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HANDBOOK ON BEST PRACTICES IN ENVIRONMENTAL & SOCIO-ECONOMIC PRESSURES MITIGATION & CONFLICT SOLVING

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PROJECT PARTNERS

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EXECUTIVE SUMMARY

This handbook showcases the main best practices in environmental and socio-economic pressures mitigation and conflict solving detected by the HealingPlaces consortium made up by partners from seven European countries (Poland, Hungary, Austria, Croatia, Czech Republic, Slovenia, and Italy).

"HealingPlaces - Enhancing environmental management capacities for sustainable use of the natural heritage of Central European SPA towns and regions as the driver for local and regional development" is a project funded by the EU Interreg Central Europe programme (2014 -2020) aimed at improving the current management practices of mineral and thermal water and other valuable natural resources of SPAs.

Mutual learning is a pillar of the project structure and, for this reason, it results particularly important to take inspiration from the main virtuous examples implemented in each of the project partner countries regarding the different aspects of environmental protection.

Although HealingPlaces main concern is water system (especially thermal and mineral water resources), within the project, the SPAs natural system has been considered as a whole and, therefore, have been taken into consideration issues such as the protection of nature and biodiversity, landcover phenomenon, air quality / microclimate pressures and the protection of cultural heritage.

For this reason, this handbook provides a valuable overview of the best practices implemented in seven Central Europe countries in the field of protection and mitigation of existing pressures and potential threats derived from climate change effects, land use, population density, energy consumption, water consumption and waste generation, disruption of ecosystem, etc… in consideration of three main macro areas: policy / legislative, environmental and socio-economic.

After presenting the project and providing a context framework of the current status of the SPAs natural resources, in the first chapter a general overview of what is intended by best practice will be analysed, as well as the main existing pressures and potential threats on Central Europe SPAs natural system.

The second chapter will be focused on the analysis of the main pressures for SPAs sustainable development in terms of policy and legislation, specially related with the issues of hands-off governance, fragmentary management and short-range vision. For each of these pressures and potential threats identified, best practices will then be presented to mitigate their effects.

The third chapter will deal with the complex question of the main environmental pressures that are currently affecting the Central Europe SPA system, namely: the depletion of water, the climate change effects, the disruption of ecosystem and the harmful effects of an expanded agriculture, as the more burdensome for SPAs sustainable development. A set of best practices will then be identified as a source of inspiration for the implementation of new technologies and / or new forms of cooperation between the different stakeholders potentially able to mitigate the effects.

To conclude, the fourth chapter will analyze the socio-economic threats affecting the SPAs system in Central Europe, including the increasing urbanization rate close to the SPAs areas and the advent of mass tourism. Also in this case, thanks to the work of the partners, for each of the potential threats a best practice potentially able to contrast them will be presented, for a more responsible and aware tourism and on a more sustainable urbanization in harmony with the natural environment.

1. HEALINGPLACES PROJECT

"HealingPlaces - Enhancing environmental management capacities for sustainable use of the natural heritage of Central European SPA towns and regions as the driver for local and regional development" is a project funded by the EU Interreg Central Europe programme. The project started in April 2019 and will end in June 2022. The project is run by 10 partners, led by Central Mining Institute (Katowice, Poland).

The project aims at improving the current management practices of mineral and thermal water and valuable natural resources of SPAs. Indeed, it is assumed that the heritage of SPAs and related natural resources are subject to environmental and economic pressures and conflicts, so one of the main challenges for the future will be to protect them in order to allow their further sustainable development.

The project consists of three different work packages: WPT1 "Environmental Mapping and Assessment" with the aim of developing common tools for an integrated assessment of current and expected threats and pressures on mineral and thermal water resources in SPAs. Its final results is the development of a common methodology and ranking criteria for the assessment of the impact strength on mineral and thermal water resources.

WPT2, closely connected with WPT1, experiences the practical implementation of sustainable thermal water use in SPAs, throughout the implementation of different Pilot Actions located in the regional territories of PPs. These Pilot Actions implemented on a local scale provides the practical elements for the development of the Integrated Strategy of the CE regions.

And WPT3, starting from WPT1 tools and the Pilot Actions implemented in WPT2, establishes an Integrated Strategy for Sustainable Management of SPAs natural resources.

1.1. THE MAIN OBJECTIVES OF WORK PACKAGE 3

The main objective of WP3 “Management strategy & guidance: Integrated Strategy for sustainable development” is to establish a shared Integrated Strategy for the sustainable management of SPAs natural resources, based on the tools and research of WP1 and the results of the pilot actions implemented in WP2. In particular, starting from the involvement of most relevant stakeholders through Regional Working Groups (RWGs) and from the lessons learnt from the best practices on management of environmental and socio-economic pressures in PPs regions.

WP3 consists of three different, but interconnected activities:

- the stakeholder involvement assessment for integrated SPAs resources management;
- the collection of the best practices in environmental and socio-economic pressures mitigation and conflict solving in PPs regions;
- the elaboration of an integrated strategy for sustainable management of SPAs most valuable natural resources and the collection of regional results and their integration into international partnership (transferability & sustainability).

Regarding the second activity, the collection of best practices carried out by the project partners within the Deliverable D.T3.2.1 *SWOT analysis of best practices existing in partners countries regarding environmental and socio-economic pressures mitigation and usage conflict solving* (including air pollution, mass tourism, investment pressure, etc.), is particularly inspiring.

Indeed, the Deliverable provides a multi-criteria decision-making approach for ranking valorisation strategies of natural resources aimed at promoting their restoration and conservation, as well as creating economic benefits.

The following handbook, strictly linked with the D.T3.2.1, brings together the main evidences that emerged within the Work Package 1 and the best practices individuated within the Work Package 3, as possible solutions to the main threats to the SPA natural system.

2. INTRODUCTION

Presence of SPAs is a well-known common feature of the Central Europe countries. They are not only an element of historical heritage but also an important element of the economy in the sectors of health, wellness, and tourism.

Following M. Smith and Puczkó (2014)[1], T. Mainil et al. (2017)[2] we use the definition of SPA tourism as: 'tourism focused on the relaxation, healing or beautifying of the body in SPAs using preventative wellness and/or curative medical techniques. We follow this definition because it makes specific reference to SPA facilities, and both preventative and curative medical techniques, as crucial elements of this type of health tourism'.

For centuries, SPAs have attracted people for rejuvenation and healing purposes, but in the wake of the current wellness trend, SPA services and facilities are being developed to better meet people's holistic wellness interests[3]. In recent decades, SPAs have increased in popularity as they (and other forms of wellness consumption) are no longer seen as conspicuous consumption but rather a necessary part of healthy living[4]. As the wellness and SPA industries continue to expand and grow, also their impact on the environment, especially on water, is more pronounced.

Therefore, the common challenge of whole Central Europe is the sustainable management of mineral and thermal waters which on one hand form the basis for SPAs existence and on the other are subjected to various threats and pressures related to economic and urban development, mass tourism, and carless sector policies.

In this context, in which the trade-offs between the preservation of natural and cultural assets and the adaptation to alternative and economically profitable uses play a key role in investment decisions, multi-criteria analyses provide robust theoretical and methodological frameworks to support decision-makers in the design and implementation of adaptive strategies for natural resources management.

SPAs development connected with tourism development can put enormous pressure on an area and lead to impacts such as soil erosion, increased pollution, discharges into the sea, natural habitat loss, increased pressure on endangered species and heightened vulnerability to forest fires. It often puts a strain on water resources, and it can force local populations to compete for the use of critical resources.

From a managerial perspective, many attempts have been performed to stress the relevance of the correct exploitation and parallel preservation of natural resources in specific areas to enhance tourism activities. The synergic combination of natural resources, healing effects, activities, and treatments represents a key reference for managers and policy makers to identify areas of intervention, marketing actions, and practices for industry development. This is corroborated by the importance of health issues due the rise in chronical diseases and an aging society, also compounded by the long-term effects of the current COVID-19 pandemic on business and people.

1 Smith, M. K., & Puczkó, L. (2014). Health, tourism and hospitality: Spas, wellness and medical travel.London: Routledge

2 Mainil, T, Eijgelaar, E, Klijs, J, Nawijn, J, Peeters, P, 2017, Research for TRAN Committee – Health tourism in the EU: a general investigation, European Parliament, Policy Department for Structural and Cohesion Policies, Brussels

3 Smith, M. K., & Puczkó, L. (2014). Health, tourism and hospitality: Spas, wellness and medical travel.London: Routledge

4 Guillet, D. B., & Kucukusta, D. (2016). Spa market segmentation according to customer preference.International Journal of Contemporary Hospitality Management,28(2), 418-434.doi:10.1108/IJCHM-07-2014-0374

In recent years, governments, public institutions, and local communities have devoted perhaps not enough attention to the identification of promising strategies for the preservation and valorisation of natural SPAS resources, through the adoption of decisions on the management of natural and cultural heritage assets based on multiple, often conflicting, criteria and on the stakes of various, and potentially non-consensual actors and stakeholders.

Indeed, the problem of the lack of sustainable development of Central European SPAs requires approaches which reflect multi-stakeholder & cross-boundary interactions. SPAs development requires cooperation between various levels of local government and the adoption of quadruple helix co-operations in key sectors linked to thermal & health industry.

Even if, some promising strategies are emerging to bring forward an increasingly conscious tourism and sustainable development of SPAs, including:

- the development of the "Green SPA", where natural influences become an element of both the "curative" design and the infrastructure part and the general program;
- the design of treatment programs and "tourist packages" that increasingly highlight the native botanical, geophysical or cultural characteristics, thus creating greater awareness for guests;
- the adoption of approaches aimed at eliminating toxic chemicals, the use of "eco-compatible" products, the installation of water purification systems;
- the engagement in public conversations, encouraging responsible media coverage and education for the public and politicians.

Referring to this complex contest, the starting point of this handbook is the work done by the HealingPlaces Partnership within the Work Package 1 Environmental mapping and assessment, focused on the collection and analysis of data and information regarding the existing status, pressures and potential threats for the sustainable development of SPAs in seven Central Europe Countries, tackling a common environmental challenge of the whole Central Europe area, which is the pressure on natural resources in SPAs.

In particular, in editing this handbook, we base on main evidences identified within:

- Report of comparison of the legal, environmental, socio-economic status of SPAs in partners regions (D.T1.1.2);
- Transnational report on comparison of most important environmental pressures & conflicts in SPAs (D.T1.3.2);
- Report on comparison of societal awareness of threats for natural resources in SPAs project regions (D.T1.3.4);

… and on the main results emerged within the Deliverable D.T3.2.1 SWOT analysis on best practices, in which each partner was asked to identify and collect at least 3 virtuous examples of environmental & socio-economic pressures mitigation & usage conflict solving, in three different fields/scopes:

- policy/legislation;
- cooperation;
- technology.

Having in mind that although HealingPlaces main concern is water resources management (especially thermal & mineral water resources, surface waters), it takes into consideration also pressures / conflicts with nature protection, biodiversity, landscape (land-use), air quality / microclimate, etc.

Therefore, based on the main existing pressures and potential threats detected within the Work Package 1, this handbook provides an overall analysis of the best practices existing in partners countries regarding environmental and socio-economic pressures mitigation and usage conflict solving (including air pollution, mass tourism, investment pressure, etc.).

The information included in it will help practitioners, technicians, the scientific community, and policy makers to identify effective tools, practices, and policies that aid them in establishing fertile grounds for more sustainable management of SPAs resources, to foster a more sustainable society and regional economic growth.

A.

CHAPTER 1

REFERENCE FRAMEWORK

3. UNDERSTANDING OF BEST PRACTICES

In accordance to the definition in Merriam – Webster dictionary, ***best practice*** is understood as "a procedure that has been shown by research and experience to produce optimal results and that is established or proposed as a standard suitable for widespread adoption".

In the field of EU projects, we can define as ***best practices*** a set of guidelines, ethics, or ideas that represent the most efficient or prudent course of action. Generally, best practices dictate the recommended course of action and they are often set forth by an authority, such as a governing body or management, depending on the circumstances.

The importance of best practices derives from their usefulness. They could be useful to share and disseminate experiences, transfer specific know-how or represent an effective reference for drawing ideas, information, and useful solutions to graft innovative developments or implementations to one's initiatives that can be adapted to local context and specific needs.

Also in the environmental field, the usefulness of disseminating and sharing good practices is widely recognized.

The environmental good practices often propose innovative and reproducible projects, that could become reference models for local administrations, scientific community, and private companies. They often purpose a path toward sustainability intended as a balance between environmental protection and economic development.

But, to be a best practice, the solution has to meet some requirements. A best practice can be defined as such when:

- impact across different sectors. For instance, they could regard mainly on environmental managerial aspects, but also influence the governance model and climate resilience into research and development projects;
- identify long-term socioeconomic benefits and costs. Models of good practice are usually presented in terms of benefits. Many projects highlight benefits in physical terms, before and after the implementation of the activities, but a best practice also have to take into consideration that every action's implementation have cost implications, so the costs of investment and maintenance should be clear and acceptable for all stakeholders involved;
- identify the appropriate implementation scale. Project operations across states add complexity during implementation. Not every best practice has to be cross borders, therefore a good practice is the one that suits the best and most effective level of implementation (local, national, or international);
- balance the roles of a different kind of knowledge and know-how. The combination of different levels is always an important added value. Each Stakeholder is important and he/she has to be put in the best position to bring his/her knowledge and point of view to the project.

Basing on this overall vision, within HealingPlaces, as best practice we understand any model, partnership, or scientific, technical, or political procedure able to contribute to the mitigation of negative effects of existing pressures or potential threats on SPAs natural resources ecosystems, able of producing benefits on specific field but also in more fields crosswise.

Indeed, one of the most important characteristics of the HealingPlaces best practices is their transversality concerning both the field scope and the topics related. Indeed, the project and the initiatives are taken into consideration can respond to a prevalent and specific "need", but at the same time, they positively influence other purposes with their actions.

4. EXISTING PRESSURES AND POTENTIAL THREATS TO SPAS ECOSYSTEMS

As existing pressures and potential threats we consider the impacts on the quality of thermal water in stricto sensu as well as the effects of increasing level of tourism impacts.

Natural deposits of mineral waters and hot springs are well known in Central Europe. Their healing power is widely used and they are important drivers of local and regional economies in the health care, wellness, and tourism sectors. However, a common challenge is the sustainable management of mineral and thermal waters which on one hand is the basis for the existence of SPAs and on the other hand is the subject of various threats and pressures related to economic and urban development, mass tourism, and careless sector policies.

According to the last data available from Global Wellness Institute (2018), SPA establishments in Europe are 46,282 (149,000 worldwide), from which 5,967 thermal / mineral spring establishments use mineral and thermal water resources for bathing, drinking, and to treat various health problems.

Parallel to the great development of SPAs, wellness tourism has grown considerably in recent years, placing mineral and thermal springs at the centre of the economic development of a multitude of European territories.

Indeed, from an economic point of view, tourism is a growth engine for many countries. In particular, healing water and thermal tourism have represented (still represent) an important socio-economic resource in many (rural) areas and thus support regional future development.

Particularly in combination with other natural resources such as air and wood and through the establishment of health systems and competencies (nature parks, organic farming, etc.), medicinal water can contribute as a “regional treasure” to sustainable development in European regions.

But, as they represent such a delicate ecosystem both from an environmental and a social point of view, it is of fundamental importance to find the properly tools to protect them. The first step to implement protection is therefore to identify the source of existing pressures and potential threats.

Thanks to the research activities carried out within the Work Package 1 “Environmental mapping and assessment” we can divide the main pressures and potential threats on SPAs, as belonging to three macro categories:

- policy / legislative pressures;
- environmental pressures;
- socio-economic pressures.

From a legislative point of view the main threats to a sustainable management of thermal natural resources are: the fragmentary legislative framework that, on one hand, allows a wide autonomy of each state, on the other hand guarantees few protections for a sustainable management of natural resources. This not homogeneous framework in terms of policy and regulation at European, national and local level gives rise to a series of risks for an efficient governance of SPAs natural resources, among these a hands-off governance, a fragmentary management of SPAs natural resources as well as a lack of a long-term vision to their development are the main threats individuated within Healing Places.

While, from an environmental perspective, SPAs development, and connected with it tourism increasing, can put enormous pressure on an area and lead to impacts such as soil erosion, increased pollution, discharges into the sea, natural habitat loss, increased pressure on endangered species and heightened vulnerability to forest fires. Undoubtedly one of the main environmental pressures is still represented by human impact. In fact, man inevitably influences every area of the earth where he settles, builds or spend time.

In accordance with Strategic Environmental Assessment (SEA) logic, below you can find a list of negative environmental impacts on:

- Air quality;
- Climate effects;
- Energy efficiency;
- Water pollution;
- Biodiversity, flora and fauna;
- Acoustic environment;
- Soil erosion;
- Cultural heritage;
- Land use;
- Waste production.

Among these, we can consider as an existing and potential pressures on SPAs natural system:

- Disruption of natural ecosystem and biodiversity;
- Depletion of water (surface water and groundwater, including thermo-mineral waters);
- Climate change effects;
- Soil and potentially harmful expanded agriculture.

From a socio-economic point of view, the main issues are concerned with the relationship between social and economic factors within society. These factors influence how a particular group or socio-economic class behave within society. To better understand and predict the effects of these parameters, so-called megatrends are described in science. These are global, sustained, and macroeconomic forces of development that are largely shaping the socio-economic landscape of today's world. Their key characteristics are the irreversibility and the long-term nature of the ongoing changes. They cannot be stopped by individual companies, institutions, or states, although they can be ignored for a certain period. Depending on the perspective and the degree of detail, very different megatrends can be taken from the current literature. However, many of these trends can be grouped into three large categories: Technologies, Demographics, and Resources.

Basing on megatrends analysis within HealingPlaces project two main assumptions can be asserted about the socio-economic pressures:

- ongoing demographic changes have a significant impact on the future shape of health and health prevention and care, as well as health tourism. Due to the process of ageing of the society, topics such as health and especially health care are becoming increasingly important. Both in the private and the medical sector, the demand for health applications and thus the need for medicinal waters will increase (Water for baths, thermal pools, new applications, etc.). The pressure on the existing water depots will increase;
- growing urbanization and its consequences will challenge the environment and its resources. The resulting changed living conditions (desire for nature, desire for individuality) will further increase the pressure on the water reservoirs.

TAB. 1. MAIN FIELDS SCOPE, MAIN PRESSURES, AND MAIN BEST PRACTICES IDENTIFIED BY HEALINGPLACES PARTNERSHIP

FIELDS SCOPE	PRESSURES / THREATS	BEST PRACTICES
POLICY / LEGISLATIVE	HANDS-OFF GOVERNANCE	The Lake Hévíz Comprehensive Protection Program
		C-Track 50. Putting Regions on Track for Carbon Neutrality by 2050
		Operational monitoring of water concessions
	FRAGMENTARY MANAGEMENT	Thermal-Health Industrial Cluster
		The Unique Management of the Euganean Hills Homogeneous Hydro-mineral basin (BIOCE)
		INKOBA Inter-communal business settlement initiative
	SHORT-TERM STRATEGIES	The concept of SPAs development and balneology of the Karlovy Vary region
		ERGO Hestia Annual Contest
ENVIROMENTAL	DEPLETION OF WATER	Technology for the reuse of thermal water to mitigate environmental pressure on SPAs
		Optimized recycling of thermal and medicinal water and reduced their environmental impact using innovative microbiological, industrial, and cavitation techniques
	DISRUPTION OF NATURAL ECOSYSTEMS	Eau Concert 2 project "Concertation and Actions of valorisation of fluvial ecosystems from Italy"
		Project Life to Grasslands
	CLIMATE CHANGE EFFECTS	Geothermal energy - a basis for low-emission heating, improving living conditions, and sustainable development co-financed by the European Economic Area (EEA) 2009-2014 from Poland
		Information System for Analysis and Assessment of Groundwater Resources in Dependence on Human Activities and Climatic Changes
	POTENTIALLY HARMFUL EXPANDED AGRICULTURE	"0-km policy - short supply chains" - Terme Sveti Martin
SOCIAL	INCREASING MASS TOURISM	Well, well...Spa Luhačovice
	INCREASING LEVEL OF URBANIZATION	Standortooe.at Platform

B.

