The Urban Lab of Europe!

JOURNAL

PROJECT

SPIRE - Smart Post-Industrial Regenerative Ecosystem

Baia Mare, Romania

TOPIC

Sustainable use of land and nature based solutions

EDIT 17 FEBRUARY 2021
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SPIRE Journal 1: get to know the latest project achievements

See on UIA website

This is the first journal of the Smart Post-Industrial Regenerative Ecosystem (SPIRE) since its start on 01/09/2019. SPIRE, led by the Municipality of Baia Mare, is an ambitious Urban Innovative Action aiming to manage land use in a sustainable way and integrate Nature-Based Solutions (NBS) to re-claim several (5) polluted sites in the city.

Executive Summary

The city of Baia Mare is the epicenter of SPIRE. Baia Mare is a municipality along the Sasar River in north-western Romania. With a population of ca. 145.000 and a metropolitan area home to more than 230,000 residents, the city is the capital of the Maramures county[1].

The project tackles the challenges urban ecosystems suffer at the nexus of the economy-society-environment. It applies adaptive phytoremediation to Heavy-Metal contaminated land (environmental lens), generates a new and dynamic land-use management through participatory planning (social lens), and creates new local value systems (economic lens).

- An adaptive approach to Nature-Based Phytoremediation and ecosystem creation on urban Heavy Metal-polluted strategic urban pilot sites is proposed.
- A long-term strategy (2050) for land use management and economic re-profiling is co-produced with the civil society, the local administration, the private sector, and academia.
- Cascading value chains from bio-based material and renewable energy flows are leveraged into social post-industrial entrepreneurship and new circular economic models, and changes in environment behaviour, counting on a local smart token value system (iLEU) and the SPIRE HUB.

As an inspiring and real exercise of integration of Nature-Based Solutions and phytoremediation strategies into sustainable urban design and management, it can potentially provide a model for other Romanian and European cities that still bear the burden of their industrial past.

The project deals on the one hand with the benefits of European, national and local policies for some of the matters it addresses; and on the other hand, with the lack of comprehensive policies at the national level on other issues, which allows it to seek and enable new and alternative urban governance models, learning worthy lessons to be applied in the near future.

This journal presents a detailed analysis of the UIA challenges in the SPIRE project, measuring their risk from low to high. According to this, cross-department working, and monitoring and evaluation present a low risk in implementation. medium risk is identified for leadership, participative approach, communication, and upscaling. Finally, high risk is present for public procurement challenges.

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[1] SPIRE (2020), D.4.1.2, Awareness and Openness Report. Available at:http://spire.city

1. Introduction to the challenge addressed

Baia Mare was historically a metallurgical area, but the city is currently transitioning from its past as Romania's mining capital towards a new sustainable social, economic, and environmental development model. However, although the city and its citizens are ready to move into a new socio-economic era, the metallurgical legacy persists in the form of Heavy Metal (HM) pollution of the environment that significantly affects local ecosystems and human health in the urban area. Thus, about 627 hectares of contaminated land (5 times over the acceptable limits) are awaiting a solution.

