
Post-Mining Sites as Drivers of Geoheritage and Sustainable Tourism: A Study of Visitor Dynamics in Polish Underground Tourist Mines (2019–2024)

Submitted 14/04/25, 1st revision 10/05/25, 2nd revision 24/05/25, accepted 15/06/25

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Abstract:

Purpose: This study examines the development and tourism performance of mines adapted for public access in Poland, focusing on visitor statistics and site characteristics between 2019 and 2024.

Design/Methodology/Approach: By analyzing data from 12 underground sites, including UNESCO-listed salt mines and lesser-known regional attractions, the paper assesses how mining heritage contributes to geotourism and local development.

Findings: The findings highlight significant growth trends, especially in the Kłodawa Salt Mine, which experienced a record increase in tourist numbers exceeding 1,600%. The study also emphasizes the educational and cultural potential of these sites, which serve not only as tourist destinations but also as platforms for geological outreach, heritage preservation, and regional revitalization.

Practical implications: Furthermore, the paper discusses infrastructural investments and marketing strategies that have supported the expansion of underground tourism in Poland, and contextualizes these trends within European examples.

Originality: The future of mining tourism lies in diversification, innovation, and heritage-based storytelling, with sites increasingly blending traditional exhibits with multimedia, thematic events, and immersive experiences to attract a wider audience.

Keywords: Mining tourism, underground tourist routes, geoheritage, visitor statistics.

JEL classification: Q26, Q56, L83, O18, Z32.

Paper type: Research article.

Acknowledgement: The authors gratefully acknowledge the cooperation of all the mines and mine administrations that provided data on visitor statistics. Publication fee was subsidized by The National Fund for Environmental Protection and Water Management.

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1. Introduction

Sustainable development has become a central focus across both the natural and social sciences. *Geotourism*, a specialized branch of tourism, emphasizes geological heritage and promotes the understanding of geological processes and their applications within the service industry. The preservation of ancient, abandoned, and unique underground sites aligns with sustainable development principles and supports the conservation of cultural heritage by maintaining historical, natural, and practical values (Wieja *et al.*, 2015).

Over the past two decades, geotourism has emerged as a significant activity at local, national, and international scales (Dowling, 2011; Dowling and Newsome, 2010; Farsani *et al.*, 2014; Gray, 2013; Lazzari and Aloia, 2014). It employs a wide array of geological resources, including geosites, ex situ collections (primarily in museums), geoparks, and other geology-related attractions, for purposes of tourism, education, and recreation. Its primary objectives include promoting geological knowledge, raising awareness of geoconservation needs, and contributing to the diversification and sustainable development of tourism industries (Ruban, 2015).

The terms geotourism and geoeducational activities are closely related to the *geodiversity* and *geoheritage* (Dixon, 1996) of a given region. Some authors distinguish between natural (primary geodiversity), referring to features formed without human influence, and secondary (manmade) geodiversity.

The latter category includes, among others, mining landforms such as quarries, pits, collapse sinks, dumps, heaps, shafts, and adits (Szabó *et al.*, 2010; Kubalíková *et al.*, 2017). This article focuses particularly on sites belonging to the secondary geodiversity — specifically, underground mines adapted for tourism. Among the fastest-growing sectors of geotourism, underground tourism is gaining notable popularity.

Mining tourism represents a prominent form of geotourism. Defined as an "organized form of mass and long-term tourism in underground spaces, conducted in publicly accessible caves or mining sites under visitation regulations" (Rybar, Hronček, 2017) mining tourism has been extensively studied (Garofano and Govoni, 2012; Buonincontri *et al.*, 2021).

It encompasses not only active and historic mining sites but also cultural centers employing mining heritage. Many former mining towns repurpose post-mining infrastructure for tourism; however, due to various limitations, access to underground routes is often restricted. Consequently, "mining tourism" should not be conflated with "underground tourism," the latter including visits to natural caves and human-made subterranean structures such as bunkers and military fortifications (e.g., the Walimskie Drifts, the Międzyrzecz Fortified Region, The Greenbrier Bunker, and the Story of Berlin Museum).