CHAPTER 2

BEST PRACTICES ADDRESSING THE MAIN POLICY / LEGISLATIVE PRESSURES TO SPAs SUSTAINABLE DEVELOPMENT

The regulations regarding the establishment, management, and control of health resorts and SPAs (including the use of healing natural resources) are autonomous in each EU member state. At the EU level, there are no legal regulation dedicated particularly to health and SPA resorts activities. Each EU member state conducts its policy in this area. EU law regulates only selected aspects of SPAs activities in member countries.

- Directive 2011/24/EU of the European Parliament and of the Council of 9 March 2011 *on the application of patients' rights in cross-border healthcare* regulates access to the healthcare, including health resort's treatment in EU countries. According to the directive, after receiving treatment at a foreign health resort, the patients can apply for reimbursement of treatment costs within the mother country health care system, providing that the particular treatment is covered by this system.
- Directive 2009/54/EC of the European Parliament and of the Council of 18 June 2009 *on the exploitation and marketing of natural mineral waters* (Official Journal EU L 164 of 26.06.2009) - regulates extraction and marketing of the natural mineral waters within EU, however, the regulation does not apply to mineral and thermal waters with scientifically confirmed healing effects.
- Consolidated version of the *Treaty on the Functioning of the European Union* (Journal of Laws EU 326/91, PL 26.10.2012) - regulates, among others, the question of public aid to the enterprises. According to art. 107 of the Treaty, the EU countries cannot support activities that distort competition across the EU. However, the financing of the health care enterprises that operate as an element of the particular national health care system are not covered by this regime, based on the exception of art. 106 (2) of the Treaty. According to this article, the activities of spa enterprises can be considered as those which 'provide services of general economic interest'.
- Directive 2001/83/EC *on the Community code relating to medicinal products for human use* (Official Journal of Laws 311, 28/11/2004, p. 67 – 128) – stresses that any rules governing the production, distribution, and use of medicinal products must be to safeguard public health.

Also, the approach to obtaining the legal status of a SPA varies greatly in different countries as well as the level of competence at which the specific rights related to health resorts and spas functioning are granted.

All these features outline an extremely fragmented legislative framework that, on one hand, allows a wide autonomy of each state, on the other hand, guarantees few protections for sustainable management of natural resources.

Among the main pressures that SPAs systems can suffer in terms of policy and regulation we can find:

- hands -off governance;
- fragmentary management;
- short-term strategies.

5. HANDS - OFF GOVERNANCE

Natural resource governance is a concept that has become embedded in the 21st century discourse on economic development. It is often used interchangeably with natural resource management, when in fact the two concepts are distinct but complementary: i.e., natural resource management deals with the interactions between humans and the natural environment, while natural resource governance addresses the systems and institutions that determine these interactions[5].

Governance is the keystone of sound natural resource management. Its core principles (accountability, transparency, participation, and the rule of law) are at the heart of the efforts being made at local, national, bilateral, and multilateral levels to ensure that decisions that affect natural resources and resource users are well-informed and implemented equitably.

Beyond core principles of governance, natural resource governance is a contested arena, in which power asymmetries are played out at the local, national, and global levels. Natural resource governance is centred on two interdependent building-blocks, namely the propositions: that the exploitation of natural resources generates negative externalities that require coordinated multi-level institutional responses; and, under the externalities generated by resource exploitation, that natural resource governance requires a multidisciplinary approach that straddles economics, law, politics, public policy, environmental management, and international relations.

Basing on this complex contest, the application on a hands-on, coordinated, and multilevel governance seems to be a good option to try to face challenges regarding the integration of heterogeneous levels of decision making governed by rules of their own and the integration of political and natural scales examined by scientific concepts often difficult to synthesize.

Especially in the SPAs sector in which the inefficient institutional design and non-robust governance has long been largely centralized and top-down, focusing primarily on conservation goals. The actual and potential role of a multiple stakeholders panel in governance has received relatively little recognition or support, despite the profound knowledge they have demonstrated in making and implementing decisions about them.

Different authors and organizations have approached and defined multilevel governance from various perspectives but they all share certain common features. Generally, it is understood as the participation of many different types of actors (public/private) in the development and implementation of policies through both formal and informal means.

Schmitter[6] defines multilevel governance as “an arrangement for making binding decisions which engages a multiplicity of politically independent but otherwise interdependent actors – private and public –at different levels of territorial aggregation in more-or-less continuous negotiation / deliberation/implementation, and that does not assign exclusive policy competence or assert a stable hierarchy of political authority to any of these levels”.

5 V. Ushiethe, “Management and Use of Natural Resources and their Potential for Economic and Social Development in the Mediterranean, IAI (Institute for International affair) Working Papers 13 | 29 – October 2013;

6 P.C. Schmitter, Neo-neofunctionalism, in Diez, T. and Wiener, A. (Eds.), European Integration Theory, Oxford University Press, Oxford, 2004;

Three good practices of coordinated and multilevel governance of natural resources are listed below as virtuous examples of governance mechanisms capable of curbing the improper use and management of natural resources.

- **The Lake Hévíz Comprehensive Protection Program from Hungary,** in which the municipalities of Balaton Upland National Park, Hévíz City Municipality, Hévíz Spa and St. Andrew's Rheumatism Hospital and Lake Hévíz and Groundwater Basin Foundation, as well as with the Water directorate cooperate against the surface and underground pollution and to protect the lake from the effects of reducing water flow.
- **C-Track 50. Putting Regions on Track for Carbon Neutrality by 2050 from Croatia,** as an initiative designed to mobilize authorities at different levels of government - local and regional - and to help them reduce their emissions to achieve climate resilience and carbon neutrality by 2050.
- **Operational monitoring of water concessions from Slovenia:** is a monitoring system established at all Slovenian sites in early 2019 that for the first time, creates a reliable national overview of the quantity and quality status of geothermal aquifers. It is a virtuous example of hands - on the governance of natural resource. Indeed, thermal water user with granted water concession must perform continuous monitoring of abstracted quantities, of impacts of water exploitation and use, and systematic monitoring of hydraulic properties of geothermal objects.

5.1. Lake Hévíz Comprehensive Protection Program

Keywords

Unique regulation, Health tourism, environmental protection

Summary

The basis of health tourism in Hévíz is the world-famous and unique Lake Hévíz, (the services related to medical tourism are also based on the lake). The program regards the elaboration and implementation of a comprehensive lake protection program to protect Lake Hévíz. In the Program concerned municipalities, Balaton Upland National Park, Hévíz City Municipality, Hévíz Spa and St. Andrew's Rheumatism Hospital and Lake Hévíz and Groundwater Basin Foundation, as well as with the Water directorate cooperate against the surface and underground pollution and to protect the lake from the effects of reducing water flow.

Pressures enfaced

Environmental, Social, Economic

Environmental aspects

Water resources, ecosystem services

Field of action

Policy/regulation

Geographical scope

Local

Timeframe

01/01/2007 – ongoing

Context and main problems addressed

The basis of health tourism in Hévíz is the world-famous and unique Lake Hévíz, (the services related to medical tourism are also based on the lake). The lake has a water surface of 44,400 square meters, so it is the largest natural hot water lake in the world. The medicinal water erupts from the spring crater at a depth of 38 meters, its average summer temperature is between 33-35 °C, but it does not fall below 23 °C even in winter, so it is suitable for outdoor swimming all year round. The water contains sulfur, alkali bicarbonate, slightly radioactive ingredients, which can primarily cure various rheumatic, locomotor, muscle, and nervous system diseases.

The quality of the water in the crater of Lake Hévíz depends on the quality of the water entering the infiltration areas, therefore the quality protection of these areas depends on the designation of hydrogeological zones and compliance with the strict regulations. In each protection zone, only those activities or land use can be performed that do not endanger the quality and quantity of water from the Lake source, and the ecosystem of the lake. Due to the importance of the territory related to health tourism and the fact that the sensitivity of the karst catchment is high, in the case of certain activities and land uses stricter regulations might be needed. (The existing legal instruments Decree 123/1997 on the protection of water bases, Decree 219/2004 transposing the Water Framework Directive of the European Union into the domestic legal order. (VII. 21.) on the protection of groundwater.) Therefore, the implementation of a uniform lake protection remains a priority so that the regeneration of Lake Hévíz can continue, and the yield of the lake reaches the forecasted optimal 550 l/s. The water temperature of the healing lake should not fall below 28ºC anywhere.

Stakeholders and actors involved

To protect Lake Hévíz, it is necessary to cooperate with the concerned municipalities, Balaton Upland National Park, Hévíz City Municipality, Hévíz Spa and St. Andrew's Rheumatism Hospital and Lake Hévíz and Groundwater Basin Foundation, as well as with the Water directorate.

Actions implemented and results achieved

In order to preserve the condition of Lake Hévíz, the protection against water-reducing effects and underground pollution is of paramount importance. Consequently, important rules have been laid down for the protection of marshy areas. Additionally, introduction of a monitoring system is of high importance among the measures of the "Lake Protection Program", including regular measurement of the yield and temperature of Lake Hévíz and the level of the surrounding karst and groundwater wells. The program determines the amount of permissible water abstraction and regulates the protection of marshlands and forests around the Lake.

New system for reviewing water uses:

- a web-based monitoring system is mandatory for all well owners, and should be available to all involved;
- the best available technology must be used by everyone in order to save water;
- in the inner zone, another water abstraction cannot be prohibited;
- in case the yield of the lake, (proven by the remote signals) is decreased, the production needs to be decreased proportionately.

The Local Government Decree 33/2017 (XI.30.) of the City Council of Hévíz on environmental protection was introduced.

Methodological approach

In 2007 the Municipality prepared the Preparatory Study of the Lake Hévíz Comprehensive Lake Protection Program. The study reviewed the following activities:

- inventory of activities, land uses and water management interventions influencing the environmental condition of the lake in the recharge area (hydrogeological protection zones) of the Lake Source;
- evaluation of the tendencies and recharge forecasts characterizing the state of the thermal karst system feeding Lake Hévíz;
- identification of factors that adversely affect the condition of the lake, in the area of the groundwater base;
- based on the study, a complex program has been drawn up, covering possible regulatory and enforcement tools.

Challenges encountered

Missing or limited willingness of relevant actors to collaborate as they do not realize the opportunities provided by a cluster-like collaboration.

Lessons learned and key messages

With regard to developments, a complex interpretation of sustainability is needed, in the context of natural, social and economic systems.

A strict monitoring system is needed.

Replicability and transferability

The methodology of the complex program can be extended to other territories; however, several elements of the program are area specific.

Source: https://www.heviz.hu/hu/galeria/gyogyuljon-meg/gyogyto

Source: https://www.heviz.hu/hu/galeria/gyogyuljon-meg/gyogyto

5.2. C-Track 50. Putting Regions on Track for Carbon Neutrality by 2050

Keywords

Multilevel governance, Climate neutrality, Action plans.

Summary

C-Track 50 aims to mobilise and guide public authorities at a local and regional level, in order to achieve climate resilience and carbon neutrality by 2050. It is an initiative designed to mobilize authorities at different levels of government – local and regional – and to help them reduce their emissions in order to achieve climate resilience and carbon neutrality by 2050. The project will link up EU, national, regional and local authorities to establish multi-level cooperation and ensure synergies when developing and implementing sustainable energy and climate policy plans.

Project consortium

- National Technical University Of Athens (Gr) – Ntua
- Energy – Environment – Local Development Sa (Gr) – Etpa
- Auvergne-Rhone-Alpes Energie Environnement (Fr) – Aura-Ee
- Iclei European Secretariat Gmbh (De) – Iclei Euro
- Fundacion Asturiana De La Energia (Es) – Faen
- Agencia Regional Da Energia Eambiente Da Regiao Autonoma Da Madeira (Pt) – Aream
- Regional Energy Agency North (Hr) – Rea North
- Wojewodztwo Wielkopolskie (Pl) – Wojewodztwo
- Lenerg Energiaugynokseg Mernoki Estanacsado Nonprofit Korlatolt Felelossegu Tarsasag (Hu) – Lenerg
- Rigas Planosanas Regions (Lv) – Riga Pl Reg
- Asociatiei Agentia De Management Energetic Maramures (Ro) – Amemm
- Energieagentur Obersteiermark Gmbh (At) – Eao
- Federation Europeenne Des Agences Et Des Regions Pour L'energie Et L'environnement (Be) – Fedarene

Pressures enfaced

Environmental, Social

Environmental aspects

Ecosystem services

FIG. 1: ECOSYSTEM SERVICES PROVIDED BY C-TRACK 50 PROJECT

Enhancing the cooperation between the different levels of governance, both at the vertical and horizontal level, in 11 European countries

Working with regions to help them adopt national strategic policy priorities, while capitalising on synergies and economies of scale for implementing energy efficiency and renewable energy actions

Building the capacity of regional/local authorities on energy and climate policy planning, implementation and financing.

116 Sustainable energy and climate policy action plans for2050 at the local and regional level.

105 Funding proposals for implementing sustainable energy and climate actions / projects

50.000 Stakeholders across Europe informed on carbon neutrality and C-Track 50 outputs

Support EU policies and initiatives, such as the Global Covenant of Mayors on Energy and Climate

Source: C-Track 50 Publications https://www.c-track50.eu/publications

Field of action

Policy/regulation

Geographical scope

Local, Regional, National, European

FIG. 2: LOCATION AND PARTNERSHIP OF THE PROJECT

Source: C-Track 50 Publications (https://www.c-track50.eu/publications)

Timeframe

March 2018 - February 2021

Context and main issues addressed

A key challenge in all participating countries is that at a regional/municipal level, there is a lack of technical know-how and expertise, in addition to insufficient resources, for developing and implementing long term energy and climate policy planning. This highlights the need to support regions and municipalities when developing and implementing such plans, taking into consideration national priorities. Another key challenge remains in linking up public bodies at the national, regional and local level, with the aim of enabling the attainment of national goals at a local scale and an energy transition driven from the local level that capitalises on synergies and economies of scale.

C-Track 50 focuses on the following thematic areas:

- capacity building: building the capacity of project partners and collaborating municipalities on themes, such as policy planning to achieve carbon neutrality and facilitating collaborative work among public authorities. Emphasis is given on learning from frontrunners and experts, as well as exchanging experiences;
- multi-level governance: working together with national, regional and local authorities in an effort to promote collaboration and coordinate activities related to energy and climate policy planning;
- energy and climate planning: providing technical support to public authorities at the local and regional level to develop or enhance long term local and regional energy and climate policy plans;
- access to funding: providing technical assistance and support to local and regional authorities to secure funding for implementing selected actions included in energy and climate plans;
- communication and dissemination: disseminating and exploiting the project results, as well as promoting the concept of carbon neutrality by 2050.

Objectives:

- enhancing the cooperation between the different levels of governances, both at the vertical and horizontal level, in 11 European countries;
- working with regions to help them adopt national strategic policy priorities, while capitalising on synergies and economies of scale for implementing energy efficiency and renewable energy actions;
- building the capacity of regional/ local authorities on energy and climate policy planning, implementation and financing;
- sustainable energy and climate policy action plans for 2050 at the local and regional level;
- stakeholders across Europe informed on carbon neutrality and C-Track 50 outputs;
- support EU policies and initiatives, such as the Global Covenant of Mayors on Energy and Climate.

Stakeholders and actors involved

There are 105 municipalities and 11 regions from 11 countries taking part in the initiative. They are working together in order to establish long-term cooperation in the fields of climate change management and project financing. The beneficiaries of the project are firstly local administration. The users are also local administration, but also Energy agencies and citizens who care about their governance structure and energy policies – Action plans. The National Technical University of Athens is the leading partner in the project.

Actions implemented and results achieved

To date, the results indicate better collaboration between all governance levels, especially local, regional and national as well as the creation of 116 local and regional Sustainable Energy and Climate Policy Plans. By participating in capacity building activities during project partner meetings, all partners gained extra knowledge regarding energy and climate planing, which was then successfully tranfered to all their supproted local and regional authorities as well as beneficiary organizations (organizations who are also developing similar documents and strategies). Some 105 funding proposals were received with regard to the implementation of the actions proposed under the energy and climate policy plany, with total value of approximately 315 million EUR in 11 countries.. In addition, information about the project and its objectives and actions was provided to approximately 50,000 stakeholders.

FIG. 3: RESULTS ACHIEVED & EVIDENCE OF SUCCESS

Source: C-Track 50 Publications (https://www.c-track50.eu/publications)

Methodological approach

Firstly, the energy planning process at the national level for the eleven partner countries was examined and compared to ensure multilevel governance between the engaged authorities. Based on the review of the energy planning process at the national level, existing multi-level governance processes were assessed to identify the most effective approach at a country level that could intensify collaboration. The best applicable model in each country was then explored, with an emphasis on developing recommendations on how to customize / improve this to enhance multi-level governance collaboration and facilitate energy and climate resilient planning at a national level. To receive as much information about the energy planning process and multi-level collaboration, a series of roundtables (both local and national) were organized. After gaining all necessary information about the energy planning process on all governance levels (approximately last for 24 months), at least one region and ten municipalities were mobilized and supported with technical help and guidance to formulate the Sustainable Energy and Climate Policy Plans.

Lessons learned and key messages

The C-Track 50 initiative is another good example of how lower levels of government – regions, and municipalities – can be fully-fledged participants in the governance of the Union and address issues that are of paramount importance to them. Correctly addressing them at this level will also mean success for the EU in achieving its goals on a national and supranational level.

The programme focuses on several areas that convey EU-specific priorities, namely:

Multilevel governance - the importance of local and regional levels is at the forefront of program development. Cornerstones have been set for cooperation between EU, national, regional, and local levels through exchange programs, round tables, workshops, etc.

Capacity Building and Awareness - One of the goals of the project is to build competencies at lower levels of government to deal with the effects of climate change. This is done mainly concerning energy policies and strategic planning.

Dissemination and communication of information - this is one of the important goals of the project to provide information in different countries and regions on good practices and opportunities offered by the initiative.

Replicability and transferability

This project can be replicated and transferred to other territories. A good example is the PentaHelix project, whose main objective is to build an integrated approach to multi-level energy and climate planning, involving participants from the following levels – citizens, NGOs, public and private sector representatives, as well as scientists and representatives of scientific institutions. The project will be tested in 8 municipalities in Norway, Croatia, Belgium, Spain, and Latvia. Another good example is Compete4SECAP, which should support the local and regional levels in implementing their sustainable energy plans.

5.3. Operational monitoring of water concessions

Keywords

Unification, monitoring, assessment

Summary

Thermal water users with granted water concession must perform continuous monitoring of abstracted quantities, of impacts of water exploitation and use, and systematic monitoring of hydraulic properties of geothermal objects. This has mostly been established at all Slovenian sites in early 2019 and makes a firm ground be able to provide, the first time, a reliable national overview of the quantity and quality status of geothermal aquifers.

Pressures enfaced

Environmental

Environmental aspects

Water resources (quantity and quality state)

Field of action

Policy/regulation

Geographical scope

National

Timeframe

2015 – ongoing

Context and main issues addressed

- Gaining sufficient data of a good quality to evaluate quality and quantity status of geothermal aquifers to regularly manage the granted water concessions (adjust allowed quantities where and when needed)
- There was no reliable operating monitoring network of geothermal wells in Slovenia.
- There was no harmonization of observed parameters and no automatic transfer data (on-line) to a database of the Environmental Agency, so quantities were lost (or never measured).
- There was no joint, national-wide reporting and interpretation of monitoring data to get a reliable overview.
- There was no requirement to regularly test geothermal wells, so even if a change in the quantity of quality of thermal water was observed, one could not determine whether this is due to deterioration of the wells or aquifer's state.
- There were only 3 water concessions for the use of thermal water issued before 2015. Each had different monitoring requirements and interpretation of state was not easy to do as some were missing. So, the Water Management Plan identified some geothermal aquifers as at risk and set up restrictions on granted quantity which was not accepted by water users. As a tool for the management of aquifers and decision-making on allowed extraction quantities, several agencies agreed upon joint harmonised requirements for monitoring of the state of the aquifers and the production objects to gain the full view of the state. All new water concessions, granted in 2015 and later, now have a systematic approach to data collections and the data is now annually interpreted and verified.
- There are more than 50 sites with thermal water (20-75 °C) in Slovenia and most gained the water concessions in 2015. These Decrees on Water Concession have prescribed two types of operational monitoring: i) monitoring of abstracted quantities, and ii) monitoring of the impacts of water use and hydraulic properties of geothermal objects. Groundwater levels, temperatures, and abstraction rates have to be measured continuously with an hourly interval of data collection, sometimes also with the daily transmission of data to the Environmental Agency of Slovenia – only 5 % of data is allowed to be missing; chemical (field parameters, main and trace elements, organics, and pesticides) and isotopic (tritium, oxygen, and deuterium in water) analyses of thermal water have to be performed annually or once in a lifetime (noble gases); temperature and quantity of wastewater have to be monitored continuously; pumping (step) tests have to be made periodically, etc. All these data must be interpreted annually in a report which is approved by the Environmental Agency of Slovenia.

