

“Recreational Use of Geothermal Water in Poland and Slovakia¹”

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Abstract

Slovakia is the country with a long history of the use of geothermal water for recreational purposes. Slovakia possess extensive infrastructure – some of which developed at the site of earlier facilities. In the first decade of the 21st century, Poland also began to develop geothermal bathing facilities. Many such facilities were successful, which gave rise to even more facilities. The following is a research-based analysis of stage and key determinants of geothermal facility development in Poland and Slovakia, including:

- supply of geothermal water, its accessibility and quality, technical issues, costs of extraction, costs of use, costs of waste management,
- history and operational traditions associated with geothermal facilities,
- legal issues linked to geothermal water extraction, construction of recreational facilities and the use of geothermal water,
- new social trend to visit thermal baths, its relationship to wellness and the use of free time.

Key words: geothermal water, geothermal pools, replication effect, Poland, Slovakia

Paper type: Scientific study

1 Introduction

The number of geothermal bathing facilities is increasing rapidly across Central and Eastern Europe, which includes Poland and Slovakia. Several large geothermal bathing facilities have emerged in Poland over the last several years, while additional facilities are at the construction stage. In Slovakia, a large number of such facilities were built in the mid-1980s, especially in the Carpathian Mountains. Popular interest in active recreation increased after the year 2000, which resulted in the construction of more large geothermal pools in Slovakia. More than two million tourists visited the three largest Slovak geothermal bathing facilities in 2007 (Liptowski Mikołusz, Poprad, Bardejov). The emergence of such facilities in Poland is largely an attempt to replicate the success of Slovak facilities. Poland's geothermal bathing industry is still in its initial stage of development (Dej, Huculak, Jarczewski 2013).

The paper attempts to analyze the determinants of geothermal facility development in Poland and Slovakia as well as the creation of an entire new industry. It also compares the level of facility development in the two countries.

1.1 Methods

The analysis of geothermal facility development is based on existing research papers on the supply of geothermal water in Europe as well as legal issues associated with geothermal bathing facilities and health spas. Other analyzed papers include works on spa and wellness tourism and other publications on

the tourism industry in Poland and Slovakia. Other key sources of information (e.g. ticket prices) on geothermal bathing facilities include the internet pages of facilities in Poland and Slovakia. The web portal infobasen.pl also provides valuable information in the form of comparisons between the various facilities in Poland, Slovakia, and Hungary. Finally, orthophotomaps were used in conjunction with GIS software to analyze land use with respect to geothermal bathing facilities.

The analysis of geothermal bathing facility development is complicated by the need to separate purely recreational facilities from health spas. Geothermal facilities and health spas usually remain separate in Poland, while in Slovakia the two tend to coexist at one location. In light of this difference, the paper reviews all facilities regardless of whether geothermal pools are accompanied by health spas or not.

2 Development of the geothermal bathing industry in Poland and Slovakia

A number of factors underpin the success of geothermal bathing facilities in Poland and Slovakia; however, the most important factors include the supply of geothermal water, geothermal bathing traditions, trend towards healthy lifestyles, and the growing role of tourism in the global economy. Another key factor is different legal regulations in Poland and Slovakia pertaining to the use of geothermal water. The following is an analysis of each of the factors listed above.

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2.1 Supply of geothermal water

The key driver of the development of the geothermal bathing industry is the supply of geothermal water. Hungary boasts the largest geothermal bathing industry in Central and Eastern Europe; Slovakia ranks second, while Poland ranks third. Figure 1 shows the geothermal potential of Europe via the continent's geothermal heat flow density.

Slovakia possesses a relatively large supply of geothermal water obtained from 76 wells (Tab. 1). A large part of the geothermal water occurs at low temperatures. The maximum temperature of extracted geothermal water in Slovakia is 92°C, while the average temperature is 47.6°C. According to the *Atlas of Geothermal Resources* (Hurter, Haenel 2002), a total of 35 locations in Slovakia use geothermal water for heating and bathing purposes. The largest concentration of geothermal sites is in southern Slovakia – especially in the Danube River Basin. According to the *Atlas*, there were 80 geothermal pools with a total surface area of 50,000 m² in 2002. The pools and spas combined were capable of serving 75,000 visitors per day. There were 11 geothermal facilities in Slovakia in 2002; another 24 were under construction.

Poland possesses less geothermal water than does Slovakia (Tab. 1) and its location is quite variable, ranging from the Polish Lowlands to the Carpathian Mountains, Carpathian Foothills, and the Sudety Mountains (Fig. 2). In 2011 the supply of extractable groundwater in Poland was estimated at 4,225 m³/h, which was 4% more than during the previous year (Szulflicki 2012). Geothermal water (warmer than 20°C) constituted 73% of the total documented groundwater supply in Poland.

Table 1. Geothermal springs and installations in Poland and Slovakia

	Poland	Slovakia
Number of springs/wells	20	76
Number of towns with springs/wells	12*	76
Average temperature of springs (°C)	47.7	47.6
Number of operating geothermal installations	2**	11
Number of geothermal installations under construction	8***	24

*Ciechocinek, Pyrzyce, Skierniewice, Uniejów, Bańska, Konstancin, Trzebnica, Cieplice, Łądek-Zdrój, Jastrzębie-Zdrój, Ustroń, Iwonicz-Zdrój

**Bańska, Pyrzyce

***Stargard Szczeciński, Skierniewice, Żyrardów, Mszczonów, Poddębice, Koło, Czarnków, Uniejów

Source: authors after Hurter, Haenel 2002.

About 63% (almost 7 mln m³) of the geothermal water was extractable. The primary use of geothermal water (almost 70%) in 2011 was district heating.

2.2 Tradition and history

The history of Slovak bathing facilities offering medical and recreational services reaches the end of the 14th century. The region began to attract tourists drawn by rich Carpathian mineral springs including geothermal springs.

