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## **THERAPEUTIC VALORISATION OF THERMAL WATERS FROM RURAL LOCATIONS OF BIHOR COUNTY**

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**Abstract.** Bihor County has a long tradition in the therapeutic use of thermal waters. Except for the established spa resorts Felix, 1 Mai and Tinca, the study focuses on capitalizing on the spa potential in the *country side*. The objective of this study is to highlight the evolution and the therapeutic and recreational valorization of the spa factor in rural localities, not included in the state balneo-tourism management plan before 1989, nor in the network of the relevant ministry from the years after this date. The paper inventories the sources of geothermal water at the scale of Bihor county that were the object of individual or collective local valorization, at the level of villages or communes. The geological prospecting works and the special drillings carried out in the period 1960-1970 with the aim of identifying oil or natural gas deposits, sometimes highlighted important geothermal resources, many of them, being interpreted and exploited ad hoc by the rural population for the purpose spa. The paper analyzes how the phenomenon of therapeutic valorization of thermal waters in Bihoreni villages developed and evolved, as well as the impact on the social-economic environment. It also assesses the rural development forecasts presented in the strategic development projects at the level of some communes, regarding the exploitation of geothermal waters.

**Keywords:** wellness and spa, country side, geothermal water

### **1. INTRODUCTION**

In Bihor county, the studied area, the geothermal water comes from the geothermal aquifers: Salonta - Ciumeghiu - Tinca; Răbăgani - Beiuș, Săcueni - Marghita - Balc (Țenu, 1981).

Bihor county has a long tradition in the therapeutic use of geothermal water. Studies on thermal springs and their appreciation, which describe the research of the spa phenomenon in Bihor County, were as Czaran, 1903; Farcas, D. M., 2005; Marușca, 2008; Gaceu et al., 2009; Ilieș et al., 2011; Marian, 2012; Teodoreanu, Gaceu, 2013; Herman, Tătar, 2015; Vlaicu et al., 2016; Tătar et al., 2018; Ciurba (Pastor) et al. 2022.

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Bihor County has 60 localities with spa resources (Fig.1), standing out since the 1960s-1970s, a period in which geological research works were carried out to identify sources of oil, natural gas, and geothermal waters. Since that time, with the exception of Băilor Tinca, a number of 13 rural localities have capitalized on geothermal water by building thermal beaches, at the initiative and own effort of the residents (Sarcău, Livada de Bihor, Tămășeu, Mădăras, Sânicolau de Munte, Chișlaz, Săcuieni, Răbăgani, Cadea, Ciocaia, Mihai Bravu, Valea lui Mihai, Balc). These thermal beaches were initially managed by the Agricultural Production Cooperatives (C.A.P) until the Revolution of 1989, and after this period, when privatization began, entrepreneurship developed and the appearance of a varied range of internal or external funding sources began. Some of these locations have prospered, or even new geothermal water harnessing sites have been developed. Others remained in disrepair, many of them disappearing with the passage of time (Răbăgani, Mihai Bravu, Valea lui Mihai, Ciocaia, Cadea, Balc).

Today, seven thermal beaches are in operation in the countryside of Bihor county (Sarcău, Livada de Bihor, Tămășeu, Mădăras, Sânicolau de Munte, Chișlaz, Săcuieni).

Over time, the geothermal water, from the studied area, was also used in agriculture (Livada de Bihor), fish farming (Sîntandrei) and as a heating agent (Săcuieni, Livada de Bihor).

The objective of this study is to highlight the evolution and therapeutic and recreational valorization of the spa factor in rural localities, not included in the state balneo-tourism management plan before 1989, nor in the network of the relevant ministry from the years after this date, as well as the impact on the quality of the soil and groundwater in the area of exploitation - utilization – discharge. Except for the established tourist resorts Felix, 1 Mai and Tinca, the study focuses on the therapeutic use of thermal waters in the countryside.

