between average values of the general assessment of geosites and average percentage share of geosite type selection by geotourists; r—correlation coefficient.

The greatest difference between the expert assessments and the preferences of tourists as regards the assessments of caves, waterfalls and viewpoints, which are the most attractive for tourists according to the respondents, but had low and average values in the general assessment. It is difficult to find a clear explanation for this situation. The author did not undertake a detailed analysis of this fact in this work, recognizing that the reasons may be many, and their explanation would require much more extensive survey research. For example, the assessment of such sites could look different if more features characterizing individual geosites were presented in the surveys. In one of the geosites, Vyšné Ružbachy

SPA (Slovakia), it was possible to conduct such detailed research. Research carried out on a group of 100 people who visited this spa shows that everyone knows the most famous tourist attractions related to abiotic nature (travertine lake crater and the White House), whereas less-accessible places ($CO_2$ crater, quarry) are not of interest to them [147].

On the other hand, analyzing the opinions of (geo)tourists regarding their expectations as to the method of geosites' development, most stated that they do not need any conveniences in this regard, e.g., the presence of a cable car to get to the viewpoint. This is mainly due to the specificity of the group of respondents, for whom hiking in a mountain area is an attraction in itself (Figure 14).

Similar assessments regarding the access (development) of geosites apply to caves. Over 30% of the surveyed people would like to see caves that are not developed or illuminated, but only made accessible, despite their exploration requiring the use of specialized equipment. This is probably due to the particular interests of the respondents and their desire to learn about something unknown (Figure 14). Regardless of the expert opinions presented and the tourist infrastructure around geosites, the preferences of (geo)tourists may be different. Differences in the selection of abiotic natural objects as tourist destinations may also depend on the additional values of the region in which they are located, e.g., its cultural and historical values. However, this requires further detailed survey research. This is also related to the need to refine the method of counting tourists visiting geosites, especially for places where access is not recorded by the payment of admission fees.

It should also be taken into account that the preference surveys were carried out in the pre-COVID period, so perhaps repeating the survey now that people have even more appreciation of the peace and quiet that contact with nature can bring would be even better.

## 6. Conclusions

The aim of this article was to compare the assessment of the geosites and with the preferences of tourists who would like to visit such places in the Sub-Tatra Region. The research showed that the most attractive geosites in the Sub-Tatra Region—the places with the highest value of the general indexation coefficient—are travertine domes and other relief forms related to travertines located in Spiš and Liptov, limestone castle hills in Orava and Spiš, and viewpoints around the Tatra Mountains. According to the author, these places could, in themselves, be major destinations for equipment-intensive tourism. The location of these geosites, most of which are grouped at short distances from each other, in regions of high geodiversity, additionally gives the opportunity to connect them along roads or tourist trails, which is an additional advantage in assessing the geotourism potential of the Sub-Tatra Region.

Using surveys among a group of 855 tourists belonging to five social media groups (four Polish and one Slovak) related to mountain tourism, an attempt was made to partially verify the assessment of the geosites by investigating what types of tourist attractions related to abiotic nature attract these people in the Sub-Tatra Region and what they expect with regard to how such places are made more accessible (development). According to the surveyed respondents, the most attractive geosites are waterfalls, caves, and viewpoints.

Comparison of the results of the general expert assessment coefficient against the preferences of tourists showed that these two indices differ only partially, correlating at a moderate level ($r = 0.4$). Geosites rated low and medium by experts (natural rock exposures, quarries, springs, various parts of valleys, peatbogs, springs, lakes, landslides) are also not attractive to tourists. On the other hand, the geosites that achieved the highest expert assessment scores, i.e., hills with castle ruins, are quite popular among the surveyed group of tourists. The greatest disproportion between the two analyzed indicators occurred in the assessment of caves, waterfalls and viewpoints, which, according to the respondents, are the most attractive for tourists, but according to experts have low and average value.

The comparison of the geosite assessment method against tourist preferences that the author proposed in this article is important for comprehensive assessment of the

tourist attractiveness of geosites, from both expert and tourist points of view. However, as the research results showed, this method still has many shortcomings, both in terms of the expert geosite assessment (subjectivity) and the tourists' preferences (number of respondents, the way of conducting surveys), which will be improved by the author in the future.

**Supplementary Materials:** The following supporting information can be downloaded at: https://www.mdpi.com/article/10.3390/resources12020025/s1, Supplementary Material File S1: Survey of tourist preferences.

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