The first mention of the use of geothermal water for medical purposes in Slovakia comes from the second half of the 14th century – Turcianske Teplice and Rajcke Teplice. However, more formal geothermal bathing facilities did not emerge until after World War One. The first Slovak town to build a geother-

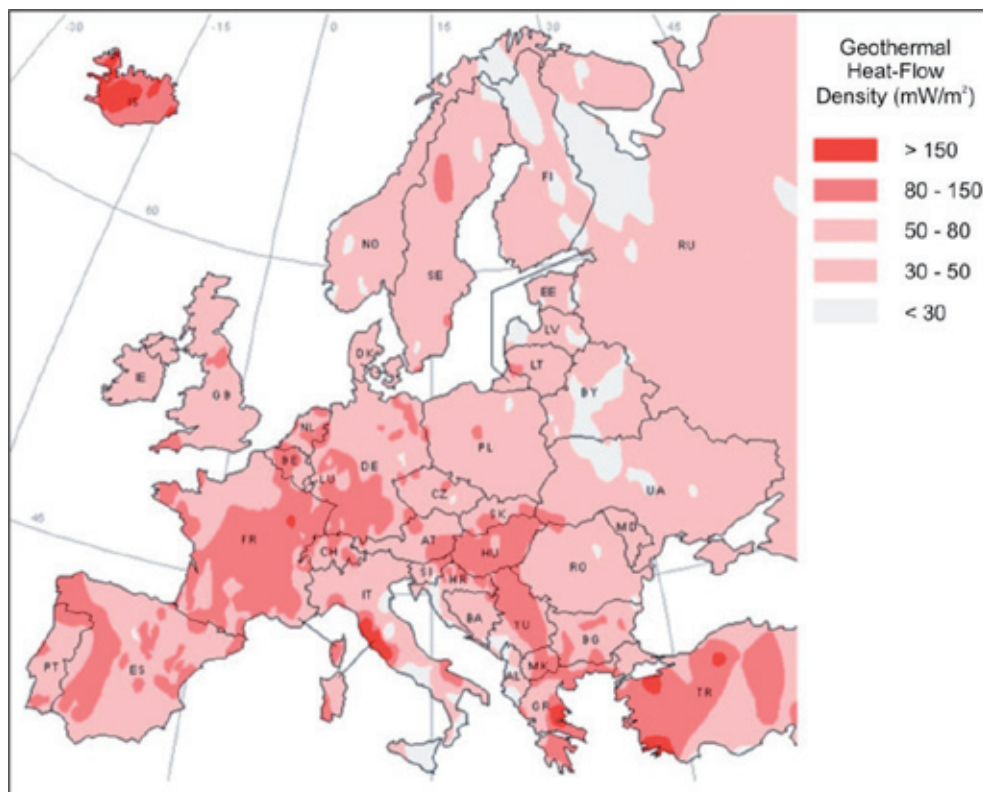


Fig. 1. Geothermal heat flow in Europe

Source: www.energetykon.pl/geotermia-wykorzystywanie-ciepnej-energii-wnetrza-ziemi,13163.html.

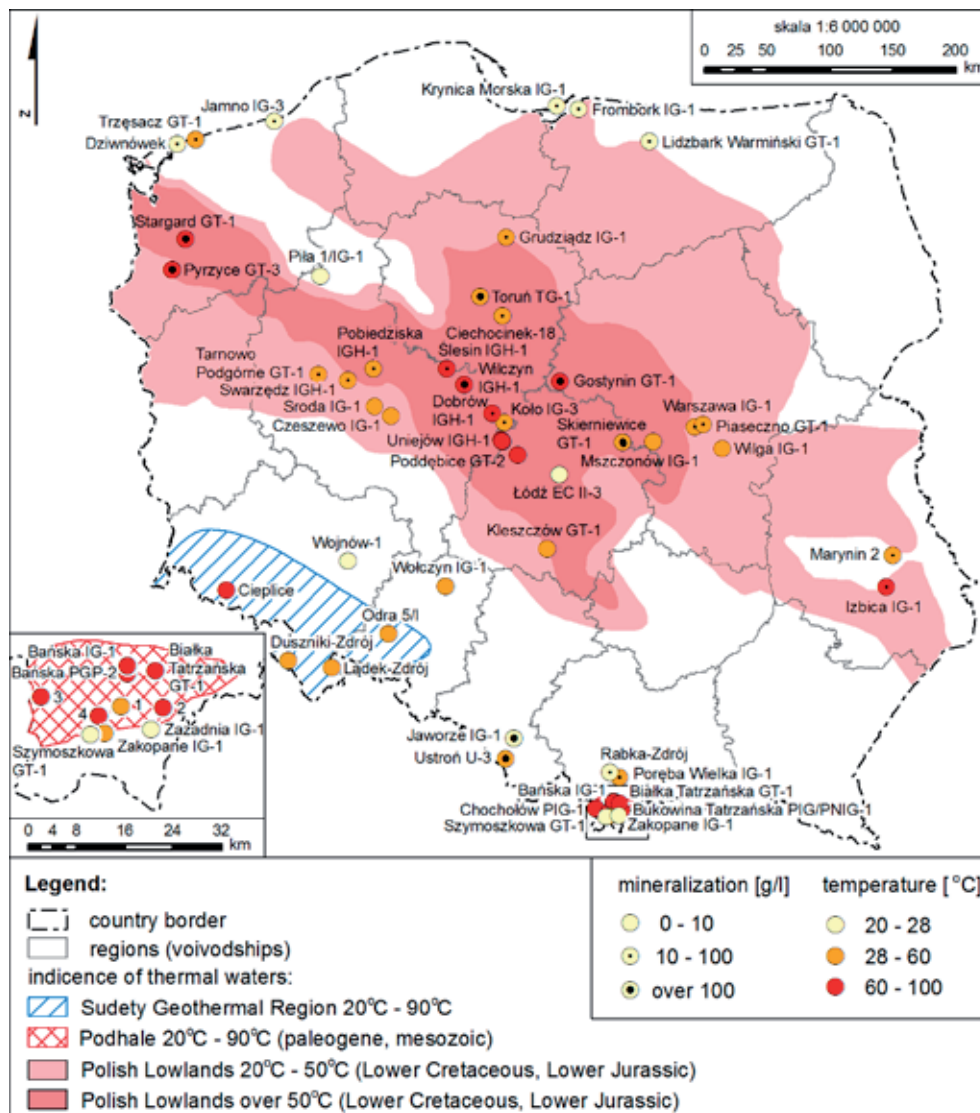


Fig. 2. Geothermal water in Poland

Source: M. Huculak based on Szuflicki 2012, after Płochniewski 1994.

mal pool was Orawice (Piziak 2013). The next Slovak town to build a geothermal pool was Vrbov.