## **2. DATA USED**

To carry out this study, data was collected through field documentation and bibliographic documentation. The documentation on the ground consisted of the inventory of geothermal water sources, at the scale of Bihor county, which were the object of individual or collective local valorization, at the level of villages or communes. The bibliographic documentation was carried out by collecting data from scientific articles (Turtureanu, 2007; Marușca, 2008; Gaceu et al., 2009; Marușca, Moț, 2010; Erdeli et al., 2011; Surdu et al., 2012; Kazandzhieva, 2014; Sebeșan et al., 2015; Nicula, Spănu, 2018), books (Țenu, 1981; Pricăjan, 1972; Măhăra et al., 1999; Pop, 2005; Florea, Munteanu, 2012), courses (Bendea et al., 2003), monographs (Berindei, Pop, 1972; Bradu et al., 2010), doctoral theses (Marușca, 2008; Handaric, 2018; Meșter, 2022), summaries of doctoral theses (Marian, 2012; Aluculesei, 2016), Sustainable development strategies 2021-2027 (SDD of the communes of Borș, Cherechiu, Chișlaz, Nojorid, Mădăras, Roșiori, Sălacea, Sălard,



### **3. ANALYSIS OF THE IMPLICATIONS GENERATED BY THE THERAPEUTIC VALUATION OF THERMAL WATERS**

The physical character rendered by the temperature and flow of geothermal water led the inhabitants of the villages to exploit the geothermal water, for spa purposes, for leisure and as a heating agent. The quality of the soil and groundwater in the exploitation-utilization-discharge area influences the purity of the water, the development of vegetation, the occurrence of endemic diseases, the socio-economic development. The pollutants that massively affect the soil and cause the degradation of the land, taking it away from agriculture, are: household waste, canal water, industrial water related to the oil exploitations from Suplacu de Barcău, Marghita and Abram (in addition to hydrocarbons, crude oil also contains hydrogen sulfide, sulfides, mercaptans, naphthenic acids, phenols, resins, aliphatic acids, nitrogen and metals such as: vanadium and nickel (Varduca, 1997), and the exploitation process led to the appearance of a specific landscape with canals, pits, collection pits of crude oil that changed the initial aspects of the relief), by the coal mining from Voivozi, Budoii, Varviz, Vărzari (these can determine high values of suspensions, fixed residues and sulfates, but also significant changes in the relief), zootechnical residues, but especially those related to modern soil cultivation (chemical fertilizers, pesticides, fungicides, insecticides, etc.). Next, we will analyze different implications and characteristics generated by the therapeutic use of thermal waters.

#### **3.1. Analysis of the regional characteristics of the exploitation of geothermal waters**

The inhabitants of the villages in the surroundings of the oldest spa resorts Băile Felix, 1 Mai and Băile Tinca, did not capitalize on the geothermal waters for spa or leisure purposes, because they benefited from the spa by moving to these locations. The inhabitants of the villages further away from these resorts, on their own initiative, set up pools with their own efforts to benefit from the "rudimentary" therapeutic and recreational effect of the geothermal water (Mădăras, Săcuieni, Chişlaz, Cadea, Tămăşeiu, Ciocaia, Sânicolau de Munte, Sarcău).

#### **3.2. Analysis of the touristic potential of the rural thermal beaches of county Bihor**

With the development of the thermal beaches by the villagers, they were given to the local authorities of the time (CAPs) for administration, which involved maintenance staff, which required remuneration. Thus, it was necessary to attract capital, involving the payment of an entrance ticket to benefit from bathing and recreation within the beach. The rural leisure and spa tourism of those times developed, bringing social benefits and being an element of community enrichment, due to the meeting of different cultures. Rural celebrations, celebrations on different occasions (Village Day) were organized, bringing an improvement in local life

through the creation and development of facilities and local infrastructure. Starting with the development of village thermal beaches and benefiting from the geographical location near the borders, they benefit from an international tourism level, being visited by tourists from neighboring countries, an increased flow is Hungarian tourists. At Sânicolau de Munte, the KRE SPA Thermal Center benefited in its development, in addition to the support of the European Union and the Romanian state, and the support of the Hungarian state. The new thermal center was inaugurated in 2022.

### 3.3. Analysis of the unsustainability of some rural thermal beaches in Bihor county

Through the passage of time and the failure to invest in maintenance at least at the level of functionality, it led to the disrepair or disappearance through demolition of the thermal beaches. This stage began with the privatization after the Revolution of 1989, when some of the thermal beaches came under different administrations, which, due to lack of financial support or low interest in their importance, remained in ruins, no longer functional, for many years (Mihai Bravu, Cadea, Valea lui Mihai, Ciocaia, Răbăgani, Balc). This is also due to the prioritization of the projects of the local administration, considering that, as a leisure base in a rural locality, it is not a priority in front of the sewage infrastructure, water supply or road paving.

