D7.2 Practice Abstracts - batch 1

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WP leader and co-leader	Pavel Kordík (CVUT), Karel Charvát (CCSS)
Deliverable leader and key author(s)	Pavel Kordík (CVUT), Alexander Kovalenko (CVUT), Karel Charvát (CCSS), Stein Runar Bergheim (AV), Ota Cerba (P4A), Matúš Botek (P4A)
Contributors and authors	Markéta Kollerová (P4A), Šárka Horáková (CCSS), David Pešek (CVUT)
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Brief abstract	This deliverable, D7.2 – Practice Abstracts (Batch 1), presents three concise summaries demonstrating AI-driven geospatial tools for rural-urban development. It highlights the use of open citizen science data (OpenStreetMap) for innovation mapping, AI-enhanced analysis of rural-urban linkages, and the superiority of the JackDaw agentic tool-calling system over standard LLMs. These abstracts serve as practical guides for policymakers, Open Call participants, and technical experts, fostering innovation, knowledge exchange, and broader dissemination of PoliRuralPlus solutions.

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Document history

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0.2	27.02.2025	D7.2 version version 0.2, second version of the videos	Pavel Kordik (CVUT) Karel Charvát (CCSS) David Pešek (CVUT)
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Table of content

Executive Summary

The **PoliRuralPlus** project aims to enhance the **quality of life** in rural and urban areas across the EU by fostering **balanced, sustainable, and evidence-based territorial development**. This is achieved through the **integration of advanced digital tools, AI-driven solutions, and geospatial data analytics** into policymaking and strategic planning. As part of its knowledge dissemination strategy, **D7.2 – Practice Abstracts (Batch 1)** delivers three concise, practice-oriented summaries that illustrate **key technological advancements** and their practical applications.

The **first batch of practice abstracts** focuses on:

- **Leveraging open citizen science data (OpenStreetMap) for regional innovation mapping** across **nine pilot regions**, providing **comparative insights** into innovation potential and infrastructure distribution.
- **Using AI-driven geospatial analysis to strengthen rural-urban linkages**, demonstrating how data-based foresight can inform **regional investment and development decisions**.
- **Comparing the JackDaw agentic tool-calling system with traditional LLM outputs**, highlighting the **advantages of integrating real-time data sources** for decision-making over relying on generic AI-generated responses.

These abstracts are intended to **support policymakers, practitioners, and technical experts**, including participants in the **Mobilise, Develop & Enhance Open Calls**, by providing tangible examples of how **AI-enhanced geospatial tools** can **drive innovation and regional development**. Additionally, they function as **dissemination materials** for engaging **both technical AI researchers and broader rural-urban stakeholders**, ensuring that the **PoliRuralPlus solutions reach a wide and diverse audience**.

By facilitating **knowledge exchange, technical refinement, and stakeholder engagement**, these practice abstracts contribute to the **long-term sustainability and impact** of the **PoliRuralPlus** initiative.

1. Introduction

The PoliRuralPlus project aims to improve the quality of life for people living in urban and rural areas across the EU by promoting coordinated and collaborative development within the regions. It does so by fostering a sustainable, balanced, equitable, place-based, and inclusive development of rural and urban areas through improved connections, governance arrangements, and integrated territorial policies that prioritize experimentation and innovation in domains that favor bi-directional urban-rural synergies and the development of a well-being economy, driven by foresight, planning, and implementation of integrated urban-rural strategies. In addition, PoliRuralPlus is committed to advancing sustainable rural-urban development across Europe by promoting innovative governance models, leveraging cutting-edge digital tools, and strengthening stakeholder engagement. As part of its efforts to disseminate knowledge and drive collaborative learning, the project produces a series of concise, practitioner-oriented practice abstracts, in line with EIP-AGRI (European Innovation Partnership for Agricultural Productivity and Sustainability) guidelines. These abstracts - made publicly available for wide circulation - provide succinct summaries of key methodologies, insights, and outcomes. Two main batches of practice abstracts are planned:

- **Deliverable D7.2 – Practice Abstracts (Batch 1)** (Lead Beneficiary: CVUT, Due Date: Month 14) comprises three practice abstracts outlining core methodologies and initial results.
- **Deliverable D7.5 – Practice Abstracts (Batch 2)** (Lead Beneficiary: CVUT, Due Date: Month 34) presents three additional abstracts capturing more advanced findings and lessons learned from the pilot implementations.