Many researchers analyzing the volume of tourist traffic along underground routes in disused mines have sought to answer the question of what exactly attracts visitors to such sites. Zelenka and Pásková (2002) suggest that participants in mining tourism are primarily attracted by the opportunity to take part in guided tours of underground passages in former or even still-operational mines, including their technical infrastructure and associated buildings.

Other authors offer a more comprehensive definition, describing mining tourism as an independent field of study focused on the examination of abandoned mining sites, remnants of mining activities, and mining heritage, with the objective of preserving their cultural and historical value and promoting their sustainable integration into the tourism sector (Cole, 2004; Hose, 2012; Conlin and Jolliffe, 2014)

Although relatively new compared to show cave tourism, which has existed for 40–70 years, mining tourism — with a development span of approximately 25–30 years has been increasingly recognized for its potential to diversify the tourism offerings of post-industrial regions (Garofano and Govoni, 2012). Their analysis of tourist traffic in Italian caves, mines, and underground routes included sites ranging from World War II tunnels to subterranean Greek labyrinths and the ancient pathways of Rome and Naples.

Among Italy's 35 operational show mines, the **Ridanna-Monteneve Provincial Museum of Mine** was the most visited, attracting 42,500 visitors in 2006; across 21 mines with available data, tourist numbers totaled approximately 215,000 that year. One of the most interesting mines in Italy is the **Realmonte Salt Mine in Sicily**.

Although the Realmonte Salt Mine is not a regular tourist attraction and remains an active site of salt extraction, it permits limited public access to a unique underground feature: the Salt Cathedral, measuring 20 metres in width, 8 metres in height, and approximately 100 metres in length (<https://www.hitsicily.com>).

Germany, with its rich mining heritage, actively preserves and promotes its extractive traditions by converting decommissioned mines into tourist attractions. Among the over 170 mines open to visitors, the highest concentrations are found in Saxony, Lower Saxony Thuringia, and Baden-Württemberg. Notably, several of these sites were recognised by UNESCO in 2019 as part of the Mining Cultural Landscape of the **Krušnohoří/Erzgebirge World Heritage Site**.

This designation, which encompasses areas in both Germany and the Czech Republic, not only highlights the region's significant contribution to mining history but also serves as an exemplary model of cross-border cooperation and mutual understanding aimed at preserving a rich and centuries-old mining heritage. Prominent examples include several sites in the Erzgebirge region, such as the **Besucherbergwerk Markus-Röhling-Stolln**, **Zinngrube Ehrenfriedersdorf**, and the **Reiche Zeche & Alte Elisabeth complex in Freiberg**.

These sites offer insights into the historical mining techniques and the socio-economic impact of mining in the region (Jelen, 2022). On the Czech side of the Ore Mountains (German Erzgebirge), there are fewer underground routes in historic mines compared to the German side.

However, particular attention should be given to those located around the historic mining town of Jáchymov, which is entirely part of the Mining Cultural Landscape Jáchymov. Notable sites open to tourists include the **Astoria Adit in the Svornost (“Concord”) Mine**, where silver and uranium were historically extracted, as well as the 260-meter-long **Adit No. 1**.

One of the best-preserved mining complexes in Europe is located in Lower Saxony: the **Rammelsberg Mine in Goslar**, a UNESCO World Heritage Site renowned for its over 1,000-year history of extracting silver, copper, and lead. The site offers visitors a comprehensive insight into both medieval and modern mining technologies through extensive underground tours and richly curated museum exhibitions.

A particularly unique example of an underground tourist route is the **Lavakeller in Mendig**, located in Rhineland-Palatinate. This site, also known locally as Mendiger Ley, comprises a network of basalt lava cellars extending over approximately 3 km² beneath the town. Excavated to a depth of 32 metres, these cellars were originally created for basalt extraction and later repurposed for beer storage by local breweries. Today, visitors can explore this subterranean landscape, witnessing the impressive basalt columns formed from cooled lava flows.

