

# WPT2\_D.T2.5.2.

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WPT1 tools adaptation to local and regional  
needs

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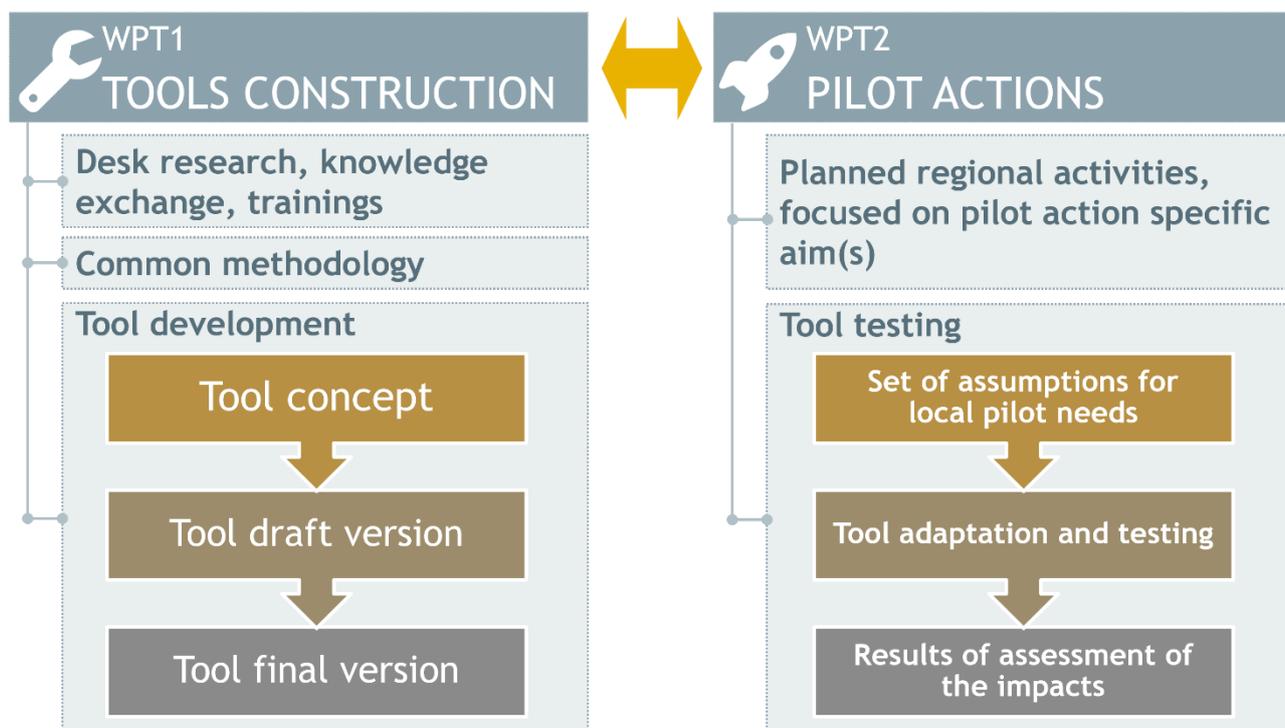
# 1. Introduction

The 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 funded by the EU Interreg Central Europe program and running between April 2019 and March 2022. The project is coordinated by Central Mining Institute (Katowice, Poland) as a lead partner, together with 9 Central European partner institutions from Hungary, Austria, Croatia, Italy, Slovenia, and Czech Republic.

In this document we are presenting the process and content of assumptions which must be considered during the process of building a tool for impact assessment & environmental capacity of SPA development. The tool impact assessment is part of activities from HealingPlaces project Work Package 1, where the Development of common tool for integrated assessment of threats & pressures on main SPAs' resources is foreseen. In the case of Croatia, the assumptions were identified and collected during the capacity building phase of HealingPlaces project activities. Numerous stakeholder meetings, regional working group sessions, and thematic events where issues for spa areas were highlighted were all part of the participation process.

The tools developed in frame of WPT1 have been tested in frame of WPT2 pilot actions at each of the Central Europe regions that take part in the HealingPlaces project.

