sustainability

MDPI

Article

Geotourism Product as an Indicator for Sustainable Development in Poland

Krzysztof Miśkiewicz

Department of General Geology and Geotourism, Faculty of Geology, Geophysics and Environmental Protection, AGH University in Krakow, Al. Mickiewicza 30, 30-059 Kraków, Poland; krzysztof.miskiewicz@agh.edu.pl

Abstract: Geotourism products are goods and services of the tourism industry that support sustainable development based on geological heritage, as exemplified by the success of UNESCO Global Geoparks. Geological and geomorphological objects are promoted and become available for sightseeing thanks to geoproducts: geotourism infrastructure and services, as well as handicrafts and merchandising inspired by geodiversity, or foods and cosmetics produced based on abiotic nature resources. This contributes to both nature conservation and the socio-economic growth of regions. This article presents an analysis of the development of the geotourism product concept concerning regional development in Poland. The types, locations, and characteristics of Polish geotourism products are presented, which allows for identifying geotourism areas. Due to the significant contribution of geotourism products to regional development, they are proposed as an indicator of sustainability.

Keywords: geotourism; geoheritage; geoproduct; geopark; Poland

Citation: Miśkiewicz, K. Geotourism Product as an Indicator for Sustainable Development in Poland. *Sustainability* **2024**, *16*, 5516. https://doi.org/10.3390/su16135516

Academic Editor: Anna Mazzi

Received: 22 May 2024
Revised: 22 June 2024
Accepted: 24 June 2024
Published: 28 June 2024

1. Introduction

The concept of geotourism emerged in the 1990s as an activity aimed at providing goods and services that enable tourists to understand the geology and geomorphology of the visited place [1]. Geoheritage, the foundation of geotourism, refers to the abiotic elements of nature that have significant value for intrinsic, scientific, educational, cultural, spiritual, aesthetic, ecological, or ecosystem reasons [2]. Geodiversity, which measures geoheritage, encompasses the natural range (diversity) of geological (rocks, minerals, and fossils), geomorphological (landforms, topography, and physical processes), soil, and hydrological features [3]. Over the past 25 years, research in geotourism has progressed and has been integrated into territorial development globally [4]. Nowadays, geotourism focuses on an area of geology and landscape as the basis of fostering sustainable tourism development to generate benefits for conservation, communities, and the economy [5].

Geotourism is most effectively implemented in the UNESCO Global Geoparks (UGGps), which are single, unified geographical areas where sites and landscapes of international geological significance are managed with a holistic concept of protection, education, and sustainable development [6]. Geoparks uphold the principles of sustainable development through geotourism, geoconservation, and geoeducation [7], as well as through geoproducts, which are the subject of analysis in this study.

Geoproducts are commercial services and goods inspired by geoheritage and geodiversity or created based on abiotic resources to ensure sustainable local development [8,9]. Completely new or newly created traditional handicrafts and agricultural products have performed well on world markets, especially in geoparks, which emphasize the connection of inhabitants and their traditions with the geoheritage of where they live. This helps to strengthen local identity, boost local economies, improve education, and contribute to nature conservation [9]. The recipients of these products are visitors who learn about the local traditions in the context of geoheritage. Hence, the development of tourism, and in particular geotourism and geoparks, translates into the creation of geoproducts.

Geotourism with geoproducts plays an important role in regional tourism in Poland, and it has been instrumental in driving socio-economic changes at the turn of the 20th and 21st centuries. The opening of borders, the development of infrastructure, and national and local promotion strategies have all contributed to a significant increase in tourism activity in Poland. Research on tourist attractions in Poland was initiated in 2010 by the Polish Tourism Organization as part of a project to certify national tourist products [10]. Geotourism has since become an integral element in this context and is particularly well developed in many regions of Poland, especially in its geoparks. So far, three UNESCO Global Geoparks have been created in Poland: Muskau Arch, the Holy Cross Mountains, and the Land of Extinct Volcanoes. Numerous geopark initiatives give hope for the further development of this idea in Poland [11]. Geoproducts in Poland are promoted by an informal action group called the "National GEO-Product Forum", which is also an annual event that brings together activists for the development of national geotourism [12,13]. One of the topics of the forum is the protection of geological heritage in geoparks by creating sustainable geoproducts.

Sustainable development not only aims to enhance the quality of life but also focuses on improving education levels, with input from local stakeholders. In the economic sphere, involving the community, social groups, non-governmental organizations, and individuals working in tourism services is crucial for successful social participation. This entails utilizing local resources for tourism development [14]. The United Nations Agenda 2030 is the current global framework for sustainable development, aligning well with geoparks and geoproducts [9]. UNESCO actively promotes these concepts through initiatives like the World Heritage and Sustainable Tourism Program, UNESCO Global Geoparks, and the UNESCO International Earth Science and Geoparks Program [6]. Monitoring the effectiveness of these initiatives relies on sustainable development indicators, which are continually being refined. The European Tourism Indicator System for Sustainable Destinations (ETIS) is used in Europe to track indicators such as the percentage of local tourism businesses supporting biodiversity protection [15]. However, there is a lack of inclusion of geodiversity-related aspects in these indicators. Protecting geodiversity, which forms the basis for creating geoproducts, is most effective at the local level, where producers are best equipped to safeguard and make geosites accessible for visitors [16].

This article aims to define geoproducts as an indicator of sustainable development, which is also the main hypothesis. This concept and some examples demonstrating the possibility of its practical use are presented. The areas of analysis are specific regions of Poland where tourism has been developing dynamically after its transformation since 1989. Areas with active and potential sustainable geoproducts are designated based on their tourism and geotourism development. To verify the main hypothesis, the following research questions were asked: (1) How do geoproducts contribute to sustainable development? (2) Do geoproducts promote local geoheritage and thus enhance protection, education, regional identity, and local economics? (3) Is it possible to designate sustainable geotourism regions using geoproducts?

2. The Concept of a Sustainable Geotourism Product

A tourism product is a complex and multi-faceted concept; therefore, there are many proposals for defining and approaching this concept [17–20]. For example, a tourist product has been defined as an integrated set of expectations, benefits, and impressions creating a unique composition with three types of travel: imagined, real, and memorized [21]. One of the most important features of a tourism product is that the recipients are tourists who purchase it before consumption, so they have certain ideas and expectations that are verified after the purchase. A product is a set of benefits for the customer [22]. These may be in the form of recreation, cognitive needs, the desire to explore, adventure, unique experiences or intellectual stimulation, satisfaction of curiosity, the need for risk, improvements to health, or others. These needs may also be based on sustainable development; for example, many

recipients care about the products they buy being made of "ecological" materials or the services they use not harming the natural environment [23].

About geoheritage-based products, the first concepts concerned geoparks and their special role in sustainable regional development. Geopark goods and services created from and inspired by geoheritage are called geoproducts [24]. A detailed analysis of geoproducts occurring in geoparks was performed by Farsani et al. [8] and Rodrigues et al. [9]. It was emphasized that geoproducts should preferably be produced by the local community from resources within that local geoheritage or be inspired by them, contributing to an improvement to the economic situation, sustainable development, promotion of the region, or education. The following are the four types of products classified as being geoproducts by UNESCO geoparks: (1) handicrafts and merchandising inspired by geodiversity; (2) food, cosmetics, land products, and others products produced from abiotic natural resources; (3) geotourism infrastructure facilities; and (4) geotourism services.

In the literature, a geoproduct is often identified as being a geotourism product; however, Dryglas and Miśkiewicz [25] proposed separating these terms. A geotourism product is a *tangible and intangible product based on geoheritage, purchased, experienced, or co-created by tourists, enabling the implementation of geotourism goals*. Here, a geoproduct is part of the complex structure of a geotourism product, just like geoheritage and trip motives (the essence of the geotourism product) and the geoeducational process (extended product), which is the main geotourism goal (Figure 1).

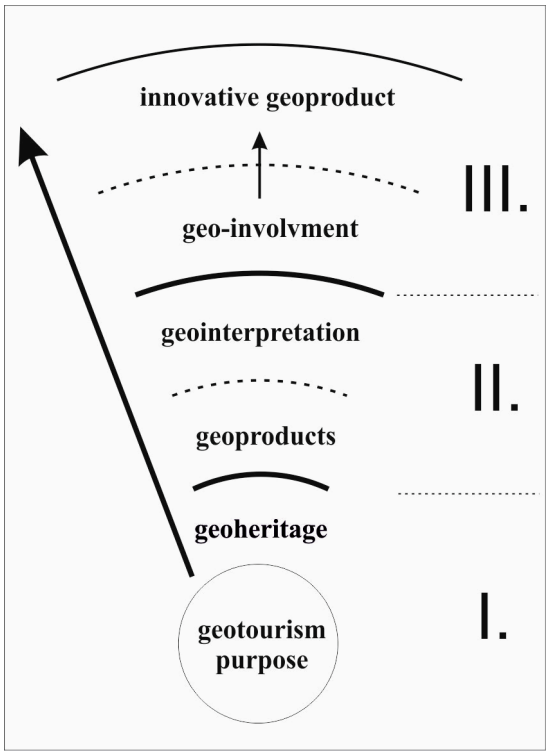

Figure 1. Structure of geotourism product: I—essentials of a geotourism product; II—a real geoproduct; III—an improved geotourism product [25].

Geoproducts become geotourism products if the recipient (tourists) and creators of the geoproducts are involved in the geoeducational process. The following are all geotourism products [25,26]:

- Geo-goods—printed and virtual supplies (e.g., geotourism guides and maps, as well as geo-websites and geo-applications); geotourism panels; geological board games; souvenirs and handicrafts inspired by geoheritage; and cosmetics and food products based on abiotic elements of nature, i.e., minerals, mineral waters, specific soils, etc.;

- Geo-objects—museums (e.g., geological, mineralogical, and paleontological); gyrocenters; Jurassic Parks; and open museums, i.e., erratic boulder lapidaries and petrographic parks, as well as mining and industrial heritage sites with geoeducation facilities and geosites open to visitors;
- Geo-services—geotourism guide services, geoeducational services (e.g., workshops and lessons), training services for geotourism, geo-information services, and others;
- Geo-events—cyclical events, in particular picnics and geological and paleontological festivals; and events related to mining and industrial heritage combined with geoeducation, mineral and fossil exchanges, etc.;
- Geo-routes—geotourism trails, geoeducational paths, geostradas, mining routes with geoeducation, etc.;
- Geo-areas—UNESCO geoparks, national geoparks, actively planned geoparks, large geological parks, and other areas with geo-identification and complex services.

A tourist package cannot be considered a geotourism product because it is a complex tourist product (e.g., can include both transportation and accommodation), a part of which may be a geoproduct but not the entire entity.