The Mendiger Ley is part of the Vulkaneifel UNESCO Global Geopark, established in 2015, which covers an area of approximately 1,800 km², extending from the Belgian border in the west, across the Eifel Mountains, to the River Rhine in the east. This region was shaped by volcanic activity, the most recent of which occurred around ~9500 years. Today, it attracts thousands of visitors annually, both domestic and international (Schumacher and Meyer, 2006; Frey, 2021).

Mines that once extracted rare or hazardous mineral resources are of particular interest from the perspective of geotourism. One such resource is mercury, a substance known for its toxicity and health risks. The only two mercury mines in the world that are currently open to tourism are located in Almadén, Spain, and Idrija, Slovenia. Together, these two sites form the UNESCO World Heritage Site titled **"Heritage of Mercury. Almadén and Idrija."**

In mercury mining regions, ongoing monitoring covers soil, water, and air contamination. In Idrija, studies mapping atmospheric mercury concentrations and speciation offer insight into its spatial distribution and main emission sources (Kocman *et al.*, 2011). As can be observed, many of the previously mentioned sites related to mining heritage have been inscribed on the UNESCO World Heritage List. Currently, there are 19 such sites located in Europe, while the total number

worldwide has reached 27, representing a significant increase since 2018 (Jelen, 2018).

The aim of this article is to present tourism activity in mines (mostly decommissioned) that have been adapted for visitors in Poland, along with a brief overview of their main characteristics. Currently, there are 18 such sites operating in Poland, primarily located in the following voivodeships: Silesian, Lower Silesian and Lesser Poland. The data on the number of visitors comes from the mine authorities. Unfortunately, not all mine authorities responded to the inquiry.

2. Underground Tourist Mines in Poland

Over the past two decades, numerous studies have addressed the adaptation of post-mining sites for tourism in Poland. A substantial number of underground tourist routes, particularly in post-mining areas, are concentrated in the southern regions, where mining has historically been most developed.

Table 1 lists the principal mines adapted for tourism. Research has predominantly focused on the geotechnical aspects of revitalizing post-mining areas (Chmura and Migdas, 2005; Wieja and Chmura, 2011; Cała and Ostreġa, 2013) and the prevention and mitigation of hazards associated with the development and operating underground tourist routes (Chmura and Wieja, 2015). Additional studies have examined visitor safety, with particular attention to exposure to naturally occurring radioactive elements such as radon.

Measurements conducted in sites including the Kletno Uranium Mine, Złoty Stok, and Kowary indicate that tourists receive radiation doses of only a few μSv —negligible compared to the average annual background dose of 2.4 mSv, and thus pose no health risk (Olszewski *et al.*, 2005). More recent research by Fijałkowska–Lichwa and Przylibski (2023) indicates that radon (^{222}Rn) concentrations in the St John Mine tourist complex in Krobica exceed the Polish legal reference level of 300 Bq/m³ during eight months of the year.

These elevated levels are associated with periods of reduced natural ventilation, particularly in autumn and spring, when atmospheric conditions limit air exchange between the mine and the surface. Also, Grygier *et al.* (2025) identified that radon (^{222}Rn) concentrations in the Historic Silver Mine in Tarnowskie Góry exceeded the Polish reference level of 300 Bq/m³, with average values reaching 1160 Bq/m³ in the first year and 1210 Bq/m³ in the second year of monitoring.

The salt mines of **Wieliczka and Bochnia**, situated in the Małopolska region of southern Poland, represent some of the oldest and most historically significant sites associated with mining tourism. Dating back to the 13th century, these underground complexes are not only of considerable cultural and historical value but also rank among the most frequently visited mining heritage attractions in the region.

Wieliczka has been a UNESCO World Heritage Site since 1978, with Bochnia added in 2013 (Puławska *et al.*, 2021a). Wieliczka remains Poland's most visited underground tourist attraction, drawing a record 1.8 million visitors in 2019. Although the COVID-19 pandemic temporarily reduced visitation, interest has subsequently rebounded. The enduring popularity of both mines is attributed to their historical significance, accessibility, proximity to Kraków, and international recognition as UNESCO World Heritage Sites and Polish Historic Monuments.