The number of Slovak geothermal bathing facilities increased dramatically in the mid-1980s. New geothermal facilities emerged in traditional health spa towns including Družbaki Wyzne and Turcianske Teplice. The growing popularity of geothermal facilities prompted the construction of even more modern facilities at other locations (Piziak, Pawlusiński 2012). Increasing popular interest in active recreation after the year 2000 leads to the construction of large geothermal complexes in Liptowski Mikulasz (Tatralandia, 2003), Poprad (AquaCity, 2003), and Bardejov (Thermal Park Beszeniowa, now called Gino Paradise, expanded in 2005). According to the Slovak National Tourist Office in Poland, the three largest geothermal complexes in Slovakia attracted more than two million tourists in 2007 alone. More than half of the tourists had come from Poland (Piziak 2013). The large number of Polish, Czech and Ukrainian tourists prompted developers to build even more new facilities and upgrade existing facilities. The best exam-

ple of this is Tatralandia – the largest water park in Central and Eastern Europe. Tatralandia was acquired in 2011 by Slovakia's largest tourist services company – Tatry Mountain Resorts.

The success of Slovak geothermal bathing facilities in recent years, especially those in the Carpathian Mountains, is linked to substantial tourist traffic from Poland. The large population of southern Poland has helped fuel the growth of Slovak geothermal bathing facilities. However, the introduction of the euro in Slovakia in 2009 helped make Slovak tourist sites less competitive. This was also true of geothermal bathing facilities. In addition, similar facilities emerged north of the Carpathians in the Podhale region of southern Poland. While the number of Poles visiting Slovakia remains much higher than the number of Slovaks visiting Poland, the popularity of Slovakia has decreased in recent years (Fig. 3). Furthermore, the main reason for Polish tourists to visit Slovakia remains geothermal pools (Tab. 2). Data for the period 2003-2007 (pre-euro period) indicate that the largest Slovak geothermal bathing facilities attracted

Table 2. Purpose of visit to Slovakia in 2007

Purpose of visit (%)	Share of visitors (%)
Transit	31.5
Leisure	19.7
Work, education	14.8
Visiting family, friends	12.0
Shopping	9.4
Heritage tourism	8.7
Bathing	3.4
Other recreation	0.6
Total	100.0

Source: www.economy.gov.sk.

Table 3. Number of visitors at the largest geothermal bathing complexes in Slovakia in 2003-2007

Complex	Number of visitors (thousands)				
	2003	2004	2005	2006	2007
AquaCity Poprad	-	-	490	750	893
Aquapark Tatralandia	230	550	570	650	753
Termal Park Beszeniowa	490	500	500	500	488

Source: Piziak 2013 after Macko 2008.

immense numbers of tourists. The visitor growth rate increased the most at AquaCity Poprad and Aquapark Tatralandia, and stagnated at Thermal Park Beszeniowa (Tab. 3).

The decreased competitiveness of Slovak geothermal bathing facilities presents an opportunity for emerging Polish geothermal bathing facilities, which may draw on their competitors' experience.

By analogy with Slovakia, the history of geothermal facilities in Poland may also be analyzed in the context of health spas.

There existed about 400 health spa towns in prewar Poland. Guidebooks from that era indicate that several different types of spas were in existence at the time: (1) proper spas, (2) medical facilities, (3) summer spas, (4) climate spas, (5) bathing areas. Most of the spas were located in mountainous and foothill areas of Poland (Rogers 2009). Historical data indicate that Slovak spas were more developed than Polish spas. World War Two destroyed spa infrastructure both in Poland and Slovakia. Tourist traffic and spa towns came back to life after the war faster in Poland versus Slovakia. Most spas during the prewar period were owned by nobles and physicians.

Spa towns became much less popular in the period 1945-1989 when Poland and Slovakia were governed by communist regimes. Spa towns had been primarily recreational centers prior to World War II and their medical function had been a secondary one. The postwar communist period (1945-1989) turned health spas into closed facilities that resembled hospitals. According to Rogers (2009, p. 71): *The most successful health spas in Europe were not those with the best mineral waters or those offering the best balneology. Instead, these were spas with the best additional infrastructure, high quality customer service, good connections to major cities, and good marketing skills (...). After World War Two, health spas in Poland and Slovakia followed a different path than those in Western Europe. Health spas became an intrinsic part of the national healthcare system, while spas*

in Western Europe remained mostly private business enterprises. Today, spas in Poland and Slovakia may be contrasted with those in Western and Southern Europe as spas focused on traditional healing using mineral waters and mud, with some contributions from medical science.

The mismatch between the offering provided by Polish health spas and customer needs in a market-oriented economy is described by T. Wołowiec (2003, p. 97): *The prewar development of Polish health spas may serve as a model of health spa development, tourism, sports and recreation, as well as the cultural aspect of such entities.* The postwar period transformed health spas into large spa-type hospitals with group discipline and generic rules of operation (Wołowiec 2002 a,b, Wołowiec 2003, Golba 2001).

The political and economic transition following the year 1989 revealed the real state of Polish health spas, with all their weaknesses and degrees of mismatch between their offering and customer needs in a market-oriented economy.

The growth of geothermal bathing facilities in Poland in recent years occurred without any connection to existing health spa facilities. The popularity of Slovak geothermal facilities prompted Polish developers to build similar facilities in Poland. The late arrival of Polish geothermal bathing facilities may be explained by legal and organizational problems associated with the late issuance of drilling permits and the significant costs of construction (Piziak 2013).