Sustainability is an intrinsic value of geotourism products and results from both its nature (inherently a type of sustainable product) and the nature of geotourism and geoparks. Geotourism is defined as a type of sustainable tourism that promotes the protection of geoheritage [27], maintains and strengthens regional identity [28], increases awareness of the high value of an area, and has a positive impact on the sustainable economy [5]. Geotourism can be implemented in the context of local development and responds to three main axes of sustainable development—environmental, social, and economic [4]. This is particularly visible in geoparks [29] because the primary objective is to promote local sustainable development, and an analysis of the literature on this topic clearly shows this [7]. Geoproducts in geoparks refer to the United Nations Agenda 2030, and their production is strongly related to sustainable development, as pointed out by Rodrigues et al. [9]. According to the analysis of these authors and the UNESCO guidelines for geoparks, geoproducts operating in geoparks are sustainable because they

- Contribute to the creation of new jobs, particularly in food production, handicrafts, education, and tourist services;
- Provide income for geopark residents and, together with tourism strategies and the green economy, support local, sustainable economic growth;
- Promote good nutrition, improving the health of residents and visitors;
- Increase agricultural productivity and the income of local small-scale producers, contributing to ensuring sustainable food production systems and implementing agricultural practices while protecting ecosystems;
- Are certified by the guidelines of UNESCO geoparks, thanks to which they can recommend best practices in agricultural production, favor sustainable production patterns, and mitigate the effects of climate change;
- Overcome dependence on fossil fuels by promoting the transition towards increased renewable energy;
- Reduce waste production, food loss, and water shortage problems;
- Build awareness about sustainable development and can themselves be educational tools in this area;
- Increase gender equality and empower women by providing direct jobs for them or developing women's cooperatives;
- Generate academic research and scientific projects and can support innovation to open new markets;
- Contribute to the protection of the world's cultural and natural heritage, including geodiversity;
- Build a strategy based on a network of cooperation at the local community level and regional collaboration at the international level, contributing to reducing inequalities within and between countries.

3. Materials and Methods

To designate regions of sustainable development based on geotourism activities in Poland, data on three aspects were used: (1) tourist accessibility, (2) attractiveness of regional geoheritage for the development of geotourism, and (3) geoproduct activity in the regions.

Ad1. Tourism indicators derived from statistical data on the current state of tourism development in Poland were synthesized (Figure 2). A proposal by Falkowski [30] was used to assess the accessibility and development of tourism, the results of Sobotka's [31] analyses were used to assess tourist use in communes, and the units of delimitation of a tourism area proposed by Cabaj and Kruczek [32] was used to assess the degree of tourism development. These data were compared with geotourism activities in Poland.

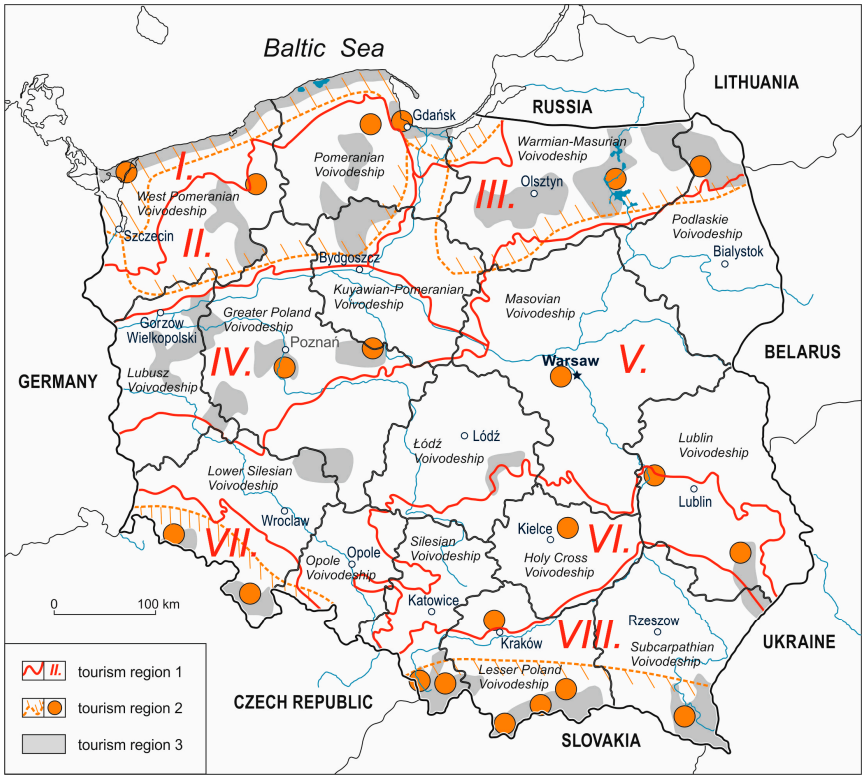

Figure 2. Regions of tourism development in Poland. Region no. 1 according to Falkowski [30], region no. 2 according to Cabaj and Kruczek [32], and region no. 3 according to Sobotka [31]. Main tourism regions according to Falkowski [30]: I—Baltic Coast; II—Pomeranian Lakes; III—Masurian Lakes; IV—Greater Poland Lakes; V—Greater Poland–Silesia–Masovian Lowlands; VI—Lesser Poland–Lublin Upland; VII—Sudetes; and VIII—Carpathians.

Ad2. Several propositions have been presented due to the attractiveness of geoheritage for geotourism in Poland. Migoń [26] mainly used the geomorphological criterion. Nita and Myga-Piątek [33] divided Poland into post-mining regions of geotourism importance. Alexandrowicz and Miśkiewicz [11] compiled data on implemented and proposed geopark initiatives, and Sygar and Zgłobicki [34] compared these data with the georesources of landscape parks, supplementing information for the planned national network of geoparks.

Regionalization on a local scale was also proposed for some areas of Poland: Rogowski [35] delimited the Sudetes according to the geoproduct criterion, and Brzezińska-Wójcik [36] analyzed geotourism products of the Lublin–Roztocze region. Gałka [37] systematized the terminologies of geotourism regionalization and the criteria for making such a division. The result of comparing the above analyses is a summary of the geotourism regionalization (Figure 3).

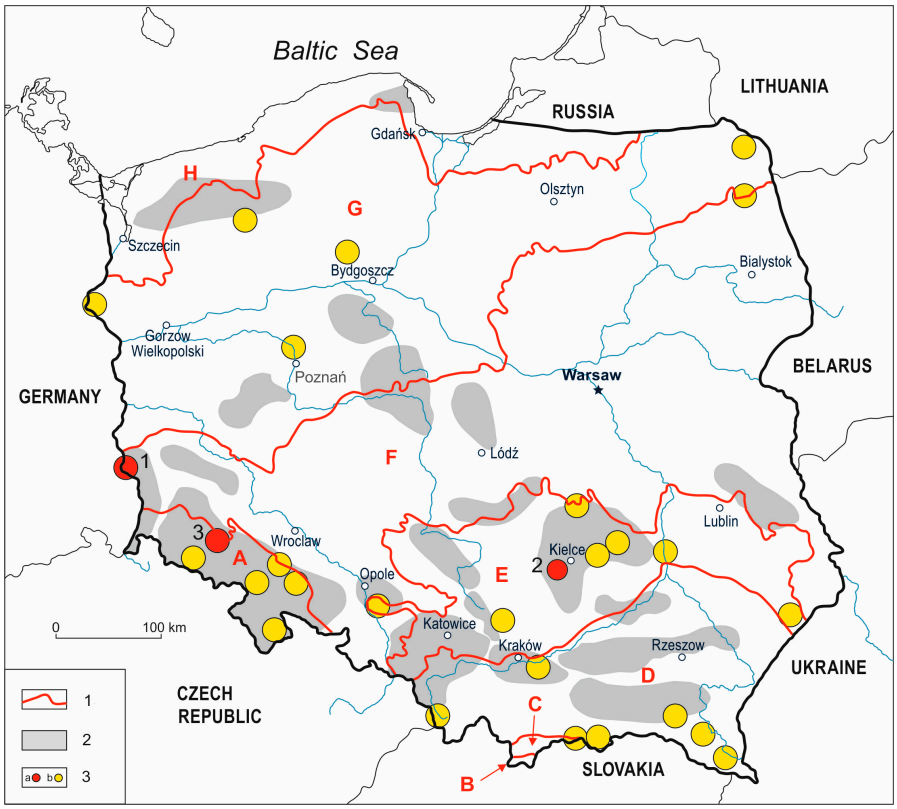

Figure 3. Areas in Poland previously recognized as geotourism regions: 1—geotourism regions according to Migoń [26]; 2—geotourism post-mining regions according to Nita and Myga-Piątek [33]; and 3—geotourism regions as geoparks according to Alexandrowicz and Miśkiewicz [11]. Main geotourism regions according to Migoń [26]: A—Sudetes with foothills; B—Tatra Mts.; C—Pieniny Mts. with Podhale; D—Beskidy Mts. and Podkarpackie Valleys (Carpathians with Foredeep); E—Southern Polish Uplands; F—Lowlands of Central Poland; G—Lakelands; and H—Baltic Coast. 3a—UNESCO Global Geoparks: 1—the Muskau Arch UNESCO Global Geopark; 2—the Holy Cross Mountains UNESCO Global Geopark; and 3—the Land of Extinct Volcanoes UNESCO Global Geopark. 3b—Other geopark initiatives according to Alexandrowicz and Miśkiewicz [11].

Ad3. Homogeneous areas were distinguished using geoproduct indicators, i.e., active geotourism services sustainably using the regional geological heritage. For this purpose, a database of Polish geotourism products was created [38]. Their number; distribution; functionality; and reference to regional geoheritage, tourism, and sustainable development were analyzed (Figure 4). The general characteristics of geotourism products and the most important examples for individual regions of Poland were obtained. A preliminary assessment of the activity of geotourism products was carried out, taking into account the following criteria: duration of activity on the tourism market, education in the field of regional geological heritage, and current activity (availability in the 2022/23 tourist season, organized current events, and timeliness of websites). Information about geoproduct activities from the literature, websites, and industry events of all editions of the GEOPRODUKT Forum in 2015–2023 was used [13].

The data were visualized on a map that displays the most developed and promising geo-regions of Poland in terms of current geoproduct activity. These regions are referred to as "geo-regions" [25]—comprehensive geotourism products based on tourism and geoeducation activity. These areas represent significant geotourism attractions where geoproducts are active and a collaboration network is being established based on its regional geoheritage, with a focus on sustainable development. By adopting this approach, the quantity and variety of geoproducts will serve as indicators of sustainable development.

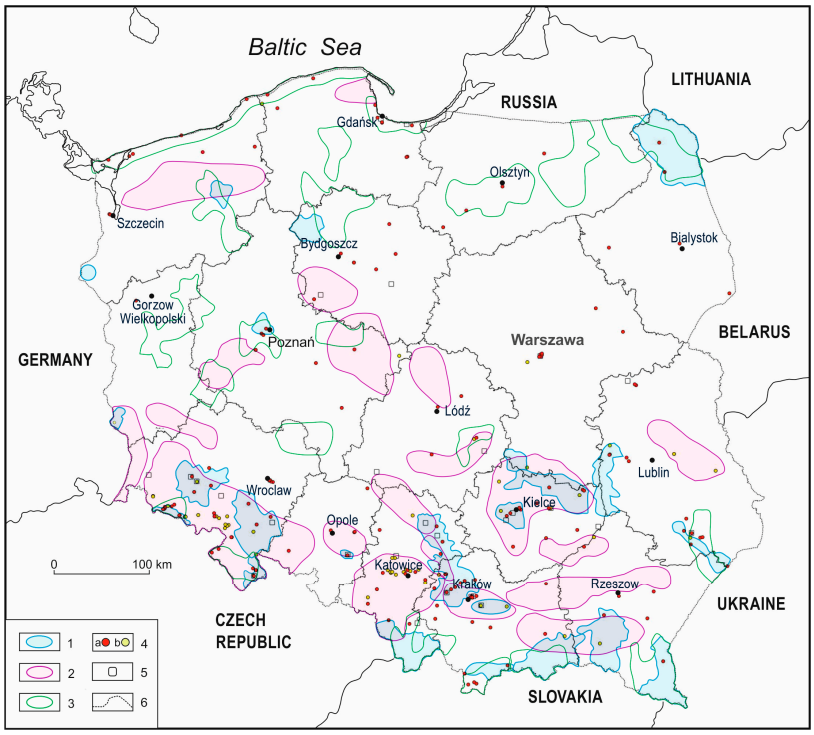

Figure 4. Compilation of geotourism developments in Poland based on tourism use: 1—all geopark initiatives [11,34]; 2—post-mining regions [33]; 3—areas with the highest level of tourist use [31]; 4—active geoproducts: a—geological, b—post-mining [38]; 5—active geoproducts: events and services [38]; and 6—borders of each voivodeship.