The Bochnia Salt Mine, recognized as a Polish Historic Monument in 2000, holds significant cultural and historical value. Although it attracts approximately one-tenth the number of visitors as Wieliczka, it remains one of Poland's most visited mines. Bochnia commenced in the 13th century and continued until 1990, creating a unique natural and technical monument.

The mine transitioned to tourism in the early 1990s, initially welcoming around 1,500 visitors annually under miner supervision. By 1995, tourism operations became professionally managed, and visitation rose to 90,000 in 2000. By 2017, annual visitor numbers exceeded 190,000, maintaining levels above 160,000 in recent years, despite a sharp decline to approximately 40,000 during the pandemic (Puławska *et al.*, 2021a). Both the Bochnia and Wieliczka salt deposits formed within an evaporite succession of the Carpathian Foredeep, an epicontinental sea existing from the Early Oligocene to the late Middle Miocene (Peryt, 2013).

In response to growing public interest in geological features, Bochnia has expanded public access to its geological formations over the past two decades. Today, the mine offers a variety of tourist experiences, including an underground multimedia exhibition (Puławska *et al.*, 2021a). Beyond its tourist routes, the mine increasingly incorporates the therapeutic potential of its subterranean microclimate, with salt chambers being employed for halotherapy as part of broader health-promotion initiatives (Puławska *et al.*, 2021b; Puławska *et al.*, 2025).

The **Guido Coal Mine** in Zabrze is also notable for its unique integration of tourism and conference facilities, located 320 meters below ground level. The mine offers a wide range of tour options, from family-friendly routes to extreme deep-mine experiences, including a simulated miner's shift during which fully equipped visitors can experience the working conditions of real miners. Tours are available on two main levels: 170 and 320 meters, as well as on one sub-level at 355 meters.

Among the most distinctive attractions are the opportunity to spend time in an underground pub and to ride a suspended underground train, formerly used for mining and transportation purposes. A broad range of tourist attractions, excellent organizational management, and effective marketing have contributed to a 70% increase in the number of visitors to the Guido Coal Mine over the past six years. The number of visitors grew from 146,917 in 2019 to 250,388 in 2024, making it currently the second most visited mine in Poland.

The dynamic rise in the popularity of the Guido Coal Mine in Zabrze led to it surpassing the **Złoty Stok Gold Mine** in visitor numbers in 2023. For many years, the Złoty Stok mine had held the position of the undisputed second most visited mining site in Poland after Wieliczka Salt mine. The Złoty Stok Gold Mine is one of the oldest gold mining locations in the country, with a history dating back to the Middle Ages.

The first opportunity to visit the underground sections of the mine emerged in 1969, when one of the adits—known as the Książęca Adit—was opened to the public. Over the years, the range of accessible areas has gradually expanded, transforming the site into a well-developed tourist attraction.

Today, it is a comprehensive and successful tourism product and one of the most frequently visited destinations in the Kłodzko Valley region. The site offers a wide variety of activities, ranging from themed events to outdoor games. In April 2025, the mine further expanded its offer by reopening the Książęca Adit to visitors—the same historical adit that was first made accessible to the public in 1969—thus enriching the overall visitor experience.

In the Tarnowskie Góry region, the concept of geoheritage preservation and protection emerged shortly before the outbreak of the Second World War. In 1938, the municipal authorities purchased the rights from the public treasury and initiated the establishment of the Bolesław Chrobry Mine. The primary objective of this initiative was to highlight and promote the heritage value of the area. Initially, the mine gained considerable popularity among tourists—not only from the surrounding region but also from more distant parts of Poland.

However, the outbreak of war brought tourism in the Tarnowskie Góry region to a halt. It was not until the political transformation of the post-war period that attention was once again directed toward the underground mining heritage. In 1957, the **Black Trout Adit** was opened to tourist traffic. At the time, it was part of the longest adit in Europe, known as the Deep Friedrich Adit. The tourist route extends 600 meters and lies between two shafts: Ewa and Sylwester. Visitors travel between these shafts by boat, allowing them to experience the unique subterranean world of the Tarnowskie Góry region.