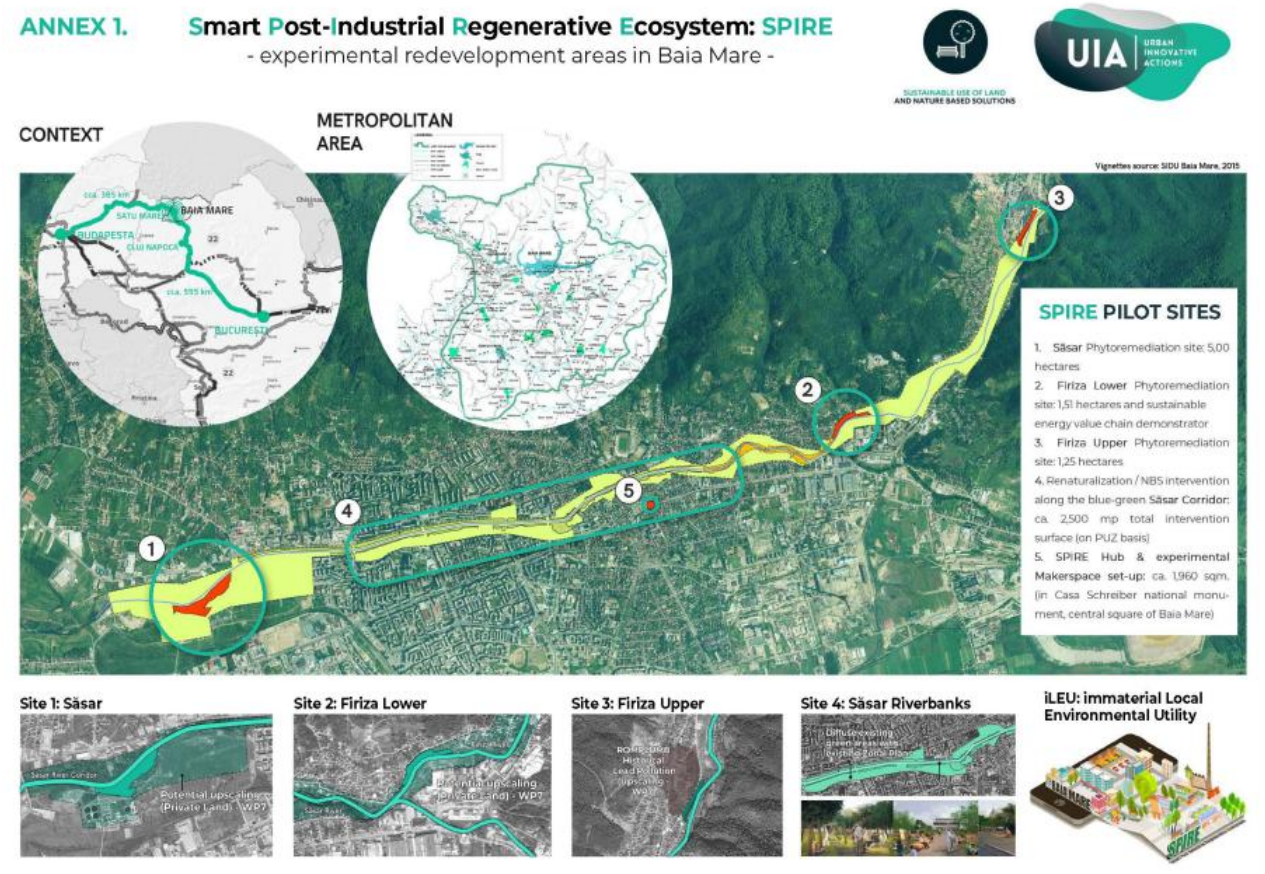

Figure 2. SPIRE's phytoremediation sites. Source: http://spire.city

SPIRE's challenge is to test an integrated and innovative strategy capable of:

- Recovering contaminated land and starting long-term phytoremediation and land revalorization process (with a Remediation Toolkit and Adaptive Site Management Application);
- Co-creating new bio-based solutions for pressing urban issues, like housing insulation or carbon emissions reduction (with a replicable approach to supporting local circular business models);
- Finding alternatives to fossil fuel to foster sustainable energy transition for potential capitalization at functional urban area level);
- Supporting participation and a behavioral shift, thanks to the immaterial Local Environmental Utility (iLEU), a novel digital solution to reward environmentally-friendly actions.

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2. How the project fits in with EU policy context, on a national and regional level

Pollution is one of the most significant environmental challenges worldwide. According to the European Environmental Agency (EEA), polluted land management costs about 6.5 billion€/ year in Europe alone. Contamination with HM, in particular, represents a real health concern. Therefore, urban ecosystems face severe problems that affect the population's health and quality of life.

In its fifth proposed mission, "Caring for Soil is Caring for Life", the research and innovation Horizon-Europe Programme set the target that by 2030 at least 75% of all soils in the EU will be healthy for food, people, nature, and climate. (The proposed mission combines research and innovation, education and training, investments, and the demonstration of good practices using "living labs" (experiments and innovation in a laboratory on the ground) and "lighthouses" (places to showcase good practices).

2.1 Policy context: International Agenda 2030

Figure 3. Primary contribution to the SDGs from the SPIRE project. Source: Leopa, S. (2020). Standards and Key Performance Indicators for Smart Post-Industrial Regenerative Ecosystems.

The **2030 Agenda for Sustainable Development** (2015) proposes 17 Sustainable Development Goals (SDGs). The SDG's recommended indicators, related to the project's approaches, have been embedded within the SPIRE Key Performance Indicators (KPI) framework which was developed to monitor the progress of Sustainable Use of Land and Nature-Based Solutions. It also allows the city to perform voluntary self-assessments and to be able to work with national authorities in the SDGs periodical reporting.

Together with SDGs, the **New Urban Agenda** (2016) stresses the commitment to strengthen the sustainable management of resources, and to minimize all types of waste, including hazardous chemicals and pollutants, encouraging the transition to a circular economy while facilitating ecosystem conservation, regeneration, restoration and resilience in the face of new and emerging challenges (paragraph 71).

The **Sendai Framework for Disaster Risk Reduction** (2015) establishes four priorities, ensuring (1) the understanding of disaster risk, (2) the strengthening of disaster risk governance to manage disaster risk, (3) the investment in disaster risk reduction for resilience and (4) the enhancing of disaster preparedness to enable effective response in recovery, rehabilitation, and reconstruction.

The **Paris Agreement on Climate Change** and EU Cohesion Policies work hand in hand with the other 2030 Agenda agreements, targeting measures to improve the urban environment and revitalize cities, regenerating and decontaminating brownfield sites.

The SPIRE project is totally aligned with Paris and NUA commitments, supports Sendai priorities 1,2 and 3, and contributes directly to 9 SDGs, beyond the SDG 11 (please, refer to figure 3).

