BASELINE REPORT

SUSTAINABLE USE OF LAND
AND NATURE BASED SOLUTIONS

SPIRE Baia Mare

Deliverable D.7.1.2

EUROPEAN UNION
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Authors: Pietro L. Verga
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INTRODUCTION

Baia Mare is a municipality along the Săsar River, in north-western Romania. With a population of ca. 145.000 and a metropolitan area home to more than 230,000 residents, Baia Mare is the capital of the Maramures county.

The city's industrial past in the mining and metallurgical sector left a legacy of approximately 627 ha of land polluted by HMs (up to 5 times the acceptable value) within the municipal boundaries, which is totally disconnected from the urban framework.

SPIRE - Smart Post-Industrial Regenerative Ecosystem proposes an innovative approach to the reuse of heavy metal-contaminated land in the city of Baia Mare, through adaptive phytoremediation and the creation of new urban ecosystems, as a long-term strategy for sustainable local economic development.

As an Urban Innovative Action, the ultimate goal of the project is to test of unprecedented solutions. Baia Mare will be a living laboratory where to monitor over the time the effectiveness of the implemented solutions. Progress and results will be assessed periodically against the initial state-of-the-art baseline presented here.

This Report builds on the analyses carried out in the context of Work Package 4 "Set-up of SPIRE Implementation Framework" and Work Package 7 "Assessment" between September 2019 and July 2020, whose findings have been thoroughly discussed in the following deliverables:

- D.4.1.1 – Awareness and Openness Report

- D.4.3.1 – State of Art. Innovation Landscape Report

- D.4.3.3 – Desk analysis, Research Repository and Awareness Appraisal

- D.7.1.1 – Site Investigation and Field Analysis.

The scope of this Report is to bring together all of the aforementioned results and findings in a unique database, in order to provide an exhaustive baseline to assess over time SPIRE's accomplishments in its key intervention fields.

To do so, data have been grouped according to the classification of challenges and indicators' definitions that have been proposed in Deliverable D.4.3.2 – Standards and Key Performance Indicators Report.

Namely:

- Challenge 1. Climate Mitigation and Adaptation

- Challenge 2. Green Space Management and Biodiversity

- Challenge 3. Air/Ambient Quality

- Challenge 4. Urban Regeneration

- Challenge 5. Participatory Planning and Governance

- Challenge 6. Social Justice and Social Cohesion

- Challenge 7. Public Health and Wellbeing

- Challenge 8. Potential for New Economic Opportunities and Green Jobs.

Furthermore, when possible, the Baseline Data table shows the link between the reported indicators and the project KPIs identified in D.4.3.2.

Moreover, in order to provide a unique baseline value, we report the average score (AVG) registered for all Likert-Scale based questions from our Questionnaire and Survey.

The AVG is calculated as follows:

$$AVG = (n_1{}^*v_1 + n_2{}^*v_2 + n_x{}^*v_x + ...)/N$$

With:

n_x = number of respondents choosing Option X;

v_x = numerical value of Option X;

N = total number of respondents.

The Baseline Data presented in this Deliverable will be compared with future measurements and analysis that will be undertaken over the course of the project in order to monitor its progress and achievements.