The first geothermal bathing facilities in Poland were constructed after the year 2000. Most are located in the Podhale region of southern Poland: Zakopane (Aquapark, 2006; Polana Szymoszkowa, 2007, use of geothermal water in 2009), Szaflary (Termy Podhalańskie², 2008), Bukowina Tatrzańska (Terma Bukovina, 2008), and Białka Tatrzańska (Terma Bania, 2011). Two facilities in Central Poland were also constructed: Uniejów (2008), Mszczonów (2009). Nevertheless, Polish geothermal facilities are still smaller than Slovak facilities. The establishment of a geothermal bathing facility in Podhale is more difficult than that in Slovakia due to highly fragmented land ownership and complex land ownership structures. In addition, some facilities in Podhale must manage low water temperatures Polana Szymoszkowa) and limited water output (Bukowina Tatrzańska, Białka Tatrzańska).

2.3 Legal issues

The European Union does not regulate health spas and recreational facilities using geothermal water. Hence, such facilities are regulated at the national level. Two legal issues warrant consideration: (1) geothermal water exploration and use, (2) healthcare aspect of spa operation.

In many European countries (Hungary, Spain, France), health spa services are considered optional services and not basic services, as is the case in Poland, Slovakia and Germany (Rogers 2009).

In light of Slovakia and large parts of Poland being part of the Austro-Hungarian Empire in the 19th century, health spa services were governed by unified laws of the Empire at the time. When Poland regained its independence in 1918, its government made an effort to unify its legal system by combining or changing Prus-

² Now called Termy Szaflary.

sian, Austrian, and Russian laws. The same was true of Czechoslovakia, with a plethora of Austrian and Hungarian laws. The Act on Health Spas was passed in 1922 in Poland and remained in force until 1966. Czechoslovakia did not manage to change or amend its Austrian and Hungarian laws, which remained in effect throughout the prewar era (Rogers 2009).

Both Czechoslovak and Polish legislation maintained health spas purely as medical facilities during the era of communism between 1945 and 1989. In Czechoslovakia, the 1951 Act on Unified Healthcare and Disease Prevention made health spas a part of the national healthcare system. This law made every health spa a hospital. Another piece of Czechoslovak legislation on spas and springs passed in 1955 confirmed the status of health spas as hospitals. Both Poland and Czechoslovakia passed new laws on health spas in 1966. The Polish legislation classified health spas as a division of the national healthcare system.

Legislation on health spas changed again after 1989 when Poland and Czechoslovakia made the transition to democracy. Czechoslovakia dissolved into the Czech Republic and Slovakia in 1993. Slovakia introduced a number of new healthcare laws in 1994. These laws also covered health spas. Both Poland and Slovakia again changed their health spa laws in 2005 and these remain in effect today. The Polish piece of legislation is known as the Act on Health Spas, Health Spa Natural Areas, and Health Spa Townships (Journal of Laws 2005 No. 167 Item 1399). The legislation outlines the following notions:

- basis for, and the conditions of, operating and financing a health spa,
- areas of medical treatment at health spas,
- regulations on the management of health spa services,
- regulations on the assignment of health spa status or health spa natural area status,
- regulations on the cancellation of health spa status or health spa natural area status,
- duties of health spa townships.

The Act cited above as well as the Ordinance of the Council of Ministers of February 14, 2006 on Groundwater, Brine, Medicinal Salts, Thermal Waters, and Deposits of Other Medicinal Elements, as well as the Classification of Common Underground Resources from Specific Deposits or Geological Units as Basic Underground Resources (Journal of Laws No. 32, Item 220 from Feb. 27, 2006) defines the supply of thermal water as the supply of groundwater present within all geological units with a wellhead temperature of at least 20°C; does not apply to water drained from active and inactive mines.

Polish and Slovak laws regulate the exploration for – and use of – geothermal water in a similar manner. Both countries recognize geothermal water as that with a temperature over 20°C. The system of geothermal water use is based on concessions and environmental permits. However, it is easier to start a geothermal business in Slovakia than in Poland. The Slovak concession process is easier, which includes exploration and extraction permits for geothermal and medicinal water as well as brine. The concession procedure for geothermal water exploration is outlined in detail in the Act of June 9, 2011, Geological and Mining Law (Journal of Laws 2011 No. 163 Item 981).

2.4 Healthy lifestyles trend

The second half of the 20th century produced a rapidly growing trend – healthy lifestyles. According to G. Lasak (2008, p. 28-29): It is commonly believed that health tourism including spa tourism will be one of the fastest growing areas of tourism. This is undoubtedly associated with the aging of European society, generally increased awareness of health issues, increased desire to improve one's health regardless of age, and generally rising incomes. Modern lifestyles make it difficult to pursue long spa stays, which makes traditional spa treatments somewhat obsolete. Instead, short stays including weekend stays or other short stays are becoming increasingly common at wellness and spa facilities.

The increasing use of the word “wellness” is one indication of its popularity. The term wellness was formally introduced in 1948 by the World Health Organization (Rogers 2009 based on Jaworska 2006) and represents a linkage between the words well-being and fitness. It is important to note that the term *spa* is more specialized than the term wellness and includes elements of wellness that require water (spa water, mineral water, geothermal water, stream water and tap water).

While healthy lifestyles (e.g. spa and wellness) have been fashionable in Western Europe for decades, this trend is new in Poland and other countries in Central and Eastern Europe. The wellness philosophy arrived in Western Europe from the United States in the 1980s, where it had developed in the 1960s. Western European countries such as Germany, Italy, France, and Austria are leaders in the number of wellness facilities; however, the rate of growth of the wellness sector is decreasing due to the recent global economic crisis, general market saturation, and decreasing demand. Spa and wellness facilities are rapidly increasing in number in Central and Eastern Europe, in part due to the influx of EU funds (Poděbradský 2008).

It is not possible to compare wellness facilities completely objectively in light of the absence of databases offering data on all such facilities. The only data available consist of estimates produced separately for each given country using different estimation methods.