2.2 Policy context: European and national level

Sustainable Use of Land and Nature-Based Solutions is a multi-dimensional matter, and in Europe, we do not have specific legislation addressing it. Furthermore, the SPIRE project considers not only environmental matters but also territorial and socio-economic dynamics and those related to health.

The SPIRE team has undertaken an in-depth analysis[2] of the European and Romanian (regional and local) legislation to develop a systemic framework, aiming to become a leading and replicable model.

The project identifies five policy domains: Environment and Climate Change, Industrial and Energy, Social and Employment, Public Health and Well-being, and Research and Innovation.

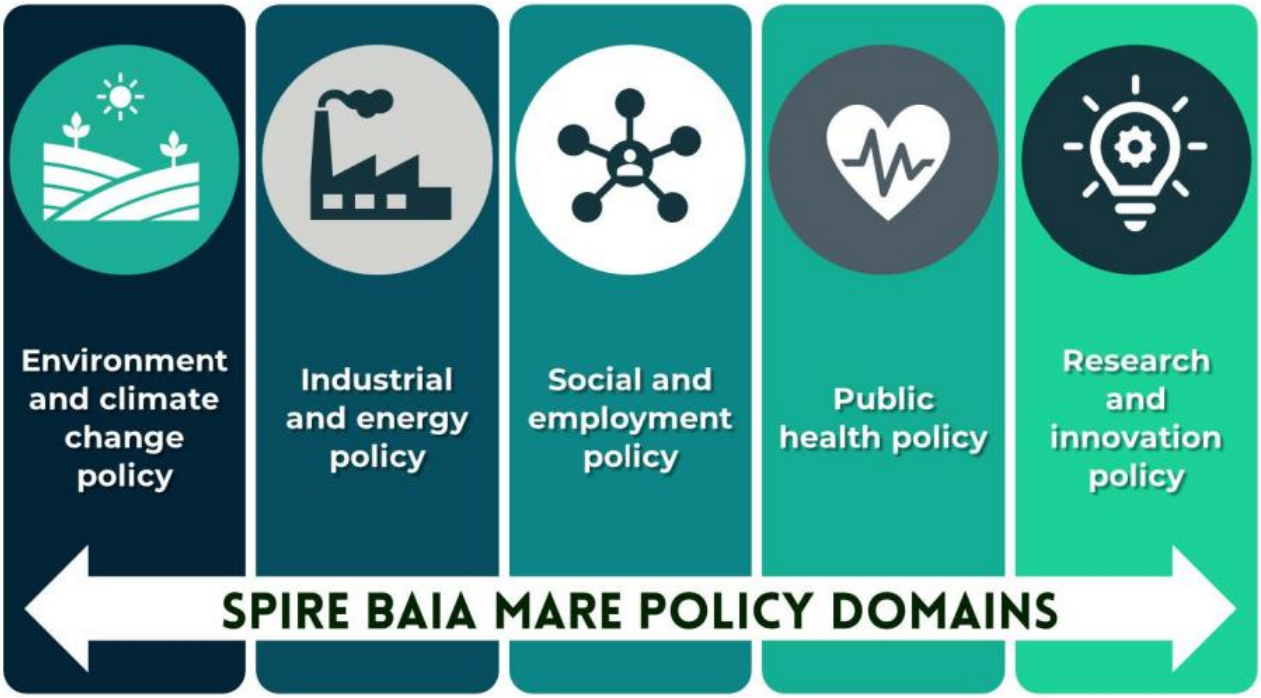

Figure 4. SPIRE policy domains. Source: Leopa, S. (2020). Standards and Key Performance Indicators for Smart Post-Industrial Regenerative Ecosystems.

Different policies and legal frameworks focus on several areas in which the EU and the Member States share or provide supporting competencies. These areas are environmental protection and climate change, circular economy and digital transition, and sustainable energy production and use.

The subjects related to social, health, employment, and innovation policies are guided by initiatives and plans that inform national legislation without the transposition of directives.

[2] This section has been built fundamentally upon: (Leopa, S. (2020). Standards and Key Performance Indicators for Smart Post-Industrial Regenerative Ecosystems. SPIRE - Smart Post-Industrial Regenerative Ecosystem, Technical Report D4.3.2, DOI: 10.13140/RG.2.2.33583.56481)

2.2.1 Environment and Climate Change policy

Climate action is an explicit objective of the EU Environmental Policy in alignment with the Paris Agreement for implementation and the EU's Emissions Trade System (EU ETS).

Besides the long-term vision of the 7th Environmental Action Programme guidelines for 2050, with (1) Natural capital, (2) Resource-efficient economy, and (3) Healthy environment for healthy people as priority areas, the EU Policy for Climate and Energy 2030 presents several other targets, all of them aligned with SPIRE project:

- A 40% reduction below the 1990 level in EU greenhouse emissions by 2030 (through domestic measures alone).
- A 27% increase in renewable energy sharing.
- KPIs to support improvement of energy efficiency for competitiveness, energy supply security, and sustainability.

At the National level, the GEO no. 195/2005 approved by Law no. 265/2006 has a chapter dedicated to soil and subsoil protection, which stipulates landowners and users' obligation to bring the land to a state to be reusable in the future.