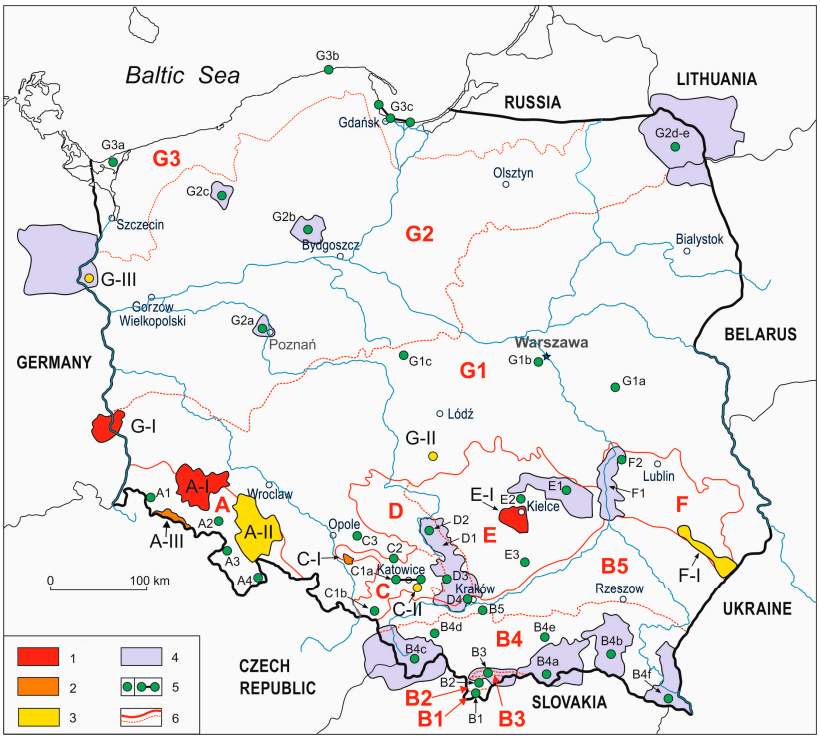

Figure 5. A proposal of geotourism regions in Poland based on geotourism products: 1—UNESCO geoparks; 2—national geoparks; 3—active geopark initiatives and geocenters; 4—proposals for geoparks as prospective geotourism areas; 5—other prospective geotourism areas; and 6—main geotourism regions according to Migoń [26] (explanations of the symbols can be found in the text).

4. Results

For this study, Poland was divided into seven research units, taking into account the tourist and geotourism regionalization of Poland (Figures 2 and 3): the Sudetes region (A), the Carpathian region (B), the Silesian region (C), the Jurassic region (D), the Holy Cross region (E), the Lublin–Roztocze region (F), and the Lowlands region (G). For each of these areas, active and/or potential geo-regions were designated due to existing geoproducts. Post-mining regions, active and projected geoparks, as well as active geoproducts were presented separately as specified objects and areas (Figure 4). A new proposal for dividing Poland into geotourism regions is presented in Figure 5.

Table 1. Selected geotourism products representing the geoheritage of the Sudetes region and their impact on sustainable development.

Name of Geoproduct	Type of Geoproduct	Examples of Geo-Activities	Impact on Sustainability
Sudetic Educational Farm—Earth Education Centre (the Land of Extinct Volcanoes UNESCO Global Geopark)	Geo-object	Laboratory classes on identifying Sudetes rocks and minerals, workshops in the volcano and earthquake rooms, geoeducational materials, field geoeducation	New jobs for locals, ecological education programs, quality certification of local products, active geopark
Sudetic Mineral Festival	Geo-event	Mineral and fossil exchange, geological lessons, guides, workshops	Local products and handicrafts
Sudetic Geostrada	Geo-route	Printed geo-guides, geotourism boards in the field	Cooperation at the Poland and Czech Republic border
Kaczawa geo-gadgets	Geo-goods	Geological games and souvenirs	Local handicrafts, cooperation network, active geopark
GECON in Sudetes Foreland geopark project	Geo-service	Study visits, workshops, summer school	Removal of barriers, involvement of the locals at the border—Czech–Polish cooperation
Czaple—Village of Sand and Stone	Geo-area	Sandstone product workshops, path-walk—along the bottom of the Cretaceous Sea, paleontological workshops	Smart Village project, green transport, healthy lifestyles

Table 2. Selected geotourism products representing the geoheritage of the Carpathians region and their impact on sustainable development.

Name of Geoproduct	Type of Geoproduct	Examples of Geo-Activities	Impact on Sustainability
Lapidarium in Tatra National Park	Geo-object	Open-air museum and geo-guide: a geological spatial map of the Tatras Mts. shows the diversity of rocks and its impact on vegetation	Protection of biotic and abiotic nature, ecological education
World Water Day in AGH University of Krakow	Geo-event	Educational workshops, lectures, fairs, competitions of mineral waters	Water resources, healthy lifestyles, student involvement
Geo-Carpathians Trail	Geo-route	Printed geo-guides, trails with geotourism boards in the fields of the Carpathians, oil geoheritage	Polish and Ukrainian cross-border cooperation

Table 2. *Cont.*

Name of Geoproduct	Type of Geoproduct	Examples of Geo-Activities	Impact on Sustainability
Geo-gadgets from Kozy Quarry	Geo-goods	Geo-guide services, events, and workshops promoting Carpathian flysch sandstone and mining heritage, geo-souvenirs	New jobs for locals, local handicrafts, a cooperation network, promotion of activity and healthy lifestyles
Geo-guide service in the Bochnia Mine UNESCO site	Geo-service	The trail and guide along the "raw" interior of the mine	New jobs for former miners, post-mining revitalization
Ciężkowice commune	Geo-area	Nature museum, Petrified City Nature Reserve—rocky sandstone, spa park, geo-guides	Protection of local geoheritage, spas, healthy lifestyles, a bicycle village, new jobs for locals

Table 3. Selected geotourism products representing the geoheritage of the Polish Uplands and their impact on sustainable development.

Name of Geoproduct	Type of Geoproduct	Examples of Geo-Activities	Impact on Sustainability
St. Anne's Mountain National Geopark	Geo-area	Geoeducational workshops and guides about Triassic limestones and Neogene volcanism of the Silesian Uplands	Preservation of geodiversity and biodiversity in landscape parks, revitalization of quarries
GEOsphere (GEOsfera) Jaworzno	Geo-object	Geoeducation about Triassic carbonate deposits with megariplemarks and remains of Nothosaurus, workshops, services, events, etc.	Ecological education, promotion of activity and healthy lifestyles, conservation of mining heritage
Jurassic Paleontological Picnic in Łutowiec	Geo-event	Jurassic marine fossils of the Kraków–Częstochowa Uplands	Promotion of local products, ecological education
Educational materials of Geoeducation Centre in Kielce (the Holy Cross Mountains UNESCO Global Geopark)	Geo-goods	Geoeducational workshops, services, events, etc. about the geoheritage of the Holy Cross Mountains	New jobs for locals, local handicrafts, cooperation network, active geopark
Geosilesia	Geo-service	Geoheritage website of the Silesian voivodeship (https://geosilesia.eu (accessed on 1 May 2024))	Dissemination of information about regional heritage via the Internet
Central Roztocze Geotourism Trail	Geo-trail	Geoheritage promotion of the Roztocze Uplands	Part of the Green Velo cycle trail, promotion of activity and healthy lifestyles

Table 4. Selected geotourism products representing the geoheritage of the Postglacial region in Poland and their impact on sustainable development.

Name of Geoproduct	Type of Geoproduct	Examples of Geo-Activities	Impact on Sustainability
Ammonites of "Kra Jurajska" (Jurassic Floe) in Łuków	Geo-goods	Ammonites and glacial geoheritage at competitions, science picnics, virtual museums, carving school	New investments promoting local heritage, improvements to the quality and availability of tourist infrastructure
Guidance in the Muskau Arch UNESCO Global Geopark	Geo-service	Guided tours in the geopark, organization of geopark events, tourist stamps	Revitalization of the post-mining area, new jobs, social activation, cross-border cooperation

Table 4. *Cont.*

Name of Geoproduct	Type of Geoproduct	Examples of Geo-Activities	Impact on Sustainability
World Championship in Amber Collecting in Jantar	Geo-event	Popular science conferences, amber route, amber museums, geo-events	Promoting geoheritage of Baltic amber, local products
The Land of the Glacier on the Oder (Moryń commune)	Geo-area	Exhibitions, models, and boards concerning postglacial geoheritage; petrographic gardens; geopark project	Regional promotion, new investments, cross-border cooperation
PGE Giganty Mocy (Power Giants) in Bełchatów	Geo-object	Geocenter with multiple activities like events, workshops, meetings, geo-gadgets	New jobs for locals, ecological education programs, promotion of local heritage
Nature trail in Pruszków	Geo-trail	Geoheritage of erratic boulders	Civic project of city residents, sustainable development of cities

4.1. The Sudetes Region (A)

The great geotourism attractiveness of the Sudetes and the presence of diverse geosites have their origins in the complex geological processes shaping this mountain mass as block tectonics with rocks ranging in age from the Proterozoic to the Cenozoic [39–41]. There are local occurrences of igneous and metamorphic rocks, especially gneiss-granite rocks. The region's outstanding features include exposures to volcanic rocks, which often occur in the form of cones, domes, and ridges, and on a smaller scale, pillow lavas and basalt columns. The sedimentary rocks are dominated by sandstones and conglomerates with interesting structures. The mineral wealth (e.g., agates, chrysoprases, opals, and amethysts) and the occurrence of ores (e.g., gold and copper) are also high. The geomorphological diversity of this region includes numerous rock formations, mainly granite and sandstone; postglacial mountain reliefs; river gorges; caves; and springs, including mineral waters and hot springs. Additionally, this region has a rich mining heritage; progressively protects its geoheritage; and makes geosites, as well as the traditions of Sudetes tourism, available for visitors.