Stakeholders and actors involved

- Water concession holders do have to pay the monitoring, but they get now very reliable information on the state of the wells and the local water balance (to plan whether they could extract more thermal water in future or not). Environmental Agency of Slovenia and their Ministry, who implements the Water Directive, receives now data of good quality and sufficient quantity to manage the water concessions based on actual state of the environment and could therewith plan the national development of geothermal use in future.
- Environmental Agency of Slovenia (as explained)
- The Water Directorate which charges the fees for a water concession
- Environmental data are public (at least as interpretation), so also the public, including for needs for research and development
- Ministry of the Environment and Spatial Planning (granting concessions and preparing the water concession decrees), Environmental Agency of Slovenia (sets requirements and controls of implementation of the monitoring), Geological Survey of Slovenia (gives professional support on BAT in monitoring practice and interpretation), users (concession holders) of the resources (they must report to the national authorities and collect and process gathered data).

Actions implemented and results achieved

In four years of establishing such monitoring systems, several challenges have had to be solved, technically and legislatively, but the data acquisition is now almost complete. In practice, wells with high free CO2 gas content and/or methane emissions still pose a technological challenge for long-term operation of the monitoring equipment, performance of step tests demands adjustments in operation of the utilization systems, interpretation of chemistry. Step tests also face some scientific questions in terms of methodological reliability.

The requirements have resulted in much better care for thermal water wells in general, as many well-logs and camera inspections were made to establish a reliable status of the casing (and its leakage) to plan well rehabilitation. Many users installed also additional heat pumps to reduce the waste thermal water temperature, now approaching 20-25 °C and not 30 °C anymore. This is favourable for keeping good aquifer's status, biological conditions in surface waters, and enhanced use of direct geothermal energy, respectively. In the year 2018, the first time a national overview of the quantity and quality status of geothermal aquifers was established and is now annually performed since then by the Slovenian Environmental Agency. Data will also be used in the new Water Management Plan 2022-2027.

Methodological approach

The process from recognizing the issue (officially) and implementing it in official decrees took about five years. It took a lot of time for discussions, not only professional but also very legal ones, to properly implement it to easily implement monitoring requirements, workshops were organised by the Ministry of the Environment and Spatial Planning each autumn where experts, authorities, agencies, water concession holders, and other professionals presented what the requirements mean in practice, how they can try to solve problems with its implementation and what the users (who pay for the monitoring system in full) will get from these data in long-term.

Then it took about three years to set up the monitoring systems at all user sites as officially required.

Challenges encountered

Certain users of the resources expressed their concerns about the water price and accountability of services that are based on natural resource. Water use became too expensive to use as a renewable energy source (for heating for example).

Lessons learned and key messages

Very strong cooperation and discussion are needed among professionals and authorities who write the legislation. Further on, the requirements must be clearly explained to the ones which are addressed by workshops.

The review of the measures required for the water concession granting process presented here has shown that it is possible to conduct a granting procedure disregarding geological, historical, legislative, and transboundary issues that may occur. Six key indicators have been outlined which can be used collectively as an objective tool for water rights distribution and may serve as minimum performance requirements. If their implementation is checked annually and granted water concessions accordingly adjusted, these activities should enable efficient control over the thermal water availability. As a result, early measures helping to diminish any possible negative impact on the aquifers could be taken. These actions should help to meet the standards required for thermal groundwater bodies according to Water Framework Directive. Best practice proposes that all geothermal resources are managed by the concordant actions of the Water and Energy sectors and controlled by the National Environmental Agency.

Replicability and transferability

To our knowledge, the approach is transferrable to other countries. It has been presented at several conferences and the Geological survey of Slovenia organized and participated in international workshops where development of monitoring systems is discussed.

Best practice proved that sustaining the health of groundwater bodies with thermal potential is possible in the future.

Credits: Geological survey Slovenia, Ljubljana, 2020, unknown photographer

6. FRAGMENTARY MANAGEMENT

As said before governance and management are often used interchangeably, when in fact the two concepts are distinct but complementary, also respect the natural resources field. The management deals with the interactions between humans and the natural environment, while natural resource governance addresses the systems and institutions that determine these interactions.

Management fragmentation occurs when critical processes aren't managed as an integrated system. Workflows become a complex series of handoffs between functions, jobs, and information systems. Each handoff represents an opportunity to introduce error, delay, and added cost. Devoid of an integrated process management framework, workflow value deteriorates. The potential for resistance increases and the speed of implementing improvements declines.

This is true for business but also the natural resources management. Fragmented legislative framework and management can lead to destructive competition and/or a lack of systematic cooperation that can hinder effective resource management and environmental planning, although the value of local self-government and stakeholder participation should not be underestimated.

Therefore, it is particularly important to overcome the fragmentation by integrating the relevant disciplines, by comparing water and biodiversity governance, by creating links between different actors (public institutions, private companies, scientific communities, and citizens to support the creation of coordinated actions toward sustainable management of SPAs resources as well as the economic value of them.

Virtuous example of mitigation of these kinds of risks are:

- **Thermal-Health Industrial Cluster from Hungary,** the Northern Great Plain Thermal Cluster Association was founded on September 22, 2005, with 18 founding members. The Association was established for the cooperation of natural and legal persons involved in thermal and medical tourism operating in the territory of the Northern Great Plain region, as well as companies without legal personality.
- **The Unique Management of the Euganean Hills Homogeneous Hydro-mineral basin (BIOCE) from Italy,** as an intermediate body between Regional Authority (Veneto Region), Euganean Hills Hydro-mineral Basin municipalities, and the owners of mining licenses inside a broad natural thermal district.
- **Inter-communal business settlement initiative INKOBA from Austria,** local councils cooperate to develop and promote business locations to minimize land consumption and urban sprawl, promote and strengthen the business location. Further, this makes it possible to jointly secure, develop, open up and market business locations while sharing costs and revenues and coordinating priorities for individual locations in a region.

6.1. “Thermal-Health Industrial Cluster” - Collaboration of different actors and sectors

Keywords

Thermal-health industry, cluster, collaboration

Summary

The Northern Great Plain Thermal Cluster Association was founded on September 22, 2005, with 18 founding members. The Association was established for the cooperation of natural and legal persons involved in thermal and medical tourism operating in the territory of the Northern Great Plain region, as well as companies without legal personality.

Pressures enfaced

Social, Economic

Environmental aspects

Water resources, Ecosystem services

Field of action

Cooperation

Geographical scope

Regional

Timeframe

2005 - ongoing

Context and main problems addressed

Its main goal is to promote the development of thermal and medical tourism in the Northern Great Plain region with the active participation of the stakeholders of thermal and medical tourism and to help the participants of thermal and medical tourism with initiatives and proposals. To this end, it operates an information and consultation forum, prepares resolutions for the resolution of professional thermal issues, and also contributes to the coordination of the tourism development tasks of the counties of the region. An important goal is to expand the local tourist offer as a result of its activities. In addition to regular exchanges of experiences and study tours, various publications and promotional materials also serve this purpose, but the company also participates in the organization of professional and further training. The priority task of the cluster is also to invite a dialogue between all actors in the sector, domestic and foreign organizations, institutions, associations, local governments, and economic enterprises interested in the activity.

In 2013, a unique initiative was launched, the Northern Great Plain Thermal Cluster "merged" with the Thermal – Health Industrial Cluster. Given the growing convergence of these two clusters in the region, the creation of a unified cluster was formulated in the minds of the leaders of the management organizations and the representatives of the key companies of the Clusters. Thus, the two clusters, both recognized in their respective fields, are "united", the cluster priorities, which are centered around one area in a dominant Cluster of the region, complement each other and help each other in the new cooperation. The direction has become common, thus creating a unified framework for both tourism and health care, as well as environmentally conscious ideas.

Stakeholders and actors involved

Through the merger with the Thermal-Health Industrial Cluster and the fact that more and more people have recently realized that real success can be achieved through joint action, the number of cluster members is constantly growing. The members of the cluster include small and medium-sized enterprises, local governments, municipally owned companies, and service companies that help the work and advocacy of the cluster on the one hand, and strengthen environmentally conscious thinking and health tourism in the region on the other.

Actions implemented and results achieved

The objective of the Thermal-Health Industry Cluster is to develop health tourism in Eastern Hungary and increase its competitiveness. It plays a leading role in the region, cooperating closely with a wide range of partners, such as the University of Debrecen, Magyar Turizmus Zrt., The region, TDM organizations, and Tourinform offices, tourism enterprises, and cross-border professional organizations in the region.

There have been several significant tourism developments based on thermal and medicinal water in the region, as a result of which the region's health tourism offer can be said to be outstanding at the national level. It is an internationally recognized, the largest spa complex in Europe, located in Hajdúszoboszló, which is the most visited spa and bathing place in the Great Plain with the highest traffic in Hungary, east of the Danube. The University of Debrecen plays an outstanding role in boosting medical tourism in the region, in connection with which the goal is to combine paid patient care and spa treatments based on the beneficial effects of thermal water, and to sell them as a package.

Methodological approach

In the Spatial Development Concepts (for the period 2014-2020) belonging to the area of attraction of the Cluster members, one of the priority strategic areas is the development of vibrant cities and settlements. In connection with which the goal is to create high value-added investments and research and innovation centers in key sectors, related to the topics of thermal, health industry, healthy food and environmental protection - development of geothermal alternative methods. Organically fitting into this strategy is the target system of the Thermal-Health Industrial Cluster developed for the coming years, which is based on thermal and health tourism, thermal water as renewable energy, and research and development related to thermal water.

They serve the ideas of the coming years, the developments started among the members, examining both the accommodation expansion and the service side. Nowadays, the development of thermal water services is taking into account the goals of health tourism. To increase the turnover of visitors in the region, the development of medical and health care services, which also means a high standard of paid patient care for guests from abroad, is a priority. At the same time, of course, the development of accommodation standards and the development of infrastructure are also part of the region's vision.

Challenges encountered

The missing or limited willingness of relevant actors to collaborate as they do not realize the opportunities provided by a cluster-like collaboration.

Lessons learned and key messages

The most important result of the operation of the cluster so far is that there is a strong demand for multi-pillar activities to serve social, economic, and environmental objectives at the same time.

Although the original goal was the development of health tourism in the region, it became clear that based on the knowledge and experience provided by cluster members, the cluster is ready to take part in R&D&I initiatives as well as energy related collaborations as well.

There is a strong need as well in the field of international collaboration: more active cooperations are needed to widen the scope of the cluster and provide the necessary partnership for its members in the future.

Replicability and transferability

This best practice can be extended to other territories. The collaboration of municipalities, service providers, research institutions and other companies in order to serve the interest of both society and the environment are transferable to other geographical contexts finding the proper development targets and processes. The development of such collaborating clusters and cluster management organizations has to be based on the proper definition of the common goals, the potential round of members as well as the revealing of necessary and available funding sources.

Source: https://www.aquaticum.hu/hu/galeria/aquaticum-debrecen-strand.
Photographers: Anna ILLÉS and György PALKÓ

6.2. The Unique Management of the Euganean Hills Homogeneous Hydro-mineral basin (BIOCE)

Keywords

Managing Thermal Water mining activities, preservation, and protection of thermal groundwater.

Summary

Bioce's main purpose is intermediating between Regional Authority (Regione del Veneto) municipalities of the Bacino Idrominerario Omogeneo dei Colli Euganei (BIOCE) and the needs of the owners of mining licenses inside a broad natural thermal district. Established for granting a proper use of the natural resource, it was formally created following legal provisions, s.a. Italian Royal Decree n.1443/1927 and the more recent Legge Regionale 40/1989 together with the disposal of the Governor of Regione del Veneto (D.P.G.R.V. n. 1586/1991). GU can be easily be explained considering it as a kind of "Mandatory Consortium" including all the owners of regional mining concessions and under the main control of the Regional Government. GUBIOCE has its own shareholders' meeting, a Governing Council with a Chairman, Auditors and a Technical Director owning the responsibility of the full mining district under National law. Acting as an intermediary between the territory and the institutional entities, as well as UE, Regione del Veneto, Provincia di Padova, and local Municipalities, and other territorial agencies, i.e. Parco Regionale dei Colli Euganei (Regional Agency for managing euganean natural park) and the University of Padua (UNIPD) Gestione Unica covers an important role to co-ordinate and join initiatives connected to any scientific, technical and environmental studies related to thermal waters and their possible uses.

Pressures enfaced

Environmental, Social, Economic

Environmental aspects

Water resources, ecosystem services.

Field of action

Policy/regulation

Geographical scope

Local, Regional, European

Timeframe

1991 - ongoing

Context and main problems addressed

The main part of the Euganean Hill District, located in the north-east sector of Italian territory, Regione del Veneto, Provincia di Padova, holds the majority of Italian thermalise. This natural resource (thermal water) is placed on the well-defined "Homogeneous Euganean Thermal Basin" (acronym: BIOCE), an out-and-out mining district having an extension of about 220 sq. Km. This precious resource is generated from the rising of hot waters (with a range of temperatures from 60°C to 86°C). The amount of extraction per year reaches 15 Mm3. Currently, the BIOCE has 136 mining licenses and water is exploited from over 260 thermal wells.

The challenge for a best practice could be identified with an analysis of all the aspects related to actual BIOCE's way of managing thermalise, exchange experiences with thermal partners getting new hints for and from other thermal districts on the best methods of handling such activities. Sharing BIOCE's own experience with other rising thermal districts and getting back, if possible, useful innovation insights could be a way to check the actual way of managing and deploy it as well.

A correct way of dealing with natural resources impacts on many other fields of interest, such as thermal healthcare, the SPAs, hotelerie, food and beverage, a wide range of activities connected to environmental protection, sport and health, and many more, including using the water heat for various geothermic and green energy purposes.

The main problems on this issue could be related to the importance of having, for each different country, appropriate law instruments targeted to take care of natural resource (i.e., water uses and exploitation), the environment (i.e., soil uses), being this, even apparently indirect, a real starting point to allow and put in place suitable thermal offerings for customers with good incentives for business activities.

The main goals could be achieved through the development of a new way of managing thermalism and all its possible connections with a wide scope of offers to any kind of customer. Stakeholders and actors involved.

The beneficiaries of the best practice are, over the entire thermal territories, the environment, and all the business activities related to the thermal area. All improvement actions are targeted to the well-being of the region, including workers and citizens as final beneficiaries.

An active role is played in the participatory processes by public administrations, policymakers, management services, companies, associations, professionals, research bodies, and all other organized territorial actors.

Actions implemented and results achieved

The activities can be grouped in four main strands:

- thermal resources administration by having a good and 'easy to use' way to comply with all the law requirements for using and exploiting thermal waters, including sanitary and health purposes. This means, briefly, to get simple procedures and cutting red tape, gaining a feasible path with full cooperation between the Regional Government and the water users;
- safeguarding and protect the thermal reservoir through a monitoring net inside the thermal territory should be created into any thermal water basin using water level measuring devices placed into test piezometer wells. Another monitoring net should be created using periodic chemical and biological water tests. Regular amounts of data acquired throughout years will check the sustainability of the groundwater and be the basis for creating a model of the aquifer.

Alternative Water uses:

- joining initiatives, as well as feasibility, for energy projects using heat energy, where interesting enthalpy fluids are available;
- allow and put in place suitable thermal offerings for customers with good incentives for business activities.

All of the above in attempt to gain development and possibly a new way of managing thermalism and all its connections with a wide scope of offers in any possible form.

The main results can be defined as follows:

- obtain a significant cut down of bureaucratic load on all thermal administrative arrangements;
- introduce innovative systems for all season monitoring water levels during high and low exploitation rates, checking water level restorations and chemical and biological parameters; improve the monitoring system to get more environmental parameters;
- create a holistic approach of the thermal activities over the territory governance, to give the best thermal offer and send out to any potential customer the best information about thermal activities: water resources management (water quality, sustainable use, regulation), territory management (control of soil use), ecological management (biodiversity preservation) and human activity management (socio-economic advantages).

Methodological approach

The methodological approach consists of the integrated approach concerning water resource management. This approach includes hydro-geologic, natural, ecological, social, and economic aspects. The BIOCE's model for integrated management of thermal water resource, as actually in use with all the territories being part of it, even with his needs to get refreshment and being updated, can lead the way through which public and private bodies can act and share plans and commit themselves to many specific topics, as well as, i.e., territorial management and maintenance of water resources, environment, and biodiversity, enhancement of socio-economic activities and communication strategies.

Challenges encountered

The public-private concertation process involves heterogeneous groups of stakeholders. The challenge is to manage and maximize the contributions of all actors. Furthermore, it is important to identify the potential financial resources that can be accessed to implement the various interventions shared by the stakeholders.

Lessons learned and key messages

- Emphasize the principles of participation and integration of policies;
- enhance, regarding the issue of water resource management with other main aspects such as sustainable development;
- invest resources in communication and awareness actions aimed at local communities;
- identify, during the participative processes, concrete paths of co-financing and implementing the measures/projects;
- apply holistic approach to the thermal territory governance;
- apply a more integrated management of thermal water use and exploitation related to their connected territories;
- implement monitoring water use and environmental aspects.

Replicability and transferability

This best practice can be extended to other territories. The governance processes which are at the basis of the it are transferable to other geographical contexts. First of all, the legislative and regulatory framework should be assessed within each country and territory.

The Euganean Thermal Basin, https://www.termecollieuganei.com/

6.3. INKOBA - Inter-communal business settlement initiative

Keywords

Joining inter-communal forces

Summary

INKOBA inter-communal business settlement initiative, local councils cooperate to develop and promote business locations. Further this makes it possible to jointly secure, develop, open up and market business locations while sharing costs and revenues and coordinating priorities for individual locations in a region. In addition, in two regions of Upper Austria makes holistic decisions on issues of intercommunal spatial development. (e.g., quality standards in settlement development). Today, Upper Austria is a national leader in intercommunal cooperation in the field of location development and business settlement. 302 out of 442 communities, which is an amount of 68.3%, are cooperating with each other through INKOBA. There are currently 28 intercommunal cooperation associations in Upper Austria. Areas with approx. 3.5 million m² = 350 ha have been developed so far, of which approx. 100 ha are still available. More than 100 companies with about 1,500 jobs have been settled. Location and site development means Upper Austria is actively involved in strategic coordination and regional cooperation. This guarantees that companies benefit from optimum framework conditions when they arrive.

Pressures enfaced

Environmental, Economic

Environmental aspects

Landscape, Securing high environmental quality

Field of action

Cooperation

Geographical scope

Local, Regional

Timeframe

2001 - ongoing

Context and main problems addressed

In order to minimize land consumption and urban sprawl, promote and strengthen the business location in Upper Austria, the idea of intercommunal cooperation came up with the first foundation in 2001. Upper Austria has all together about 442 communities, who can legally work on their own because of the federal structure in Upper Austria. That's why working together to provide an optimal operating location for potential investors together with space offered by private owners is the initial objective. The concept optimizes and improves the regional planning with focus on minimizing new consumption of greenfield and using existing brownfields. Joint investments of members of the INKOBA help to save resources. For example, the need for construction of canals or roads is reduced.

The concept shows that communities jointly create areas for the settlement of businesses, also taking environmental factors into account to avoid unnecessary land consumption and urban sprawl. Interested companies are thus given quick and uncomplicated access to suitable sites that meet the highest standards.

Stakeholders and actors involved

Involved institutions are mainly the local municipalities and their representatives, the State of Upper Austria and the Upper Austrian business and location agency Business Upper Austria, among these:

- representatives of municipalities;
- business/location developer/consulter;
- (potential) investors;
- State of Upper Austria.

Furthermore, as the beneficiaries can be seen as members of INKOBAs and the region of Upper Austria. The cooperation and joint investments strengthen the business location Upper Austria and synergies between the municipalities are environmental-friendly used. As well as settled businesses since there are also joint investments in infrastructure.

Fotocredit: Province of Upper Austria/Lisa Schaffner

Actions implemented and results achieved

The first activities have already been set in 1998. The first INKOBA has been founded in 2001. Between 2001 and 2009, municipal associations are formed for the regional development of individual business locations. Through the decisive operation of the former Upper Austrian TMG (Upper Austrian Technology and Marketing Company, today: biz-up or business Upper Austria), the foundations for the first association were laid, in close coordination and initially also with resistance from the provincial directorate of internal affairs and local government. Based on this, the first marketing activities were started.