Wellness tourism has a relatively long history in Slovakia, thanks in part to clear tax laws (Wittemberger, Pinka 2005). The hotel industry in Slovakia estimates the number of hotels with wellness services at about thirty. Unlike in Poland, wellness centers in Slovakia (except water parks) are located in health spa towns and supplement the offering of health spas (Rogers 2009).

Spa services tend to be offered along with tourist and recreational services (e.g. wellness) in the Carpathian part of Slovakia. This makes it possible to manage seasonal tourist traffic. Wellness centers are available in Družbaki Wyzne, Rajecké Teplice, and Turčianské Teplice. Some of the largest facilities in Slovakia include geothermal pool complexes such as those in Liptowski Mikuláš, Beszeniowa, Poprad, and Orawice (Piziak 2013). Tourism data from 2007 (Macko 2008) illustrate the popularity of wellness services in Slovakia and their impact on tourism at the national level. The data show that seven out of the ten most popular tourist sites in Slovakia are geothermal bathing facilities (Tab. 4).

The wellness trend has a much shorter history in Poland and generally replicates trends in Slovakia. This is especially true of geothermal bathing facilities. The hotel industry in Poland estimates the number of hotels featuring wellness services to be about 100. Unlike in Slovakia, wellness centers in Poland tend to emerge at environmentally attractive locations, and usually not in health spa towns. Some spa towns in Poland restrict the introduction of wellness services, perceiving them to be competitive and not complementary. Some older health spas are introducing wellness services in an effort to modernize their customer offering.

While the history of wellness services in Poland is very short, it is characterized by a high rate of growth in the wellness industry including health spas. *Today's health spas include hospitals and traditional spa facilities as well as high quality hotels, pools, water parks, and other attractions. The current trend to prevent illness is creating a link between health spas and spa tourism* (Małecka, Marcinkowski 2007, p. 14).

The first Polish facility to offer comprehensive spa treatment was the Dr. Irena Eris Hotel Spa in the 1990s in the town of Krynica. Other spa facilities in the Carpathian Mountains followed suit including Zakopane, Wierchomla, Rytro, Wisła, Szczyrk, Bielsko-Biała, Ustroń. A number of large geothermal bathing facilities were built after 2005. The first such spa and recreational facility was built in Zakopane – Antałówka in 2006.

3 Current stage of development

3.1 Attractiveness of facilities

There are currently nine geothermal bathing facilities in Poland. Five out of nine are located close to each other in the southern Podhale region – two in the city of Zakopane, two in Bukowina Tatrzańska Township, and one in Szaflary Township.

Geothermal bathing facilities in Poland differ significantly in terms of size, number of pools, pool surface area, outside and inside pool layout, facility equipment, additional services (e.g. sauna), and supplementary services (hotels and conference rooms). The most complete source of information on these facilities is currently available at infobasen.pl, a website that compares the offerings of various facilities. Each facility in Poland, Slovakia and Hungary listed by infobasen.pl is ranked on a scale from 0 to 10 (maximum). The ranking consists of two parts: quality of

offering (70%), customer opinions (30%). Table 5 shows a list of the top ranked facilities in Poland and Slovakia.

Slovakia possess many more geothermal bathing facilities than does Poland. This includes many of the top ranked facilities. Seventeen facilities were identified in Slovakia that meet the criteria described earlier. The best of the best facilities listed on infobasen.pl are found in Hungary. Slovak facilities are ranked somewhat lower – none of the top five Slovak facilities were ranked an eight or higher. The highest rank was achieved by Aquapark Tatralandia in Liptowski Mikulasz and Thermal Park Velky Meder (7.4 each). Figure 3 and Table 5 show each of the facilities described herein.

3.2 Facility land use

Orthophotomaps as well as GIS software were used to estimate the amount of land used by geothermal bathing facilities. The number of available orthophotomaps was limited; hence, only six of the largest Polish facilities and five Slovak facilities were analyzed. The land use calculation was based on the assumption that a facility consists of buildings, external infrastructure, parking spaces, and external green areas such as grassy beaches surrounding outside pools.

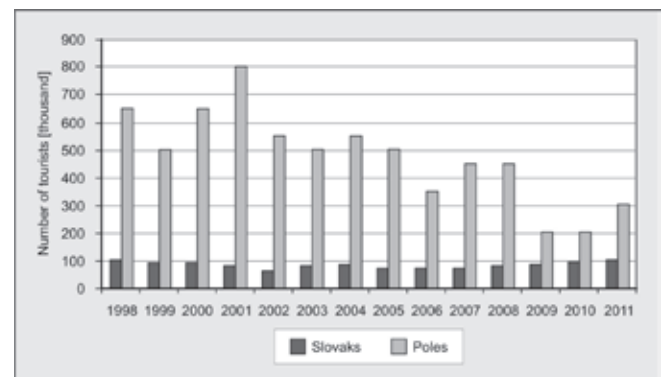


Fig. 3. Number of Slovak tourists visiting Poland and Polish tourists visiting Slovakia for at least one day (24 hours) in the years 1998-2011

Source: Piziak 2013.

Table 5. Top ranked Polish and Slovak geothermal bathing facilities

No.	Name	Town	Rating*
POLAND			
1	Park Wodny Bania	Białka Tatrzańska	8.1
2	Termy Maltańskie	Poznań	7.6
3	Terma	Bukowina Tatrzańska	7.3
4	Aquapark Zakopane	Zakopane	6.9
5	Termy Podhalańskie	Bańska Niżna	6.1
SLOVAKIA			
1	Aquapark Tatralandia	Liptovský Mikuláš	7.4
2	Thermal Park Velky Meder	Velky Meder	7.4
3	Thermal Park Besenova	Besenova	7.2
4	Aqua City Poprad	Poprad	6.9
5	Aqua Park Turcianske Teplice	Turcianske Teplice	6.8

* comprehensive rating for the entire complex from www.infobasen.pl.

Source: www.infobasen.pl.