The Sudetes region is represented by interesting geotourism products. An important center of ecological and geoeducation is the Sudetic Educational Farm—Earth Education Centre located in the Land of Extinct Volcanoes UNESCO Global Geopark [42]. Another geo-object, called the Georetum (an open-air museum) in Wojsławice (part of the Sudetes Foreland projected geopark), is also a good place to get acquainted with the rock wealth of the Sudetes [43]. Noteworthy museum centers include the Copper Museum in Legnica; the Gold Museum in Złotoryja; the JUNA Earth Museum; the Coal Mining Museum in Wałbrzych; the edu-centers of the Karkonosze National Park; as well as mineralogical museums, e.g., in Szklarska Poręba, Kudowa-Zdrój, Szczawno-Zdrój, Stronie Śląskie, and Wrocław. The rich mining heritage is also available to tourists, including in Kowary (uranium ore), Złotoryja and Złoty Stok (gold), Krobica (tin and cobalt ore), Nowa Ruda (coal), Szklary (nickel, chrysoprase, and opal), and Kletno (uranium ore). There is also a mining and metallurgical open-air museum in Leszczyna and an annual organized event, called "Dymarki Kaczawskie" (copper bloomery). Due to the great petrographic and mineralogical importance of this region, events related to collecting rocks and minerals have also been organized, e.g., the Lwówek Agate Summer, the Sudetic Mineral Festival, the World Gold Panning Championship in Złotoryja, and the International Championship in Mineral Exploration in Kletno. There is also an academic geotourism center at the University of Wrocław.

In terms of geotourism routes, a large study called Sudetic Geostrada serves as a complex trail, along with field boards, printed guides, and maps [44], and the Trail of Extinct Volcanoes has also been developed. Other smaller trails include the Amethyst Trail in Szklarska Poręba, mining and geological trails in Karpacz, the Colourful Lakes Trail in Rudawy Janowickie, the Rock Sculpture Trail in the Table Mountains, the Golden Miners Trail, the Municipal Geotourism Trail in Kłodzko, and others.

Among the geo-area projects, the most significant is the Land of Extinct Volcanoes UNESCO Global Geopark developed by the Local Action Group "Partnerstwo Kaczawskie", the Karkonosze National Geopark, and the advanced Sudetic Foreland geopark project [11,42,43,45]. Czaple—Village of Sand and Stone and the Land of Gold are also significant regional initiatives.

Geotourism services are still developing in the Sudetes, e.g., the "GEOpassion" geological workshops and Rocksi Geoeducation. An interesting geoproduct is the Explorer's Passport at the Land of Extinct Volcanoes UNESCO Global Geopark, which involves collecting stamps/stickers for participating in workshops, visiting geosites, as well as staying in selected guesthouses and restaurants, for which one can receive a diploma and prizes. The production of "Kaczawa geo-gadgets" was also initiated in the Land of Extinct Volcanoes—these are geoeducational games, as well as souvenirs, with the geopark logo and volcanic and agate symbols. For the selected geoproducts, a more detailed analysis is presented in Table 1.

According to previous studies [11,35,42,43,45–53] and analyses of geoproducts, the following areas can be considered active geo-regions:

- Land of Extinct Volcanoes A-I (including the LAG Kaczawa Partnership, the Land of Extinct Volcanoes UNESCO Global Geopark, the Sudetic Educational Farm geocenter, the Sand and Stone Village, a landscape park, events, and workshops);
- Sudetic Foothills A-II (including an active geopark project, the Sudetic Foothills Association; the LAG Granite Trail; the Strzegom Granite Festival; the Georetum open-air museum; landscape parks; annual geotourism rallies; and other events and workshops);
- Karkonosze Mts. A-III (including the Karkonosze National Park; the Karkonosze National Geopark; geocenters; and museums with geo-information, geo-trails, geo-events, and workshops).

Due to other geoproduct initiatives and proposals, other potential geo-regions of the Sudetes can be suggested:

- Jizera geo-region (A1): the geopark project of Krobica and the Jizera Mts, trails and objects of mining heritage (tin and cobalt ore), spa and mineral waters, and events like the Sudetic Mineral Festival;
- Wałbrzych geo-region (A2) [42]: coal museums, underground routes, geopark propositions such as the Central Sudetes geopark, and landscape parks;
- Table Mountains geo-region (A3): national parks, eco-centers, spas, and geo-trails;
- Śnieżnik Kłodzki geo-region (A4): accessible tourist mines (uranium and gold), the Bear Cave, spas, mineralogical museums, geo-festivals in Kletno, geopark propositions, and landscape parks.

4.2. Carpathian Region (B1. Tatra Mts., B2. Spisz and Podhale, B3. Pieniny Mts., B4. Outer Carpathans, B5. Carpathan Foredeep)

Compared to the great geotourism attractiveness of the Sudetes region's rich traditions of tourism; numerous geotourism studies, including guides and catalogs of geosites; and activities related to geoconservation, there are not many active geoproducts in the Carpathians area. However, some geosites are open to visitors through trails and information boards in the field, although the latter is mostly quite laconic in terms of geological information, poorly legible, and unattractive [54].

The geotourism potential of the Carpathians results from the different origins of its individual regions, with the Tatra Mountains, Pieniny Mountains, and Outher Flysh Carpathians having high geodiversity [41,55–57]. The Tatra Mountains, with their charac-

teristic alpine landscape, are abound in easily accessible exposures of Paleozoic igneous, metamorphic, and vein rocks with hydrothermal mineralization, as well as Mesozoic sedimentary rocks with fossils. The Tatra Mountains are also rich in karst forms (including caves) and glacial forms (activity of past mountain glaciers), with numerous lakes and valleys. Podhale, located north of the Tatra Mountains, is rich in geothermal waters and numerous surface peat bogs. The Polish part of the Pieniny Mountains is a part of the so-called Pieniny Klippen Belt, a tectonically strongly deformed structure. In the Pieniny Mountains, there are numerous exposures of Mesozoic carbonate–silica rocks in the form of rocky forms, ravines, and river valleys. Interestingly, there are some volcanic rocks as well as mineral waters, with the Dunajec Gorge popular among tourists. Historical exploration and the mining of ores are thus characteristic activities of the Tatra and Pieniny Mountains.

The Outer Carpathians are the most widespread area, composed mainly of Flysch formations (sandstone–siltstone–clay series) of the Cretaceous and Paleogene, with rich sedimentary structures that are exposed in river and stream valleys, within rocks, and in numerous quarries. The wealth of this region is in its geomorphology, with its gravitational and hardstone rock formations, pseudokart caves, landslide areas, waterfalls, and springs. The paleontological heritage is dominated by microfossils, but there are also fossil remains of fish and ichnofauna. Moreover, many of the georesources can be used by humans: sandstones in particular are subject to extraction and use as building stones, and even in the form of traditional stonemasonry; oil is the heritage of the Eastern Carpathians; and many health resorts use mineral waters. Furthermore, the Carpathian Foredeep is an area where salt and sulfur can be found.

However, the main active geotourism products are museums and university centers, where there are printed geoeducation materials; collections of Carpathian rocks; and guide services, i.e., numerous geological museums in Krakow as well as natural museums in national parks. Also worth paying attention to are the Nature Education Centre of Jagiellonian University in Krakow, the AGH Museum in Krakow, The Peatlands Promotion and Protection Centre in Chochołów, the Museum of the Polish Sulfur Industry in Tarnobrzeg, and the Museum of Oil and Gas Industry Ignacy Łukasiewicz in Bóbrka. Some of the more interesting active activities include local government initiatives in the quarry in Kozy and the Petrified City in Ciężkowice.

Two trails are important: (1) the Lesser Poland Geotourism Trail, which was one of the first geo-trails in Poland with geotourism panels in the field (currently, many boards are destroyed), presented by the GEOTYDA Foundation, and (2) the Geo-Carpathians Trail, a Polish–Ukrainian project with a printed guide and geotourism boards in the field [58]. As potential geoproducts of the geo-route type, it is worth mentioning the oil routes, the mineral and thermal water route, and the salt route in the Wieliczka–Bochnia area, although currently, these are more mining heritage activities than geological ones. Wieliczka and Bochnia play important roles among geotourism products as UNESCO sites. In the Carpathians, there are two dino-parks (in Zator, there is a fossil museum, an educational path, and the Young Paleontologist's Workshop). There are several geopark projects, but they have not been implemented: the Pieniny geopark (consulted locally); the Wisłoka Valley—Polish Texas geopark; and other proposals such as the Flysch Carpathians geopark and their mineral waters, as well as the Silesian-Morawski Beskids geopark, the High Bieszczady geopark, and the Flysch Carpathians geopark [11]. For the selected geoproducts, a more detailed analysis is presented in Table 2.

There are no regionally geoproduct-networked areas in the Carpathians, but certain prospects can be identified. According to previous studies [11,57,59–66] and analyses of active geoproducts in the region, the following potential geo-regions of the Carpathians can be proposed:

- Tatra geo-region (B1): a national park, long traditions of mountain tourism, numerous geoeducation materials, the Tatra Museum with the lapidarium and geology lessons in the Education Centre, caves open to visitors;

- Spisz-Podhale geo-region (B2): geothermal spas, springs, and peat bogs open to visitors; the Peat Bog Museum;
- Pieniny geo-region (B3): national parks; a museum with geo-exposure; the Pieniny geopark project, which consults the local community; numerous geoeducation materials;
- Flysch Carpathian geo-regions (B4), including
    - Carpathian balneological geo-region (B4a): spa resorts and springs, a geopark project, landscape parks;
    - Carpathian oil geo-region (B4b): oil museums, a geopark project, the LAG Land of Oil, oil routes, a Geo-Carpathians trail, a landscape park;
    - Cieszyn-Żywiec geo-region (B4c): a geopark proposition, museums, landscape parks;
    - Kozy geo-region (B4d): activities in the Kozy Quarry—geotourism attraction, a landscape park;
    - Ciężkowice geo-region (B4e): "Petrified City"—a geotourism attraction, spa park, geotourism services, a landscape park;
- Bieszczady Mts. geo-region (B4f): a geopark proposition, a national park, landscape parks;
- Carpathian salt geo-region (B5): the Wieliczka–Bochnia Salt Mine UNESCO sites, salt routes, salt geo-gadgets.

4.3. The Silesian Region (C)

The geoheritage of the Silesian Upland and surroundings is represented mainly by sedimentary rocks from the Devonian to the Jurassic, Carboniferous coal, and Neogene volcanism [41,67,68]. Particularly characteristic exposures are Triassic limestone with numerous fossils, including the remains of reptiles. Numerous quarries provide the opportunity to observe rocks on the surface. Carboniferous coal is a valuable mining heritage, as reflected in numerous underground mines, many of which are open to the public. For tourists, the region is famous for its mining traditions, monuments, and museums devoted to the history of exploitation, but its adaptation for geotourism purposes is in the initial phase.

The leading geotourism and geoeducational center of this region is GEOsfera Jaworzno with the Gródek Park, created in a closed quarry of Triassic limestone [69]. Numerous initiatives, events, services, printed materials, etc. make it the most complex geotourism product. Important geo-objects in the region include the Tarnowskie Góry Lead–Silver–Zinc Mine, its Underground Water Management System (a UNESCO site), and the Mining Museum in Zabrze. A large coal museum has recently been established, called Carbonariun—Łaźnia Moszczenica in Jastrzębie-Zdrój, and it is part of a Polish–Czech cooperation named "Industrial Borderland". There are JuraPark Krasiejów dedicated to dinosaurs, the Paleontological Museum in Lisowice, and The European Center of Paleontology located in Opole.