From 2009, regional cooperation will be extended to all business development areas above a certain size. From 2010, small-scale regional cooperation will be extended to all business development areas and, for the first time, to retail areas. From 2011, the district-wide business park development without business area regulation will start parallel to district-wide cooperation with all business development areas and commercial areas. From 2013, multi-thematic (spatial) planning associations will be established. From 2017 onwards, inter-state associations of municipalities will be created.

Today, Upper Austria is a national leader in intercommunal cooperation in the field of location development and business settlement. 302 out of 442 communities, which is an amount of 68.3%, are cooperating with each other through INKOBA. There are currently 28 intercommunal cooperation associations in Upper Austria. Areas with approx. 3.5 million m^2 = 350 ha have been developed so far, of which approx. 100 ha are still available. More than 100 companies with about 1,500 jobs have been settled.

Methodological approach

As a basis for the political discussions on the establishment of an association of municipalities, a location analysis is carried out about area potential. Among other things, the local development concept or zoning plan serves as a basis for this.

Lessons learned and key messages

For avoiding unnecessary land consumption, it is important to cooperate besides local and regional level, on an intercommunal level.

The key message is: “From an individual municipality problem to a regional solution”.

Replicability and transferability

As even examples in other provinces of Austria are showing, the concept of INKOBAs can be transferred to other regions and even across borders as well. Due to the past, it currently looks as if land consumption is progressing rapidly, which is why cooperation at the intermunicipal level would also make sense in other regions and the demand for cooperation is increasing. Therefore, the Upper Austrian INKOBA concept can be seen as role model for other regions. In addition, the concept could be extended to social aspects such as common infrastructure like public swimming pools or cinemas. If it is possible to improve the quality of life through the social aspects mentioned above, the rural environment would become more and more interesting and expertise and skills would remain in the region.

7. SHORT-TERM STRATEGIES

The Iroquois (native American Indian tribe) were governed by the principle that important decisions had to be made weighing not only their immediate effects but also how they would impact seven generations to come.

As a consequence of global environmental change, long term strategies that can deal with unexpected changes in resource dynamics are becoming increasingly important. Stable long-term strategies are crucial to help achieve any kind of substantial results.

Following a period of great uncertainty such as the one that the SPA sector is experiencing due to the pandemic, particularly harmful are short-range vision management that establish operational objectives to survive in the immediate future, but not an overall vision on the direction to point tomorrow.

Until now, the management of thermal resources, in HealingPlaces countries, has often proved to be the result of local interests among stakeholders who have acted based on individual competences and stakes. The ongoing pandemic and ongoing climate change are reshaping the world and amplifying the risks of instability in all its forms. The management of water resources, in general, and of thermal resources in particular, represents an asset of strategic importance for the future development and protection of the territories.

Below we present two best practices that contrast the effects of a short-range vision by medium-long term concerted strategy for SPAs development, but also by annually replicating the local contestable to inject new idea and continuously involve the local stakeholders and the citizens in SPAs development.

The concept of SPAs development and balneology of the Karlovy Vary region from Czech Republic, is a medium-term strategic document that indicates the directions in which SPA and balneology will develop in the Karlovy Vary Region. The overarching framework of the whole concept is a vision that describes the future state, which should be achieved through close cooperation of relevant actors in the field of SPA and balneology in the Karlovy Vary region in the medium term by meeting the set goals and a set of targeted actions to reach them.

ERGO Hestia for the Environment from Poland, in partnership with the Association of Polish SPA Communities has organized an annual contest for environmental initiatives (investments in environmental protection and all accompanying activities) of Polish spas. The Eko Hestia SPA aims to promote innovative and effective local government pro-ecological activities and investments related to environmental protection, implemented by municipalities with the status of health resorts, and to award one municipality recognized by the Competition Committee as the best in this regard.

7.1. The concept of SPAs development and balneology of the Karlovy Vary region

Keywords

SPA development, Karlovy Vary region

Summary

The Concept of SPA Development and Balneology of the Karlovy Vary Region is a medium-term strategic document that indicates the directions in which spa and balneology will develop in the Karlovy Vary Region. The concept was approved by the Karlovy Vary Regional Council by Resolution No. ZK 62/02/19. This is the first concept that deals with the topic of balneology. The concept of SPA development and balneology of the Karlovy Vary Region was created within the project "Support for the activities of the Regional Standing Conference of the Karlovy Vary Region 2018 – 2019" - OPTA 2014 - 2020. The concept was developed by the company MEPCO, s.r.o., the contracting authority is the Karlovy Vary Business Development Agency, p.o.

Pressures enfaced

Environmental, Economic

Environmental aspects

Water resources; Landscape, Brownfield, Wastelands, Empty spaces

Field of action

Cooperation

Geographical scope

Local; Regional; cross-border project

Context and main issues addressed

The overarching framework of the whole concept is a vision that describes the future state, which should be achieved through close cooperation of relevant actors in the field of SPA and balneology in the Karlovy Vary region in the medium term by meeting the set goals, i.e., through meaningful activities contributing to these goals. As a result of these debates in the balneological platform, a vision was formulated. The vision is followed by other outputs of the design part. The design part consists of four pillars, which correspond to the set vision and respond to the conclusions of the analyzes. The pillars are closely interlinked and their scope overlaps. The pillars are further divided into objectives, of which there are a total of 11. Each objective has specified measures. SPAs in the Karlovy Vary region have a centuries-old tradition and worldwide fame. Today, the private sector has a decisive influence on SPAs. The disadvantage of today's SPA is also its instability in the public health system, which is related to the focus of the spa, especially on foreign visitors due to the small domestic market. At the same time, due to the lack of balneological research, the therapeutic effects of spa care have not been proven, so doctors rely on their empirics and historical experience and without a deeper knowledge of the ongoing processes. The result of such a system is the distrust of the professional public in the effects of spa treatment, which results in a reduction in the number of physicians who indicate spa treatment (except for proposals for indication groups related to musculoskeletal treatment). Most SPAs today try to combine the offer of therapeutic and wellness stays, but relaxation stays should be only one way to maintain the spa, not the goal itself. The key for the direction of spa and balneology is to focus on prevention in cooperation with insurance companies and at the same time to defend scientifically valid procedures and look for their current forms.

There is no balneological research in the region, despite the efforts of individual entities / cities. For the successful development of balneology and spas, it is crucial to renew the professional platform dealing with exact research in the field of balneology and subsequently, within the application of outputs in practice, to develop other activities aimed at the development of the above areas.

For the development of SPAs, it is necessary to initiate cooperation between public administration bodies, the private and academic sectors and to implement activities together on a platform managed by one of the key players - the Karlovy Vary Region. Regional policy can coordinate spa interests in the region and provide personnel support at offices (municipalities, municipalities, and municipalities), and provide sufficient regional marketing support.

The SPA infrastructure is very underinvested in the region. It partly owns the spa infrastructure of the city, but they do not have enough funds for their reconstruction, operation, and maintenance, although some of them declare the development of spas as their main priority. Private entities owning spa infrastructure invest considerable funds, however, their direction to the infrastructure is sporadic.

Stakeholders and actors involved

As this is a general strategy of SPA sector development, there is a broad scope of beneficiaries in each pillar, in particular: SPA operators; health care facility operators; doctors and medical staff;

Balneological Institute of Karlovy Vary, o. P. S.; Balneological Research Institute, v.v.i. -Mixed-baths; Institute of Spa and Balneology v.v.i.1; Czech Inspectorate of Spas and Springs Users are a broader group of institutions, especially in Karlovy Vary region. Among others, they include: Ministry of Health; local self-government; government; educational facilities; universities; Institute of Postgraduate Medical Education; Academy of Sciences of the Czech Republic; spa operators; Destination agency; associations and interest organizations; organizers of cultural, sporting and leisure events; hotel complex operators;

The establishment of a professional platform of professionals in the field of SPA and balneology, representatives of SPAs facilities, public administration, the private sector, etc. was initiated in 2018 by Ing. arch. Vojtěch Franta. At regular meetings, problems in the field of balneology and SPAs were defined, possible remedies and individual parts of the concept were discussed. The following entities, for example, joined the IP: Lázně Františkovy Lázně, BIKV, ops, Imperial Karlovy Vary, AQUAFORUM, MEDISPA, Association of Medical Spas in Karlovy Vary, VUB Mšené - lázně, Association of Hotels and Restaurants, Association of Spa of the Czech Republic, Lázně Jáchymov, Czech Inspectorate of Spas and Springs of the Ministry of Health of the Czech Republic, Administration of Natural Healing Resources and Colonnades, Commission of the Karlovy Vary Regional Council for Spa and Tourism, Alžbětiny Lázně, Františkovy Lázně IMPERIAL, Léčebné lázně Mariánské Lázně as, Monti Spa, Františkovy Lázně, Léčebné lázně Lázně Kynžvart, KARP, p.o.

Actions implemented and results achieved

The concept consists of 4 pillars, which involve different group of partners:

- Pillar 1 Health - Spa as prevention and part of a healthy lifestyle. Interconnection of spa care with other health services.
- Pillar 2: Research and science - Animated balneological research. Ensuring an adequate supply of education, restoration, protection, and maintenance of natural healing resources.
- Pillar 3: Economic - The most attractive field of the local economy. Streamlining the activities of self-government and state administration in the field of SPA and balneology. Development of destination management and marketing of SPA and balneology.
- Pillar 4: Social - Modernization, and expansion of accompanying services and the development of cultural, sports and leisure activities, ensuring suitable non-financial conditions for spa and balneology staff, Developed spa infrastructure and therapeutic landscape.

Methodological approach

Within the analytical part, controlled interviews were conducted with persons who were selected in cooperation with the contracting authority, data processing from previous meetings, and data processing from publicly available sources were performed, including a comparison of selected indicators with other regions. The output of the analytical part was a SWOT analysis and starting points for the design part. The design part was processed on the basis of the starting points from the analytical part. A first draft was prepared respecting the vision set by the contracting authority. Subsequently, an electronic comment was made on the first version of the design part by the IP members, and these comments were incorporated by the developer, who further elaborated the descriptions of the objectives and discussed them on the IP.

In the implementation part, which was also discussed at the IP, the organizational provision of the implementation on the principle of partnership, fulfillment, and evaluation of the fulfillment of the concept is established, as well as the procedures for updating and evaluating the concept.

Challenges encountered

As any longer-term strategic project, it is dependent on involvement and interest of broad range of actors in the region with often not only complementary but also controversial interests. Implementation is a high priority, especially reflecting the fact of COVID-19 impact on the spa sector of Karlovy Vary region (which consists 20% of regional GDP). So, there is hope that reflecting the COVID-19 socioeconomic situation all potential actors will be more motivated for implementation (which is still ongoing).

Lessons learned and key messages

Any proposals to improve the functioning of the SPA sector must be based on well-performed analyzes of a complex nature. At the same time, the design part must have support across all key actors in the spa sector and must be sufficiently specific and motivating for their involvement. At the same time, support must be obtained in a wider range of state administration and self-government from the local to the national level. It is also important to highlight the fact that broad institutional involvement in the creation of the strategy implementation model increases the chance of successful and comprehensive implementation of the strategy.

Replicability and transferability

The Karlovy Vary region is an important spa region in Europe in the field of spas. Any strategic documents in the region in the field of natural resources, but of course also general socio-economic development must include a section on spas. The project and strategy have a well-developed methodological part based on the analytical, design, and implementation part. For this reason, its transferability to other spa regions within the Czech Republic and abroad is possible.

http://www.viphotels.cz/krlovy-vary-lazne-svetoveho-vehlasu/

http://www.viphotels.cz/krlovy-vary-lazne-svetoveho-vehlasu/

7.2. ERGO Hestia for the Environment

Keywords

Environmental initiatives, annual contest, spa municipality

Summary

ERGO Hestia in partnership with the Association of Polish Spa Communities has organized an annual contest EKO HESTIA SPA for environmental initiatives (investments in environmental protection and all accompanying activities) of Polish spas. The Eko Hestia SPA aims to promote innovative and effective local government pro-ecological activities and investments related to environmental protection, implemented by municipalities with the status of health resorts, and to award one municipality recognized by the Competition Committee as the best in this regard.

Pressures enfaced

Environmental

Environmental aspects

Water resources, Biodiversity, Landscape, Air quality

Field of action

Technology, Cooperation

Geographical scope

National

Timeframe

2016 - Ongoing

Context and main issues addressed

The main idea of the competition is to identify the best ideas and models in the field of environmental protection and modern pro-ecological solutions of Polish SPA communities.

Environment-friendly behaviour of the local community and visitors is particularly important in spa communities. Nature offers great potential and represents a major commitment. The EKO HESTIA SPA competition not only shows the best ideas and innovative pro-ecological solutions in Polish spas but also creates a catalog of good practices in this area, worth following by all local governments who are close to the idea of sustainable development.

Stakeholders and actors involved

The beneficiaries of best practice are statutory spa resorts in Poland. The Polish Spa Resorts are situated in the most beautiful regions of Poland and they are abundant in natural assets. They offer not only treatment with natural resources but can also satisfy the most sophisticated tastes and needs of clients in spa tourism, recreation, spa & wellness. At the present moment in Poland, there are 45 statutory spa resorts and many towns with potential spa resort qualities. The users of the best practice are social partners, inhabitants, tourists, SPA guests (estimates).

Actions implemented and results achieved

The Eko Hestia SPA aims to promote innovative and effective local government pro-ecological activities and investments related to environmental protection, implemented by municipalities with the status of health resorts, and to award one municipality recognized by the Competition Committee as the best in this regard.

The contest EKO HESTIA SPA has organized by ERGO Hestia and the Association of Polish Spa Communities. Ergo Hestia is one of the biggest insurers in Poland. Sopot, the home city of ERGO Hestia's headquarters, is a spa. The notion "spa" is an asset, as well as a commitment to ensure care and protection. The Association of Polish Spa Communities (SGU RP) is an all-Poland organisation that associates communes of similar character and profile where health and spa resorts and areas are located or the communes aspiring to a health resort status. The Association provides consultancy services and supports the procedures to obtain the status of a health and spa resort or health and spa area in the communes where health and spa resorts can be created. SGU RP has many tasks assigned to it, connected with representation of interests of spa communes, both at the national and international level. However, the most important tasks include protection and representation of interests of spa communes, supporting any activities aimed at development of Polish health and spa resorts, promotion of health and spa resorts in Poland and abroad.

Methodological approach

The presented best practice takes the form of a national competition organize by insurance company in partnership with The Association of Polish Spa Communities. The competition qualification will take into account pro-ecological activities and activities that bring ecological effects at least in a given health resort commune, projects and programs, among others in the field of ecological education, environmental protection, sustainable development, activating the local community, creating leaders, etc. Currently, the fifth jubilee edition of the competition is underway. A total of 24 spas participated in the four previous editions. In 2016, the winner of the main prize was Uniejów, the next year it was Busko-Zdrój, in 2018 - Inowrocław, and a year ago the winner was Lądek-Zdrój.

Challenges encountered

For all Polish spas, closed to patients during the pandemic Covid-19, the last few months have been an extremely difficult period and a unique, unprecedented experience. Despite significantly reduced budgets, many of them did not give up their previous investment plans and activities related to the broadly understood environmental protection and ecology. Therefore, the initiative like EKO HESTIA SPA competition has a special meaning in such a difficult time.

Lessons learned and key messages

Local governments should foster and promote environment-friendly behaviour of the local community and visitors. This is particularly important in spa communities, where we have to protect the natural environment at any cost. Nature offers great potential and represents a major commitment. The received award of PLN 100,000 has to be allocated for continued environmental initiatives of the winner community e.g. 1) solar installations or photovoltaic batteries in public utility facilities (kindergartens, schools, cultural and art institutions, social welfare homes, sports facilities, etc.) 2) investments in renewable energy, 3) creating green areas (e.g. park) 3) educational activities in the field of ecology with visible or documented effects of the activities undertaken. It is also important to highlight the fact that the competition tool and the award have a knock-on effect on the continuation of sustainable investment in SPAs.

Replicability and transferability

The described best practice could be replicated in other countries on a similar basis.

Source: http://szczawnica.pl/pl/1772/10821/pol-miliona-na%C2%A0polskie-eko-uzdrowiska-jubileuszowy-konkurs-eko-hestia-spa.html?out=print

https://nowymarketing.pl/a/37975,eko-hestia-spa-ruszaja-zgloszenia-na-najbardziej-ekologiczne-uzdrowisko

C.

CHAPTER 3

BEST PRACTICES ADDRESSING THE MAIN ENVIRONMENTAL PRESSURES TO SPAs SUSTAINABLE DEVELOPMENT

8. DEPLETION OF WATER

Although indestructible, freshwater is a finite and precious resource essential for sustaining life, supporting economic activities, and for the environment itself. Water resources in Europe are, in many locations, under threat from a range of human activities, which lead to problems of overexploitation and low quality of inland waters.

There are many reasons why water resources are coming under pressure: increasing populations, economic growth, intensive agriculture, rapid urbanisation, growing tourism and leisure activities, as well as the lack of proper supply and treatment facilities or institutional arrangements for water management.

Not all water uses put equal stress on water resources, but generally growth in the world's population, cities, and GDP is putting acute pressure on water supply and waste disposal. For this reason, scientists estimate that by 2030 the global gap between water supply and demand could reach 40 percent.

As SPA depends on water – even the word "SPA" is derived from sanus per aquam— "health through water", impact of this sector on water (especially thermal and mineral water) resources is very important. Therefore, managing water consumption and quality is vital to ensuring sustainability

Therefore, to reach the goal of sustainable water management a balance has to be achieved between the abstractive uses of water (abstraction for public water supply, irrigation, and industrial use), in-stream uses (recreation, ecosystem maintenance), discharges of effluents, and the impacts of diffuse sources. This requires that quantity, quality, and ecological effects are all taken into account.

In this sense the practice of water reuse presents several environmental, economic, and social benefits, among these, water reuse can:

- increase the natural and artificial flow in streams and ponds, in some cases, leading to the revival of aquatic ecosystems;
- recharge aquifers helping in meeting good quantitative status and avoiding deterioration in the status of groundwater if it can be ensured that the chemical status is not adversely affected;
- allow for better resilience to changes in water demand triggered by population changes but also climate change;
- in water stressed countries, may present a lower environmental impact than other alternative water supplies such as desalination;
- can reduce the need for artificial fertilisers by providing nutrients for irrigation.

Regarding thermal and medical water, the issue of reusing (readapting) the post bathing water seems to be crucial for effective water waste management at SPAs. The best practices presented below seem to deal effectively with this issue with a particularly effective result:

- **Technology for the reuse of thermal water to mitigate environmental pressure on SPAs from Poland,** the project aims at creating a pilot facility to implement in real conditions technologies for the treatment of post-bathing water, currently treated as industrial wastewater to a state allowing its reuse in the activities of the SPA.
- **Optimized recycling of thermal and medicinal water and reduction of their environmental impact using innovative microbiological, industrial, and cavitation techniques from Hungary,** the project develops a complex method of desalination, combining benefits of a photobioreactor, and the positive features of open water systems.

8.1. Technology for the reuse of thermal water to mitigate environmental pressure on SPAs.

Keywords

Technology, post-bathing water, innovation.

Summary

The subject of the project is the development of a pilot facility to implement in real conditions technologies for the treatment of post-bathing water, currently treated as industrial wastewater to a state allowing its reuse in the activities of the SPA..

Pressures enfaced

Environmental

Environmental aspects

Water resources, ecosystem services.

Field of action

Technology

Geographical scope

National

Timeframe

2018 - ongoing

Context and main issues addressed

Busko-Zdrój Health Resort is one of the most popular Polish resorts. The main activities are SPAs treatments, carried out with the use of its sources of medicinal waters - sulphide water and brine. The patients can attend about 80 types of treatments. From 2013. "Uzdrowisko Busko-Zdrój" S.A. is run by the local government of the Świętokrzyskie Voivodeship.

Following its activities, the Health Resort currently produces about 200 thousand cubic meters of post-bathing water annually. This is waste with a high degree of salinity, containing various chemical, biological substances, and pollutants. At the moment, the Health Resort's post-bathing Water Treatment Plant is located in the village of Siesławice. The treatment process includes post-bathing wastewater from mineral waters used for treatments in facilities located in the Health Resort (waters classified as chloride - sodium, iron, iodide, fluoride, sulphide), tap water used for washing bathtubs and baths other than saline, wastewater from mineral water bottling plants (bottle washing) and wastewater from infiltration in the field[8]. The concept of the project starts from the lack of technology in the country that would enable further use of post-bathing waters from health resorts. In most cases, the sewage goes to the sewage system and further to the treatment plant. This involves the high costs of wastewater discharge.