In contrast to the historic mines of southern Poland, the **Kłodawa Salt Mine** in central Poland represents the country's largest and deepest operational salt mine. While maintaining active salt extraction, the mine has significantly expanded its tourism sector. Unlike the sedimentary evaporite deposits at Wieliczka and Bochnia, Kłodawa's salt forms a stable diapir.

The mine hosts Poland's deepest tourist route, located 600 meters underground, and has experienced a nearly twentyfold increase in visitor numbers over the past five years, with new attractions introduced annually. A significant increase in tourist

numbers in recent years has led to new investments. In October 2023, a new facility dedicated to tourist services was opened at the Kłodawa Salt Mine. The newly constructed building covers an area of approximately 400 square meters. In addition to the visitor service office, the facility includes a modern waiting area designed to accommodate approximately 200 people, as well as a gift shop offering salt-based products and salt produced directly at the mine (<https://www.pgi.gov.pl>).

It should be noted that the increase in the number of visitors to the Kłodawa Salt Mine between 2019 and 2024 is record-breaking, amounting to over 1,600% (Table 1). In the coming years, a further increase in the number of tourists visiting the underground route in Kłodawa is forecasted.

The Uranium Mine in Kletno, situated in the Śnieżnik Massif of Lower Silesia, is a historically and geologically significant site. Operated as a secret Soviet-run uranium mine from 1948 to 1953, it now functions as a tourist attraction. Visitors explore Adit No. 18, a 400-meter route featuring mineral formations and exhibits on the area's mining and geological history.

A slight year-on-year decline in tourist numbers between 2023 and 2024 may be attributed to the severe flood in mid-September 2024, during which road access to Kletno was disrupted for several weeks due to the destruction of a bridge. Old mines serve as excellent sites for geoscience research and education (Madziarz, 2013; Hellqvist, 2019).

Among Poland's underground tourist destinations, the **"Former Mine" Science and Art Centre in Walbrzych** serves as an exemplary site for preserving industrial heritage, focusing on the history of coal mining in Lower Silesia. The museum complex includes restored post-mining structures such as a machine park, a bathhouse, and mine shafts, although only a small underground section is accessible to visitors. Nevertheless, the center effectively showcases the region's industrial legacy and engages the local community through a variety of cultural and scientific events.

Three lesser-known sites that attract a comparable number of visitors are the Neolithic Flint Mines in Krzemionki, the Chełm Chalk Tunnels, and the Nagórzyce Grottoes in Tomaszów Mazowiecki. In 2024, these sites were visited by 37,634, 34,960, and 31,792 tourists, respectively. Despite their predominantly local character, these locations represent phenomena of global significance.

They serve not only as outstanding examples of geoheritage or mining heritage, but also as sites of considerable archaeological value. In all three cases, the extracted materials were lithic raw materials, rather than mineral resources, as was the case in the previously discussed examples. **The Neolithic Flint Mine in Krzemionki Opatowskie**, discovered in the 1920s, now serves as a well-developed educational center with a nearly 500-meter-long tourist route.

It presents the early history of mining and offers insights into human life 6,500 years ago, with clearly exposed flint concretions visible along the path (Zagożdżon and Zagożdżon, 2016). The significant decline in the number of tourists in 2020 was influenced not only by the COVID-19 pandemic, but also by the renovation of the underground route. During this period, the site was closed to visitors.

A unique underground structure on a European scale resulting from mining activity is the **Chelm Chalk Tunnels**, which were formed through the extraction of writing chalk by the town's inhabitants from the 13th to the 19th century. Most of the excavation work was entirely unregulated. As a result of archaeological work carried out in the 1960s and 1970s, nearly 8 kilometers of underground, multi-level workings were identified, and the total length was estimated at approximately 40 kilometers. For tourism purposes, a section of the tunnels, about 2 kilometers in length, was designed and secured for visitor access (Gołub, 2009).

The Nagórzyce Grottoes in Tomaszów Mazowiecki form an underground tourist route showcasing the remnants of quartz sandstone mining, active from the late 18th to the early 20th century. Originally exploited for domestic use and later for glass production, the mine was closed by Tsarist authorities following a fatal collapse, after which it gradually became a local attraction.