*Table 1. Touristic and spa infrastructure at the level of rural thermal beaches in Bihor county*

No	Location	Accommodation infrastructure	Number of accommodation places	Restoration infrastructure	Number of restaurant seats	Leisure base	Wellness and SPA	Treatment base
1.	Mădăras	rooms	22	fastfood	-	-	-	not
2.	Livada de Bihor	modern cottages	8	restaurant terraces	30 170	sports field	-	not
3.	Săcuieni	wooden houses	60	restaurant with terrace	200	sports field playground	-	not
4.	Sarcău	villa and guesthouses	42	restaurant	25	sports field	dry sauna infrared sauna massage	yes
5.	Tămășeu	in the project	-	restaurant	70	-	massage	in the project
6.	Chișlaz	wooden houses	43	bar, fastfood, terasce	40	playground	-	not
7.	Sânicolau de Munte	wooden houses rooms guest house mobile homes	64	restaurant summer garden	100 140	place to play thematic events camps for children wine tastings	artificial sauna massage jacuzzi	not
	<b>TOTAL</b>		<b>239</b>		<b>775</b>			

### **3.4. Analysis of tourist and spa services offered by rural thermal beaches**

Tourist and spa services have managed to develop over time through the construction of accommodation structures from wooden houses, modern wooden cabins, to the construction of rooms, as well as villas and guesthouses classified with 3\*. In addition to these fixed accommodation structures, the vast majority of rural beaches have an on-site camping area for caravans.

Regarding the restaurant infrastructure, each rural thermal beach benefits from at least one restaurant structure, either of the fast food or restaurant category (Table 1).

### **3.5. Analysis of the administrative aspects of the exploitation of rural spa sources**

Starting from their development, where there was no tourism manager, the locals adapted to the geothermal resource, transporting the water in containers at home, using the water in their own bathrooms and at the same time making village pools by their own efforts, which were later given to administration of local C.A.P.s (Agricultural Production Cooperatives) until the end of the communist period in 1989. After this period, when privatization began, entrepreneurship developed, and a diverse range of internal or external funding sources began to appear, some of these locations prospered, of course, where the administrative factor was involved and concerned with their development and improvement (Sânicolau de Munte, Sarcău, Mădăras, Livada de Bihor), these developing modern accommodation and restaurant structures. Another category was maintained to function even today (Chişlaz, Săcuieni, Tămăşeşu). With the retrocession of the lands, part of the thermal beaches came into the possession of natural persons (Răbăgani), who requested the town hall to demolish the beach, or were sold to companies that failed to keep the beaches functional (Mihai Bravu, Valea lui Mihai, Ciocaia, Balc).

### **3.6. Analysis of the modernity characteristic of some facilities - wellness and spa (Sarcău and Sânicolau de Munte)**

While in some villages the thermal beaches have deteriorated, or even been abolished (Răbăgani, Mihai Bravu, Ciocaia, Valea lui Mihai, Cadea, Balc), some are functioning with modest improvements (Chişlaz, Livada de Bihor, Mădăras, Săcuieni, Tămăşeşu), there are thermal beaches that have developed, becoming wellness and spa centers (Sarcău and Sânicolau de Munte).

In Sarcău in the 1970s, four small pools were built so that the locals could benefit from the healing effect of the geothermal water, which over time became of local, then regional interest, being managed by CAP. As time went by, with no investment being made in the early 1990s, only two pools out of four were still operating. And since 2003, in a short time, these pools entered an accelerated development process, becoming the property of a private company, which preceded an auction, becoming the Adorianis Complex, with a treatment base, which provides assistance and

complex medical treatment, leisure base, 3 stars accommodation structures and catering structures, indoor thermal water pool, covered outdoor thermal water pool, three outdoor thermal water pools, semiolympic pool. This spa complex has a permanent regime.