Stakeholders and actors involved

The beneficiary of the project as well as the user of the analyzed best practice is Uzdrowisko Busko-Zdrój S.A. in Poland. The partners involved are scientific institutions selected by tender - Jan Kochanowski University in Kielce and Silesian University of Technology.

Other project stakeholders include in particular:

- other health resorts that may be struggling with the problem of post-bathing water management;
- local government / local government organizations and other institutions responsible for the quality of medicinal waters;
- scientific institutions carrying out their research in the area of wastewater management;
- water and sewage companies;
- society, supporting work on improving the quality of the Maskalis stream.

Actions implemented and results achieved

Within the framework of the implemented project, Busko-Zdrój Health Resort intends to reuse the waters used for medicinal baths. The authorities of the resort cooperate with Jan Kochanowski University in Kielce and the Silesian University of Technology in works on new technology. Busko-Zdrój Health Resort plans to build an installation allowing for reuse of sulphide water and iodide brine for medicinal purposes, production of bath salts, sale of water already used once to other centers, and supplying it to the brine graduation tower to be built in the Centre of the New Spa Park. According to the assumptions, the planned installation may also serve as a demonstration model of the proposed technology for several dozen other health resorts in the country, which are struggling with the problem of industrial wastewater management and obtaining new sources of medicinal water.

8 http://bip.realnet.pl/uzdrowiskobusko/pliki/SIWZ_MODERNIZACJA_OCZYSZCZALNI_SCIEKOW.pdf

The result of the project implementation will be an innovative installation of comprehensive treatment and recovery of medicinal waters on a pilot scale. This installation, apart from offering the possibility of post-bathing water reuse, will enable to achieve the following results:

- minimise the amount of final waste,
- minimising the impact of odor emissions (mainly sulphur compounds),
- improving the water purity of the receiver,
- achieving optimal levels of post-bathing water treatment,
- identification and removal from post-bathing waters of possible residues such as antibiotics, steroids from ointments and medicines,
- reduce current demand for local hydrogeological resources (fresh mineral water) for bathing purposes,
- ensuring a constant supply of water to the graduation tower.

Methodological approach

The key factor for the recognition of a project as good practice is the use of a methodological approach that is similar to the methodology used in R&D works and the implementation of their effects in practice. The initiator of the project is one of the most popular Polish resorts - Busko-Zdrój Health Resort. The facility currently produces about 200 thousand cubic meters of post-bathing water per year and struggles with the problem of its proper management. Due to the lack of appropriate technology on the market, cooperation with research institutes has been established to support work on developing an innovative pilot technology. The implementation of R&D works completed with validation - checking the functionality in real conditions will allow confirming the effectiveness and efficiency of the installation's operation within the framework of post-bathing water management. The project may be a vision of best practice for other SPAs, indicating the possibilities of reuse of sewage from activities.

The scope of planned research and experimental and development works includes among others:

- tests on the variability of water composition,
- selection and production on laboratory scale as well as testing and optimisation of the structure and properties of purification agents, nanostructured sorbents, coagulants, and sedimentation agents,
- production in semi-industrial quantities necessary for the purification project, nanostructured sorbents, coagulants, and sedimentation agents.

The final effect of the above-mentioned work (stage I) will be the achievement of the target results of the research based on which it will be possible to prepare assumptions for the development of the pilot installation. The technical pilot installation built in the second stage will be based on the existing treatment installation in the Busko-Zdrój Health Resort, taking into account the planned modernization based on research and technological guidelines obtained in the laboratory. The pilot plant will therefore be used for continuous operation for wastewater treatment and for determining operational parameters. The final verification tests will be carried out by accredited measuring devices.

Lessons learned and key messages

The following main lessons have been identified:

- highlight the issues related to the management of post-bathing waters;
- strengthening the approach related to the implementation of pro-ecological and eco-innovative actions and technologies, which can also be applied in a small scale of the spa's activity (exemplary ecological effect of this project - improvement of water purity (quality) of the Maskalis stream);
- according to the assumptions, the planned installation may also serve as a demonstration model of the proposed technology for several dozen other health resorts in the country, which are struggling with the problem of industrial wastewater management and obtaining new sources of medicinal water;
- spreading the idea of cooperation between entrepreneurs from the tourism sector and scientists to create innovative solutions.

The key messages related to this best practice include / relate to:

- an innovative system of post-bathing water management;
- the possibility of obtaining new sources of medicinal water.

Replicability and transferability

This practice can be applied in other locations. The final implementation should be verified in terms of assessing regulatory and legislative issues in the country.

Source: https://radiokielce.pl/619073/post-70447/

8.2. Optimized recycling of thermal and medicinal water and reduction of their environmental impact using innovative microbiological, industrial, and cavitation techniques

Keywords

Thermal, medicinal water, recycling.

Summary

Each Hungarian thermal water contains a large number of dissolved ions, which is a major social and economic problem in proportion to the country's thermal water resources. The R&D tasks of the project include the development of methods for zooplankton, periphyton and by the use of higher organisms, through which the thermal water used can, after further removal of the nutrients, be brought into a condition which, when discharged into natural waters, is the least possible burden on the receiving water bodies. The complex method developed will increase the targeting and efficiency of desalination, as well as combine good practices, the benefits of a photobioreactor, and the positive features of open water systems. By the European legislation, the Water Framework Directive deals with the thermal and medicinal water issue. In terms of the directive the criteria of return into surface reservoirs have been established. Thermal waters contain a large number of dissolved ions countrywide, therefore their treatment presents an extended socio-economic problem. R+D activities of this project include development of new methods (using zooplankton, periphyton, and higher organisms), aiming for further reduction of nutrients of thermal waters (along with reduction of salt content and temperature, or the nutrient consumption of algae) to prevent surface reservoirs.

Pressures enfaced

Environmental

Environmental aspects

Water resources, ecosystem services

Field of action

Technology

Geographical scope

National (Hungary)

Timeframe

2017 - 2020

Context and main issues addressed

Each of the Hungarian thermal waters contains a large number of dissolved ions, which is a major social and economic problem in proportion to the country's thermal water resources. The R&D tasks of the project include the development of methods for zooplankton, periphyton and by the use of higher organisms, through which the thermal water used can, after further removal of the nutrients, be brought into a condition which, when discharged into natural waters, is the least possible burden on the receiving water bodies. The complex method developed will increase the targeting and efficiency of desalination, as well as combine good practices, the benefits of a photobioreactor, and the positive features of open water systems.

Stakeholders and actors involved

Beneficiaries: citizens of the river basin.

Users: actors of thermal/medicinal water use, particularly spa institutions.

Within the framework of the consortium, 3 universities (Szent István University, University of Debrecen, Pannon University) and two companies (Hidrofilt Ltd., HungaroSpa cPlc.) participated in the project. The new complex technology is realized through the effective collaboration of these research sites and companies. Szent István University dealt with the research of algal strains and symbiotic bacteria that can be used indoors in algae reactors. The University of Debrecen dealt with the study of algal and bacterial strains required for biological desalination processes in natural or artificial lakes.

Researchers at the Pannon University researched the cavitation sterilization process using ultrafiltration (UF) and / or a special glass bead-based charge (SGR) unit.

Hidrofilt Kft. conducted research with the help of industrial reverse osmosis (RO) technical elements.

Actions implemented and results achieved

Below you can find a short description of the main activities performed by each partner within the project.

Hidrofilt Ltd.:

- Research of normal and elevated temperature reverse osmosis technology (Industrial research);
- development of an industrial-scale prototype using high-temperature RO technology (Experimental development).

HungaroSPA cPlc.:

- research of a complex water treatment control solution (Industrial research);
- integration of experimental water treatment technology into the effluent of the Hajdúszoboszló Spa (Experimental development).

Pannon University:

- research of the efficiency of the cavitation process in high temperature environment (Industrial research);
- development of a sterilization prototype with a high temperature cavitation process (Experimental development).

Szent István University:

- research of high salt tolerance algal strains and algal bacteria with adaptive evolution for algae reactor (Industrial research);
- research of high salt tolerance algal strains and algal bacteria by genomic tools, for algae reactor (Experimental development).

University of Debrecen:

- periphyton and algae biomass salt fixation research on bioactive-biochip baffles for surface waters (Industrial research);
- development of a prototype of bioactive-biochip baffle system (Experimental development)

Therefore, the technology implemented within the framework of the collaboration is suitable for the environmentally friendly desalination of thermal water effluent.

Accordingly, economic and social exploitation is possible in the following areas:

- sewer limit cleaning,
- desalination for discharge into an aquifer,
- production of water suitable for irrigation,
- use as bathing water,
- production of water suitable for fish farming,
- production of desalinated water for heating or technological use.

Methodological approach

There are more than 1,500 thermal water wells in the country. Of these, more than 900 wells are in operation, 31% of which are for balneological purposes, more than a quarter of which are used for drinking water supply, and nearly half for direct heat recovery purposes. The heat content of the extracted thermal water is usually used for medical purposes or in thermal baths, in agriculture for heating greenhouses, for heating buildings and swimming pools, for domestic hot water production, and in some cases for district heating.

During the preparation of the project, an analysis of the most important technologies on the market was performed. The analysis of competing technologies shows that the placement of thermal water in surface waters is a realistic option, but their salinity-reducing effect individually is not sufficient.

The R&D tasks of the project included the development of methods for zooplankton, periphyton, and using higher organisms, which, in addition to the reduction in salinity and temperature and the use of nutrients by algae, for.

After the water has been used in the boating lake and the subsequent reservoir lake, the addition of dilution water not only dilutes the salinity and lowers the temperature, but based on the inorganic and organic substances of the used thermal water, the reproduction of organisms entering with the dilution water begins. This colonization is a natural process that contributes to making thermal water from deep layers increasingly similar to natural surface waters.

The complex method developed, increases the targeting and efficiency of desalination. It combines good practices, taking advantage of the photobioreactor (enrichment of appropriate algal species), and the positive features of open water systems.

Lessons learned and key messages

Within the framework of the research and development project with a total budget of nearly HUF 1.4 billion, new complex technology has been created, which enables the optimized recycling of thermal waters and reduces the salinity of wastewater and its impact on the environment by combining algae reactors and industrial reverse osmosis technologies.

The complex multi-stage thermal water treatment technology and the related equipment created as a result of the successful cooperation were put into operation in the area of the Hajdúszoboszló Spa.

The new cavitation technology allows the recirculation of thermal and medicinal waters without the use of chemicals, while maintaining the beneficial balneological properties. The technology ensures the economical use of used water and other by-products generated during water use, as well as the introduction of used thermal water into a state that can be introduced into natural recipients in compliance with the applicable European Union limits.

Replicability and transferability

This best practice can be extended to other territories. The collaboration of research institutions and companies to serve the interest of both society and the environment are transferable to other geographical contexts finding the proper funding sources (particularly RDI Funds). The process has to be based on the proper definition of the problem to be solved as well as the target groups and the expected environmental-societal-economic impact.

Source: https://termalonline.hu/wp-content/uploads/2019/03/hajduszoboszlo_latkep.jpg

9. DISRUPTION OF NATURAL ECOSYSTEMS

A critical indicator of the health of the world's biodiversity is comprised in the IUCN Red List. Established in 1964, the International Union for Conservation of Nature's Red List of Threatened Species has evolved to become the world's most comprehensive information source on the global extinction risk status of animal, fungus, and plant species. Far more than a list of species and their status, it is a powerful tool to inform and catalyse action for biodiversity conservation and policy change, critical to protecting the natural resources we need to survive. It provides information about a range, population size, habitat and ecology, use and/or trade, threats, and conservation actions that will help inform necessary conservation decisions.

In all SPAs areas analysed by HealingPlaces project, high diversity of habitats and species was recorded, of both flora and fauna. Anthropogenic influence, urbanization, and construction as well as disturbances and changes in agricultural practices have resulted in a reduction of the area of certain habitat types causing decreasing populations of specialized and less numerous species and their replacement by widespread opportunistic and invasive species - often allochthonous, leading to unification of communities and loss of biodiversity.

Therefore, it is urgent, today more than ever, to protect the most vulnerable natural resources from the effects of this huge impact, by carrying on first of all awareness rising actions addressed to decision and policymakers, private companies, and citizenship to mitigate the existing and potential pressures insisting on them.

An attack on the biodiversity can be determined by several elements such as increased industrial and agricultural production (pesticides, fertilizers, biotechnology), but also a more general effects determined by climate change. This attack on a specific area generally can lead to several severe effects among these for example:

- loss of habitat due to deforestation and devastation of forests and expansion of agricultural land,
- fragmentation and disruption of natural ecosystems,
- destruction and decomposition of biotopes,
- bio invasion of alien species,
- pollution of soil, water and atmosphere on a local, regional, global scale,

In order to mitigate negative effects provoked by the loss of biodiversity, below we present two Best Practices:

- **Eau Concert 2 project "Concertation and Actions of valorisation of fluvial ecosystems from Italy,** the project aims to restore and protect cross-border aquatic ecosystems (Italy – France), and to enforce ecosystem, that means services offered by natural environment to humans (foods, sanitarian, economical). The challenge enfaced by it is to integrate the idea of a simple protection of the quality and quantity of river water with an overall vision that includes the enhancement of the entire river ecosystem, meaning both the actual waterway and the territory that it depends.
- **Project Life to Grasslands from Slovenia,** of which purpose was to improve the condition and ensure long-term management of dry grasslands and related plant and animal species in four project sub-areas: Haloze, Pohorje, Kum and Gorjanci – along with all being Natura 2000 sites, also by offering new knowledge and insights for future improvements.

9.1. Eau Concert 2" project "Concertation and Actions of valorisation of fluvial ecosystems"

Keywords

Water, ecosystem services

Summary

Restore and protect cross-border aquatic ecosystems; enforce ecosystem services. The objective of Eau Concert 2 project is to restore and protect cross-border aquatic ecosystems and enhance their ecosystem services (what nature offers to humans: food, health, economic support). Particular attention is paid to the conservation of biodiversity, ecological corridors, and adaptation to climate change. The project aims to restore and protect cross-border aquatic ecosystems (Italy – France), and to enforce ecosystems, which means services offered by natural environment to humans (foods, sanitarian, economical). The cooperation on cooperative participative governance of fluvial ecosystems of rivers in France and Italy are based on Rivers Contract instrument, which constitute a working method for the negotiated management and shared hydraulic resources at watershed level. The project area concerns, for Italy, the entire water catchment area of the Dora Baltea river (in Piemonte region). The territory includes the Metropolitan City of Turin, the Province of Vercelli and 84 Municipalities, of which 27 are represented by the Mountain Catchment Area Consortium. In France, the project involves the catchment area of the Chèran river in Savoy (Rhône - Alpes). The challenge enfaced by the project is to integrate the idea of a simple protection of the quality and quantity of river water with an overall vision that includes the enhancement of the entire river ecosystem, meaning both the actual waterway and the territory that it depends.

Pressures enfaced

Environmental

Environmental aspects

Water resources, Biodiversity, Ecosystem services

Field of action

Cooperation

Geographical scope

European (Programme 2014 - 2020 INTERREG V-A France - Italy (ALCOTRA)

Timeframe

ongoing

Context and main issues addressed

The project area concerns, for Italy, the entire water catchment area of the Dora Baltea river (in Piemonte region). The territory includes the Metropolitan City of Turin, the Province of Vercelli, and 84 Municipalities, of which 27 represented by the Mountain Catchment Area Consortium. In France, the project involves the catchment area of the Chèran river in Savoy (Rhône - Alpes).

The challenge is to integrate the idea of simple protection of the quality and quantity of river water with an overall vision that includes the enhancement of the entire river ecosystem, meaning both the actual waterway and the territory that it depends.

The main problems refer to the protection and valorisation of the river ecosystem, the reduction of pollution of both surface and groundwater, the restoration of the landscape and historical cultural sites, and the protection of biodiversity. The extreme climatic events that have intensified in recent years have emphasized the importance of taking care of natural environments to strengthen their resilience and preserve the ecosystem services offered by nature.

The main goals are achieved through the development of an already existing participatory management tool, the River Contract. In fact, both in France and in Italy, the participatory governance of river ecosystems is based on the instrument of the River Contract which is a working method for the management of water resources at the scale of the river basin. The River Contract is a process of negotiated governance and it's based on the active participation of local actors. The heart of the instrument is the participated process, the strong ongoing dialogue between actors of different nature, and the consensus they express around the objectives of the River Contract. The goal is to recover, improve and preserve a river through concerted initiatives of all public administrations, water management services, companies, associations, and all other organized territorial actors.

Stakeholders and actors involved

The beneficiaries of the BEST PRACTICE are the citizens who live in the river basin. All improvement actions are targeted to citizens as final beneficiaries.

The users are the actors which play an active role in the participatory processes: public administrations, policymakers, water management services, companies, associations, professionals, research bodies, and all other organized territorial actors.

The actors involved in the territorial animation are called to contribute directly to the definition of the River Contract Action Plan, the tool through which to plan the future of the river basin in the medium and long term. Their involvement takes the form of participation in the thematic workshops aimed at negotiating strategic actions in a participatory way.

All beneficiaries are actively involved in the participatory planning process. All target groups are called to build what we can define as a "river community" within the hydrographic basin.

Actions implemented and results achieved

The activities can be grouped into three main strands:

Participatory planning: local concertation and shared definition of actions, through the involvement of local communities to define the Action Plan of the River Contract (the Dora Baltea's River Contract), the implementation of environmental awareness activities, the mapping of cultural and naturalistic sites. A common rising awareness is also provided with schools, universities, and economic actors on the risk of pollution of the Cheran River (in France).

The enhancement of riversides and fluvial ecosystems, through the training of local technicians for the maintenance of the territory, the management of invasive species along the river, the establishment of optimized monitoring of the quality of the water and the river ecosystem, the implementation of the riparian vegetation management plan and the development of local ecological networks, the economic evaluation of ecosystem services deriving from management activities.

The Communication: Dissemination and communication activities (Journal of the Dora Baltea and the Chéran, newsletter, events, press communicates, events ...).

The main results can be defined as follows:

- enhancement of fluvial ecosystems through instruments of participated management;
- introduction of innovative training, monitoring, restoration, and enhancement processes for aquatic ecosystems;
- development of the River Contract as a tool for participated planning and water resources management in which the river basin is the territorial area of reference;
- raising awareness of local communities on the holistic approach to the river territory governance: water resources management (water quality and water regulation), territory management (control of soil's degradation and use), ecological management (biodiversity preservation), and human activity management (socio-economic advantages) (Moss, 2003).

Methodological approach

The methodological approach consists of the participatory planning. The tool used is the River Contract which introduces an integrated approach concerning water resource management. This approach includes hydraulic, natural, ecological, social and economic aspects.

River Contracts are voluntary based tools for the integrated management of water bodies and their connected territories, through which public and private bodies share an action plan and commit themselves to implement it with the subscription of an agreement. The River Contract Action Plan may concern water quality improvement, river banks recovery, territorial management, and maintenance, flood prevention, management of water resources according to the different end-users (citizens, farmers, and entrepreneurs), environment and biodiversity, landscape protection, enhancement of socio-economic activities and communication strategies.

Different workshops of participated planning were implemented at the local level. The workshops were focused on 6 main topics: protection and enhancement of the environmental heritage; usability, identity, and promotion of the territory; integrated management of the river framework; ecological networks; territorial marketing; sustainable agriculture.

The Best Practice capitalizes the experience started with the first Eau Concert project under the previous Interreg ALCOTRA (2007-2013) Programme.

Challenges encountered

The public-private concertation process involves heterogeneous groups of stakeholders. The challenge is to manage and maximize the contributions of all actors. Furthermore, it is important to identify the potential financial resources that can be accessed to implement the various interventions shared by the stakeholders.

Lessons learned and key messages

- Emphasize the principles of participation and integration of policies.
- Enhance, regarding the issue of water resource management and in addition to environmental restoration, other aspects such as sustainable development, adaptation to climate changes, ecosystem services...
- Invest resources in communication and awareness actions aimed at local communities.
- Identify, during the participative processes, concrete paths of co-financing and implementing the measures/projects.

Key messages are:

- holistic approach to the river territory governance;
- integrated management of water bodies related to their connected territories;
- integration of funds and resources.