Potential geo-products include mining heritage trails, e.g., the Industrial Monuments Route in Silesia (together with the Industriada Event), the Miners "Gwarki" Trail (together with the Miners Event—"Gwarki Tarnogórskie"), the Upper Silesian Mining History Trail, the Metallurgists' Trail, and the Polish–Czech Coal and Steel Route. There is also a paleontological trail in the region—the Silesian Dinosaur Trail.

An important area is the St. Anne's Mountain national geopark with a well-accessible quarry of volcanic rocks [70]. The names with the tag LAGs refer to geological heritage sites, e.g., Land of Dinosaurs. An interesting provincial initiative is GEOSILESIA—an educational and informational website about the geological heritage of the Silesian voivodeship [67].

The following areas can be considered as active geo-regions:

- St. Anne's Mountain geo-region C-I (including a national geopark, a landscape park, events, and workshops);
- Jaworzno commune geo-region C-II (the geocenter GEOsphere Jaworzno, Gródek Park, geo-events, and workshops).

According to the great geotourism potential of mining and fossil heritage, some geo-regions can be proposed:

- Silesian Coal geo-region no. 1 (C1a): Zabrze–Katowice–Dąbrowa Górnicza—mines and museums open to visitors;
- Silesian Coal geo-region no. 2 (C1b): Rybnik–Jastrzebie–Zdrój area with Carbonarium (coal museum), spas;
- Geo-region of lead–silver–zinc in Tarnowskie Góry (C2)—a UNESCO site;
- Dinosaur geo-region due to its paleontological heritage (C3): Jura Park Krasiejów, Silesian Dinosaur Trail, and LAG Land of Dinosaurs, Lisowice.

4.4. The Polish Jura (Polish Jurassic Highland): Kraków–Częstochowa–Wieluń Uplands (D)

The geological heritage of this region consists primarily of karst formations (i.e., rocky forms, caves, valleys, springs, etc.) within the Jurassic carbonate rocks, Permian volcanism, and mining heritage of rock raw materials and silver ore [41,71,72]. The oldest rocks available for observation are outcrops of Palaeozoic sediments (Devonian and Carboniferous) and manifestations of Permian volcanism—volcanic rocks, minerals, and old lava flow. There are also exposures of Upper Cretaceous marls. Additionally, the paleontological richness of marine organisms in carbonate rocks as well as the mineralogical richness in crystalline rocks are representative of this region. The heritage of surface mining is significant, thanks to which there are numerous exposures of rocks and the use of stone in architecture [73,74].

The large potential of geoheritage for creating geoproducts and the tourism and geoconservation traditions did not contribute to the creation of active geoproducts. Rather, the most numerous are printed materials and museums. The types of geo-objects in this region include geological museums in Krakow; nature museums in the Ojców National Park; the Jura Natural and Cultural Heritage Centre in Podlesice; the Agates Museum in Rudno; lapidarium in Dubie; the "GEO-Gródek" garden of experiences in Krakow; as well as objects of mining heritage, i.e., underground Olkusz (Silver City) and the Iron Ore Mining Museum in Częstochowa. There is also an academic geotourism center at AGH Univeristy of Krakow.

Very special traditions are often cyclical events, such as so-called geo-picnics and geo-festivals, e.g., the Jurassic Picnic in Olsztyn, the Jurassic Paleontological Picnic in Łutowiec, and the Geological Festival in Wieluń.

The Polish Jura is part of the already mentioned Lesser Poland Geotourism Trail. Interesting geological and mining paths are located in the region of Chrzanów and Trzebinia. The popular Eagles' Nests Trail has potential to become a geoproduct, as do the Silver Trail of the Olkusz Miners, the Coal Mining Trails in the Krzeszowice area, the Cavemen Trail in the Wodąca Valley, the Karst Phenomena Trail, the Desert Trail in the Błędowska Desert, and the "On the trail of the Jurassic lime kilns" route. An interesting student project (AGH Student Geotourism Scientific Club) has also become a trail and guide to the Racławka Valley [75].

Local initiatives related to geoheritage include LAG Jurassic Land; geopark projects; and logos, for example, the Włodowice commune iconographic, which includes an ammonite. The Jurassic geopark project was proposed in 2000 but is not yet implemented; however, the Northern Jura geopark project has started [76,77].

The following areas can also be considered potential geo-regions:

- Jurassic geo-region (D1): a national park, landscape parks, a geopark proposition (first in Poland), geo-events in the region;
- Northern Jura geo-region (D2): a projected geopark, a landscape park;
- Silver geo-region (D3): Olkusz Silver City;
- Kraków and surroundings geo-region (D4): stone in architecture (the Kraków Old Towne UNESCO site), landscape parks, volcanic and Jurassic geoheritage in numerous initiatives.

4.5. The Holy Cross Mountains Region (E)

The geological heritage of this region is represented by the diversity of sedimentary rocks—ranges of hills made of Paleozoic formation, surrounded by exposures to Mesozoic

rocks, a unique region of gypsum karts, and many examples of mineralization [41,78–80]. The highest Łysogóry range is the Cambrian sandstones. Many geosites document the history of life (including tetrapod traces), exposures to geological profiles, and tectonic phenomena. A rich mining heritage is thus presented (in the Old Polish Industrial District), especially the numerous quarries and the use of stone in architecture. Also interesting are the calcite veins, deposits with lead and copper ores, valuable striped flints and jets, as well as gypsum crystals. There are also numerous rocky forms, mainly sandstones, caves in limestones and gypsum, and unique block fields.

This region is rich in traditions of geological research and geoconservation, with great geotourism potential [81]. Becoming increasingly more accessible through geoproducts is the geo-region in the Chęciny-Kielce area, where the Holy Cross Mountains UNESCO World Geopark is located [82]. Geoeducational materials (including field boards and guides) make this region an increasingly accessible geotourism area.

The Centre of Geoeducation in Kielce is the largest active geo-object in Poland, with numerous initiatives, especially valuable workshops for schools [83]. This place is also the headquarters of the Holy Cross Mountains UNESCO Geopark and part of a city initiative called Geonatura Kielce. The JuraPark Bałtów is also interesting (from a small paleontological find to an amusement park), as well as the Owadów-Brzezinki quarry (called a geopark), with numerous Jurassic fossils, which is open to the public in the Sławno commune. There are also important museums in this region: the Museum of Minerals and Fossils and the Natural History Museum of the Holy Cross Mountains National Park. The European Centre for Geological Education in Chęciny serves as an academic teaching and conference center. Many museums are also concerned with mining heritage, e.g., the Museum of Nature and Technology in Starachowice, the Miedzianka Museum of Ore Mining (copper ores), the Museum of the Old Polish Industrial Region in Sielpia, the Museum of Ancient Metallurgy in Nowa Słupia (iron ores), and others. The famous "Krzemionki" is a UNESCO site (a striped flint mining region), but also accessible is Nagórzyckie Grottos (a deposit of quartz sandstones). Many events are also related to mining heritage, e.g., "Dymarki Świętokrzyskie" (an iron bloomery), lead smelting in Tokarnia, and the Striped Flint Festival. Other events include the Jurassic Picnic in Sławno and the Geological Picnic in Nowina.

A large trail is the Świętokrzyski Archaeo-Geological Trail, and other interesting trails include, for example, the Hell Trail (includes sandstone rocky forms) and Szydłowiec—a city on a stone (stone in architecture).

The geotourism regions here include the following:

- Kielce-Chęciny geo-region (E-I), where the Holy Cross Mountains UNESCO Global Geopark is located, can be considered the main active geo-region, while other propositions include the following:
  - Kamienna Valey geo-region (E1): a geopark project, an iron ore mining heritage, Jura Park Bałtów, the Krzemionki UNESCO site, the Hellish Trail, landscape parks;
  - Tetrapod Land geo-region (E2): a landscape park, LAG;
  - Ponidzie geo-region (E3): landscape parks.

4.6. Lublin–Roztocze Region

The geological heritage of this region consists of valuable exposures to Cretaceous and Neogene carbonate–silica rocks, fossils, gorges in loess, and mining heritage [41,84]. The fossils include, e.g., Cretaceous marine vertebrates, Miocene scallops, and petrified wood of Neogene cypress trees. Geomorphologically, the Lublin Uplands are a large area of loess relief with numerous gorges. In Roztocze, there are a Cretaceous karst and beautiful waterfalls. Mining heritage here is related to the use of stone in architecture, especially valuable stonework, as well as loess used to produce bricks [85].

The Lublin–Roztocze region is an area with identified geoproducts [36,86,87]. There is even an association: the Geotourism Association of East Roztocze. The geo-objects include the Geotouristic Pavilion in Józefów, the Museum of Petrified Trees in Siedliska,

the Roztocze National Park Museum, the Meteorite and Amber Museum in Kazimierz Dolny, the Natural History Museum in Kazimierz Dolny, the Mineral Museum—Hipolit Mill, the Museum of Treasures of the Earth and the Sea in Szczebrzeszyn, and the Guciów Family Farm (an ethnographic museum but with exhibitions: "Traces of dinosaurs" and "Meteorites" with a meteorite picnic). This region is also interesting due to the mining and use of natural stone in architecture and stonemasonry traditions (Masonry Museum), the Chełm Chalk Underground, and the Adits in Senderki. There is also an academic geotourism center—Maria Curie-Skłodowska University in Lublin. A potential geo-product in pottery is the Museum of Krasnobród Village and the Geological-Pottery Museum, and there are several events related to this.

Some valuable trails include the Central Roztocze Geotourism Trail and the project of the second trail in the eastern part, the Loess Gullies Trail, the Iron and Blacksmith Traditions Trail, the Petrified Trees Trail, as well as the Central Roztocze Cycling Trail. Area initiatives include two geopark projects: the Małopolska Vistula River Gap geopark and the Petrified Forest in Roztocze geopark, as well as the LAG the Land of Loess Gorges [11,88–90].

Thus, the geotourism regions are as follows:

- Roztocze geo-region (F-I) is the area that can be considered an active geo-region, especially the eastern part of Roztocze: a geopark project (the Petrified Trees geopark), the East Roztocze Geotourism Association, the Geotourism Trails. Promising regions are as follows:
  - Vistula River Gorge geopark project (F1);
  - Land of Loess Gorges (F2).

For the selected geoproducts of Polish Uplands, a more detailed analysis is presented in Table 3.

4.7. Postglacial Region (G1. Lowland, G2. Lakelands, G3. Baltic Coast)

This region is the largest geotourism area in Poland, with dominant glacial and periglacial deposits and reliefs, as well as landforms of the sea coast, mining heritage, amber, and others [41,91,92]. There are geosites with great geotourism potential but that are poorly used in geoeducation, i.e., glacial lakes, moraine hills, multi-channel river valleys, peat bogs, gorges, dune fields, and postglacial rock outcrops. The erratic boulders are best exposed and accessible [93–95]. Non-glacial geoheritage is related mainly to exposures of Mesozoic rocks, traces of meteorite impacts, and georesources like coal and salt.