BASELINE DATA

KPI Nr.	INDICATOR	BASELINE VALUE		DATE	SOURCE	NOTES
		1. CLIMATE MITIGATION AND ADAPTATION				
	Local Mobility Habits	**Average Score**				
1.3.1	Frequency of local trips by Public Transport	2,9 /4		Nov-19	Citizens' Questionnaire	"How often do you use the following means of transportation to move within your neighbourhood?" 4-points Likert scale: 1 - never; 4 - regularly
1.3.2	Frequency of local trips by Bicycle	2,0 /4				
1.3.3	Frequency of local trips by Walking	3,5 /4				
		2. GREEN SPACE MANAGEMENT AND BIODIVERSITY				
	Use of Green/Blue Spaces	**Average Score**				
	Frequency in the use of Parks / Public Gardens (SPRING / SUMMER)	2,8 /5		Nov-19	Citizens' Questionnaire	5-points Likert scale: 1 - seldom or never; 5 - almost daily
	Frequency in the use of Parks / Public Gardens (FALL/WINTER)	2,0 /5				
	Frequency in the use of Woods / Other Natural Green Spacese (SPRING / SUMMER)	2,8 /5				
2.1.1	Frequency in the use of Woods / Other Natural Green Spaces (FALL/WINTER)	1,9 /5				
	Frequency in the use of Agricultural Fields (SPRING / SUMMER)	2,1 /5				
	Frequency in the use of Agricultural Fields (FALL/WINTER)	1,4 /5				
	Frequency in the use of Blue Spacese (SPRING / SUMMER)	1,9 /5				
	Frequency in the use of Blue Spaces (FALL/WINTER)	1,7 /5				
		3. AIR / AMBIENT QUALITY				
	Pilot Sites' Soil pH	**pH**				
	ROMPLUMB | depth <20cm	6,86	Neutral	2020	SPIRE Deliverable D.7.1.1 - Site Investigation and Field Analysis	
	ROMPLUMB |depth >20cm	7,22	Neutral			
	FERNEZIU 1 |depth <20cm	6,73	Neutral			
	FERNEZIU 1 |depth >20cm	6,60	Neutral			
	COLONIA TOPITORILOR |depth <20cm	7,55	Slightly alkaline			
	COLONIA TOPITORILOR |depth >20cm	7,29	Neutral			
	URBIS – LOCAL POLICE STATION |depth <20cm	7,51	Slightly alkaline			
	URBIS – LOCAL POLICE STATION |depth >20cm	7,74	Slightly alkaline			
	CRAICA 1 |depth <20cm	6,06	Moderately acid			
	CRAICA 1 |depth >20cm	5,95	Moderately acid			
	CRAICA 2 |depth <20cm	4,35	Extremely acid			
	CRAICA 2 |depth >20cm	4,19	Extremely acid			
	Pilot Sites' Hummus Content	**Hummus Content %**				
	ROMPLUMB | depth <20cm	2,12	Low			
	FERNEZIU 1 |depth <20cm	5,29	High			
	COLONIA TOPITORILOR |depth <20cm	3,42	Normal			
	URBIS – LOCAL POLICE STATION |depth <20cm	4,41	Medium			
	CRAICA 1 |depth <20cm	5,45	High			
	CRAICA 2 |depth <20cm	4,51	High			

KPI Nr.	INDICATOR		BASELINE VALUE		DATE	SOURCE	NOTES
	Pilot Sites' Lead Concentration	**Pb (mg/kg dw)**		**Status**			
	ROMPLUMB | depth <20cm	117,32	Alert (sensitive)				
	ROMPLUMB |depth >20cm	172,39	Alert (sensitive)				
	FERNEZIU 1 |depth <20cm	119,77	Alert (sensitive)				
	FERNEZIU 1 |depth >20cm	288,05	Alert (sensitive)				
	COLONIA TOPITORILOR |depth <20cm	114,92	Alert (sensitive)				
	COLONIA TOPITORILOR |depth >20cm	123,81	Alert (sensitive)				
	URBIS – LOCAL POLICE STATION |depth <20cm	342,98	Alert (less sensitive)				
	URBIS – LOCAL POLICE STATION |depth >20cm	417,97	Alert (less sensitive)				
	CRAICA 1 |depth <20cm	43,69	Above Normal				
	CRAICA 1 |depth >20cm	46,36	Above Normal				
	CRAICA 2 |depth <20cm	50,59	Alert (sensitive)				
	CRAICA 2 |depth >20cm	52,42	Alert (sensitive)				
	Pilot Sites' Cadmium Concentration	**Cd (mg/kg dw)**		**Status**			
	ROMPLUMB | depth <20cm	0,24	Normal				
	ROMPLUMB |depth >20cm	0,27	Normal				
	FERNEZIU 1 |depth <20cm	0,33	Normal				
	FERNEZIU 1 |depth >20cm	1,22	Above Normal				
	COLONIA TOPITORILOR |depth <20cm	0,99	Normal				
	COLONIA TOPITORILOR |depth >20cm	1,17	Above Normal		2020	SPIRE Deliverable D.7.1.1 - Site Investigation and Field Analysis	
	URBIS – LOCAL POLICE STATION |depth <20cm	0,46	Normal				
	URBIS – LOCAL POLICE STATION |depth >20cm	0,51	Normal				
	CRAICA 1 |depth <20cm	0,80	Normal				
	CRAICA 1 |depth >20cm	1,25	Above Normal				
	CRAICA 2 |depth <20cm	1,10	Above Normal				
	CRAICA 2 |depth >20cm	0,43	Normal				
	Pilot Sites' Copper Concentration	**Cu (mg/kg dw)**		**Status**			
	ROMPLUMB | depth <20cm	21,13	Above Normal				
	ROMPLUMB |depth >20cm	27,00	Above Normal				
	FERNEZIU 1 |depth <20cm	25,45	Above Normal				
	FERNEZIU 1 |depth >20cm	38,82	Above Normal				
	COLONIA TOPITORILOR |depth <20cm	32,27	Above Normal				
	COLONIA TOPITORILOR |depth >20cm	64,44	Above Normal				
	URBIS – LOCAL POLICE STATION |depth <20cm	22,45	Above Normal				
	URBIS – LOCAL POLICE STATION |depth >20cm	24,06	Above Normal				
	CRAICA 1 |depth <20cm	86,33	Alert (sensitive)				
	CRAICA 1 |depth >20cm	128,78	Alert (sensitive)				
	CRAICA 2 |depth <20cm	124,31	Alert (sensitive)				
	CRAICA 2 |depth >20cm	128,96	Alert (sensitive)				