Several Government Decisions and Romanian laws address different matters related to Environment and Climate

Change, as (1) Sustainable Use of Land, (2) Soil protection, and (3) Clean Air and Water.

Sustainable Use of Land

The "Roadmap to a Resource Efficient Europe" (2011) sets the goal of zero land take by 2050.

Linked to Sendai Framework for Disaster Risk Reduction, the Seveso-III-Directive (2012/18/EU) targets major accident risk reduction with a specific focus on risk mitigation by land-use planning.

The SLU and NBS Partnership Action Plan (2018) is aligned with the Urban Agenda for the EU. Two Actions of the Plan apply to SPIRE: (A No.2) Funding and financing guide for brownfield development and (A No.9) agreeing on common targets and indicators for NBS, urban green infrastructure, biodiversity, and ecosystem services in cities.

- At the Metropolitan level, some strategies have been developed, such as (1) the Baia Mare Metropolitan Area Development Strategy 2010 – 2020 (MADS), (2) the Integrated Territorial Strategy for the Metropolitan Area of Baia Mare (ITS), and (3) the Land Use Policy for the Metropolitan Area (LUP), developed as part of the USE ACT project under the URBACT II framework.
- At the Municipal level, the reference documents are the Integrated Urban Development Strategy (IUDS), the General Urban Plan (GUP), and the Local Urban Regulation (LUR).

Soil protection. HM and soil pollution

There is no specific legislation in Europe regarding soil protection, even if this priority is recognized in the 7th Environmental Action Programme. In EU COM (2006) 231, the main threat to soil quality were determined, including contamination and soil biodiversity loss.

In Europe, soil does not benefit from the same detailed regulations against pollution as water, air, or biodiversity. Therefore, soil protection is indirectly enforced at the European level through secondary laws such as the Environmental Impact Assessment Directive (2011) and its further amendments, regulating HM soil pollution to protect plant products and activities.

HEAVY METALS (HM) – PARAMETERS	LIMITS VALUES (MG/KG DRY MATTER)
Cadmium (Cd)	1 to 3
Copper (Cu)	50 to 140
Nickel (Ni)	30 to 75
Lead (Pb)	50 to 300
Zinc (Zn)	150 to 300
Mercury (Hg)	1 to 1.5
Chromium (Cr)	/

Figure 5. Directive 278 /1986 limit values of HM concentration in soil (only information of this type in the European legislation). Source: EurLEx

- At the National level the Law no. 74 of 25 April 2019 determines that the National Environmental Protection Agency shall assign a risk score to each site included in the national list of contaminated sites to carry out remediation projects.
- The Government Decision GD 683/2015 concerns the National Strategy and the Plan for the Management of Contaminated Sites in Romania, aiming to eliminate or limit (potential) risks to human health and the environment. The strategy identifies a set of environmental, socio-economic, and technical objectives directed at the decontamination of soils, economic and social development goals, and the promotion of the principle of subsidiarity.
- The Government Decision GD 1408/19.11.2017 and GD 1403 / 19.11.2017 create a distinction between potentially contaminated and contaminated sites. There must be an updating process focused on adapting these criteria. This differentiation is based on the evaluation of analytical results. Human and environmental risks need to be considered when selecting appropriate remediation strategies.

Clean Air, Clean Water and HM pollution

The Cleaner Air for Europe (CAFÉ) DIRECTIVE 2008/50/EC and the EU COM (2018) 330 provide a robust framework to establish air quality objectives in Europe.

Regarding HM air pollutants and industrial activities, the Directive 2010/75/EU includes air emission limit values for waste incineration plants and co-incineration, and the Regulation 2004/107/EC contains indicators associated

with arsenic, cadmium, mercury, nickel, and polycyclic aromatic hydrocarbons. The atmospheric pollutants in ambient air concentrations are measured according to the Romanian Law no. 104/2011, Order no.592/2002, and Air Quality Directives (EU, 2004, 2008).

Regarding water, we count on several Directives: 105/2008/EC, 118/2006/EC, and 60/2000/EC, which establish a framework for Community Action related to water quality and another framework for HM water pollutants.

- In Romania, the Government Decision no. 683/2015 on the Approval of the National Strategy and the Plan for the Management of Contaminated Sites in Romania, and the Maramures County Local Environmental Action Plan (LAMP-2013) refers to soil and groundwater contamination at the national and regional level.

The provisions of the national framework are aligned with SPIRE's phytoremediation strategy. It provides a cost-effective NBS remediation solution to contaminated soils and includes new socio-economic goals and citizen participation in development plans.

2.2.2 Industrial and Energy policy

The new European industry strategy (COM/2020/102) was presented in 2020 to transition towards climate neutrality and digital leadership, enhancing industrial competitiveness and strategic autonomy.

Efficient and sustainable energy use

In alignment with the EU's Paris Agreement (2015), several Directives related to Energy Performance of Buildings, Renewable Energy and Energy Efficiency were developed ((EU) 2018/844, 2018/2001, and 2018/2002).