The logic of testing the tools is presented in the following diagram:



The feedback from testing of the tools in frame of WPT2 has been an important input to process of tool development in frame of WPT1. The important strategic decision that was done in cooperation with all Project Partners is that the tool for assessment of the environmental



pressures should be as simple for the user as possible in order to increase the probability of its wide use after the project end throughout Central Europe space also outside the partner regions. Moreover, due to the specificity of each pilot action, development of assumptions for AT14 tool adaptation to local needs was necessary.

## 2. Assumptions for AT14 tool adaptation to local needs

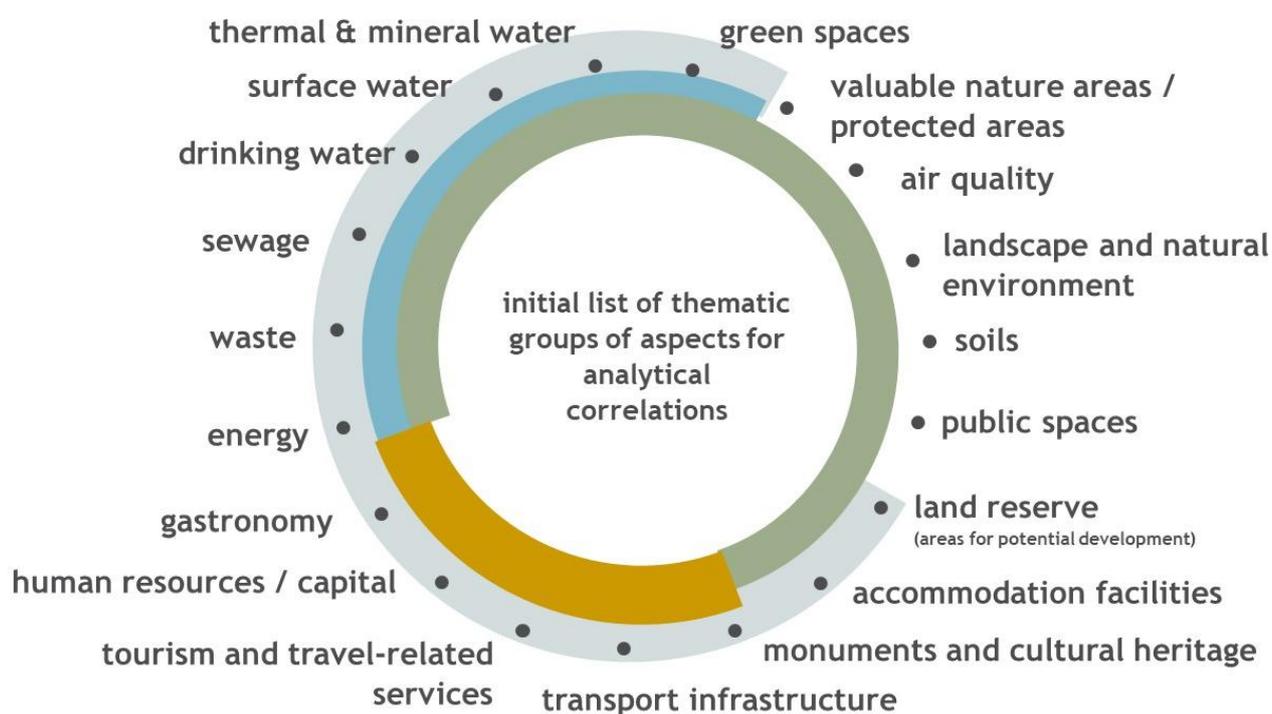
These assumptions were identified and gathered through internal project meetings and workshops amongst various project partners, as well as the capacity development process of HealingPlaces project activities aimed at local and regional key players. In the instance of regional pilot action, the focus was on SPA municipalities in Croatia's northwestern region. Numerous stakeholder meetings, regional working group sessions, and individual collaboration with SPA municipality officials were held as part of the participation process, during which challenges for SPA areas were presented.

Because the work on constructing the tool in WPT1 is directly tied to the work on adapting the tool to local and regional needs and tool testing planned in WPT2, it was determined that the tool testing in WPT2 should begin before the tool is finalized, using the internal working version of spreadsheets. As a result, feedback from tool testing in the context of WPT2 will be a significant input to the ongoing process of tool development in the context of WPT1.

From methodological point of view, the work on the tool have been scheduled as follows:

The main idea behind the tool is to calculate pressures on the environment that are following the development of SPA tourism.