Replicability and transferability

This Best Practice can be extended to other territories. The governance processes which are at the basis of the BEST PRACTICE are transferable to other geographical contexts. First of all, the legislative and regulatory framework should be assessed within each country and territory.

https://www.interreg-alcotra.eu/it/decouvrir-alcotra/les-projets-finances/eau-concert-2 concertazione-e-azioni-di-valorizzazione-degli

9.2. Project “Life to grasslands”

Keywords

Grasslands, Sustainable agriculture, Rural architecture, Rural development

Summary

Within project several topics were addressed such as conservation, protection, and management of dry grasslands in Eastern Slovenia. As one of the key environmental challenges in modern world is to sustain biological diversity, sectors like agriculture, nature conservation, education, and economy joined forces in tackling the project’s aims. Its purpose was to improve the condition and ensure long-term management of dry grasslands and related plant and animal species in four project sub-areas: Haloze, Pohorje, Kum, and Gorjanci – along with all being Natura 2000 sites. The project implemented management practices of dry grasslands from the Management Programme for Natura 2000 sites in Slovenia (2015–2020) and offered new knowledge and insights for future improvements.

Pressures enfaced

Environmental, Social, Economic

Environmental aspects

Biodiversity, Landscape, Land use, agriculture, forestry

Field of action

Cooperation

Geographical scope

National,

Timeframe

2015 - 2020

Context and main issues addressed

The key environmental challenge addressed by the project is the conservation of biodiversity in the agricultural cultural landscape. Extensive dry grasslands are among the most endangered habitats. We have been facing the decline of biodiversity in the agricultural landscape in Europe for several decades, including Slovenia having a particularly important role to play in preserving it.

The project aimed to improve the condition and ensure long-term management of dry grasslands and related plant and animal species in four project sub-areas: Haloze, Pohorje, Kum, and Gorjanci (Natura 2000 sites). All four areas face problems of overgrowing and abandonment of agricultural use on the one hand and inadequate, over-intensive agricultural use on the other. The project aimed to improve the conditions of two Natura 2000 priority habitat types of grasslands in unfavourable conditions: semi-natural dry grasslands and shrub phases on carbonate soils, which are important cuckoo habitats, and species-rich grasslands with predominant Nardus grasslands on silicate soils.

Threats to the conservation of dry grasslands addressed by the project were:

- abandonment and overgrowing;
- intensive use;
- eutrophication;
- ownership fragmentation of land;
- decay of meadow orchards;
- erosion;
- tourism: human activities in the natural environment and construction of ski resorts.

Stakeholders and actors involved

Direct users of BEST PRACTICE are primarily farmers as extra and renewed conditions for traditional agriculture were created. Several indirect impacts of BEST PRACTICE were planned and reached:

- communication and planning of land use among private owners and renters of (agricultural) land;
- rising awareness and capacity building among managers and visitors of protected areas;
- prepare and disseminate educational materials regarding the project's topic;
- involve and enhance knowledge of agronomists and technical staff from chambers of agriculture;
- prepare expert grounds for policymakers in ministries of agriculture and environment;
- networking of persons employed or volunteering in tourism sector.

During the implementation of best practice, several institutions contributed to project's results. Lead partner was the Institute of the Republic of Slovenia for Nature Conservation and their central unit from Ljubljana. They pay special attention to the most valuable parts of nature conservation and the most endangered areas and species. At work, they strive for professionalism, objectivity, and dialogue, as well as the establishment of quality relations with stakeholders and the public. Through nature protection guidelines, the Institute has an important influence on the planning and management of space and the use of natural resources.

Among project partners, there were an NGO, agricultural institute, local community, and institute for rural development. Each of them covered a specific area in their region of East Slovenia and contributed to project results with their diversified sources characterized by local environments and practices.

Actions implemented and results achieved

Project partners have prepared Action Plans to improve the situation and ensure long-term management of dry grasslands, which included the Nature Conservation Baselines for Dry Grassland Management of habitats HT 6210 (*) and 6230 (*) for all four pilot projects areas. Nature conservation guidelines for management were prepared using a participatory approach, involving experts, partners, and relevant stakeholders in the document preparation process. To promote the involvement of farmers and owners in the project activities, they conducted local workshops: 9 at Haloze, 5 at Gorjanci, 4 at Kum, and 3 at Pohorje. 356 farmers / landowners participated in the local workshops. The project staff made more than 1200 visits to the farms.

To ensure long-term sustainable multifunctional management of dry grasslands with grazing, late mowing, and restoration of tall meadow orchards, the project provided farmers with free grazing equipment, mowers, seedlings of tall fruit varieties and enable removal of overgrowth and rejuvenation of old trees. Together with the Agricultural and Forestry Institute Ptuj, they prepared 49 Farm Plans (Haloze 30, Pohorje 7, Gorjanci 2, Kum 10), whose main goal is to enable the farm to economically successful agricultural activity, taking into account the objectives of preserving extensive (dry) grasslands.

External subcontractors prepared reports of the assessment of the socio-economic impact of the project actions on the local economy and population and assessment of the project's impact on the ecosystem functions. Project staff organized more than 30 events (presentations, workshops, or nature science days in the field) for children and teachers. More than 1000 children and more than 100 teachers participated in project events. The Institute of the Republic of Slovenia for Nature Conservation has prepared an educational programme for teachers Suha travišča kot model za pouk spoznavanja okolja, naravoslovja in biologije, which is available online. The program was enrolled in the National Catalog of Additional Educational Programs and Training for Educational Workers (KATIS) at the Ministry of Education, Science and Sport. Successful integration of "dry meadows as a sample for learning about environmental and biology", into official national education programs, was a great achievement for the project.

The planned project activities were:

- identification of areas that are becoming overgrown, analysis of the agricultural use and monitoring of the status of the habitat types;
- communication and networking with the owners of the land and the farmers to provide management of abandoned lands;
- lease and redemption of abandoned lands (and further rental of the land under the deal) to ensure continuous management of grasslands;
- elimination of overgrowth/clearing of the land in various phases of overgrowth;
- ensuring continuous management of grasslands by guiding and offering support (procurement of equipment and machines) based on the agreements reached with the owners and the lessees;
- renewal and establishment of grasslands with extensive tall-trunk orchards (procurement of saplings and protective equipment, planting, and education about maintenance);

- connecting farmers to provide management of cleared areas and surfaces that are inappropriately used;
- preparation of plans for agricultural holdings for the selected – interested farms;
- preparation of technical basis for the agricultural environmental programme from the field of continuous management of grasslands for individual areas, which was submitted to the Ministry of Agriculture, Forestry and Food and to the Ministry of the Environment and Spatial Planning, to improve the programme with Agri-environment payments measures and adjust the latter by the characteristics of individual regions;
- activities and the plan to establish the trademark and the products connected to dry grasslands, orchards, grazing, and mowing (workshops, marketing, promotion);
- promotional and educational activities – co-operation and programmes/accessories for schools, education for farmers, municipalities, communication with decision makers from the field of agriculture and the environment on the national level, equipment of interpretation and info points, complementation of existing interpretation routes, publications.

Success factors accompanied the project activities throughout whole project duration.

Methodological approach

The project's idea was based on addressing the conflict of land use between sectors of agriculture and nature conservation, including socio-economic depopulation of areas in less-favoured areas and absence of economic development in rural areas. The key environmental challenges addressed by the project are the conservation of biodiversity in the agricultural man-made environment; to be more specific. the conservation of dry grasslands. The project LIFE TO GRASSLANDS contributed to the achievement of the Natura 2000 Management Programme (2015-2020), while it addressed the most endangered species and habitat types, of which the status in this area needs to be improved.

Challenges encountered

One of the project's challenges was to seek possibilities for the re-cultivation of abandoned agricultural lands and thus "bring life back to the grasslands". In this way, it can show that providing food security and the security of nature can go hand in hand. If we enable life to grasslands, the latter will even ensure our own survival.

Credits: Project LIFE TO GRASSLANDS, unknown photographer, https://www.lifetograsslands.si/fotogalerija/gorjanci/

10. CLIMATE CHANGE EFFECTS

Defining “climate change” and try to list the several effects that it entails is a hard mission. The effects of climate change are around us and it affects all regions around the world. Polar ice shields are melting and the sea is rising. In some regions, extreme weather events and rainfall are becoming more common while others are experiencing more extreme heat waves and droughts.

The main driver of climate change is the greenhouse effect. Some gases in the Earth’s atmosphere act a bit like the glass in a greenhouse, trapping the sun’s heat and stopping it from leaking back into space and causing global warming.

2011-2020 was the warmest decade recorded, with global average temperature reaching 1.1°C above pre-industrial levels in 2019. Human-induced global warming is presently increasing at a rate of 0.2°C per decade.

An increase of 2°C compared to the temperature in pre-industrial times is associated with serious negative impacts on to the natural environment and human health and wellbeing, including a much higher risk that dangerous and possibly catastrophic changes in the global environment will occur.

For this reason, the international community has recognised the need to keep warming well below 2°C and pursue efforts to limit it to 1.5°C.

Climate disrupts all-natural ecosystems, directly and indirectly. Aquatic ecosystems result deeply affected through changes in temperature, wind, and precipitation, and indirectly through watershed effects. Increased variability in precipitation and more extreme weather events caused by climate change can lead to longer periods of droughts and floods, which directly affects availability and dependency on groundwater. In long periods of droughts there is a higher risk of depletion of aquifers, especially in case of small and shallow aquifers. People in water-scarce areas will increasingly depend on groundwater, because of its buffer capacity.

At the same time, indirect climate change impacts such as the intensification of human activities and land use changes increase the demand for groundwater. Strategic use of groundwater for global water and food security in a changing climate is becoming more and more important. This is another reason why groundwater should have a more prominent role in climate debates.

Climate change does not only affect groundwater quantity, but also it’ s quality. Sea level rise may lead to saltwater intrusion into coastal aquifers affecting groundwater quality and contaminating drinking water sources. Once saltwater has intruded into the fresh water system it is difficult to reverse the process. Particular vulnerable are already low-lying coastal zones and small island developing states. On the other hand, saline/brackish groundwater bodies also represent opportunities for economic activities and ecosystems. Understanding these systems will promote effective management interventions in the face of climate change.

Below we show you two best practices for the mitigation of climate change effects. The first one regards the application of geothermal energy considered as a sustainable renewable energy alternative to fossil fuels but a substantial increase in its development is needed for it to make a difference in the combat against climate change. And, the second one regarding directly the groundwater resource as seen below, as one of the main ecosystems directly affected by the climate change effects.

- **Geothermal energy - a basis for low-emission heating, improving living conditions, and sustainable development co-financed by the European Economic Area (EEA) 2009-2014 from Poland,** the project aims to transfer knowledge, technology, and good practices of application of geothermal energy (RES) in buildings from Norway, Iceland to Poland. One of the elements of the project was also to propose formal and economic tools which, together with the transfer of knowledge and good practices, will ensure sustainable development of district heating based on geothermal resources in Poland

- **Information System for Analysis and Assessment of Groundwater Resources in Dependence on Human Activities and Climatic Changes from the Czech Republic,** the project aims at developing an information system for analysis of existing and assessment of future dynamics of groundwater resources (Information System ZAVOD) to respond to the actual negative climate change trends and tries to provide technological solution available to water management bodies (providing services in the field of drinking water supply, draining and sewage water treatment) to better manage, anticipate and adapt to hydrometeorological changes and its impacts on the hydrological balance and the state of underground water resources.

10.1. Geothermal energy - a basis for low-emission heating, improving living conditions, and sustainable development co-financed by the European Economic Area (EEA) 2009-2014

Keywords

Knowledge transfer, geothermal, cooperation.

Summary

The project aims to transfer knowledge, technology, and good practices of application of geothermal energy (RES) in buildings from Norway, Iceland to Poland. The Donor countries are Norway, which is a leader in the use of heat pumps, and Iceland - a leader in the use of water in district heating, thus ensuring zero-emissions, good living conditions, sustainable development, and efficient energy management. In Poland, the extraction of geothermal energy is at an initial stage.

The project aimed to support capacity building; increase the acceptance and knowledge of many stakeholder groups for the wider use of geothermal energy; a low-carbon sustainable economy; improving living conditions; building bilateral cooperation.

The project has carried out preliminary feasibility studies and proposals for pilot projects in Poland based on the experience of Norway and Iceland. One of the elements of the project was also to propose formal and economic tools which, together with the transfer of knowledge and good practices, will ensure sustainable development of district heating based on geothermal resources in Poland.

Pressures enfaced

Environmental

Environmental aspects

Water resources, Ecosystem services.

Field of action

Technology, Cooperation

Geographical scope

European

Timeframe

2017

Context and main issues addressed

For proper and sustainable development of low-emission and ecological heating in Poland, the use of geothermal energy is a necessary and preferred direction. In this respect, the experience of world leaders in this sector should be used to implement good and proven practices. In connection with the identified need, the idea of the project was developed and initiated by the Ministry of the Environment, and especially by the Government Plenipotentiary for Resource Policy and the Chief Geologist of the Country. The results of the works were to contribute to proper, sustainable development of geothermal heating in Poland, thus strengthening the work undertaken by the Polish government in this area.

As geothermal heating in Poland is still at an initial stage (currently there are six geothermal power plants), it is necessary to take comprehensive actions aimed at effective development. The key barrier is the lack of sufficient knowledge and awareness, as well as limited access to the best solutions and technologies. Therefore, the project aims to contribute to the dissemination of knowledge and increase acceptance among many groups of stakeholders for the wider use of geothermal energy; a low-carbon sustainable economy; improving living conditions; building bilateral cooperation.

Stakeholders and actors involved

The beneficiaries and participants of the project on the side of the EEA Grant Donor Countries in the field of geothermal energy were:

National Energy Authority of Iceland,

Christian Michelsen Research AS in Norway

There was also a team from the European Geothermal Energy Council, and Polish specialists represented the following centres:

- Institute of Mineral Resources and Energy Management of the Polish Academy of Sciences (Project leader);
- AGH University of Science and Technology in Cracow;
- Wroclaw University of Technology.

The project was also supported by experts, representatives of Lądek-Zdrój, Konstantynów Łódzki, Poddębice, Sochaczew - their location is shown on the map. Among the cooperating entities were also Uzdrowisko Lądek-Długopole SA and Geotermia Poddębice Sp. z o.o.

Other project stakeholders include in particular:

- other municipalities where geothermal energy can be used;
- local government / self-government organizations;
- scientific institutions carrying out their research in the field of geothermal energy;
- heating companies;
- environmental organisations;
- society, citizens.

Actions implemented and results achieved

The scope of the project included seven substantive tasks:

1. Study visit to Poland - obtaining information for preliminary studies on the possibilities of using geothermal energy and effective energy management in selected localities: Konstantynów Łódzki, Poddębice, Sochaczew, Lądek-Zdrój.
2. Study visit to Norway - learning about experiences in selected facilities and establishing contacts.
3. Study visit to Iceland - learning about experiences in selected facilities and establishing contacts.
4. Study visit reports - technical reports summarising observations and conclusions of the visits.
5. Study visit report. Elaboration of the main material effect of the project - Study Visits Report.
6. Dissemination of the Project - within the framework of national and international conferences, publication of press releases, promotion.

The material effects of project implementation include:

- preliminary studies on the possibilities of using geothermal energy in selected cities;
- proposals for pilot heating installations using geothermal energy;
- a proposal to introduce various financial instruments for geothermal energy, including the establishment of a geological risk insurance fund;
- appropriate drilling technologies and borehole research in geothermal energy.

Methodological approach

The methodology of the project assumed the implementation of tasks enabling an effective exchange of experience between foreign partners and selected localities in Poland to develop a preliminary study on the possibilities of using geothermal energy in selected cities, including, among:

- review of experience to date in the field of: drilling technologies, borehole equipping, research, and borehole measurements for the needs of geothermal energy in Poland - conclusions for selected project areas;

- best practices in geothermal drilling in Iceland useful for Poland;
- heat pumps in geothermal heating in Norway and Iceland - recommendations for Poland;
- technologies of underground heat storage in Norway and Europe - recommendations for Poland;
- legal and financial conditions for the successful development of geothermal heating;
- general conditions for the development of geothermal energy use in Poland and proposed actions;
- proposals for pilot projects in Poland based on the results of the project.

As part of the identified success factors, it is necessary to specify the level of cooperation and the results achieved, which have convinced all Partners about the validity and need for further cooperation. It is based on:

- good business and personal contacts established;
- it is important to initiate cooperation between teams that are leaders in their own countries and internationally, which should be continued and developed;
- comprehensive knowledge, experience, and creative invention of individuals and teams, which can create further advanced and innovative topics and projects (research, implementation, investment).

Lessons learned and key messages

The following main lessons have been identified:

- exchange of experience and building a sustainable network of contacts should be encouraged;
- proper cooperation enables the implementation of new, joint projects;
- the initiative has contributed to increasing knowledge and acceptance by many stakeholder groups for the wider use of geothermal energy.

The key messages related to this best practice include / relate to:

- it is necessary to continuously improve the general and specialist knowledge and level of knowledge of many social groups concerning geothermal and energy efficiency;
- energy clusters - initiatives tested in Iceland and Norway are an inspiration for their establishment also in Poland.

Replicability and transferability

This best practice can be applied in other locations. Establishing cooperation between geothermal leaders and stakeholders in the field of geothermal energy brings some benefits and enables the implementation of investment projects. The location aspect, in this case, is limited to the places where geothermal heat recovery is possible.

Source: http://www.eeagrants.agh.edu.pl/geobooster/study-visits-geobooster/

10.2. Information System for Analysis and Assessment of Groundwater Resources in Dependence on Human Activities and Climatic Changes

Keywords

Underground water resources, climate change, human activities

Summary

The project of applied research, realized by the Technical University of Liberec, was supported by the Technological Agency of the Czech Republic, Program Alfa. The main aim of the project is the development of information system for analysis of existing and assessment of future dynamics of groundwater resources (further in text is also used abbreviation "Information System ZAVOD"). The project responds to actual negative climate change trends and tries to provide technological solution available to water management bodies (providing services in the field of drinking water supply, draining, and sewage water treatment) to better manage, anticipate and adapt to hydro-meteorological changes and it impacts on the hydrological balance and the state of underground water resources. The system consists of parts enabling acquisition, management, and processing of the long-term monitoring data (treatment and display of raw data, data derivation, data visualization, trend analysis, time series, and spatial distribution analysis) and methodology for use of the long-term monitoring data for assessment of existing groundwater resources and their future changes in the given area considering expected development of climate and land use (for example landscape).

Pressures enfaced

Environmental

Environmental aspects

Water resources, Landscape, Underground water resources, Long-term monitoring, Prediction, Drought, Precipitation, infiltration

Field of action

Technology

Geographical scope

Local, Regional, National, cross-border project

Timeframe

2014 - 2017

*The project itself was carried out between 2014-2017, but the period of implementation is subsequently underway.

Context and main issues addressed

The challenge of drought and its negative consequences for agriculture, industry, and human society in general is the issue of wide public discussion recently. Czech Republic has a specific hydrological situation, based on prevalence of springs and surface sources (rivers) prevalently running-off the country together with specific geological composition, preventing effective infiltration of precipitation into soil and underground in selected regions. Moreover, in the Czech Republic there are located main watersheds (Elbe, Danube, and Odra) and for these reasons, the country is generally called "the roof of Europe" (more specifically, it is located in Kralický Sněžník Mountains). That is why we need to develop effective strategies and methods how to increase the capacity of soil retention from precipitations, including ensuring infiltration into underground water resources. Especially underground water resources are under long-term pressure due to ongoing process of climate change, manifesting itself as climate extremes. Mainly decrease in precipitation and periods of droughts negatively affect the quality of water resources, including the quality and the amount of underground water supply, which cause problems of so-called socio-economic drought, manifested as shortage of water supply for human needs (municipalities and another kind of human activities). Especially during period of droughts, selected municipalities and households, which depend mainly on underground water, suffer from shortage of these kinds of resources. And vice versa, human activities, especially agriculture and industrial activities, might negatively influence the quality and the state of underground water resources.

On the national/country level, several strategies how to cope with negative impacts of hydrological situation have been elaborated, one of the most important is the Strategy of how to cope with impact of drought in the Czech Republic (2017).

The main problem is lacking instruments not only how to effectively monitor the state of underground water (see c)), but how to predict impacts of climate extremes that affect underground water and how to effectively adapt human society to this problem. This issue is key especially for water management experts, providing public service based on drinking and non-potable water supply and sewage water treatment.