Updated thresholds for greenhouse emissions were proposed for biofuels (transport and bioliquids), soil and gaseous biomass (heat and power), and woodchips from short rotation coppice. Minimum energy performance requirements have been combined with certifications, ongoing constraints, and incentives hand in hand to improve the current data.

- A 27,9% as the target (national) for renewable energy by 2030, rising to 30.5% by a revised National Integrated Climate Change-Energy Plan, under development.
- A 32.5% as the target for energy efficiency by 2030, encouraging public bodies to adopt integrated and sustainable energy efficiency plans and involve citizens in the process.
- The legal transposition Law no. 121/2014 has not been transposed yet. The Romanian Energy Strategy 2016-2030 sets an annual target of thermal rehabilitation of at least 3% of public buildings' overall number.
- At the local level, the Sustainable Energy Action Plan (SEAP) is the primary reference for SPIRE's actions.

Waste management, brownfield recovery and the circular economy

Regarding landfills, the European Landfill Directive (LD) 1999/31/EC highlights these facilities' space requirements. The Waste Framework Directive 2008/98/EC introduces the "polluter pays" principle and "waste hierarchy" (waste prevention, re-use, recycling, and recovery):

- A target of 50% of household waste and 70% of demolition and construction waste being recycled by 2030. This measure complements the differentiated collection systems that most European cities have put in place in the last 20 years.

At the national level, the transposition comes with Law no. 211/2011, with several strategy documents (National Waste Management Strategy and National Waste Management Plan among others) as necessary tools to set some targets that affect the SPIRE project:

- 50% (of recyclable waste) preparation for reuse and recycling of municipal waste by 2020
- 50% (of municipal waste) preparation for reuse and recycling of municipal waste by 2025
- 35% (of 1995 levels) decrease of municipal biodegradable waste stored by 2020.
- 15% increase of the degree of energy recovery by 2025.
- The National Strategy and Action Plan for the Management of Contaminated Sites (2014) identifies 1183 potentially contaminated sites and 210 contaminated sites. The target is the complete remediation of all the 1193 sites. The mid-term target proposed by 2020 has not been achieved.

The estimated cost for the risk assessment of these sites amounts to a total of €8.409 billion. There is an urgent need to find alternatives, as the one's SPIRE project presents.

Industrial policy and bio-based building materials

The Eco-Design Directive (2009/125/EC) provides rules for improving products' environmental performance. The Construction Products Regulation (EU) 305/2011 lays down standardized conditions for the marketing of construction products.

The European industrial policy supports the transformation of EU energy-intensive industries to climate-neutral and circular ones by 2050. It includes the need to empower citizens with skills and advanced technologies to achieve the goal.

2.2.3 Social policy and employment

The New Skills Agenda (2016) and the Resolution 2018/C 456/01 derived from EU Strategy for Youth 2019-2027 aim to ensure the EU develops adequate training and skills, as well as deliver services aimed at improving mental health and wellbeing, providing quality employment, and implementing learning support for the youth.

The European Employment Strategy (EES, 1997) constitutes part of the Europe 2020 growth strategy, with periodical reports in Romania.

2.2.4 Public Health and wellbeing

The Third Health Programme (2014-2020) has been succeeded by EU4Healt 21-27, which is focused on urgent health priorities as Covid-19, cancer, antimicrobial-resistant infections, and vaccination rate improvements. It is a cross cutting policy, from the Zero Pollution Action Plan (COM (2029)640) to Farm to Fork strategy (COM (2020)381).

The Horizon-Europe Programme has cancer as its second mission area, and the word “healthy” is referring to water and soil (fourth and fifth missions)

2.2.5 Research and Innovation

The research and innovation Horizon-Europe Programme, currently in place, is the Horizon 2020 framework's successor, supported by the COM (2012) 497 and the Treaty of Lisbon. It proposes five mission areas, with 1,2,3 and 5 directly involving the SPIRE project: (1) Adaptation to climate change including societal transformation; (2) Cancer; (3) Climate-neutral and smart cities; (4) Healthy oceans, seas, coastal and inland waters; and (5) Soil health and food.

Regulations across Europe about the creation and usage of local currencies are highly different regarding their issuing and use, often depending on their form. In Romania, only the National Bank can print money. However, specific laws enable the circulation of electronic currencies, in certain conditions, while virtual currencies are unregulated[1].
The **immaterial Local Environmental Utility (iLEU)** within the SPIRE project represents a reward system for environmentally friendly activities based on blockchain technologies. It develops the systemic change needed by working in the interdependencies between the local community, locally owned businesses, training and education programs, innovation and new technologies, and environmental behavior[2].
iLEU reward system has encountered several legal barriers in its implementation due to the system's innovative nature. It highlights the need for culture-shifting towards RESILIENCE, not only in citizens' environmental behavior but also in legal frameworks and procedures. Only by allowing ourselves and our procedures to be adaptable, reflexive, and transformative will these groundbreaking initiatives be able to occur.