At Sânicolau de Munte, in addition to the thermal beach that has been operating since 1973, today it operates with improvements in the accommodation structure from caravans, cottages, to a 3 stars guesthouse and restaurant base with a terrace, the semi-covered thermal pool. In the summer of 2022, the Thermal KRE SPA - Medical Beauty Center was inaugurated, located in the immediate vicinity of the old beach. Equipped with modern mobile homes, restaurant, thermal water pool and cold water pool. Both beaches operate on a permanent basis.

### **3.7. Analysis of the socio-economic consequences arising as a result of the arrangements**

With the establishment of the village thermal beaches, a social phenomenon was created, they offered the opportunity to spend free time, where the villagers met after work, and dozens and dozens of visitors came on Saturdays and Sundays. These thermal beaches being among the few, if not the only, recreational activities in the countryside during the communist period. Today, they are visited in a fairly high percentage by city dwellers, who prefer quiet areas and avoid the crowds in established resorts. The economic characteristic being under the tutelage of an administrative factor, jobs were generated, the contribution to the local budget increased through the payment of taxes, thus contributing to the growth of the local economy, through the accumulation of capital and contributing to the improvement of the quality of life of the villagers.

### **3.8. Analysis of the development prospects of the spa factor**

In order to identify the prospects for the development of the spa factor, we will refer to the rural development strategies presented in the strategic sustainable development projects at the level of some communes (Table 2). They may also be due to the status of a tourist resort that it benefits from and which facilitates access to new internal or external financing axes.

It is possible to observe the development perspective of the rural towns of Bihor, which have capitalized on the geothermal water resource since the 1960-1970s, they have projects regarding the capitalization of geothermal water by establishing treatment bases (Sântandrei, Tămășeu, Borș), in heating and production of green energy (Sălard, Roșiori, Livada de Bihor). In addition to these, there are rural localities that have in the portfolio of projects from the Sustainable Development Strategy, the execution of geothermal water drilling, in order to exploit it for heating and leisure (Cherechiu, Sălacea).



**Table 2. Projects to capitalize on the spa factor in rural localities in Bihor county.**

No.	Rural towns with a spa function	Strategic projects to capitalize on the spa factor at the level of communes in Bihor county
1.	<b>Borș</b>	- Borș Thermal Complex - Treatment Base - Extension of Hotel Iris - Conference room and SPA center. (source: Sustainable development strategy of Borș commune, 2021-2027)
2.	<b>Cherechiu</b>	- Location of thermal water exploitation borehole in Cherechiu commune. - Establishment of thermal camping in Cherechiu commune (source: Local development strategy for the period 2021-2027 of the Cherechiu territorial administrative unit).
3.	<b>Chișlaz</b>	- The utilization of renewable energy resources at the level of Chișlaz commune; - Local economic development by promoting green energy: thermal water, solar energy in public institutions in the commune; - Realization of leisure/leisure infrastructure connected to the thermal water exploitation project/ (source: Local development strategy of Chișlaz commune, 2011).
4.	<b>Livada de Bihor</b>	- The development of the geothermal water supply infrastructure and the expansion of the geothermal heating network - by executing new boreholes for geothermal water; - The development of the geothermal water supply infrastructure and the expansion of the geothermal heating network - by taking over and reworking the abandoned well in the commune of Nojorid; - Taking steps to obtain the status of a spa town/tourist resort of local interest. (source: Sustainable development strategy of the commune of Nojorid, 2021-2027)
5.	<b>Mădăras</b>	- Construction of an Aquapark in the town of Mădăras; - Capitalizing on natural potential; (source: Local development strategy of Mădăras commune, 2021-2027).
6.	<b>Roșiori</b>	- Realization of thermal energy production capacities based on geothermal energy in Roșiori commune, Bihor county (source: Local development strategy for the period 2021-2027 of the administrative territorial unit Rosiori)
7.	<b>Sălăcea</b>	- Establishment of the central heating system with thermal water in Sălăcea commune, Bihor county. - Location of thermal water exploitation borehole in Sălăcea commune. - Establishment of a thermal campsite in Sălăcea commune. (source: Local development strategy for the period 2021-2027 of Salacea territorial administrative unit).
8.	<b>Sălard</b>	- Thermal water well location in Sălard commune; - Aquapark construction in Sălard commune; - Increasing energy production from less exploited renewable resources (biomass, biogas, geothermal) (source: Local development strategy for the period 2021 - 2027 of the Sălard territorial administrative unit).
9.	<b>Sântandrei</b>	- Treatment/leisure base - thermal beach; (source: Sustainable development strategy of the commune of Sântandrei 2021 – 2027).
10.	<b>Tămășeu</b>	-The project includes a treatment base with accommodations, and an aquapark. (source: thermal beach administration)