Therefore, many aspects and indicators had been taken into consideration as important to fully calculate the different pressures and take into consideration all necessary aspects. Some of these are presented on the scheme below:





Project Partners from Poland (PP1 - GIG and PP2 - IRT) have been in charge of developing this tool, working directly with other Partners in the developing process and data input.

At this step, due to the variety of partners pilot actions, and especially due to: very different approaches to the definition of SPA in specific countries and the resulting variability and difficulty in obtaining some of the data in partner countries, as well as difficulties in identifying threshold values for indicators, the important strategic decision that was done in cooperation with all Project Partners is that the tool for assessment of the environmental pressures should be as simple for the user as possible.

Therefore, many bilateral meetings between partner responsible for the tool preparation (LP-Central Mining Institute) and respective partners responsible for the specific pilot actions have been organized to ensure, that all assumptions from specific local needs are included into the tool.

## 2.1. Description of A.T2.5 pilot action

The main objective of WP2 is the practical implementation of sustainable thermal water use in SPA, understood primarily as ensuring effective and rational use of identified resources and protection of ecosystems while realizing and enhancing its social and economic functions. In Particular, the aim PA5 is the practical implementation of the Eco-friendly SPA management in region (Kontinentalna Hrvatska) and appropriate guidance for sustainable use of local thermal and mineral groundwater resources. It is understood primarily as ensuring effective and rational use of identified resources and protection of ecosystems while realizing and enhancing its social and economic functions. It will result in assessment of SPA management in region with Terme Sveti Martin as an example focusing on using existing resources of thermal and mineral groundwater in sustainable and ecological way. Also, an assessment (non-invasive research) on Krizevci thermal and mineral water in possibility of closing the loop water of water flow in order to depletion of resources will be made. In addition, as part of Pilot Action 5, PP6 must host a Regional ECO-SPA conference with panel discussions and presentations on the overall theme of Pilot Action 5 - exploiting thermal and mineral water resources in an environmentally friendly manner and doing green business in SPA management.

Overall, three studies will be drafted within this Pilot Action and one ECO-SPA conference will be organized:

1. Documentation on the possibility to close the loop of water flow in Krizevci will be based on:
  - Geophysics research with non-invasive magnetotelluric method
  - Multidimensional study - circular way of using the existing geothermal water resource in order to avoid depletion of water
2. Environmental study „SPA center impact on local environment” in Terme Sveti Martin will be based on:
  - Study to determine if available techniques of research and monitoring used in Terme Sveti Martin are adequate in terms of protecting nature and groundwater flow in areas where boreholes are made



- Study-visits and practical work for students
- 3. Management plan of using thermal-mineral water resources in City of Križevci in sustainable and ecological way will be based on:
  - Deliverable D.T2.5.1 (Documentation on the possibility to close the loop of water flow in Krizevci)
  - Environmental impact assessment (Deliverable D.T2.5.3)
- 4. Regional ECO-SPA conference will be based on:
  - Panel discussion
  - Presentations related to using resources of thermal and mineral water in ecological way and doing green business in SPA management

## 2.2. Description of tool

The tool is intended as a support in decision-making process. It is dedicated for the SPA municipalities (the municipalities that have at least one SPA in their area regardless of having or not having official status of SPA municipality). The main idea behind the tool is to calculate pressures on the environment that are following the development of SPA tourism.

The tool uses algorithms related to the determination of two significant correlations:

- The impact of SPA and tourism industry development on the availability of thermal and/or mineral water resources in quantitative terms,
- The influence of the development of spa communities and changes in land use on the threat to the quality of thermal and/or mineral water resources.