The mining heritage is associated especially with Miocene brown coal, Permian salt deposits, and Quaternary sand. The main geotourism product among all geo-object types is the geocenter PGE Giganty Mocy in Bełchatów (Power Giants), promoting the geoheritage of coal. Others include the Konin coal mine. There is also Permian salt geoheritage like the salt mine in Kłodawa with an underground route, the LAG Salt Valley, the LAG Chernozem on Salt, health resorts, the Salt Festival in Ciechocinek, and others. Mining heritage can also be found in the "Stone—Bronze—Iron" archaeological festival (the Archaeological Museum in Biskupin). The Museum of Fossils "Kra Jurajska" with the Regional Museum in Łuków are also interesting, with numerous specimens of ammonites from glacier floe.

Local lapidaries and petrographic parks based on erratic boulders are characteristic of this region, and open to the public. Numerous universities have museums, including Szczecin, Poznań, Toruń, Konin, Olsztyn, Suwałki, and Augustów. In Warsaw, various museums are active: the Geological Museum of the Polish Geological Institute, the Earth Museum of the Polish Academy of Sciences, the Museum of Evolution of the Polish Academy of Sciences, and the Copernicus Science Centre. JuraPark in Solec Kujawski is open, and several smaller dinoparks are in the region.

There is also the Glacial Lakes Trail, and some designed geoeducational paths. Provincial geotourism initiatives include, e.g., a geotourism map of the Łódź voivodeship, and PGI geotourism maps for communes and landscape parks.

The main area used as a compact geotourism product is the Muskau Arch UNESCO Global Geopark, with coal post-mining and postglacial geoheritage [96]. There are several

geopark projects: the Land of the Glacier on the Oder in Moryń; the Postglacial Land of the Drawa and Dębnica Rivers; the Postglacial Land of Eskers; the Yotvings geopark; the Augustów Canal—Augustów Sandrs geopark; the Morasko geopark [11]; as well as other areas with geo-identification, e.g., the Sandrs of Brda River LAG, the Land of Living Water LAG, and the Land of Eskers LAG.

The baltic coast region (G3) was distinguished due to its active coastal geological processes; the heritage of Baltic amber, particularly characteristic cliff sections; active dune fields; coastal lakes; islands; and spits. The region is quite accessible for tourism and recreation but has poor geotourism infrastructure, which means there is a lack of geoeducational materials in the field. Interesting facilities include amber museums (in Gdańsk, Gdynia, Malbork, Słupsk, and Stegna) and the nature museums of the Słowiński National Park and Woliński National Park. Important events include the World Championship in Amber Collecting in Jantar and the Amber Expo in Gdańsk. An area of geo-identification is the LAG Amber Passage, and the local initiative is the so-called Amber Laboratory. For the selected geoproducts, a more detailed analysis is presented in Table 4.

The following areas can be considered active geotourism regions:

- Muskau Arch geo-region (G-I): a UNESCO Global Geopark, a landscape park, cross-border cooperation;
- Bełchatów geo-region (G-II): a Giganty Mocy (Power Giants) geocenter, geotouristic activity of the Bełchatów coal mine, the concept of a geopark;
- Moryń geo-region (G-III): a geopark project, a landscape park, a geo-information center, numerous initiatives, cross-border cooperation.

There are many local initiatives related to geoheritage, which, however, lack broader cooperation. The following areas are selected examples, but other regions can also be taken into account as potential geo-regions: the Łuków ammonite geo-region (G1a); the Pruszków erratics geo-region (G1b); the Kłodawa salt geo-region (G1c); the Morasko craters geo-region (G2a)—a project of the geopark; the Krajna geo-region—the Postglacial Land of Eskers geopark project (G2b); the Postglacial Land of the Drawa and Dębnica Rivers geopark project (G2c); the Podlasie geo-region (G2d-e) with two projected geoparks (transboundary Yotvings and Augustów Sanders); the Wolin Island geo-region (G3a); the Slovincian dunes geo-region (G3b); and the Gdańsk coast geo-region as an amber center (G3c).

5. Discussion and Conclusions

Geoheritage is a key aspect of geotourism, as it relies on natural and cultural values related to abiotic nature. However, the development of geotourism requires proactive efforts. The identification of geotourism regions should not solely rely on natural factors but also on activities that promote and provide geoheritage for local development. Geotourism products are well suited for this purpose, as they can be criteria for designating geotourism regions and regions of sustainable development. This leads to the definition of a sustainable geoproduct, which is derived from this research. The analysis of Poland's geotourism products demonstrates their significant impact on sustainability, making them indicators of sustainable development. These products primarily promote local geoheritage values, ecological education, natural and cultural revitalization, as well as new investments in tourism development. They also encompass tourist services, local handicrafts, and food products, the promotion and distribution of which contribute to job creation, increased ecological awareness, and cultural development.

This article presents the characteristics of Poland's active geotourism products in the context of tourism development. It attempts to distinguish geotourism regions not only based on geoheritage values but also on local activities and products that are connected to geoheritage or have the potential to be. Among these regions, known as geo-regions, existing UNESCO geoparks such as Land of Extinct Volcanoes (A-I), Muskau Arch (G-I), and Holy Cross Mountains (E-I) fulfill their roles well. Additionally, some planned geoparks like Sudetic Foreland (A-II) and the eastern part of Roztocze (F-I) are also expected to do so. Geopark initiatives actively support the creation of geoproducts during the geopark project

stage. Not only these areas but also communes that invest in geotourism and are home to active geotourism products present great opportunities for network cooperation, as seen in Jaworzno (C-II), Bełchatów (G-II), and Moryń (G-III). The total number of geoproducts identified is 403, which includes various types of services, indicating great potential for geotourism development in many Polish communes [38]. These services primarily consist of traditional and open geological museums with lapidaries and geocenters (189); mining heritage sites and trails (59); geotourism trails (91); places offering geoeducational services such as events, workshops, and guides (30); and geopark proposals (34). This serves as a valuable database for further research. Although geoeducational materials are being developed in Poland, it still lags behind other countries. Many regional initiatives for promoting local geoheritage are not effectively networked at the regional level. Consequently, there is a lack of coordination and insufficient promotion of activities. In areas identified as potential geo-areas, the creation of active geotourism and sustainable development regions is possible, provided that local governments show interest.

In comparison to Polish geotourism, the Sudetes region (A) has achieved the best results. Three geotourism regions have been designated in this area: Land of Extinct Volcanoes—UNESCO Global Geopark (A-I); Sudetic Foreland (A-II), and Karkonosze Mts. (A-III). The Wałbrzych area (A2) shows great promise for further development. While there are no geotourism regions in the Carpathians (B), there are several individual initiatives with potential. Examples include the Kozy commune (B4d) and Ciężkowice commune (B4e), as well as the mineral water region (B4a) and the oil region (B4b). Despite the mining heritage of the Wieliczka and Bochnia Salt Mines, the salt region (B5) is underutilized for geotourism. The Silesian region (C) consists of two geotourism regions: St. Anne's Mountain (C-I) and Jaworzno commune (C-II). The region's coal heritage (C1) is currently the most underutilized geotourist resource. The Jurassic region (D) does not have networked areas, but the Northern Jura geopark project (D2) shows promise. The Holy Cross Mountains region has one geotourism area, which is the Holy Cross Mountains UNESCO Global Geopark (E-I) within the area of Kielce-Chęciny. In the Lublin-Roztocze region (F), geotourism is most active in the southern part of Roztocze (F-1), while the Vistula River Gorge of Lesser Poland (F1) and the Land of Loess Gorges (F2) have potential for development. In the Postglacial area (G), there is a cross-border Muscau Arch UNESCO Global Geopark (G-I) and two geotouristically active regions: the Bełchatów commune with a Power Giants geocenter (G-II) and the Moryń commune (G-III) with a cross-border geopark project. Additionally, the Łuków commune (G1a) has interesting initiatives, while the salt heritage (G1c), glacial forms including erratic boulders (G1b), and amber heritage (G3c) are also areas with potential for geotourism.

"The GEO-PRODUKT Forum" has held annual meetings since 2015 to integrate various geoproduct initiatives in Poland [12]. These meetings bring together designers and producers of geotourism products, including scientific, educational, and tourism institutions, as well as the local government [13]. The main focus is on addressing challenges such as making geoproducts more attractive to recipients. In Poland, geoproducts include fossils, colorful minerals, rocks, stone works of art, and mining heritage showcased in Polish geocenters like PGE Giganty Mocy, GEOsphere Jaworzno, the Geoeducation Centre in Kielce, and the Sudetic Educational Farm. Geosites in Poland where geoproducts are created include caves, springs, erratic boulders, rocky forms, and mining objects. However, there is a need for greater geoeducational involvement in mining heritage and raw material utilization [33,97]. The revitalization of mining heritage is essential for the development of geoproducts and may contribute to the sustainable development of regions, especially in areas with closed post-mining mines and underground mines. PGE Giganty Mocy in Bełchatów and GEOsphere Jaworzno are excellent examples of geoeducation in mining areas. Additionally, national and international initiatives can help develop training materials for geotourism staff [98].

The main conclusions, study limitations, and future analyses include the following:

- Geoproducts can be used as indicators of sustainable development because they are produced following sustainability principles; promote local geoheritage; and thus, enhance protection, education, regional identity, and local economics.
- This is the first comprehensive study about active geoproducts in Poland, and there are no official nationwide databases of this type of goods and services. It should be taken into account that not all geoproducts have been identified yet; therefore, further research is needed.
- The analysis of geoproducts is based on information on websites, the literature, and meetings such as the "GEO-PRODUKT Forum"; therefore, research is needed on the geoproducts themselves, especially according to objects, events, workshops, etc. that attract visitors, where surveys can be conducted.
- According to data from the Polish Tourist Organization (www.pot.gov.pl/en), domestic tourism has not yet returned to its pre-pandemic state and will take one or two years to normalize the situation. The current statistical data on the number of visits are not reliable, so it was decided that the further study would be to determine the number of participants in the geoeducational offer in Poland. However, examples of statistics sent by the main geocenters in Poland give a positive picture of the interest. In the 2023 GEOsphere Jaworzno geocenter (C-II), four events per season were visited by approx. 500 people and approx. 12,000 people attended classes with an educator. The Sudetic Educational Farm in the Land of Extinct Volcanoes UNESCO Global Geopark (A-I) was visited in 2022 by 2362 individuals and 6712 organized groups. The Geoeducation Center was visited by 34,199 people in 2023 and all Geonatura Kielce facilities by 537,229 visitors. Research on this topic will continue.
- Comparing previous analyses of geotourism regions with the research results in this article, it can be concluded that some areas are currently more promising due to the combination of geological and mining potential and good tourist development, e.g., the Karkonosze geo-region and their surroundings (A-III), the Śnieżnik Kłodzki geo-region (A4), the Tatra-Podhale-Pieniny area (B1-B2-B3), the Carpathian balneological geo-region (B4a), and the Postglacial Land geo-region (G2c). Also important are the Silesian region (C); the Jurassic geo-region (D1); and the areas of eastern Poland, i.e., Roztocze (F-I) and Podlasie (G2d-e). The Vistula River Gorge geopark project (F1) has many studies on geoheritage. The entire Sudeten and Holy Cross Mountains regions are the richest in geoproducts and the most promising. Many post-mining geotourism regions do not have active geoproducts; therefore, there is a need to involve local governments in this type of activity. An interesting solution may be the development of urban geotourism in Polish cities and metropolitan areas, i.e., the Wrocław, Katowice, Krakow, Kielce, Poznań, Warsaw, and Tri-City regions (Gdańsk–Gdynia–Spopot). The Kielce region develops best from this type of activity (Geonatura Kielce initiative).