Table 4. Top ten tourist attractions in Slovakia in 2007 (number of visitors)

Tourist facility	Rank	Number of visitors (thousands)
AquaCity Poprad	1	893
Aquapark Tatralandia	2	753
TK Velky Meder	3	615
TK Podhajska	4	575
TK Vadas	5	555
TK Besenova	6	488
ZOO Bojnice	7	371
Muzem SNP	8	331
Aquathermal Senec	9	255
ZOO Bratislava	10	250

TK – Termálne kúpalisko

Source: Macko 2008.

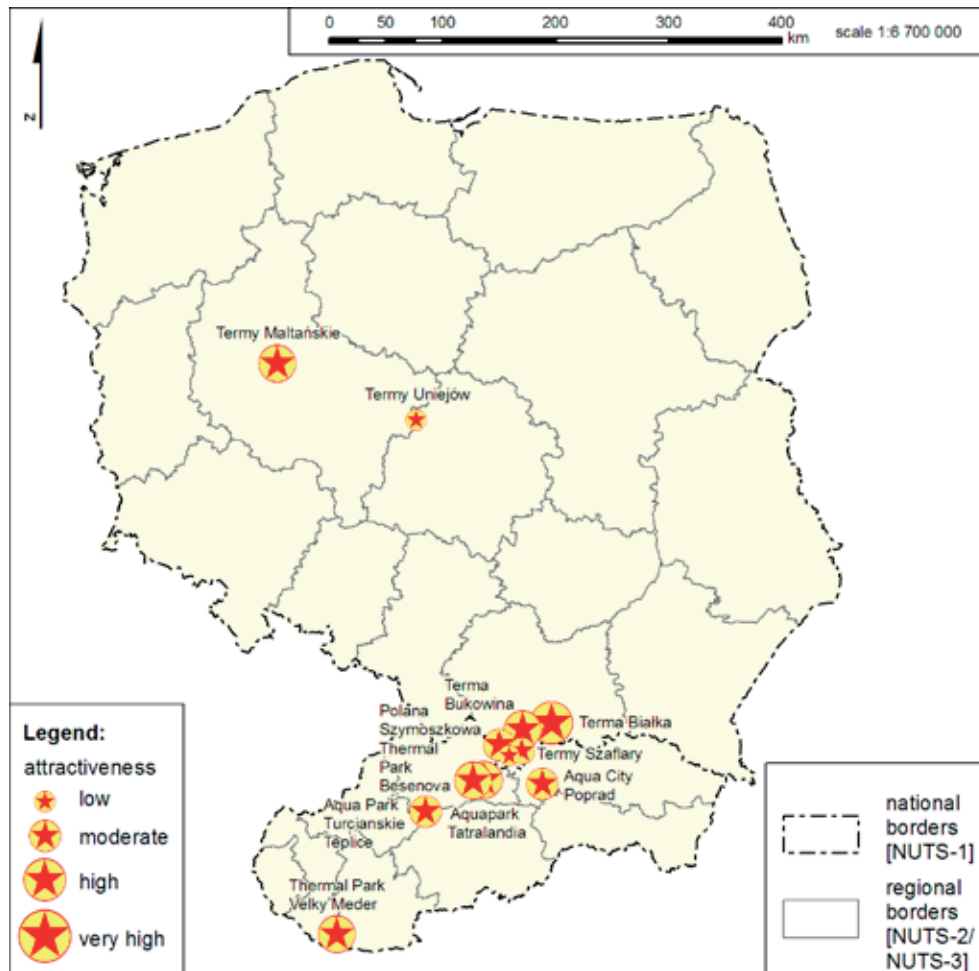


Fig. 4. Popularity of geothermal spas in Poland, Slovakia, Hungary and the Czech Republic according to www.infobasen.pl

Source: authors, on the basis of www.infobasen.pl ratings.

Polish geothermal bathing centers occupy relatively small areas – less than 5 hectares (Tab. 6, Fig. 4). The largest Slovak facilities are much larger – between 7 and 11 hectares. Polish facilities offer few outdoor attractions, usually limited to a single outdoor pool with only some accompanying infrastructure. The one exception in Poland is Termy Bukowina Tatrzańska. Polish geothermal bathing facility managers usually point to the high cost of outdoor infrastructure and the short summer season in Poland.

3.3 Level of competitiveness

Poland possess few geothermal bathing facilities compared to Slovakia, which has seven times fewer inhabitants but more than twice as many geothermal bathing facilities. In Slovakia,

there are about 300,000 residents per one facility (Tab. 7), while in Poland it is 4.2 million residents per facility. The disproportion is even larger given that the number of facilities in Slovakia is underestimated. Finally, Slovak facilities are distributed somewhat evenly throughout the country, while in Poland, they are concentrated in the small southern region of Podhale.

A comparison of ticket prices in Poland and Slovakia in 2013 is quite interesting (Fig. 5). The tickets analyzed were normal 2.5-hour tickets during the high tourist season. The ticket prices in Poland and Slovakia reflect broader macroeconomic trends. Tickets in Slovakia are more expensive, mainly due to the use of the euro. In Poland, ticket prices vary strongly by region and type of offering.

Table 6. Surface area of Polish geothermal complexes in 2011 (area given in ares)

No.	Name	Township	Total area	Outdoor section	Indoor section	Car parking	Other
1	Termy Podhalańskie	Szaflary	79.3	15.6	20.7	28.9	14.0
2	Terma	Bukowina Tatr.	395.0	41.0	32.4	81.2	240.4
3	Termy Uniejów	Uniejów	64.0	19.0	7.0	23.0	15.0
4	Polana Szymoszkowa	Zakopane	186.0	113.0	4.4	no data	no data
5	Aquapark Zakopane	Zakopane	93.3	7.9	31.9	16.7	36.8
6	Termy Maltańskie	Poznań	456.0	no data	no data	83.0	no data

Source: authors.