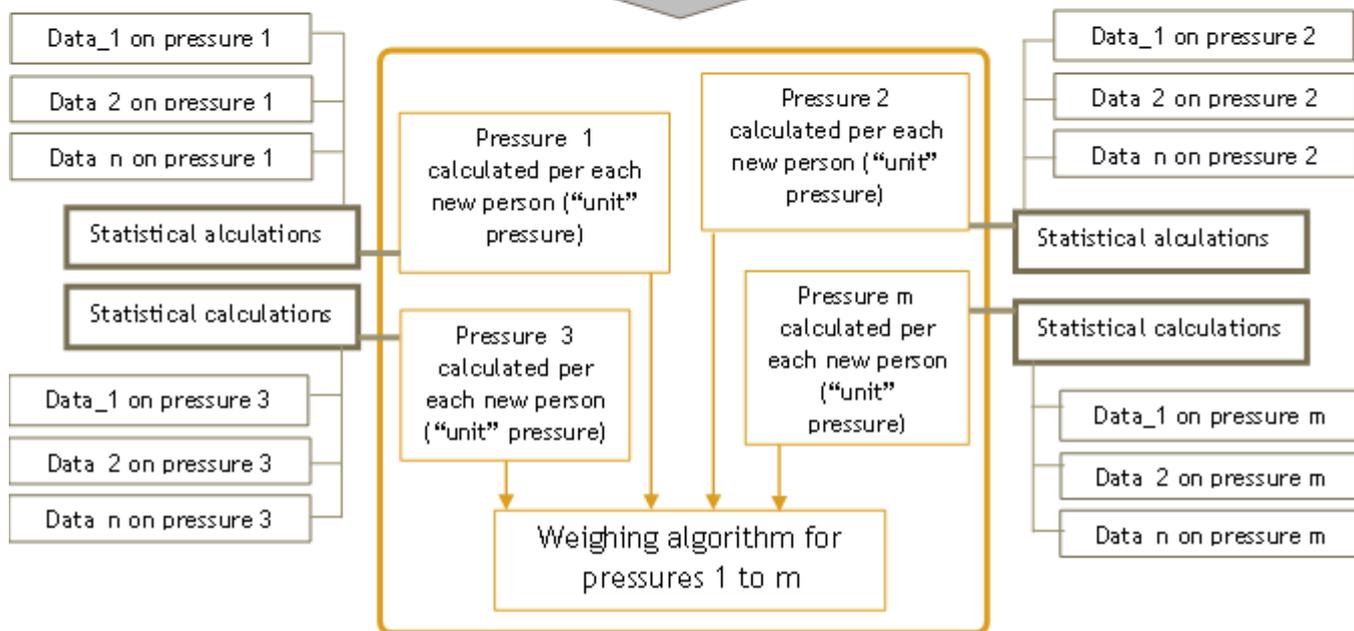
It was agreed that the main input data required from the user is the **number of new SPA guests expected**. The tool is going then to recalculate the number of new guests into series of individual pressures - each pressure with its own algorithm derived mainly from available statistical data for SPA regions. Then, the individual pressures are going to be weighted among themselves in order to obtain unified overall value of the impact of SPA development on the environment. This process is illustrated on the flowchart below.



Number of new SPA guests expected . May be subdivided into categories, like e.g.:

- Patients receiving balneological treatment
- Tourists spending regular holiday in SPA town
- Tourists spending weekend in SPA town
- Daily tourists visiting SPA town without staying overnight
- ...

## INPUT



## OUTPUT



**Assessment of the impact of SPA development on the environment**

**LEGEND:**

Partners input

Tool's result

**EXAMPLE:**

Data\_1: SPA\_1 - amount of water used by tourists, number of tourists  
 Data\_2: SPA\_2 - amount of water used by tourists, number of tourists  
 Data\_n: SPA\_n - amount of water used by tourists, number of tourists  
 Statistical calculations on Data\_1 to Data\_n gives result ("unit" pressure):  
 average amount of water used by tourists per tourist per day

**Figure 1. Tool logic**

*Source: DT1.4.1. Common methodology & ranking criteria for assessment of impact strength on natural resources in SPAs, Central Mining Institute, 2020*



The basic and key value for the tool calculations is the number of available beds in all accommodations in SPA municipality. It is assumed that this number represents the maximum number of tourists in high season which is the value relevant for pressure assessment. The tool offers also a possibility of adding the number of daily tourists (tourists that do not stay overnight) to the number of total tourists if only this type of tourists seem to be relevant for given SPA municipality.

The Excel-based tool is divided into three parts.