In Poland, new underground tourist routes continue to be developed in disused mines. One of the most recently opened facilities is the **St. John Mine (Kopalnia św. Jan) in Krobica**, located in the Izera Foothills. The site was officially opened to the public in July 2013 and represents a unique heritage monument that both commemorates and makes accessible the rich mining history and traditions of Lower Silesia. The St. John Mine in Krobica is one of the oldest mining sites in Poland, where tin (primarily from cassiterite) and cobalt ores were extracted as early as the 16th to 18th centuries.

The adaptation of the site for tourism was made possible through financial support from the European Union. The total cost of the project entitled "Reclamation of areas degraded by mining activities in the Municipality of Mirsk and creation of a tourist trail – In the Footsteps of Former Ore Mining" amounted to 3.7 mln PLN and was financed through the European Regional Development Fund under the Regional Operational Programme for the Lower Silesian Voivodeship 2007-2013 (2.5 mln PLN), the municipal budget (1.1 mln PLN), including a loan from the Provincial Fund for Environmental Protection and Water Management (WFOŚiGW) in Wrocław (0.7 mln PLN), and a donation from the Polska Miedź Foundation (150,000 PLN) (<https://mirsk.pl/turystyka/geopark/>).

As demonstrated by the example above, the costs associated with adapting a decommissioned mine for tourism purposes are extremely high—especially when a significant amount of time has passed between the mine's closure and its eventual reopening to the public. Ensuring visitor safety, reinforcing backs, often excavating

buried tunnels, maintaining hydrogeological conditions, and ensuring proper shaft ventilation are among the top priorities for investing entities. In some cases, these investors are private individuals—enthusiasts of geology, mining, or local history. One such example is the former **nickel mine in Szklary**, which was opened to tourism in 2013 thanks to the efforts and financial investment of a private individual. This site is particularly valuable, as it is located on the only nickel ore deposit in Poland that has been exploited since the 19th century and is also known for being a source of chrysoprase—a precious gemstone renowned worldwide. Today, the mine operates as a tourist attraction, offering guided tours and geological workshops to visitors (Furmankiewicz and Krzyżanowski, 2008; Zagożdżon and Zagożdżon, 2016).

During the preparation of this article, intensive work has been underway to adapt another underground site in Poland for tourism—the Underground Complex of Kamienna Góra in Lubań, located in Lower Silesia. This site is not a typical mine; it was most likely constructed as an air-raid shelter, with work beginning in 1943.

It is mentioned here because it represents one of the few underground structures in Poland excavated in columnar-jointed basalt, which may constitute a unique geotouristic attraction, comparable to the previously mentioned German Lavakeller in Mendig. The project is being carried out by local enthusiasts from the Association of Upper Lusatia Enthusiasts, with support from the Municipality of Lubań, the KGHM Foundation, and private donations.

In order to enhance the appeal of underground tourist routes, site managers continually seek ways to diversify their offerings. A variety of events and activities are organized, including concerts, sports competitions, exhibitions by local artists, geological workshops, and numerous attractions for children. Some of the mines even offer underground boat rides.

The longest such route—spanning over 1,000 meters—is located in the Queen Louise Adit which, together with the Guido Mine Complex, forms the Coal Mining Museum in Zabrze.

Shorter underground boat trips are also offered by the Gold Mine in Złoty Stok, the Black Trout Adit, and the Historic Silver Mine in Tarnowskie Góry. In addition, underground tourist routes in the former uranium mines of **Kowary and Kletno** feature displays of uranium glass, which fluoresces under UV light due to the presence of uranium compounds, primarily sodium diuranate and uranium oxides.

Beyond its aesthetic appeal, mineral fluorescence provides substantial educational value. By demonstrating the absorption of UV energy and the subsequent emission of visible light, such exhibits offer insights into the physical mechanisms of luminescence, the identification of fluorescent minerals, and the role of elemental impurities in producing this phenomenon.

Most of the mines described above, which have been adapted for tourism, maintain an active presence on social media. The content they publish is not limited to current announcements about events taking place at the sites; rather, these platforms are often well-developed and serve as valuable tools for educational outreach in the field of geotourism. In recent months, there has been a notable increase in social media activity by the Gold Mine in Żłoty Stok and the Salt Mine in Kłodawa.