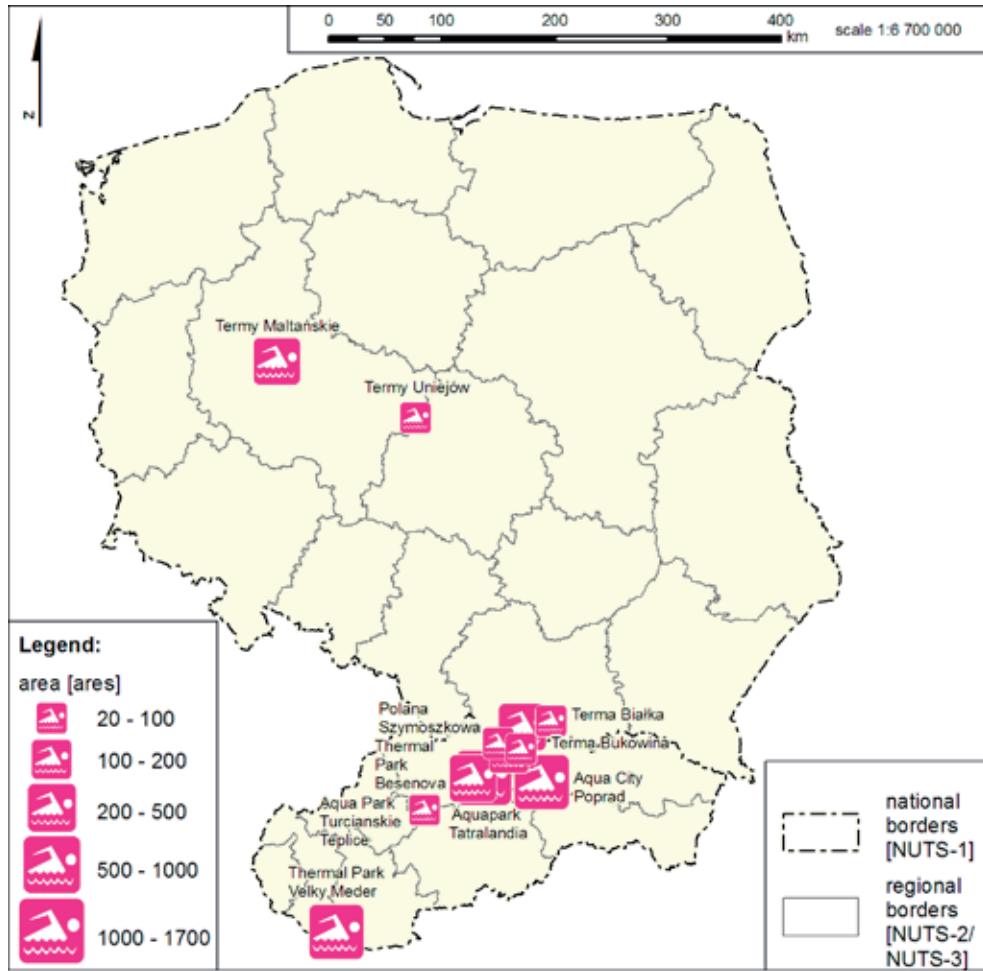


Fig. 5. Surface area occupied by geothermal pool complexes

Source: authors.

Table 7. Geothermal bathing facilities in Poland and Slovakia versus size of population

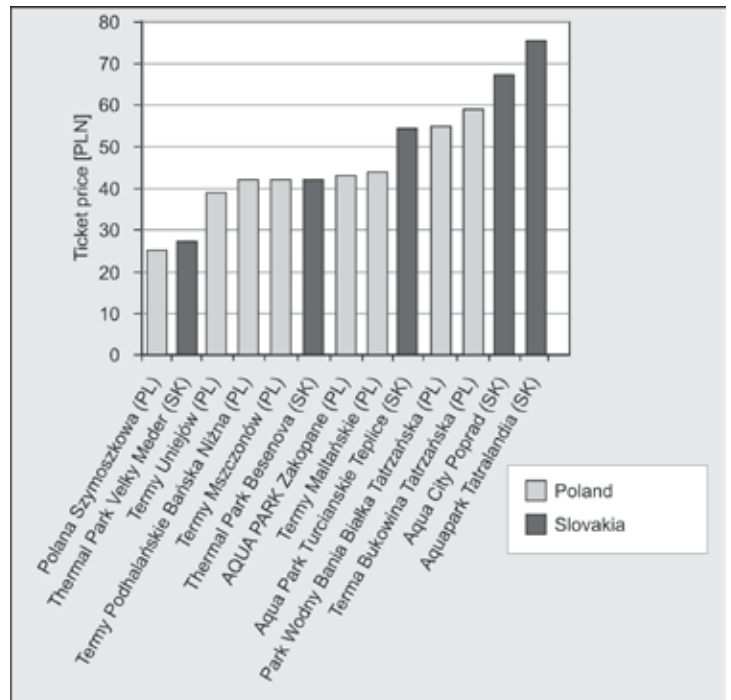
Country	Number of geothermal bathing centres*	Population (milions)	Population per 1 geothermal facility (milions)
Poland	9	38.0	4.2
Slovakia	17	5.5	0.3

* for Slovakia, the figures are based on the number of facilities listed at www.infobasen.pl

** including two to be commissioned in 2013

Source: authors.

Furthermore, prices at spa and wellness centers differ from prices at health spas. According to 2009 data (Skalska 2009), spa and wellness prices in Poland were much higher than those in other countries in Central and Eastern Europe. Prices at Polish spa and wellness centers in 2009 were markedly higher than those in Slovakia (Fig. 7). The opposite was true of hotel prices at health spas, which make Poland highly price competitive in Central and Eastern Europe. This is especially true relative to hotel prices at health spas in the Czech Republic (Fig. 6).



Note: price of standard 2.5-hour visit in the high season
Fig. 6. Ticket prices in Poland and Slovakia in 2013

Source: authors.