	A	B	C	D	E	F	G
1	Country:	Poland					
2	Spa:	Ladek-Zdroj					- data received from database sheet
3	Municipality area [km <sup>2</sup> ]	117.27					- to be filled by end user
4	Area of SPA parks [ha]	6.54					- result of calculations
5	Defert-Baretje's index						
6	Current No. of inhabitants [persons]	8276					Vulnerability
7	Current tourists accommodation capacity [persons]	1178				Overburden lithology	metamorphic
8	Current estimated daily visitors number [persons]	1767				Aquifer lithology	metamorphic
9	Current maximum tourists number [persons/d]	2 945				Groundwater table type	Unconfined
10							
11							
12	<b>Main indicators</b>						
13	Indicator (resource)	environmental capacity of the municipality area	environmental capacity of SPA parks	capacity of the legal protected areas	mineral water quantity		sewage
14	units:	persons/km <sup>2</sup>	persons/ha	persons/km <sup>2</sup>	m <sup>3</sup> /d		m <sup>3</sup> /d
15	Current level of use	25.1	450.3	0.51	478		2 488
16	Limit value of scalable resource	58.0	500.0	25.00	1 224		8 000.0
17	Current use of capacity	43.3%	90.1%	2.0%	39.1%		31.1%
18	Maximum additional tourists number	3 857	325	141 590	17 502		24 864
19							
20							
21							
22							
23	<b>Illustration indicators</b>						
24	Indicator (resource)	Drinking water	Wastes	Energy	Financial income		Groundwater vulnerability
25	units:	m <sup>3</sup> /d	Mg/yr	MWh/yr	€/year		[descriptive]
26	Current level of use	742	3 174	3 736	13 155 831		moderate risk
27	Predicted level of use for min. Additional tourists number (estimated from main	763	3 266	3 844	14 607 662		
28							

The first section contains data describing the condition at a particular SPA, including such information as:

- municipality area [km<sup>2</sup>] (data source: on-line database)
- area of SPA parks [ha] (only if applicable, Data source: partner's data)
- Defert's tourist function (TF) index, which measures tourist 'intensity' or 'activity' by comparing a destination's population with the number of tourists, calculated from current tourists accommodation capacity (data from partner) / current no. of inhabitants (on-line data or partner's statistic data)
- current no. of inhabitants [persons] (data source: partner's statistic data)
- current tourists accommodation capacity [persons/d] (data source: partner's statistic data)



- current estimated daily visitors number [persons/d] (all day-tourists spending less than 24h in SPA, to be estimated by partners in ‘database’ sheet within Excel-based tool)
- current maximum tourists number [persons/d] (sum of “Current tourists accommodation capacity” and “Current estimated daily visitors number”)

In this part, also the groundwater / thermal and mineral water vulnerability is assessed, based on following aspects:

- overburden lithology (dominating lithology of rocks situated above the mineral/thermal water deposit (selected from pre-defined drop-down menu),
- aquifer lithology (dominating lithology of rocks that host the mineral/thermal water deposit (selected from pre-defined drop-down menu),
- groundwater table type. The type of groundwater table of mineral/thermal water of concern (selected from drop down menu) as follows:
  - unconfined - the level of groundwater table changes with changing pressure of mineral/thermal water in the aquifer; there are no rocks of low permeability in the overburden
  - confined - the level groundwater table is constant, as there are low permeable rocks in the overburden and therefore mineral/thermal water is under pressure; there is no change of water table level with changing pressure of the water in the aquifer

For these information, tool is based on specific data source - partner’s data from Google form, which was a part of D.T1.2.1. *Guideline for standardized acquisition of harmonized data on mineral and thermal waters.*

Aside of informative data, the tool consists of several indicators and for most of them the maximum number of tourists in high season is taken into calculations. There are two types of indicators in the tool: main indicators and illustrative indicators.

## MAIN INDICATORS

There are 5 main indicators which are used in the process of calculation of SPA development capacity. For each indicator the “current level of pressure” is compared to “limiting value of the pressure”. Then, for each indicator the Maximum additional tourists’ number is calculated, meaning the number of additional tourists still allowed while the Limiting value of the pressure is not exceeded for a given indicator. Finally, the “Maximum additional tourists’ numbers” for each indicator are compared and the lowest number is selected to be displayed as “Limit of additional tourists”. This value represents the suggestion for decision makers about how many additional tourists are still allowed in order to keep the environmental pressure at relevant level.