KPI Nr.	INDICATOR		BASELINE VALUE		Status	DATE	SOURCE	NOTES
	Pilot Sites' Zinc Concentration		Zn (mg/kg dw)					
		ROMPLUMB | depth <20cm	84,57	Above Normal				
		ROMPLUMB |depth >20cm	113,88	Above Normal				
		FERNEZIU 1 |depth <20cm	105,20	Above Normal				
		FERNEZIU 1 |depth >20cm	152,67	Above Normal				
		COLONIA TOPITORILOR |depth <20cm	125,69	Above Normal		2020	SPIRE Deliverable D.7.1.1 - Site Investigation and Field Analysis	
		COLONIA TOPITORILOR |depth >20cm	160,57	Above Normal				
		URBIS – LOCAL POLICE STATION |depth <20cm	88,43	Normal				
		URBIS – LOCAL POLICE STATION |depth >20cm	115,68	Above Normal				
		CRAICA 1 |depth <20cm	270,09	Above Normal				
		CRAICA 1 |depth >20cm	385,22	Alert (sensitive)				
		CRAICA 2 |depth <20cm	349,86	Alert (sensitive)				
		CRAICA 2 |depth >20cm	62,85	Normal				
					Average Score			
3.2.1	**Citizens' Perception on Air Quality**		3,5 /5			Nov-19	Citizens' Questionnaire	To what extent do you agree with the following sentence: "The Air Quality in my neighbourhood is good" 5-points Likert scale: 1 - strongly disagree, 5 - strongly agree

4. URBAN REGENERATION

KPI Nr.	INDICATOR		BASELINE VALUE			DATE	SOURCE	NOTES
	Neighbourhoods' Total Population							
		Craica/Vasile Alecsandrii	18.767	inhabitants		Jul-20	Municipality of Baia Mare	Population at each city address (based on house owner declarations for garbage collection fees)
		Lower Ferneziu	1.995	inhabitants				
		Upper Ferneziu	2.484	inhabitants				

5. PARTICIPATORY PLANNING AND GOVERNANCE

KPI Nr.	INDICATOR		BASELINE VALUE		Average Score	DATE	SOURCE	NOTES
	Citizens Satisfaction with Baia Mare Green/Blue Spaces							
5.1.1		Quality of the green/blue environment	3,0 /5			Nov-19	Questionnaire's Responses	5-points Likert scale: 1- very dissatisfied; 5- very satisfied
		Amount of the green/blue environment	2,9 /5					
		Maintenance of the green/blue environment	2,7 /5					
		Safety of the green/blue environment (perception of danger/safety)	2,8 /5					
		Accessibility of the green/blue environment	3,1 /5					
		Walkability of their neighbourhood	3,0 /5					
		Availability and safety of bike lanes	2,2 /5					
		Availability and accessibility of playgrounds / public sport facilities	2,7 /5					
	Citizens' Active Participation							
5.2.1		Focus Groups' Participation	44	Participants		Nov-19	Participants Lists	Total Number of Participants to the Four Focus Groups organised in Baia Mare in November 2019
			57,0%	Women				
		Citizens' Questionnaire Respondents	60	Respondents		Nov-19	Questionnaire's Responses	
			62,7%	Women				
		Awareness & Openness Online Survey Respondents	118	Respondents		Jul-20	Survey's Responses	

KPI Nr.	INDICATOR	BASELINE VALUE		DATE	SOURCE	NOTES
	Awareness & Openness towards NBS and SLU	**Average Score**				
5.2.2	Level of knowledge on the reuse and recycling of plant biomass	3,2 /7		Jul-20	Awareness & Openness Online Survey	7-points Likert scale: 1- not at all; 7 - very much
	Interest in visualising how land use changes in the city and having public access to monitoring the quality of the local environment	6,0 /7				
	Willingness to participate in workshops for co-creation and design of public and green spaces of Baia Mare	5,4 /7				