#### 4. RESULTS AND DISCUSSIONS

The physical characteristics of geothermal water have determined the local people, since its discovery, to adapt and capitalize on geothermal water for spa purposes and not only, through their own efforts and initiative, creating pools, some of which today enjoy an increased flow of tourists, and at the same time the influence on the socio-cultural and economic life of the locals.

Regarding evolution of the therapeutic exploitation of geothermal water in Bihoren rural localities, from their development until today, out of the total of 13 rural thermal beaches, which worked until the Revolution of 1989 and the seven functional today, only one rural thermal beach has a base of treatment, which provides assistance and complex medical treatment.

Analyzing the perspectives of therapeutic spa development, three rural localities have in their portfolio projects to establish a treatment base.

The indisputable and unanimously recognized worldwide therapeutic efficiency of the existing balneoclimatic potential in Romania obliges all the responsible factors to intensify their efforts for the full use and superior valorization of the natural healing factors (Niță et al., 2007).

Therapies in wellness and spa tourism aim at relaxation, improving well-being with a holistic approach (Yurcu, 2017). The concept of wellness is the co-product of awareness of health, well-being and happiness (Koncul, 2012).

Rural tourism is a concept that includes tourist activity organized and led by the local population, and which is based on a close connection with the environment, natural and human (Nistoreanu, 2022), but it also influences social and cultural aspects, specialists in the field pointing out the fact that there may be changes in the value scale of the locals, or in the lifestyle or in the structure of the community (Botezat, 2009).

One of the important economic characteristics of tourism is that the income earned in the places of residence of the tourists is spent in the places visited (Holloway and Robinson, 1995).

Tourism development can have a considerable socio-cultural impact on communities, but few studies have attempted to separate the unique impact of tourism from the overall impact of modernization and clearly describe its mechanism (Likun, 2014).

The socio-cultural impact of tourism is how tourism contributes to changes in value systems, individual behaviour, family relationships, collective lifestyles, moral behaviour, creative expressions, traditional ceremonies and community organization (Abraham and Ady, 1986).

Tourism is an economic sector capable of providing a significant contribution to the economic growth of a region and the labor market and creates employment opportunities directly and indirectly through the supply of goods and services necessary for tourism activities (Livandovschi et al., 2018 ).

Spa villages support spa tourism of local and, rarely, regional importance, relying on a series of exploited and exploited tourist resources: carbonated mineral waters, skunks, springs or salty lakes, mud, etc. (Matei, 2005).

## **5. CONCLUSIONS**

The table of our analysis outlines the rural spa potential of Bihor county, by highlighting the multiple characteristics of the geothermal resource and its impact on the quality of life of the local residents, the infrastructure and the forecast situation of local spa development.

As an alternative exploitation of geothermal water, in addition to bathing and recreation, in the villages of Bihor, the geothermal resource is also used in heating, fish farming and agriculture.

Unfortunately, where the villagers worked for the valorization of the spa source, in the few villages, after the communist period, thanks to a private or public

administration, for various reasons, it determined the marked degradation of the thermal stands, totally annihilating the valorization of the thermal waters.

A significant opportunity is represented by the picturesque environment in the area of the thermal beaches, it causes tourists, especially from urban areas, to take advantage of the tranquility, by visiting and spending their vacation, taking into account that almost all these beaches have accommodation structures, fixed, mobiles or campsites.

The wellness and spa segment of the Bihoren rural thermal towns is on the rise, in many of them, more and more emphasis is placed on these modern tourist services, in their development plan, but also in the sustainable development strategy.

Regarding the forecast characteristic of the development of the rural spa factor at the level of Bihor county, there is a gratifying balance found in the sustainable development strategies of some municipalities, a consistent number of projects aim at the therapeutic valorization of the spa factor, which provides for the valorization of rural spa sources at the level of Bihor county.

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