In the Czech Republic, the state of hydrology balance and underground water has been monitored mainly by public institution, Czech Hydrometeorological Institute (CHMI, https://portal.chmi.cz). CHMI, Department of Underground Water, also runs the dense network of monitoring sites and provides information about actual situation, including hydrological assessment, overview, and evaluation (http://voda.chmi.cz/opzv/).

Obtained data are publicly available and service for public use, and other research institutions and universities. In this field, the Technical University of Liberec, thanks to its expertise in technology and informatics, focuses on inventing technical solutions promoting gathering all kinds of hydrological data to enable effective long-term monitoring, assessing, and also predicting the state of underground water resources, especially for water management experts.

Stakeholders and actors involved

Based on the nature of this scientific project supported by the Technological Agency of the Czech Republic, obtained results in this project should be applied and implemented by customers who had already expressed their interest in results in project application. These confirmed customers are three important private companies in the field of water management. Aquatest operates almost in the entire Czech Republic and other two companies are regionally grounded and providing important water management services in regions. North Bohemian Water Pipe and Sewerage System (joint-stock company, https://www.scvk.cz/)

The mission of this company is to ensure water infrastructure in Northern Bohemia. Company provides services related to production and supply of drinking water, draining, and sewage water treatment. Company supplies by drinking water 1.1 million of inhabitants, who live in Liberecký and Ústecký region. Company runs 81 water treatment plants and 211 sewage treatment plants. Water Pipe, Sewerage System Hodonín (joint-stock company, https://www.vak-hod.cz/)

The mission of this company is to ensure water infrastructure in South Moravia, specifically in 4 districts (Hodonín, and partially Kroměříž, Vyškov, and Břeclav). Company supplies by drinking water 68 municipalities, ensure draining for 42 municipalities, and runs 23 sewage water treatment. Aquatest. (joint-stock company, http://www.aquatest.cz/)

Expert and consultation company focusing on hydrogeology, hydrology, and mineral water. The center is located in Prague and has 6 regional representations in the country. The service includes hydrogeological and hydrological investigations, contaminated land remediation, accredited laboratory services, design and implementation of drinking and process water treatment including design and operation of wastewater treatment plants, sewerage system, and flood protection.

Actions implemented and results achieved

The project carries out several activities among these:

- the ideation of an Information System for Analysis and Assessment of Groundwater Resources in Dependence on Human Activities and Climatic Changes (the instrument for creating database of all public available data relating to underground water resources and the state of underground water. This software can collect, store, manage and analyse hydrological and hydrogeological data in user-friendly modality. Data will be possible to process and display in the form of statistical graphs, maps, and other kinds of outputs to analyse and predict trends, and to model impacts of changes;
- the creation of a specialised map with the scientific content, the Groundwater resources map (Tlustecký blok and Jetřichovická antiklinála) as a groundwater resources map depicts hydraulic head in the BC aquifer of the Czech cretaceous basin results of groundwater model. Moreover, water extraction objects, monitoring wells, springs, and gauges are depicted);
- the elaboration of the Hydrogeological Information System (HgIS) aimed at loading data from available data sources of any kind (semi-structured data), to visualize and analyse data (to support formulation of alternative conceptual models), and to implement simple procedural models.

Methodological approach

The project consisted of several steps in sequence and is divided into three parts. First analytical part is based mainly on gathering data, second synthetic part to data processing and creation information system ZAVOD. Third implementation part is based on implementation project results by customers. Gathering of all publicly available hydrological and hydrogeological data. Elaboration databases in user-friendly environment. Creating the Information System for Analysis and Assessment of Groundwater Resources in Dependence on Human Activities and Climatic Changes, enabling graphical display of data to obtain information about the state and changes in underground water resources, including prediction of future trends, including unfavourable effects. Creating own modelling of hydrological trends.

Lessons learned and key messages

The key message of the project is the necessity to manage water resources, in this case underground water in a way that is effective and responsible. This project aims to support underground water management by developing software that enables to handle hydrological data, to predict unfavourable trends, and to apply adaptation measures in advance to prevent negative impacts of ongoing climate change, expressing itself as the change of precipitation patterns, period of drought, hydrometeorological extremes, etc. Customers, who use Information System ZAVOD, mainly appreciate the function related to prediction of future state of underground water resources, based on actually measured data (precipitation, etc.).

Replicability and transferability

The obtained products are under license and are possible to ask research team for software provision and transfer to other regions. According to research team, development and further implementation stage of the Information System ZAVOD was successful and neither research team nor customers indicated any problems. Several customers run the Information System ZAVOD according to their needs.

11. POTENTIALLY HARMFUL EXPANDED AGRICULTURE

Human settlements, industries, and agriculture are the major sources of water pollution. Agriculture, which accounts for 70 percent of water abstractions worldwide, plays a major role in water pollution. Farms discharge large quantities of agrochemicals, organic matter, drug residues, sediments, and saline drainage into water bodies. The resultant water pollution poses demonstrated risks to aquatic ecosystems, human health, and productive activities.

In most high-income countries and many emerging economies, agricultural pollution has already overtaken contamination from settlements and industries as the major factor in the degradation of inland and coastal waters. Nitrate from agriculture is the most common chemical contaminant in the world's groundwater aquifers[11].

Although the considerable progress carries on in Europe over the past two decades in reducing discharges from point sources, and problems related to oxygen-demanding substances, microbiological contamination of drinking water, and bathing water quality, 38 percent of water bodies are significantly under pressure from agricultural pollution.

There has been far less success in controlling discharges from diffuse sources, in particular from agriculture. The use of commercial inorganic fertilisers, in conjunction with increased livestock densities and concentration of livestock production, has resulted in the application of large loads of nutrients to cultivated land. Many of these find their way into watercourses, where they may cause eutrophication, and into groundwater where they contaminate water supply systems. Elevated concentrations of hazardous substances, including pesticides and heavy metals, can still be found in many European waters.

On the other hand, another crucial issue related to the expanded agriculture is the irrigation. Irrigation can affect the environment through impacts on water quantity (lowering the groundwater table and affecting river flow), water quality through increased content of salts and pollutants, and soil, biodiversity, and landscapes.

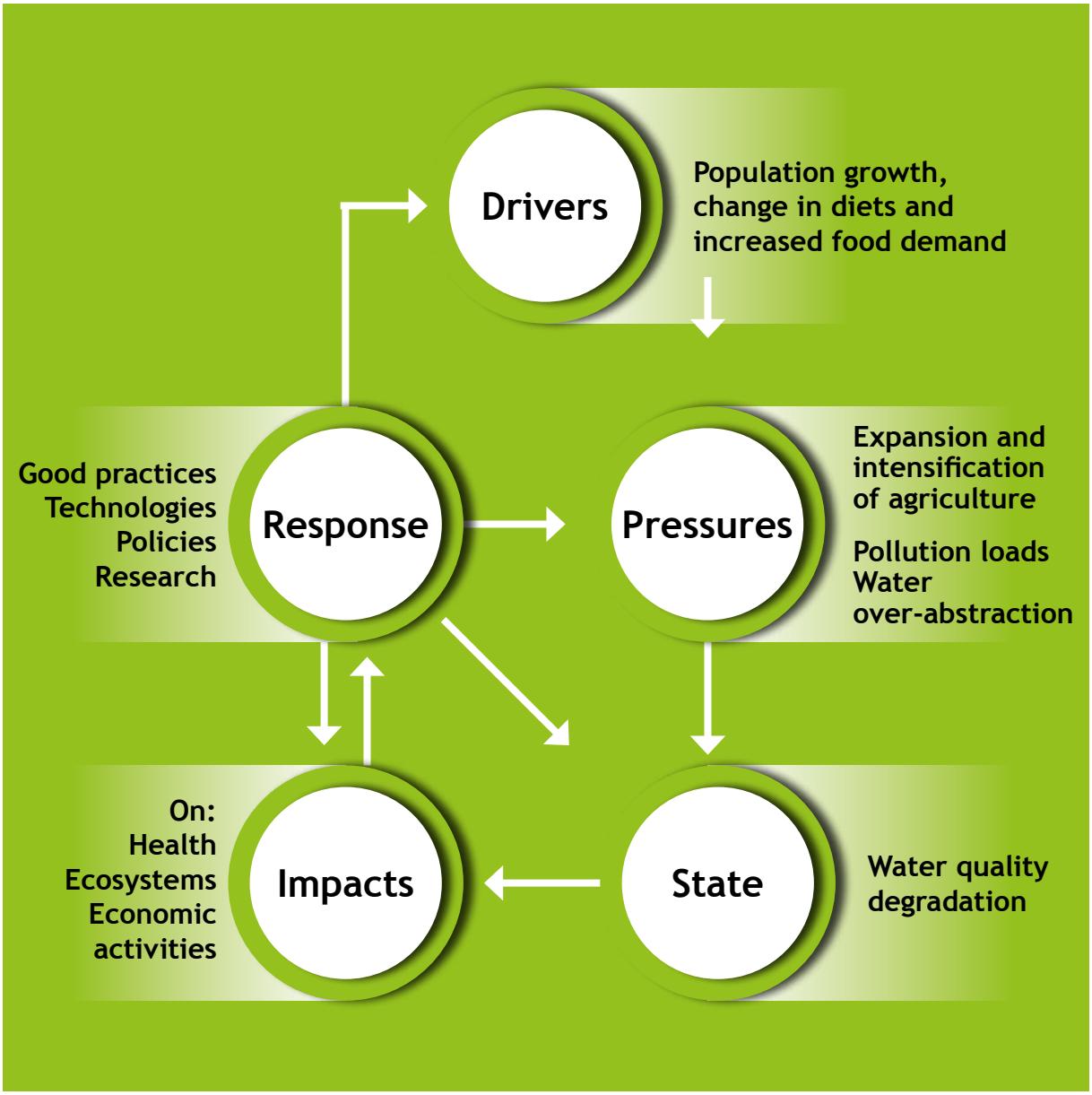
The area equipped for irrigation has more than doubled in recent decades from 139 million hectares and the total number of livestock has more than tripled due especially for increasing cropping and livestock systems and aquaculture, which have all expanded and intensified to meet increasing food demand related to population growth and changes in dietary patterns.

Investments in agriculture, fishery and forestry, and spending on research and development are key requirements for the management of aquatic ecosystems and the mitigation of harmful impacts on them. This is required to promote the adoption of sustainable production systems and practices, including integrated crop-livestock and aquaculture-crop systems, conservation agriculture, agroforestry, nutrition-sensitive agriculture, sustainable forest management, and sustainable fisheries management.

These, and other, forms of climate smart agriculture will help farms, ecosystems, and communities to adapt to, mitigate and build resilience to climate change, and address country specific needs and gender-specific contexts. In addition, because prevailing price incentives and supports often run counter to sustainable agriculture, a realignment of implicit and explicit agricultural subsidies is also needed.

11 FAO, Water pollution from agriculture: a global review Executive summary, 2017

FIG. 1: ANALYSIS OF WATER POLLUTION CYCLE IN AGRICULTURE



Source: *FAO, Water pollution from agriculture: a global review*

Below we are going to illustrate the good practice from "0-km policy – short supply chains" - Terme Sveti Martin from Croatia, as an on-farm response project that aims to incentivise the local and organic agriculture. Indeed, this serves as an accelerator of the small economy of the municipality and the county, and thus work on improving the local community. Promoted by Terme Sveti Marti that has signed contracts with local suppliers who bring freshly picked fruits and vegetables to restaurants throughout the resort every morning. Around 30 local farmers are included in the process. This project area is within Međimurje county. Challenge that is being addressed the need to eat locally and preferably organically grown and to close the process of getting fresh produce, using them, and then what is left turn into bio-waste (compost, again natural produce back in the soil).

11.1. “0-km policy – short supply chains” - Terme Sveti Martin from Croatia

Keywords

Agriculture, organic, biodynamic.

Summary

0 Km project serves as an accelerator of the small economy of the municipality and the county, and thus work on improving the local community. Promoted by Terme Sveti Marti that has signed contracts with local suppliers who bring freshly picked fruits and vegetables to restaurants throughout the resort every morning. Around 30 local farmers are included in the process. This project area is within Međimurje county. Challenge that is being addressed the need to eat locally and preferably organically grown and to close the process of getting fresh produce, using them, and then what is left turn into bio-waste (compost, again natural produce back in the soil).

Supporting local suppliers and Family farms, going towards EU’s New Green Deal - Farm to Fork Strategy – for a fair, healthy, and environmentally friendly food system.

LifeClass Terme Sveti Martin also serve as an accelerator of the small economy of the municipality and the county, and thus work on improving the local community. Terme has signed contracts with local suppliers who bring freshly picked fruits and vegetables to restaurants throughout the resort every morning. An annual meet-up is also organized in Terme with local farmers to exchange news and knowledge and to express gratitude for good cooperation in both ways.

Food systems cannot be resilient to crises such as the Covid-19 pandemic if they are not sustainable. We need to redesign our food systems which today account for nearly one-third of global GHG emissions, consume large amounts of natural resources, resulting in biodiversity loss and negative health impacts (due to both under- and over-nutrition), and do not allow fair economic returns and livelihoods for all actors, in particular for primary producers. the limited arable land for expanding food production and the increasing pressures on natural resources also pose challenges that need to be rapidly addressed. Furthermore, all these factors are enhanced by climate change that is altering the world at a rapid and increasing rate, producing some potentially irreparable damage (Jones et al. 2017; Wheeler and Braun 2013). The limited arable land for expanding food production and the increasing pressures on natural resources also pose challenges that need to be rapidly addressed. Furthermore, all these factors are enhanced by climate change that is altering the world at a rapid and increasing rate, producing some potentially irreparable damage (Jones et al. 2017; Wheeler and Braun 2013). The limited arable land for expanding food production and the increasing pressures on natural resources also pose challenges that need to be rapidly addressed. Furthermore, all these factors are enhanced by climate change that is altering the world at a rapid and increasing rate, producing some potentially irreparable damage (Jones et al. 2017; Wheeler and Braun 2011)

Pressures enfaced

Environmental, Social, Economic

Environmental aspects

Landscape, ecosystem services

Field of action

Cooperation

Geographical scope

Local, Regional

Timeframe

ongoing

Context and main issues addressed

Unsustainable farm practices, geared only towards higher yields, put additional pressure on global issues such as: Climate change, Loss of biodiversity, Soil erosion, and Pollution of the most important natural resources (soil and water).

In an attempt to accommodate global food demands, and in efforts to mitigate the aforementioned problems, many countries and farmers have begun turning to organic farm practices (today, there are 2.3 million certified organic farmers in 172 countries and, more importantly, the agricultural land under organic farming is constantly increasing). Still, organic farming occupies only 1% of the total agricultural land.

This project area is within Međimurje county (NUTS-3 level). Around 30 local farmers are included in the process. Challenge that is being addressed is the need to eat locally and preferably organically grown and to close the process of getting fresh produce, using them, and then what is left turn into bio-waste (compost, again natural produce back in the soil).

The biggest problem Terme encountered was the insufficient amount of local products that would meet the needs of the whole LC Terme Sveti Martin resort.

The initial context is to provide a full-healthy service to locals and tourists.

Main goals achieved are the offer of domestic, local, and healthy products to all guests of the whole resort, but also to employees. Also stimulating the local economy and agricultural production.

Stakeholders and actors involved

The beneficiaries of the BEST PRACTICE are local producers and their families, tourists and visitors that come and enjoy the produce, and in the end the SPA itself with a good story, marketing, and lower transport rates for food they use.

The users are guests and visitors that come to LifeClass Terme Sveti Martin.

This project, or rather an approach, is supported on all levels – even national.

There is also support of the centre of Dr. Rudolf Steiner from Donji Kraljevec Municipality and in cooperation with the Faculty of Agriculture (University of Zagreb) and the center of Dr. Rudolf Steiner - LC Terme Sveti Martin have founded their biodynamic garden.

The project team consists of:

- Purchasing Director - a person who was the link between supply and demand, i.e., who connected the needs of the Food and Beverage Department and the family farm;
- Director General - one of the bearers in terms of supporting the initiative itself;
- Director of Human Resources and Organizational Culture - project initiator, coordinator, and person who monitored the project outcomes.

Actions implemented and results achieved

Actions implemented:

- creating a network of local producers, connecting them with Terme but also with each other;
- annual producers meet-up in Terme, promoting this cooperation regionally and nationally;
- raising awareness of the impact of the food we eat on our health, the importance of organic farming;
- creating a “seed-bank”, to exchange (old, native) seed, turned out to be very popular in Covid-19 crisis.

Results achieved:

- boosting the local economy, money created, money spent, no big transportation costs;
- recognizing and promoting the dr. Rudolph Steiner philosophy, biodynamic approach;
- opening a shop within the SPA’s Hotel – where not only food but organic cosmetics, clothes, and many various products are being sold – all made in the region and from natural materials.

Evidence of success:

- LifeClass Terme Sveti Martin’s biodynamic garden is a proof of the motivation and desire of the resort employees for healthier agriculture and healthy food. Satisfied guests are the biggest motivation to continue working on this project.
- The support of the local community and extremely good cooperation with local family farms and encouraging our employees to open their family farms is what drives this project within Terme. They have also made a gallery-like walls in their restaurant “Mira” with pictures of local families that own the farms so that guests can see the people who have grown their food.

Methodological approach

The vision of LifeClass Terme Sveti Martin is the “World of Healthy Delights” in which all employees and the local community participate.

Terme was able to connect all participants of the destination potential, including their employees. The offer itself is based on the encouragement of local, traditional and indigenous. Several years since the launch of this idea, they have managed to become an example of good practice for cooperation with local family farms, cooperation with the entire local community, and work on sustainable development.

At the time of working on the tender for local family farms, they realized that some of our employees who have domestic food production also applied. It is important to emphasize that Međimurje is a region where people are hardworking. This was visible when Terme realized that a good portion of the employees went home from work and worked in the field or the vineyard.

Lessons learned and key messages

Better cooperation with the local community, stimulating the local economy and environmentally friendly agricultural production.

Offering healthy food and healthy food.

Encouraging the wider community to adopt healthy living habits.

Support local entrepreneurship by encouraging cooperation with local food producers

Replicability and transferability

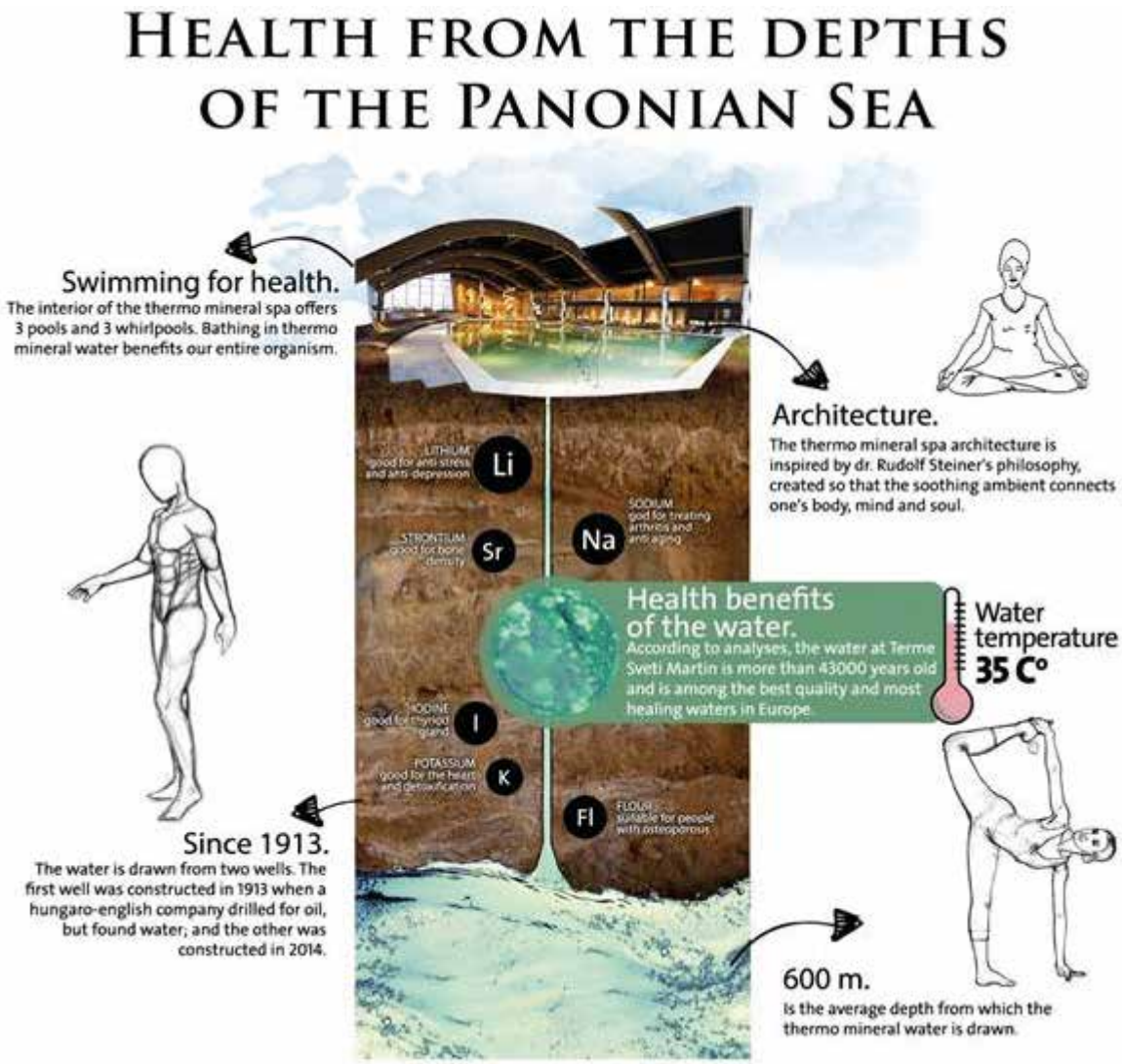
The philosophy behind it is recognized regionally, even nationally. Of course, this project can be expanded and transferred to other organizations that have the will and desire to support a healthier way of production and life and /or propose a broader approach to the management of the SPA area also in terms of implementing the Green Deal and the farm-to-table strategy.