	6. SOCIAL JUSTICE AND SOCIAL COHESION					
	Citizens' Expectations from their Neighbours	**Average Score**				
6.1.2	Have people who care about what happens to them	2,1 /4		Nov-19	Questionnaire's Responses	Multiple-choice question converted into 4-points Likert Scale: 1 - very difficult; 4 - very easy The value 0 has been attributed to both "I don't know" and "I don't need such kind of support" answers
	Get chances to talk to someone they trust about their personal problems	1,6 /4				
	Get invitations to go out and do things with other people	2,1 /4				
	Get useful advice about the neighbourhood and its services	1,9 /4				
	Get help when sick in bed	1,7 /4				
	Get chances to leave their children with someone they trust in case of necessity	1,5 /4				
	Leave the keys of their home to someone in case of emergency when they are away.	1,4 /4				

	Youth's Involvement	**Number**	**Age Group**			
6.3.2	Youth Participants to Focus Groups	12	14-17 years old	Nov-19	Participants Lists	All of the youth that participated to Focus Groups also responded to the Questionnaire
		3	18-25 years old			
	Youth Responents to the Questionnaire (incl. participants to Focus Groups)	17	14-17 years old	Nov-19	Questionnaire's Responses	
		5	18-25 years old			

	Awareness & Openness towards Digital Tools and Applications	**Average Score**				
6.4.2	Familiarity with the use of smartphones and digital technologies in general	6,5 /7		Jul-20	Survey's Responses	7-points Likert scale: 1- not at all; 7 - very much
	Willingness to use a digital token system to make daily payments in Baia Mare	5,9 /7				
	Willingness to participate in the co-creation of a system of local values for ecological practices, based on the iLEU blockchain technology	5,7 /7				

	7. PUBLIC HEALTH AND WELLBEING					
	Infant Mortality	**Number**	**Calc. Rate**			
7.1.2	Maramures	24	4,78	2018	County report regarding the environment in Maramureș County for 2018, Chapter VIII - Urban environment, health and quality of life, p. 277	
	Baia Mare	5	1,49			
	Infant Mortality from Respiratory Diseases	**Number**	**Calc. Rate**			
	Maramures	5	1,00			
	Baia Mare	1	0,30			
	General Mortality - Total	**Number**	**Calc. Rate**			
	Maramures	5.694	10,90			
	Baia Mare	1.263	8,67			

KPI Nr.	INDICATOR		BASELINE VALUE		DATE	SOURCE	NOTES
	Mortality from Respiratory Diseases		**Number**	**Calc. Rate**			
		Maramures	379	72,58			
		Baia Mare	84	57,65			
	Mortality from Cardiovascular Diseases		**Number**	**Calc. Rate**			
		Maramures	3.139	601,16			
		Baia Mare	106	72,74			
	Mortality from Respiratory Malignancies		**Number**	**Calc. Rate**		County report regarding the environment in Maramureș County for 2018, Chapter VIII - Urban environment, health and quality of life, p. 277	
		Maramures	1.048	200,71			
		Baia Mare	315	216,17			
7.1.2	**General Morbidity - Total**		**Number**	**Calc. Rate**	2018		
		Maramures	497.354	952,50			
		Baia Mare	159.747	1.096,27			
	Respiratory Morbidity		**Number**	**Calc. Rate**			
		Maramures	137.361	26.306,61			
		Baia Mare	44.887	30.804,02			
	Cardiovascular Morbidity		**Number**	**Calc. Rate**			
		Maramures	28.943	5.543,00			
		Baia Mare	8.423	5.780,34			
	Morbidity from Malignant Tumors		**Number**	**Calc. Rate**			
		Maramures	1.503	287,85			
		Baia Mare	487	334,21			
7.2.2	**Citizens' Perceptions on Environmental Pollution Risks**			**Average Score**	Nov-19	Questionnaire's Responses	5-points Likert scale: 1- strongly disagree; 5- strongly agree. The value "0" has been attributed to "does not apply" answer
	The pollution of the soil/water is a direct threat to my health		3,3 /5				
	I do not use green/blue spaces because I am afraid for my health		2,4 /5				
	I prevent my children from playing outside to protect their health		1,7 /5				
	I am afraid of contracting pollution-related illnesses		2,4 /5				
	I / a member of my family contracted a pollution-related illness		1,7 /5				

8. POTENTIAL FOR NEW ECONOMIC OPPORTUNITIES AND GREEN JOBS							
8.4.2	**Average Sales Prices (€/sqm)**		**Vasile Alecsandrii**	**Baia Mare**	Mar-20	https://www.storia.ro/	Data inferred from Real Estate website storia.ro
		2-Rooms Apartments	€747,18	€866,86			
		3-Rooms Apartments	€755,94	€853,17			

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