Funding: This study was supported by grants from AGH University in Krakow 16.16.140.315.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: Data are contained within the article.

Acknowledgments: The author thanks the following people for sending statistical data: Agnieszka Chećko from geocentre GEOsfera Jaworzno, Monika Cychowska from the Land of Extinct Volcanoes UNESCO Global Geopark, and Michał Poros from Holy Cross Mountains UNESCO Global Geopark.

Conflicts of Interest: The author declares no conflicts of interest.

References

1. Hose, T. Selling the story of Britain's stone. *Environ. Interpret.* **1995**, *10*, 16–17.
2. Reynard, E.; Brilha, J. *Geoheritage: Assessment, Protection, and Management*; Elsevier: Amsterdam, The Netherlands, 2018.
3. Gray, M. *Geodiversity: Valuing and Conserving Abiotic Nature*; John Wiley & Sons: Chichester, UK, 2004.

4. Duarte, A.; Braga, V.; Marques, C.; Sá, A.A. Geotourism and Territorial Development: A Systematic Literature Review and Research Agenda. *Geoheritage* **2020**, *12*, 1–19. [CrossRef]
5. Dowling, R.K.; Newsome, D. (Eds.) Geotourism: Definition, characteristics and international perspectives. In *Handbook of Geotourism*; Edward Elgar Publishing: Cheltenham, UK, 2018; pp. 1–22.
6. UNESCO. *What Is a UNESCO Global Geopark?* United Nations Educational, Scientific and Cultural Organization: Paris, France, 2017. Available online: http://www.globalgeopark.org/aboutGGN/6398.htm (accessed on 22 March 2024).
7. Ferreira, D.R.; Valdati, J. Geoparks and Sustainable Development: Systematic Review. *Geoheritage* **2023**, *15*, 1–18. [CrossRef]
8. Farsani, N.T.; Coelho, C.; Costa, C.; Carvalho, C.N. *Geoparks and Geotourism: New Approaches to Sustainability for the 21st Century*; Brown Walker Press: Boca Raton, FL, USA, 2012.
9. Rodrigues, J.; Neto de Carvalho, C.; Ramos, M.; Ramos, R.; Vinagre, A.; Vinagre, H. Geoproducts—Innovative development strategies in UNESCO Geoparks: Concept, implementation methodology, and case studies from Naturtejo Global Geopark, Portugal. *Int. J. Geoheritage Parks* **2020**, *9*, 108–128. [CrossRef]
10. PTO, Polish Tourism Organization. 2024. Available online: https://www.pot.gov.pl (accessed on 22 March 2024).
11. Alexandrowicz, Z.; Miśkiewicz, K. Geopark—From the concept to implementation, with special reference to Poland. *Chrońmy Przyr. Ojczystą* **2016**, *72*, 243–253. (In Polish)
12. Miśkiewicz, K.; Poros, M. Nationwide GEO-PRODUKT Forum: A project to integrate activities in the field of tourist availability and promoting the geological heritage of Poland. *Przegląd Geol.* **2022**, *70*, 568–570. (In Polish)
13. Miśkiewicz, K. Geotourism product as a geoeducational tool and a method of promoting geological heritage of Poland. *Przegląd Geol.* **2023**, *71*, 314–320. (In Polish)
14. Kapera, I. Sustainable tourism development efforts by local governments in Poland. *Sustain. Cities Soc.* **2018**, *40*, 581–588. [CrossRef]
15. European Commission. *The European Tourism Indicator System—ETIS Toolkit for Sustainable Destination Management*; Publications Office of the European Union: Luxembourg, 2016.
16. Kubalíková, L.; Bajer, A.; Balková, M.; Kirchner, K.; Machar, I. Geodiversity Action Plans as a Tool for Developing Sustainable Tourism and Environmental Education. *Sustainability* **2022**, *14*, 6043. [CrossRef]
17. Middleton, V.T.C. *Marketing in Travel and Tourism*; Butterworth-Heinemann: Oxford, UK, 1988.
18. Medlik, S. *Dictionary of Travel, Tourism and Hospitality*; Butterworth-Heinemann: Oxford, UK, 1993.
19. Smith, S. The tourism product. *Ann. Tour. Res.* **1994**, *21*, 582–595. [CrossRef]
20. Kotler, P.; Bowen, J.; Makens, J. *Marketing for Hospitality & Tourism*; Prentice Hall: Upper Saddle River, NJ, USA, 1996.
21. Kaczmarek, J.; Stasiak, A.; Włodarczyk, B. Tourism product. *Tur. Hotel.* **2002**, *1*, 33–54. (In Polish)
22. Levitt, T. *The Marketing Mode: Pathways to Corporate Growth*; McGraw-Hill: New York, NY, USA, 1969.
23. De Marchi, D.; Becarelli, R.; De Sarli, L. Tourism Sustainability Index: Measuring Tourism Sustainability Based on the ETIS Toolkit, by Exploring Tourist Satisfaction via Sentiment Analysis. *Sustainability* **2022**, *14*, 8049. [CrossRef]
24. UNESCO Digital Library. *UNESCO Geoparks Programme: A New Initiative to Promote a Global Network of Geoparks Safeguarding and Developing Selected Areas Having Significant Geological Features*; 156 EX/11Rev.; UNESCO: Paris, France, 1999.
25. Dryglas, D.; Miśkiewicz, K. Construction of the geotourism product structure on the example of Poland. In Proceedings of the 14th International Multidisciplinary Scientific Geoconference, Albena, Bulgaria, 17–26 June 2014; pp. 155–162.
26. Migoń, P. *Geoturystyka*; PWN: Warszawa, Poland, 2012.
27. Newsome, D.; Dowling, R. *Geotourism: The Tourism of Geology and Landscape*; Goodfellow Publishers: Oxford, UK, 2010.
28. Arouca Declaration 2011—Arouca Geopark, Portugal, 12th November 2011. Available online: https://www.europeangeoparks.org/?p=223 (accessed on 22 March 2024).
29. Farsani, N.T.; Coelho, C.O.A.; Costa, C.M.M. Analysis of Network Activities in Geoparks as Geotourism Destinations. *Int. J. Tour. Res.* **2014**, *16*, 1–10. [CrossRef]
30. Falkowski, J. Koncepcja typologii i regionalizacji turystyczno-rekreacyjnej w ujęciu krajowym (Polska) i globalnym (Świat). *Geogr. Tour.* **2016**, *4*, 7–21.
31. Sobotka, S. Próba wyznaczenia obszarów o najwyższym stopniu wykorzystania turystycznego jako przesłanki do regionalizacji turystycznej Polski. *Turyzm* **2014**, *24*, 35–43. [CrossRef]
32. Cabaj, W.; Kruczek, Z. *Podstawy Geografii Turystycznej*; Proksenia: Krakow, Poland, 2007.
33. Nita, J.; Myga-Piątek, U. Geotourist Potential of Post-Mining Regions in Poland. *Bull. Geogr. Phys. Geogr. Ser.* **2014**, *7*, 139–156. [CrossRef]
34. Sygar, S.; Zgłobicki, W. Geoheritage Resources in Polish Landscape Parks as a Basis for Developing a Network of Geoparks. *Land* **2022**, *11*, 2277. [CrossRef]
35. Rogowski, M. The potential of the Sudetes Mountains for the Development of Geotouristic products. *Geotourism* **2016**, *46–47*, 59–80. [CrossRef]
36. Brzezińska-Wójcik, T. Produkty geoturystyczne w województwie lebelskim jako przykład działań innowacyjnych, poszerzających dotychczasową ofertę turystyczną regionu. In *Wpływ Sektora B + R Na Wzrost Konkurencyjności Polskiej Gospodarki Poprzez Rozwój Innowacji*; Jegorow, D., Niedużak, A., Eds.; Chełmskie Stowarzyszenie Rozwoju Społeczno-Gospodarczego CIVIS: Chełm, Poland, 2012; Volume 1, pp. 127–148.
37. Gałka, E. Geotourism regions—Delimitation, classification, basic concepts. *Geogr. Cassoviensis* **2019**, *13*, 180–195. [CrossRef]