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[1] Verga P. L. (ed.), Onesciuc N., Mihaiescu T., Plesa A., Vajda B., Sebestyen T., Pop S., Ghise C. R., Ghise C. I., Pop A. M., 2020 SPIRE Baia Mare: State of the Art / Innovation Landscape Report. Bioflux Publishing House, Cluj-Napoca. Online edition, ISBN 978-606-8887-73-9

[2] SPIRE (2020), D.5.2.1, iLEU whitepaper. Available at:http://spire.city

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3. Implementation challenges

The UIA Permanent Secretary proposes seven implementation challenges, outlined below, to assess the project’s progress and potential barriers. It is vital that these challenges include a focus on meaning, intensity, likelihood, and temporality.

Following a traffic-light rating system, a legend is presented where red indicates that the challenge is particularly relevant for the project; yellow indicates that the challenge is somewhat applicable to the project; green indicates that the challenge is only limitedly suitable for the project.

Implementation Challenge	Level
1. Leadership	Medium
2. Public procurement	High
3. Participative approach	Medium
4.Cross-department working	Low
5.Monitoring& evaluation	Low
6. Communication	Medium
7. Upscaling	Medium
8. Other challenges	High

Table 1. Mapping SPIRE against implementation challenges

3.1. Leadership (Risk level: Medium)

The Municipality vision to support the SPIRE project is very clear and based on previous experiences and proposals, such as C-BREATH.

SPIRE is a very comprehensive and ambitious project covering an important set of subjects from different angles. It provides a systemic and interlinked approach: brownfield phytoremediation and future Master Plans, community engagement and participation, new business models, bio-mass material development for energy and bio construction, cryptocurrencies, etc., being developed in parallel in a three year timeline.

In such an innovative and complex project, Baia Mare municipality's leadership is built upon SPIRE's committed partnership. One of this partnership's assets is the involvement of several members in the previous C-BREATH project. The partners have the advantage of outstanding competence in heavy metals pollution risk assessments performing in soil and plants; experience in participatory processes strategies design and development and social innovation modeling; expertise in blockchain and smart technologies, GIS, as well as environmental monitoring; knowledge in business planning and mentoring related to biomass-based and circular economy; and management, communication, and dissemination know-how. They are all actively involved in the SPIRE's project research, tests, counterchecking, and development (including continuous re-design of some activities due to Covid-19).

Despite this, this challenge is active due to the fact that the Local Stakeholders Activation, SPIRE Hub, Makerspace, and ILEU platform and wallet operations in place are essential to position Baia Mare in a stronger place.

- Online strategies are currently strengthening the Local Stakeholders Activation capabilities; GIS and ILEU platforms and wallet are ready to be used as soon as Covid-19 constraints dissipate; SPIRE Hub and Makerspace works have already begun.

3.2. Public procurement (Risk level: High)

The definition of the best services and equipment is a crucial aspect of an initiative such as the SPIRE project. As for the formal process(es) needed for project implementation, legal procedures have allotted time for due process(es), but contingencies have been encountered due to the different and diverse types of actions proposed. Due to the pandemic, some process(es) have been delayed, such as:

(1) legal barriers to iLEU as a reward method because the present fiscal legislation doesn't allow the Local Authorities to use the public budget for such an innovative mechanism. Communication channels were opened with the Ministry of Finance, with no clear answers yet, and a new communication process with the Court of Auditors to find solutions began.

The challenge is active because the ILEU platform and system are at the core of SPIRE's project, and the interdependencies with the other areas and approaches are very tight.

- Proper Quality Management related to this process is already in place to minimize potential impacts on the activities' implementation.

(2) legal procedures needed to start the agro-mechanic equipment acquisition linked to difficulties in accessing pilot areas and start soil preparation and cultivation. Despite this, the deforestation of invasive vegetation has been developed. The five pilot sites went through a cleaning process from October to December 2020 in order to prepare the land so that the terracing and planting works could start in Spring 2021.

The challenge is active because the agro-mechanical works, soil remediation/amendment, landscaping, and implementation of small urban interventions have been seriously affected by the lengthy pandemic problems.

- Due to this situation, some changes for the entire investment were already revised, new specifications were prepared in anticipation of budget change and modification approval.

(3) permits obtention was affected at the national level for the SPIRE Hub (Cultural Heritage Monument) when the lockdown disrupted communication with the Ministry of Culture. The permits were finally obtained in September 2020, and refurbishment works started in October, showing the local management effectiveness.

The challenge is active due to the fact that all furnishings and equipment, as well as makerspace arrangements, are expected to be purchased and installed for the HUB to start functioning as an essential element interlinked with co-creation processes and circular biomass angles, as well as participatory processes for the future master plan.

- From a positive perspective, some processes are ahead of schedule, as the Department of Culture permits for the second phase.

3.3. Participative approach (Risk level: Medium)

The project's strategic multi-stakeholder framework aims to transform the current administrative archetype into a new model: (1) **Citizen engagement** is a high priority for the SPIRE project and partners since the participatory approach is in the spirit of the project. (2) Real **co-creation processes** are the tool to ensure consistency between citizens, future business models, and the final Integrated Metropolitan bio-based strategy and Masterplan 2050. (3) **International expert community** support is needed in certain parts of the project due to its complexity and innovative nature.