Table 1. *The number of tourists visiting mines open to tourism in Poland from 2019 to 2024*

Name of the mine	Mineral deposit	Number of visitors*/**					
		2019	2020	2021	2022	2023	2024
Wieliczka Salt Mine	Salt and salt crystals	1861 840	441 060	693 600	1119 320	1518 700	1725 330
Guido Mine in Zabrze	Coal	146 917	44 297	93 413	203 867	240 988	250 388
Gold Mine “Żłoty Stok”	Gold and arsenic	210 000	123 000	187 000	213 000	228 000	200 000
Bochnia Salt Mine	Salt and salt crystals	176 726	47 738	107 260	161 002	166 414	160 478
Historic Silver Mine	Lead-Silver-Zinc	89 410	27 317	65 590	74 052	77 849	69 896
“Former Mine” Science and Art Centre in Wałbrzych	Coal	36 905	19 428	31 128	58 265	71 873	66 695
Kłodawa Salt Mine	Salt	3 280	7 913	20 705	31 346	45 952	56 147
Uranium Mine in Kletno	Uranium	n/a	n/a	n/a	48 733	46 417	41 000
Neolithic Flint Mines in Krzemionki	Striped Flint	45 893	1 791	20 124	37 233	36 157	37 634
Chełm Chalk Tunnels	Chalk	34 679	17 674	24 233	29 833	27 750	34 960
Black Trout Admit	Lead-Silver-Zinc	38 381	9675	32876	39 175	38 038	34 532
Nagórzyckie Grottoes in	Quartz sand	31 946	12 509	23 033	32 245	30 069	31 792

Tomaszów Mazowiecki							
Mines in Kowary	Uranium	n/a	n/a	n/a	n/a	n/a	n/a
Former Mine Nowa Ruda	Coal	n/a	n/a	n/a	n/a	n/a	n/a
Saint John Mine in Krobica	Tin, cassiterite	n/a	n/a	n/a	n/a	n/a	n/a
Szklary Mine	Nickel, Chrysoprase	n/a	n/a	n/a	n/a	n/a	n/a
Museum of Iron Ore Mining in Częstochowa	Iron	n/a	n/a	n/a	n/a	n/a	n/a
Aurelia Gold Mine in Złotyja	Gold	n/a	n/a	n/a	n/a	n/a	n/a

Note: * The data on the number of visitors comes from the mine authorities; **n/a – no data available

Source: Own study.

3. Conclusions

The preservation of historical underground structures is a vital component of cultural heritage conservation and sustainable development. The conservation and adaptive reuse of these spaces encompass aesthetic, environmental, and socio-economic dimensions, while also supporting urban planning and geological education.

In response to growing public interest, the number of underground tourist routes worldwide continues to increase, with many abandoned mines repurposed as educational and recreational attractions. These initiatives contribute to regional development and create employment opportunities.

Underground tourism in Poland has experienced dynamic growth, with several sites—including Kłodawa and Zabrze—reporting significant increases in visitor numbers over the past six years, underscoring the growing interest in geoheritage and industrial history.

Historic mines provide more than cultural value; they also offer unique opportunities for scientific education, health-related activities (e.g., halotherapy), and community

engagement, reinforcing their role in sustainable regional development. The Wieliczka and Bochnia Salt Mines, both UNESCO World Heritage Sites, attract over 1.8 million visitors annually. They offer an immersive experience that integrates the history of salt mining, regional geology, and the technological evolution of underground labor.

Attractions such as underground train tours, boat rides, and overnight stays broaden their appeal to diverse audiences. Adaptive reuse of post-mining infrastructure requires substantial investment, yet it proves effective in revitalizing former industrial areas. Successful examples are often marked by professional management, diversified attractions, and integration with broader cultural or environmental initiatives.

The future of mining tourism lies in diversification, innovation, and heritage-based storytelling, with sites increasingly blending traditional exhibits with multimedia, thematic events, and immersive experiences to attract a wider audience.

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