Dr. Rudolf Steiner's quote: "What a human being sees, what surrounds him becomes the strength of that being. A human being is formed in accordance with his environment".

According to the number of nights and reviews that Terme Sveti Martin receive; a lot of guests, especially from Western Europe, are familiar with the work of Dr. Rudolf Steiner and they recognize the service and philosophy that Terme Hotel & SPA offers them.

*There is also a **biodynamic garden** in SPAs landscape; that can be enjoyed. The BD garden is increasing the functionality of Hotels' green space and is actively promoting sustainable development. With functionality, the Hotel raised the value of green space, which improves residents' health and awareness of environmental protection, healthy nutrition and sustainable development. Guests have direct access to the groceries that are being served to them. The climatic conditions for growing berries are very suitable in this area, especially for blueberries and garden visitors can directly eat / harvest berries and have a fruit meal while walking in the garden.*

The principle is also aligned with Hotel & SPA's philosophy in geothermal resource usage in thermal pools within SPA. They call it "A World of Healthy Pleasures" - see the photo (courtesy of LifeClass Terme Sveti Martin ©):



D.

CHAPTER 4

BEST PRACTICES ADDRESSING THE MAIN SOCIAL PRESSURES TO SPAs SUSTAINABLE DEVELOPMENT

12. INCREASING MASS TOURISM

Uncontrolled conventional tourism poses potential threats to many natural areas around the world. A large flow of people pouring into an area at the same time can put enormous pressure on it and lead to impacts such as soil erosion, increased pollution, discharges into the sea, natural habitat loss, increased pressure on endangered species, and heightened vulnerability to forest fires. In addition, it often puts a strain on water resources, and it can force local populations to compete for the use of critical resources.

Among the main physical impacts of tourism development, we can find:

- *construction activities and infrastructure development*. The development of tourism facilities such as accommodation, water supplies, restaurants, and recreation facilities can involve sand mining, beach and dune erosion, soil erosion, and extensive paving. In addition, road and airport construction can lead to land degradation and loss of wildlife habitats, and deterioration of scenery;
- *deforestation and intensified or unsustainable use of land.* Construction of resort accommodation and facilities frequently requires clearing forested land. Coastal wetlands are often drained and filled due to lack of more suitable sites for construction of tourism facilities and infrastructure. These activities can cause severe disturbance and erosion of the local ecosystem, even destruction in the long term;
- *marina development*. Development of marinas and breakwaters can cause changes in currents and coastlines. Furthermore, extraction of building materials such as sand affects coral reefs, mangroves, and hinterland forests, leading to erosion and destruction of habitats.

Water, and especially freshwater, is one of the most critical natural resources. The tourism industry generally overuses water resources for hotels, swimming pools, golf courses, and personal use of water by tourists. This can result in water shortages and degradation of water supplies, as well as generating a greater volume of wastewater.

Water resources and especially thermal sites are particularly threatened by the new phenomena of ageing tourism. The ageing of populations in the developed countries poses new challenges not only to healthcare systems, but also for tourism and recreation. Due to increased life expectancy and the prevailing ideological elements of wellness and active ageing, wellness-related consumption of water has become a distinctive aspect – especially in affluent societies[12]. With the increasing number of tourist category "65+" significant of interest will be hotels in which not just medical care is available, but also special geriatric care. Accommodation of older people and meeting their special needs will become a priority for many international hotel chains.

In thermal sectors many facilities are gearing up to welcome the senior visitors by designing product for this specific target that extends the market of medicinal and thermal tourism to those sending areas where the demand for medicinal and wellness tourism related to natural waters can be increased.

12 Koskinen, V. (2019). Spa tourism as a part of ageing well. International Journal of Spa and Wellness, 1–17. doi:10.1080/24721735.2019.1668673

Therefore, it is particularly important to find long-term strategies capable of reconciling the economic revenues from tourism and the environmental pressures to which these flows could subject the natural resources of the areas concerned as showing in the Best Practice below. Although the project is not only aimed at the over 65s, but is concerned with the creation of a network to promote a natural and sustainable tourism in the thermal areas of Luhačovice (Czech Republic), it lays the foundations for the elaboration of a long-term strategy of sustainable development of the tourism in thermal areas easily adaptable to specific targets.

Well, well…Spa Luhačovice" from the Czech Republic, it's a project aimed at boosting cooperation & communication strategy by consolidating a partnership among the main local stakeholders to provide tourism-related services with the impact on protecting natural resources and their sustainable management, especially water curative springs in Luhačovice SPA. The partnership acts in order to collectively promote tourism, gain new types of visitors searching for quality-based nature tourism.

12.1. “Well, well…Spa Luhačovice”

Keywords

Green Tourism, water resources, marketing activities

Summary

Sustainable usage of natural curative resources, maintenance of protected landscape area, emphasize on supporting small businesses. The main target of Zlinsko-Luhačovicko project aims at boosting cooperation & communication strategy between DMO’s, local stakeholders, and visitors to support tourism activities. Behind the cooperation and communication of involved participants, the keynote is to provide tourism-related services with the impact on protecting natural resources and their sustainable management, especially water curative springs in Luhačovice spa.

Pressures enfaced

Environmental, Social

Environmental aspects

Water resources, Landscape, Ecosystem services

Field of action

Cooperation

Geographical scope

Local

Timeframe

2018 - ongoing

Context and main issues addressed

The project area is situated in the eastern part of the Czech Republic. Luhačovice, as the location of the SPA and the lead partner, is concerned as the second largest SPA resort in the country. The position of SPA is in the middle of the protected landscape area Bílé Karpaty known for the precious species of flora & fauna and meadows with special requirements of nature management (e.g., hand mowing or grazing). The project partners include other municipalities concentrated in the framing organization of destination management (DMO) Zlínsko and Luhačovicko responsible for the coordination and support of tourism activities in the region.

The challenge is to harmonize the tourist activities such as SPA guests, urban day trippers and outdoor tourists with the protection of natural water resources. The further aim is to coordinate developing activities (building of new hotels and other tourist's facilities) regarding the natural ecosystems.

The main problems concern the setting up of carrying capacity of the destination and the management of visitor activities in the area of Luhačovice. The destination is well-known for the old tradition of using natural healing resources, architecturally significant buildings (designed by famous artists Dušan Jurkovič and Bohuslav Fuchs), and nature heritage of the White Carpathians range. The key role of the DMO Zlínsko and Luhačovicko should ensure the coordination of all subjects to support tourism and take into consideration the protection of natural resources as well.

The main goals are achieved through the broader participation from municipal bodies in the promotion of the destination, not only as a seasonal spa stopping place but as a destination with a year-round offer. The key activities include spreading the tourist visitors in time and space to avoid peak season and the pressure on natural resources in the area, creating itineraries to provide new experiences in less frequented areas, and a meaning-based marketing targeted on the responsible type of tourists who think about the quality of environment and prefer the "eco-friendlier" tourists' experiences.

Stakeholders and actors involved

The beneficiaries of the Best Practice are local inhabitants living in the town of Luhačovice. All the activities lead to more effective tourism management with an emphasize on the higher quality of the environment and protection of natural resources.

The users are local stakeholders – small business, providers of tourism-oriented services, municipality representatives, investors, and developers.

The actors are represented by the DMO's officers which are responsible for strategy of tourism management. Their role is to promote tourism, gain and target tourism activities on selected groups of visitors, provide unique experiences and support these types of businesses which take into a consideration the protection of the environment.

Actions implemented and results achieved

The activities can be divided into three several steps.

The preliminary phase has led to the creation of public - private partnership. The organization Zlínsko and Luhačovicko consists of various types of members connecting municipalities, local entrepreneurs and businesses, SPA providers, hotel owners, and local inhabitants. This partnership aimed to collectively promote tourism, gain new types of visitors searching for quality-based nature tourism. This initiative was followed by the creation of the strategy of tourism management, where the main vision was formulated: to support and preserve traditional values and protect nature resources.

The implementation phase includes the creating of 3C Platform (coordination, cooperation & communication) for further activities. With the concept of promoting sustainable tourism ideas, the DMO Zlínsko & Luhačovicko organizes sessions on regular basis. These meetings are used for sharing know-how in the area of green tourism sector, providing thematic workshops, and discuss about the possibilities of dispersing tourist flows in the whole region (in effort to avoid tourist congestion).

all the activities mentioned above lead to the formation of new tourist products dealing with the sustainable water resources management. In 2019 the DMO Zlínsko and Luhačovicko create the project Well, well…Spa Luhačovice concerning the tradition of the spa and well-being in the Luhačovice region and effective usage of nature resources in usage of modern wellness methods in advance to provide high-quality experience. This effort has achieved the European destination of excellence (EDEN) award as the winner in the 'Health and wellbeing tourism' category.

Methodological approach

The methodological framework comprises the strategic planning approach. The main outcome (the project Well well…Spa Luhačovice) was created as the product of consistent strategy planning. After the establishment of Zlínsko and Luhačovicko DMO, the strategy of tourism management was created combining the methods of analysis, draft of strategic vision, suggestion, and implementation of concrete activities supporting the sustainable tourism in the Luhačovice region. The creating of strategy includes socio-economic, urban, and ecological agenda.

The strategy is followed by the number of participatory activities, such as thematic workshops, focus groups, fam/press trips, the evaluation of the quality-of-service providers, certification programs to emphasize the application of nature-based sustainable concepts in destination management. All these activities lead to the coordination of tourism activities with the importance of preserving natural heritage and especially water resources in the Luhačovice region. Furthermore, the role of the DMO is also crucial for the life of local inhabitants. Firstly, they can be engaged in the strategic planning and bring new ideas from their point of view, secondly, the impacts of all mentioned activities concerning the visitor management are beneficial for their everyday life and living environment.

Challenges encountered

Nowadays, in the era of growing competitiveness and increasing demands and expectations of visitors for the destinations, there is significant need to understand the character of visitor experiences. Creating meaningful partnerships is as crucial to reasonable management as is comprehension of the natural processes and smart water-resources management. In the Luhačovice region there is a necessity to connect different types of involved participants in tourism management and nature protection throughout the strategic documents. However, the key to a successful sustainable development is behind the on-site activities, evaluation, and monitoring on a regular base.

Lessons learned and key messages

- Role of coordination, cooperation, and communication of all involved groups is crucial in order to include all the aspects dealing with sustainable tourism (environment, economy, society);
- Strategy planning is essential to define opportunities and boundaries of effective resource management;
- Sharing know-how, organizing thematic workshops and various types of trips is an important part of visitor dispersal and management in time and space;
- Local inhabitants must be heard - they are primary beneficiaries of health and balanced environment.

Key messages are:

- the role of local communities should not be underestimate;
- profitability of the destination is ensured by long-term sustainability;
- the measurements of quality and hospitability need to be followed to evaluate the success of the current strategy.

Replicability and transferability

This best practice can be transferred to any other destination concerning the water resources management, visitor management strategies, and local stakeholder's engagement.

https://www.spa.cz/lazne-luhacovice/jurkovicuv-dum/ - Hotel Jurkovič

13. INCREASED LEVEL OF URBANIZATION

As urban space continues to expand to accommodate a growing global population, there remains a real need to quantify and qualify the impacts of urban space on natural processes. The expansion of global urban areas has resulted in marked alterations to natural processes, environmental quality, and natural resource consumption. Urban landscapes are host to a suite of contaminants that impact water quality, where novel contaminants continue to pose new challenges to monitoring and treatment regimes.

Urbanisation is also one of the major driving forces behind the formation of today's land use systems. It almost always involves the conversion of land use from non-urban to urban uses. A great deal of contemporary urbanisation has been characterised as urban sprawl, a highly extensive form of land take for urban uses having environmentally detrimental effects. However, urban land use change can occur in relatively diverse forms in terms of layout, building density, and speed of change, to name but a few aspects. In recent decades, researchers have made substantial progress in empirically addressing the various forms of urban land use and its change over time.

Urbanization therefore appears to be an inevitable process which, if it cannot be stopped, we must prevent that it produces further pressures and threats on the natural environment.

The urban regeneration of post-industrial sites is part of this practice of limiting excessive urbanization. Restoring new life to old abandoned sites avoids consuming new land with constructions responding to economic purposes. This is the philosophy behind the platform Standortooe.at from Austria.

Standortooe.at is a comprehensive online platform for the avoidance of land use, because it offers a detailed overview of existing and available real estate for municipalities, but also for the Upper Austrian location agency Business Upper Austria. The declared aim is to make information on existing industrial wastelands transparent in the site database. This includes areas with an existing dedication that have been vacant for more than three years, e.g., former production and storage areas or unused industrial sites.

13.1.Standortooe.at

Keywords

Sustainable site management

Summary

Standortooe.at is a comprehensive online platform for the avoidance of land use, because it offers a detailed overview of existing and available real estate for municipalities, but also for the Upper Austrian location agency Business Upper Austria. In the service for companies the database means a big advantage in service quality. At the push of a button, users of standortooe.at can create an exposé of the desired real estate and thus receive the most important information including contact persons summarized. The declared aim is to make information on existing industrial wastelands transparent in the site database. This includes areas with an existing dedication that have been vacant for more than three years, e.g. former production and storage areas or unused industrial sites.

Pressures enfaced

Environmental, Economic

Environmental aspects

Landscape, Brownfield; wastelands; Empty spaces

Field of action

Technology

Geographical scope

Local, Regional

Timeframe

2015 - 2020

Context and main issues addressed

At the moment one main challenge in Upper Austria is the rapid increasing land use. The online platform standortooe.at is an important instrument against empty spaces, brownfields and land consumption in the initial context. The database supports in the identification and search of empty properties, business premises and industrial wastelands and offers the information at one place online. With a few clicks interested person can find a suitable location or empty spaces in Upper Austria.

A main problem regarding the online database is, that the data is static and has to be filled in through the contact person and activated through a project manager of Business Upper Austria for guaranteeing high data-quality. This could lead to either data online visible, which is not available anymore or a surplus of non-serious advertisements that falsify the statistics of brownfields and empty spaces. That's why the data has to be strictly controlled according to elaborated guidelines through a responsible person of the project.

Stakeholders and actors involved

The project is a cooperation between the Upper Austrian Economic Chamber of Commerce, its local offices, and the business and location agency Business Upper Austria. As well the government of Upper Austria is interested in avoiding empty spaces and brownfields.

The user are the local municipalities, the Upper Austrian business, and location agency Business Upper Austria on the one hand. On the other hand, users are people who are interested in investing, renting, or buying empty spaces in Upper Austria such as entrepreneurs, investors, …. Overall, also the State of Upper Austria is a user because they can see immediately the number of empty spaces or brownfields.

As beneficiaries of the BEST PRACTICE can see the general public, State of Upper Austria, and municipalities. For municipalities the platform has the big advantage of promoting its areas for free and fast. Further the environmental aspect of removal of contaminated sites is a big interest for the general public and State of Upper Austria, which also leads to a protection of biodiversity and creates fertile land for the future. In addition, brownfields can be better used, as no new areas need to be developed.

Actions implemented and results achieved

A project team of Business Upper Austria together with the local Economic Chamber of Commerce (WKO) created the idea of making empty spaces and industrial wasteland online visible with just a few clicks.

Standortooe.at is a comprehensive online platform to avoid the overconsumption of land use, because it offers a detailed overview of existing and available real estate for municipalities, but also for the Upper Austrian location agency Business Upper Austria. At the push of a button, users of standortooe.at can create an exposé of the desired real estate and thus receive the most important information including contact persons summarized. The declared aim is to make information on existing industrial wastelands transparent in the site database. This includes areas with an existing dedication that have been vacant for more than three years, e.g. former production and storage areas or unused industrial sites.

The online platform provides all relevant information and functions at a glance:

- precise location including a map view;

- area designation (also of surrounding areas thanks to DORIS integration) – With DORIS (Digital Upper Austrian Spatial Information System), the province of Upper Austria offers geoinformation from the responsible departments in the form of downloadable maps and interactive map services (www.doris.at);
- available infrastructure (distance to airport/motorway/public transport);
- relevant contact persons;
- generation of watch lists and comparison lists;
- creation of comprehensive exposés;
- possibility of networking of the communities within a region and joint creation and management of advertisements.

As of the beginning of June, there are around 350 entries in the database - from office space to large areas for companies, with the reactivation of derelict industrial sites playing a particularly important role.

Methodological approach

The best practice came up through brainstorming in an internal project management training in 2015. The question was how to make visible empty spaces and properties. Therefore, a user-friendly online platform was created. After some time, the online platform needed to be reconsidered because user numbers and data quality went down. Within that process and because of up-coming political pressure regarding the important aspect of brownfields and industrial wasteland was included. That's why the online database was relaunched and promoted in June 2020 with new functions.

Lessons learned and key messages

- User-friendly platform.
- Comprehensive overview on land use online, which can be used easily for statistics.
- Through digitization the platform, on the one hand, helps to minimize excessive land consumption, which is one main challenge in Upper Austria and on the other hand makes brownfields and empty spaces easily online accessible e.g., for statistics.
- A systemic approach to land management based on GIS tools allows sustainable land management and saving of green field sites for new investments.

Replicability and transferability

Further extension could be possible through other sectors and regions. Even bilateral cooperation in particular with Bavaria could be a chance for extension. As well extension by implementing shared offices and creating a booking system could be a possible. Overall, the best practice provides a well-developed tool for regional development and remaining the skills and working expertise in the region, which lead to a higher regional resilience and supports against land grabbing of (foreign) investors. A practice worth implementing for practical, data-based land management.

https://standortooe.at/

14. CONCLUSIONS

Sustainable Management is

"the use of natural resources in a way and at a rate that maintains and enhances the resilience of ecosystems and the benefits they provide. In doing so, meeting the needs of present generations of people without compromising the ability of future generations to meet their needs, and contributing to the achievement of the well-being goals."

The mineral and thermal water will gradually become a strategic asset in the future. And, even if, at the moment for the European society healing water does not have the same strategic importance, it will gain more and more strategic relevance for European member states like drinking water.

To date, we are witnessing a strategic repositioning of the SPAs sector as an important player in the post-pandemic period. SPAs can play a fundamental role in the rehabilitation of coronavirus (Covid-19) patients, with all the benefits that thermal therapy can have in restoring physical health and reducing the risk factors. It is scientifically assumed that the virus leaves important sequelae from the respiratory, motor, and psychic point of view in many people who have recovered and the SPAs can offer ad hoc rehabilitation programs.

Therefore, the more important it becomes, the more it will suffer pressures from which it will be necessary to adequately protect it.

To provide sustainable use of water resources and to overcome the long-term environmental pressures and conflicts in SPAs, a mix of local, regional, national, and European measures will be necessary.

This Compendium of best practices as the result of extensive outreach, data gathering, and analysis conducted by the HealingPlaces partnership represents one more element able to improve European cooperation in the protection and sustainable use of healing water resources and their surrounding nature.