(1) regarding citizen's engagement, in November 2019, several semi-structured interviews, Focus Groups, youth, and SMEs presentations were set up as start point. Social-research activities involving representatives, teachers, parents, and students from several pilot sites' schools and neighborhoods (Firiza, Ferneziu, and Vasile Alecsandrii), and local authorities' (Youth Federation, Chamber of Commerce, Workers Union) were carried out.

The Covid situation brought up challenges for the plan of work and delayed co-creation activities in 2020. Due to the low level of social cohesion, environment awareness, and entrepreneurship, as well as the lack of digital skills, online communication, and social media are not as effective as other strategies to reach local actors and communities.

- On-site and in-person events, respecting social distances in the short term, have to be run intensively to gain time and speed up the associated processes.

Figure 6. Meeting in Baia Mare. Source: Baia Mare Municipality.

(2) regarding the co-design and co-creation strategy, COVID-19 restrictions meant it shifted to on-line workshops and questionnaires with Baia Mare inhabitants. An on-line public survey was launched in July 2020 to assess the level of awareness and openness among citizens concerning the critical ecosystem services that will be co-developed and implemented in Baia Mare: (a) phytoremediation and biomass upcycling; (b) dynamic land-use management and participatory planning; and (c) local value systems and blockchain support services.

The results set the baseline for the citizenry's awareness and openness towards SPIRE's topics, activities, and objectives. The first on-line workshop - held in Romanian, with citizens' participation and built upon the previous survey - on "Ecologic Transformation of the pilot sites" took place in November 2020.

- Several co-creation processes have been completed (zoning plan and brainstorming for community public spaces). Nevertheless, SPIRE Hub is an essential element of awareness raising, training, communication, dissemination, and participation that has to be exploited as soon as possible to enhance stakeholder engagement and co-creation dynamics.
- A Circular Economy Startup Programme will be initiated soon: Open Call + 10 applicants' selection – with six ten proposals selected by citizens-. This process will be followed by an Accelerator Programme / mentoring to help the three finalists to develop their ideas.

(3) regarding the international expert community's involvement, several on-line workshops have also been developed to transfer scientific research results from higher education institutions and practitioners to landowners by implementing the concept of integrated phytoremediation in urban settings, participatory practices, and wellbeing goals for the city's inhabitants.

- The planned Launch Conference was postponed due to social distance restrictions, but four thematic webinars developed since November worked very well in its place, preserving their initial goals and broad international outreach. The fifth webinar will be developed in late February 2021.

3.4. Cross-department and integrated management and implementation (Risk level: Low)

The setting up of effective coordination mechanisms is functioning in Baia Mare Municipality. The Content and Strategic Management Board (CSMB), Operational Management Team (OTM), and Technical and Administrative Management Team (TAMT) are in place since November 2019 following an Organigramme specifically designed for it. The project's design included an intranet platform and a risk management analysis shared with the various project partners involved.

Local elections took place in October 2020 and meant some administrative delays added to the Covid-19 situation. Luckily, there are no changes in the project's guide and expectations from the municipal government.

The ongoing communication between the municipal departments (personnel, urban planning, investment, financial, and others) is agile. The consortium partners have maintained their roles during this difficult implementation period, showing strong cohesion.

- Even if a Quality and Risk Management Plan is in place, Covid-19 contingencies were unexpected. Part of the rationale is being periodically redefined (some delays, for instance, are due to national legislation or payment constraints, but others are a direct consequence of the pandemic situation).

3.5. Monitoring and evaluation (Risk level: Low)

Due to the project's complexity and different angles, a unitary evaluation framework has already been developed, allowing the project to correctly measure its results against a baseline valid for the local scale whilst also usable at the European Level.

The SPIRE Standards and key Performance Indicators (KPI) are built upon the Sustainable Development Goals (SDGs) – particularly Goal 11 - and the European Commission's areas of EU Action domains affecting the project, with a particular focus in two main areas: Smart and Sustainable Urban development Assessments and Nature-Based Solutions.

Finally, the eight areas of specific measurement in the Standards are climate adaptation and mitigation, green space management, air/ ambient quality, urban regeneration, participatory planning and governance, social justice and social cohesion, public health and well-being, and potential for a new green economy and green jobs, with a total number of 28 indicators related to different planned tasks and actions. Furthermore, several auxiliary tools have been proposed:

- A GIS Dynamic Atlas platform has already been developed to track progress with phytoremediation techniques, providing near real-time data from pilot sites (remotely measured as well as on-site) and thematic georeferenced datasets.
- Regarding phytoremediation processes, the Conceptual Adaptive Site Management Application (CASMA) has already been designed to provide a scoring system for the expected impacts in Baia Mare of each of the proposed remediation options. Specifically, each option will be attributed a score ranging 0-10 on different dimensions including, but not limited to: local fit; phytoremediation capacity; lifecycle duration; biomass produced and applications; value chains / cascading use; landscaping qualities; cost.
- A remediation TOOLKIT will be guided by the CASMA, as a digest of possible phytoremediation, material re-valorization, and planning options for HM-polluted brownfields. It provides a choice catalogue based on soil HMC, cost-effectiveness, biomass harvest cycle, secondary / cascading uses, and time horizons for naturalization or productive land reuse, as well as a set of design options.