38. Miśkiewicz, K. Geotourism Products of Poland. Available online: https://www.google.com/maps/d/u/0/edit?hl=pl&mid=18jHlAhOnKYyD6kJg7LOZnUmhBF8&ll=51.98266140490037,17.444732256599647&z=6 (accessed on 22 March 2024).
39. Migoń, P. High-mountain Elements in the Geomorphology of the Sudetes, the Bohemian Massif, and Their Significance. *Geogr. Pol.* **2008**, *81*, 101–116.
40. Gawlikowska, E. *Ochrona Georóżnorodności Na Dolnym Śląsku*; PIG: Warszawa, Poland, 2000.
41. Słomka, T. Geodiversity of Poland. *Przegląd Geol.* **2008**, *56*, 584–587.
42. Pijet-Migoń, E.; Migoń, P. Promoting and Interpreting Geoheritage at the Local Level—Bottom-up Approach in the Land of Extinct Volcanoes, Sudetes, SW Poland. *Geoheritage* **2019**, *11*, 1227–1236. [CrossRef]
43. Tarka, R. Związki geologii z historią jako podstawa tworzenia geoproduktów na obszarze Geoparku Przedgórze Sudeckie—Fakty i perspektywy. *Geotourism* **2017**, *48–49*, 61–84. [CrossRef]
44. Bartuś, T. Geotourist maps of the Sudetic Geostrada Trail as a new form of popularization of geotourism in the Sudety Mts. *Geotourism* **2015**, *40–41*, 3. [CrossRef]
45. Knapik, R.; Migoń, P.; Szuszkiewicz, A.; Aleksandrowski, P. Geopark Karkonosze—Georóżnorodność i geoturystyka. *Przegląd Geol.* **2011**, *59*, 311–322.
46. Migoń, P. Górne Łużyce jako region geoturystyczny. *Geoturystyka* **2005**, *2*, 23–32.
47. Madziarz, M. Historical ore mining sites in Lower Silesia (Poland) as geo-tourism attraction. *Acta Geoturistica* **2013**, *4*, 15–26.
48. Ihnatowicz, A.; Koźma, J.; Wajsprych, B. Wałbrzyski obszar geoturystyczny—Inwentaryzacja geotopów dla potrzeb promocji geoturystyki. *Przegląd Geol.* **2011**, *59*, 722–731.
49. Gawlikowska, E. Stołowe (Table) Mountains. *Przegląd Geol.* **2008**, *56*, 699–705.
50. Solecki, A.T. *Geoeducational Potential of the Sudety Mts*; Univerity of Wroclaw: Wrocław, Poland, 2008.
51. Marek, A. Wybrane kamieniołomy ziemi kłodzkiej i ich wykorzystanie geoturystyczne. *Hered. Minariorum* **2017**, *4*, 153–170.
52. Kryza, R.; Dziedzic, M.; Unterwurzacher, M.; Prell, M.; Pietrzykowska, K.; Strick, D.; Schumacher, V.; Wilhelm, D. Local and exotic building and decorative stones in historical castles of SW Poland: A reconnaissance study. *Przegląd Geol.* **2015**, *63*, 332–344.
53. Lorenc, M.W.; Mazurek, S. Selected, new proposals of geotouristic attractions from Lower Silesia. *Geotourism* **2010**, *22–23*, 3–18. [CrossRef]
54. Welc, E.; Miśkiewicz, K. The Concept of the Geotourism Potential and Its Practical Application: A Case Study of the Prządki (the Spinners) Nature Reserve in the Carpathians, Poland. *Resources* **2020**, *9*, 145. [CrossRef]
55. Alexandrowicz, Z.; Poprawa, D. *Ochrona Georóżnorodności w Polskich Karpatach*; PIG: Warszawa, Poland, 2000.
56. Krobicki, M.; Golonka, J. Geotouristical values of the Pieniny Klippen Belt and Tatra Mountains regions (Poland). *Przegląd Geol.* **2008**, *56*, 670–679.
57. Drewnik, M.; Felisiak, I.; Jerzykowska, I.; Magiera, J. The Tatra Mts—rocks, landforms, weathering and soils. *Geotourism* **2008**, *13*, 51–74. [CrossRef]
58. Bubniak, M.; Solecki, T. *Przewodnik Geoturystyczny po Szlaku Geo-Karpaty*; Państwowa Wyższa Szkoła Zawodowa w Krośnie: Krosno, Poland, 2013.
59. Chrobak, A. Valorisation and categorization of the geosites in the Podtatrze area. *Geotourism* **2016**, *3–4*, 3–26. [CrossRef]
60. Golonka, J.; Doktor, M.; Miśkiewicz, K.; Krobicki, M.; Słomka, T. Selected geosites within a proposed new trans-border Pieniny Geopark (Polish-Slovakian). *Acta Geoturistica* **2014**, *5*, 46–63.
61. Wasiluk, R.; Radwanek-Bąk, B.; Bąk, B.; Kopciowski, R.; Malata, T.; Kochman, A.; Świąder, A. A Conception of a Mountain Geopark in a SPA region; an example of a projected Geopark "Wisłok Valley—The Polish Texas", in the Krosno region. *Geotourism* **2016**, *3–4*, 43–52. [CrossRef]
62. Golonka, J.; Krobicki, M.; Miśkiewicz, K.; Słomka, T.; Waśkowska, A.; Doktor, M. Geopark "Beskid Śląsko-Morawsko-Żywiecki"—Najstarsze utwory Karpat fliszowych. *Przegląd Geol.* **2013**, *61*, 277–285.
63. Alexandrowicz, W.P.; Alexandrowicz, Z. Geosites in Tourist Areas: The Best Method for the Promotion of Geotourism and Geoheritage (an Example from the Polish Flysch Carpathians). *Geoheritage* **2022**, *14*, 1–18. [CrossRef]
64. Miśkiewicz, K.; Golonka, J.; Waśkowska, A.; Doktor, M.; Słomka, T. Flysch Carpathians and their mineral waters cross-border geopark. *Przegląd Geol.* **2011**, *59*, 611–621.
65. Gonera, M. Beskidy w oczach geologa, czyli Geopark "Karpaty fliszowe". *Wierchy* **2004**, *69*, 125–142.
66. Haczewski, G. O celowości utworzenia geoparku w Bieszczadach Wysokich. *Probl. Ekol. Kraj.* **2011**, *29*, 61–66.
67. Chybiorz, R.; Kowalska, M. Inwentaryzacja i ocena atrakcyjności geostanowisk województwa śląskiego. *Przegląd Geol.* **2017**, *65*, 365–374.
68. Badora, K.; Nita, J. *Georóżnorodność Opolszczyzny Oraz Jej Znaczenie w Systemie Ochrony Przyrody i Krajobrazu*; Studia i Monografie 547; Wydawnictwo Uniwersytetu Opolskiego: Opole, Poland, 2017.
69. Bieniek, B.; Kordysh, A.; Mirosławski, M.; Nowak, K.; Sękowski, K.; Sierka, E. Geoproduct potential analysis based on the example of the GEOsfera Ecological and Geological Education Center in Jaworzno. *Geotourism* **2019**, *3–4*, 3–11. [CrossRef]
70. Woźniak, P.; Sikora, R.; Lasoń, K.; Markowiak, M.; Haisig, J.; Szulc, J.; Hagdorn, H. Geopark Góra Św. Anny—"król-tułacz" wrócił na stolicę! *Przegląd Geol.* **2011**, *59*, 291–310.
71. Matyszkiewicz, J. The Cracow-Częstochowa Upland (Southern Poland)—The Land of White Cliffs and Caves. *Przegląd Geol.* **2008**, *56*, 647–652.

72. Alexandrowicz, S.W.; Alexandrowicz, Z. Selected geosites of the Cracow Upland. In *Representative Geosites of Central Europe*; Alexandrowicz, Z., Ed.; Polish Geological Institute Special Papers; Polish Geological Institute: Warszawa, Poland, 1999; Volume 2, pp. 53–60.
73. Rajchel, J. The Stony Cracow: Geological valors of its architecture. *Przegląd Geol.* **2008**, *56*, 653–662.
74. Nita, J. Quarries in Landscape and Geotourism. *Geogr. Pol.* **2012**, *85*, 5–12. [CrossRef]
75. Szczurek, S.; Bąk, M.; Dulemba, P. The Racławka Valley—An example of an educational geosite related to the development of a Paleozoic carbonate platform. *Geotourism* **2016**, *44–45*, 45–56. [CrossRef]
76. Alexandrowicz, Z.; Alexandrowicz, S.W. Draft project of Jurassic Geopark in the Kraków–Częstochowa Upland (Southern Poland). In Proceedings of the Annual Meeting of ProGEO Prague, Prague, Czech Republic, 19–28 September 2000; Abstracts 6–7.
77. Krzeczyńska, M.; Woźniak, P.; Garecka, M. *Przewodnik Geoturystyczny po Geoparku Północnej Jury*; PIG: Warszawa, Poland, 2022.
78. Urban, J.; Wróblewski, T. *Representative Geosites of the Góry Świętokrzyskie (Holy Cross Mts) and Nida Basin, Central Poland*; Polish Geological Institute Special Papers; Polish Geological Institute: Warszawa, Poland, 1999; Volume 2, pp. 61–70.
79. Urban, J.; Gągol, J. Geological heritage of the Świętokrzyskie (Holy Cross) Mountains (Central Poland). *Przegląd Geol.* **2008**, *56*, 618–628.
80. Wróblewski, T. *Ochrona Georóżnorodności w Regionie Świętokrzyskim*; PIG: Warszawa, Poland, 2001.
81. Gałka, E. The Development of Geotourism and Geoeducation in the Holy Cross Mountains Region (Central Poland). *Quaest. Geogr.* **2023**, *42*, 19–27.
82. Poros, M.; Wesołowski, W.; Sutowicz-Kwiecińska, M. *Holy Cross Mountains Geopark Field Guide*; Stowarzyszenie Gmin Geopark Świętokrzyski: Kielce, Poland, 2024.
83. Kamińska, W.; Barcicki, M.; Poros, M.; Sutowicz-Kwiecińska, M. Centrum Geoedukacji w Kielcach-czy jest marką turystyczną? *Biul. KPZK PAN Kom. Przestrz. Zagospod. Kraj. Pol. Akad. Nauk.* **2018**, *269*, 157–180.
84. Harasimiuk, M.; Brzezińska-Wójcik, T.; Dobrowolski, R. *Budowa Geologiczna Regionu Lubelskiego i Problemy Ochrony Litosfery*; UMCS: Lublin, Poland, 2007.
85. Brzezińska-Wójcik, T.; Skowronek, E. Tangible Heritage of the Historical Stonework Centre in Brusno Stare in the Roztocze Area (SE Poland) as an Opportunity for the Development of Geotourism. *Geoheritage* **2020**, *12*, 10. [CrossRef]
86. Lezzerini, M.; Brzezińska-Wójcik, T. Geocultural Heritage as a Basis for Themed GeoTown—The "Józefów StoneTown" Model in the Roztocze Region (SE Poland). *Sustainability* **2024**, *16*, 1188. [CrossRef]
87. Dolecki, L. *Rzeźba i Osady Czwartorzędowe Jako Element Produktu Geoturystycznego Lubelszczyzny*; Wyższa Szkoła Społeczno-Przyrodnicza w Lublinie: Lublin, Poland, 2014.
88. Warowna, J.; Zgłobicki, W.; Gajek, G.; Telecka, M.; Kołodyńska-Gawrysiak, R.; Zieliński, P. Geomorphosite Assessment in the Proposed Geopark Vistula River Gap (E Poland). *Quaest. Geogr.* **2014**, *33*, 173–180. [CrossRef]
89. Harasimiuk, M.; Domonik, A.; Michalski, M.; Pinińska, J.; Warowna, J.; Szymkowiak, A. Małopolski Przełom Wisły—Projekt geoparku. *Przegląd Geol.* **2011**, *59*, 405–416.
90. Krąpiec, M.; Jankowski, L.; Margielewski, W.; Urban, J.; Krąpiec, P. Geopark "Kamienny Las na Roztoczu" i jego walory geoturystyczne. *Przegląd Geol.* **2012**, *60*, 468–479.
91. Jurys, L.; Kaulbarsz, D.; Koszka-Maroń, D.; Zaleszkiewicz, L. Baltic cliffs and much more. *Przegląd Geol.* **2008**, *56*, 595–603.
92. Kosmowska-Ceranowicz, B. Glowing stone: Amber in Polish deposits and collections. *Przegląd Geol.* **2008**, *56*, 604–610.
93. Górska-Zabielska, M.; Nowak, I. The geoheritage potential of the south-east Pałuki (Western Poland) to promote geotourism. *GeoJournal Tour. Geosites* **2024**, *52*, 294–312. [CrossRef]
94. Górska-Zabielska, M. A New Geosite as a Contribution to the Sustainable Development of Urban Geotourism in a Tourist Peripheral Region—Central Poland. *Resources* **2023**, *12*, 71. [CrossRef]
95. Górska-Zabielska, M.; Kamieńska, K. Geotourism Potential of the Drawskie Lake District as a Support for the Planned Geopark named Postglacial Land of the Drawa and Dębnica Rivers. *Quaest. Geogr.* **2017**, *36*, 15–31. [CrossRef]
96. Koźma, J.; Kupetz, M. The transboundary Geopark Muskau Arch (Geopark Łuk Mużakowa, Geopark Muskauer Faltenbogen). *Przegląd Geol.* **2008**, *56*, 692–698.
97. Duraj, M.; Marschalko, M.; Duda, R.; Sitanyiova, D.; Masarovicova, S. The history of pyrope extraction and processing in the Czech Republic and its significance for geotourism. World Multidisciplinary Earth Sciences Symposium WMESS 2015. *Procedia Earth Planet. Sci.* **2015**, *15*, 663–668. [CrossRef]
98. Miśkiewicz, K.; Waśkowska, A.; Welc, E. *Documentation and Assessment of Geosites for Geotourism and Geoparks*; AGH University of Science and Technology: Kraków, Poland, 2024.