The main indicators are as follows:

- 1) environmental touristic capacity of the municipality area



- 2) environmental capacity of SPA parks
- 3) capacity of the legal protected areas
- 4) sewage
- 5) mineral water quantity

## ILUSTRATIVE INDICATORS

There are 5 more indicators for which no clear limit of SPA tourism development could be defined, however the indicators seem to be relevant for increasing the awareness about the environmental pressure that follows the SPA development.

The illustrative indicators are as follows:

- 1) drinking water
- 2) wastes
- 3) energy
- 4) financial income
- 5) groundwater vulnerability calculation.

The specific information about the indicators, as well as the specific instruction how they are calculated are available in Deliverable D.T1.4.3 - *User guide (Technical protocol / guideline for impact assessment & environmental capacity matrix)*.

### 2.3. Stakeholders involvement in tool testing for local needs

List of stakeholders involved in tool testing for local needs will be the representatives of 6 SPAs in Croatia:

- Terme Sveti Martin
- Terme Tuhelj
- Varaždinske Toplice
- Terme Jezerčica
- Krapinske Toplice
- Stubučke toplice.

These stakeholders were involved in tool testing, as data from their territory were collected in tool development. PP6 and GIG team had several meetings/discussions related to tool amending process. The meetings were held in March 2021, the first on 17.03., and the second on 29.03. Given that a large amount of data that had to be collected by each project partner, bilateral meetings were a good opportunity to determine the consistency between the partners when searching for needed data and enter them into the tool. Also, due to the variety of partners pilot actions, and especially due to: very different approaches to the definition of SPA in each country and the resulting variability and difficulty in obtaining some of the data, as well as difficulties in identifying threshold values for indicator, the important



strategic decision that was done is that the tool for assessment of the environmental pressures should be as simple for the user as possible.

The following starting points were agreed:

1. Definition and implementation of the architecture and main components of the Tool for impact assessment & environmental capacity of further SPAs development
2. Available data on lower territorial levels (such as municipality (LAU 2) level) which were obtained during activities, such as:
  - HealingPlaces previous Deliverables within WPT1, including D.T.1.2.1 Guideline for standardized acquisition of harmonized data on mineral and thermal water and D.T1.2.2. Knowledge database (GIS map) and data acquisition tool on mineral and hot water resources/deposits, as well as environmental and socio-economic reports (D.T1.3.2 and D.T1.3.4.);
  - The whole process of elaboration of the Tool for impact assessment & environmental capacity of further SPAs development (meetings and discussions between project partners in period May 2020-June 2021).
3. Available data on land use (change) from sources such as national authorities, European Space Agency, Copernicus programme, regional authorities, and sectoral agencies.

Feedback from testing of the tools in frame of WPT2 has been an important input to still ongoing process of tool development in frame of WPT1.

## 2.4. Results of consultations.

GIG team briefly explained the main objective of the tool and each indicator that was taken into account, as listed in chapter 2.2. Each partner shared their thoughts and explained their country's method to defining SPA and the ensuing variety and difficulty in acquiring parts of the data, as well as difficulties in determining threshold values for indicators.

The GIG team was able to construct the tool after input from each project partner and depending on the availability of individual data, so that the tool's results were directly tied to the entered data. These consultations aided in gaining a better understanding of the instrument, its genuine purpose, and proper data entry.

## 3. Conclusions

The creation of this tool and its application will assist certain stakeholders (SPAs) in further stimulating and supporting green business and the use and development of green technology to preserve and better manage natural resources. It will also aid in the advancement of spatial planning and environmental practices in spa regions. The tool must be built on current and available datasets gathered from a variety of sources, such as Statistics Bureaus, Local Authority budget records, or similar. The main datasets for creating the Tool were already prepared through Deliverables D.T1.1.2 and D.T1.2.2, and have been updated on a



regular basis following meetings with project partners to ensure consistency and quality of the outputs.

## 4. Sources / references

- DT1.1.2. National report of comparison of the legal, environmental, socio-economic status of SPAs in Croatia, City of Krizevci, 2020
- DT1.4.1. Common methodology & ranking criteria for assessment of impact strength on natural resources in SPAs, Central Mining Institute, 2020
- D.T1.4.3 - User guide (Technical protocol /guideline for impact assessment & environmental capacity matrix), Central Mining Institute, 2021
- DT1.5.3 National reports preparation regarding environmental & socio-economic impact of SPAs