3.6. Communication with local partners and beneficiaries (Risk level: Medium)

The Activation of Local Stakeholders is vital to this project since community engagement, participation, and commitment are the elements that ensure coherence and consistency to all its pieces and interdependencies.

Therefore, efforts in multi-channel communication have been made at various levels. Both traditional media (newspapers, radio) and social media (project website and Facebook, Linkedin and Twitter channels) have been addressed. Scientific papers showing the undertaken research and further findings have also been published.

The project has identified different target groups: (1) Citizens of Baia Mare, especially those in the five pilot sites' immediate vicinity/impact area. (2) Kids, students, and their families. (3) Potential local entrepreneurs for bio-mass solutions. (4) The ecosystem of local, national, and EU international stakeholders, such as experts, private sector, academia, civil society associations, and Government. A specific Communication Manager has been appointed to ensure the effectiveness of the strategies.

The pandemic situation maintains this challenge active (on-site meetings and collaborative works, SPIRE Hub, and Makerspace engagement in-person potentialities are needed to endure project success and sustainability).

- Beyond initial materials prepared for the first on-site events, SPIRE's visual communication materials are now intensively disseminated digitally.
- Communication strategies and participative processes of all kinds are closely interlinked and depend on the others in the project. SPIRE team has been swift in finding adaptive and mitigative solutions to the social distance constraints.

Figure 7. Press Release about SPIRE (24.04.2020). Source: http://spire.city

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3.7. Upscaling (Risk level: Medium)

The metropolitan scaling-up possibilities and strategies have already been considered in the project with regards to the Integrated Metropolitan bio-based strategy and Masterplan 2050 (participative and co-creative workshops, dynamic Master Plan GIS scenarios...)

- Since citizens' engagement and proactive behavior for climate and living environment action are one of the keys of this project, Baia Mare Municipality will need to carry out intense disseminating and networking activities to communicate with all relevant local stakeholder progress, benefits, pros and cons.

Furthermore, SPIRE (Smart Post-Industrial Regenerative Ecosystem Project) has been chosen as a reference to re-claim polluted sites into urban design and city planning thanks to cost-effective phytoremediation strategies, with great potential to provide a model for other Romanian and European cities that still bear the burden of their industrial past.

- Apart from policy-related work, a closer relationship between the Municipality and the local mining industry is recommended, as well as a potential dialogue with other Local Government's peers suffering similar problems of brownfield remediation and circular biomass solutions.

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4. Next steps

SPIRE has focused on setting up the policy and legal analysis, the KPI monitoring framework, and the tools needed for Phyto-strategies and soil remediation. Raising awareness and participatory activities have been shared with citizens and experts, leading to the next step of co-creation dynamics and decision making for future landscaping and development plans for the metropolitan area. The partners have shown remarkable resilience and adaptability with reference to the Covid-19 situation.

• The plantation, once all the deforestation works of the invasive vegetation have been developed in the pilot sites and phytoremediation species have been selected, will begin in Spring 2021.

• The co-creation dynamics and activities will continue, at least, during the first semester of 2021 and stakeholders

are expected to get involved thanks to the multi-channel participatory and communication strategy that must keep working with intensity.

• The upcoming Circular Economic Startup Programme and the Accelerator Programme / mentoring must leverage the new business models possibilities and support the entire project's communication and participatory efforts.

• The researching studies and consultations to assess bio-mass materials' possibilities will follow during all this year.

• Such an innovative project requires a change in the way of working with regional and national administrations. iLEU processes are crucial for the project's success, and it is needed to get it and its platform full of potentialities on board timely.

• This project has wide environmental, social, cultural, political, and economic dimensions. The phytoremediation results (on soil and with regards to biomass possibilities) and the long-term decisions made through the participatory processes currently in place for landscaping and development are leading. They will co-define the Baia Mare metropolitan trajectory soon, proposing a better city and improving the inhabitants' well-being.

Figure 8. Pilot site Colonia Topitorilor. Source: http://spire.city

5. Acknowledgements

This first journal has been written based on the inputs provided by email exchanges and online conferences with the SPIRE team partners during the second semester of 2020, as well as the deliverables submitted by the team during this period (please, refer to 6. Bibliography). The planned field visits were canceled due to the Covid-19 situation. Nevertheless, the information exchanges and conversations have been continuous, including recording some pilot sites' videos through drone flights.

I would like to thank all the partners for their enthusiasm and transparency to debate constructively on the current project's situation and potentialities. And, especially, for their commitment to overcome the barriers Covid-19 has raised in the present and for the near future.

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