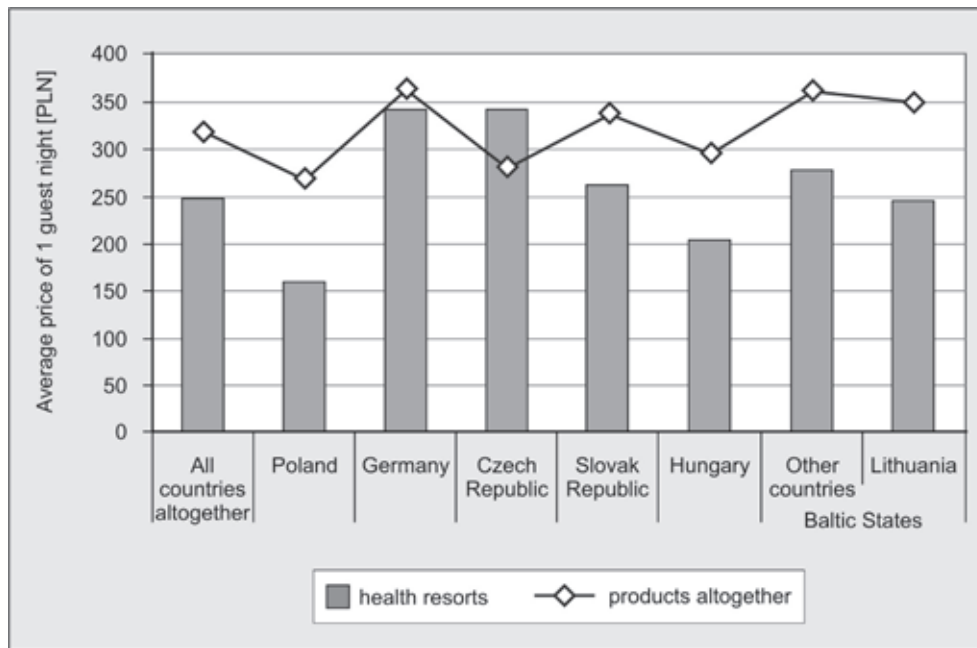


Fig. 6. Average hotel prices at health resort facilities in selected countries

Source: Skalska 2009.

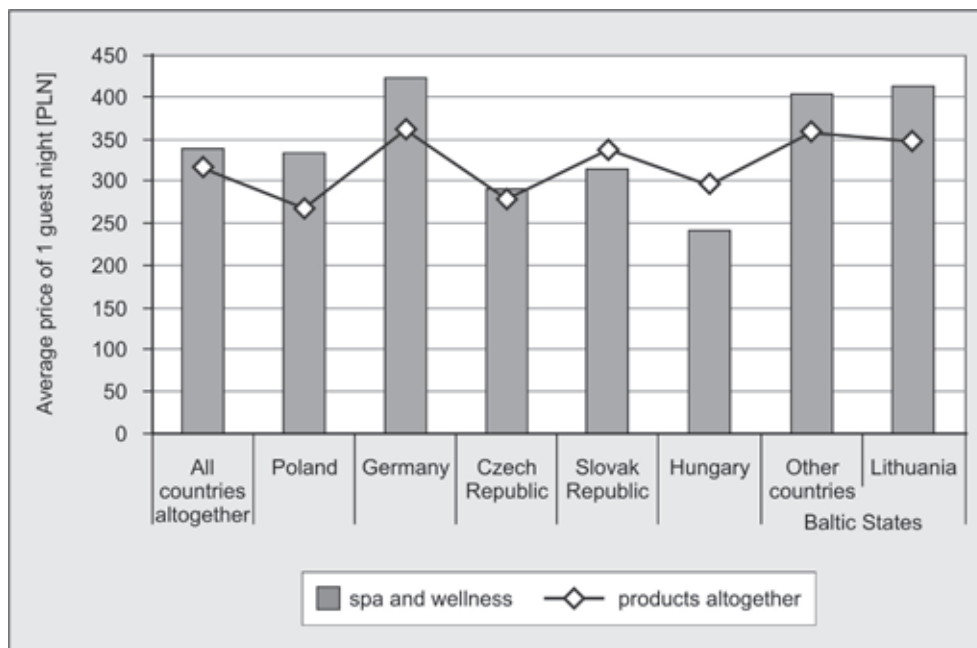


Fig. 7. Average hotel prices at spa and wellness facilities in selected countries

Source: Skalska 2009.

4 Conclusions

Poland and Slovakia share a number of historical, political, and cultural similarities. However, the two countries offer two very different climates for the development of geothermal bathing facilities and the result of this has been disparity in the development of such facilities. An array of determinants affect the development of the geothermal bathing industry at the local, regional and national level. Key factors at the national level include the supply of geothermal water, geothermal traditions, national history, legal issues, as well as the recent trend towards healthy lifestyles, which help fuel the use of geothermal bathing facilities.

An analysis of the determinants of geothermal bathing industry development indicates that faster development in Slovakia may be attributed primarily to a larger supply of geothermal water, which is concentrated in the Carpathian part of both Slovakia and Poland. Historical factors may also help explain the disparity in development. In Slovakia, health spas served as the basis for newly added recreational functions based on geothermal water after 1990. In Poland, health spas and recreational centers developed in parallel but separately from one another during the same time period.

A long tradition of health spa and geothermal bathing facility development in Slovakia makes the growth of the sector an

almost natural consequence of previous developments. Expansion of the infrastructure and improvements in quality reinforce local traditions and the trend towards the use of such facilities. Sporadic use of geothermal water for medicinal purposes in Poland has not created a tradition of geothermal bathing. Polish geothermal bathing facilities simply seek to replicate the success of their Slovak counterparts. Many Polish tourists have had the chance to visit geothermal bathing facilities while on vacation in

Slovakia or Hungary. The positive experience of Polish tourists abroad is generating demand at home. Local residents in Podhale have also taken note of the income generated by geothermal bathing facilities in Slovakia and the value these facilities add to the overall tourist experience in the Tatra Mountains. Geothermal bathing facilities are especially practical in mountainous areas, which experience bad weather quite frequently, and an alternative to hiking and other good weather attractions is needed.

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