1.1 Contribution of the PoliRuralPlus Practice Abstract to the project objectives

The first batch of practice abstracts, presented as three informational outputs, demonstrates how new technological features (outlined in Deliverable 4.1) can effectively support and advance the overall PoliRuralPlus objectives. By illustrating practical usage scenarios for both pilot regions and future Open Call participants, the practice abstracts provide stakeholders with a clear view of the solution's relevance and application potential. Key contributions to the project objectives are described below:

1. **Supporting O1 (Foresight-Based Framework)**
   These materials highlight how advanced decision-support functionalities - such as geo-enabled conversation interfaces and AI-driven analytics - underpin a foresight-based framework that encourages interregional coordination. This approach enables a more robust, data-driven understanding of rural-urban dynamics, thus strengthening strategic planning efforts among diverse territorial actors.
2. **Advancing O2 (Integrated Strategies & Action Plans)**
   By showcasing integrated geospatial and artificial intelligence tools, the practice abstracts demonstrate how rural-urban development strategies can be improved to foster innovation and a more circular, green economy. Examples include geospatial mapping for ecosystem services and AI-based evaluation of local business opportunities, both of which support evidence-based decision-making.
3. **Enhancing O3 (Mutual Access & Social Connectivity)**
   The technological achievements presented enable more effective information sharing and stakeholder engagement. Access to up-to-date spatial insights, user-friendly interfaces, and collaborative data platforms facilitates joint initiatives between rural and urban communities, promoting resilience and strengthening social connectivity across regions.

4. **Contributing to O5 (Cross-Disciplinary Collaboration & Data Leverage)**
   By integrating geospatial data, open data portals, and machine-learning approaches, the showcased solution aligns with existing European data infrastructures and research resources. This fosters cross-disciplinary teamwork among policy analysts, software developers, local authorities, and other stakeholders involved in rural-urban planning.
5. **Facilitating O6 (Mission-Oriented Experimentation & Innovation)**
   The practice abstracts emphasize iterative testing and demonstration as a means to explore novel approaches. Stakeholders - through pilots or Open Calls - can employ the introduced tools to design innovative cultural or environmental initiatives, ultimately strengthening well-being in rural-urban contexts and fostering new avenues of experimentation.

Relevance for stakeholders and future Open Calls

The videos serve both existing pilot regions and prospective applicants in upcoming Open Calls, offering concise, non-technical presentations of how the new digital tools can be put into practice. This allows regional authorities, researchers, small and medium enterprises, and community organizations to gain a deeper understanding of how they might adopt the PoliRuralPlus innovations to fulfill specific policy, societal, or economic objectives within their own contexts. By aligning these explanatory materials with project objectives and demonstrating tangible outcomes, the practice abstracts act as a direct pathway for stakeholder engagement and the broader dissemination of PoliRuralPlus solutions. In this way, the material under Deliverable 7.2 drives awareness of innovative technologies and clearly positions them within the strategic framework of PoliRuralPlus, thereby reinforcing the initiative's aims for more robust rural-urban cooperation and sustained territorial development.

1.2 Building on and following up the PoliRural project

In the PoliRural project, we observed that certain digital solutions and tools - particularly in the realm of advanced analytics and geospatial interfaces - were not fully adopted by local communities. Various hurdles, such as limited technical know-how and restricted awareness of potential benefits, impeded broader implementation. Building on these insights, PoliRuralPlus aims to provide best-practice demonstrations showcasing how new technologies, including AI-driven applications, can effectively support rural-urban stakeholders in achieving data-driven insights, enhanced collaboration, and more impactful decision-making.

1.3 Technical foundations and envisioned output

The presented practice abstracts draw primarily on a selection of the most promising technical developments discussed in Deliverable 4.1, where the PoliRuralPlus platform design and associated functionalities are defined. These include advanced AI-driven analysis, geo-enabled data integration, and collaborative tools for enhanced stakeholder engagement. By focusing on the most mature and versatile components, these demonstrations highlight how pilot regions and Open Call participants can harness cutting-edge technologies for more effective decision-making and integrated rural-urban planning.

1.4 Relationship to the other PoliRuralPlus Work Packages

Although the current material originates largely from the technological advancements achieved under WP4 (Platform Design and Implementation), it also incorporates conceptual and methodological insights from WP3 (Regional Action Plans Methodology). The resulting output will serve as a key input for WP2 (Testing and Validation of Tools) and WP5 (Implementation in Pilot Regions). Crucially, these practice abstracts are also intended to inform

the forthcoming activities within WP6 (Open Call Mobilise, Develop & Enhance), providing tangible illustrations of how the Deliverable 4.1 technologies could be adopted, enhanced, and scaled under diverse regional conditions. Finally, this deliverable will support the broader objectives of WP7 in terms of dissemination, exploitation, and ensuring the sustainability of PoliRuralPlus innovations.

2. Description of Practice Abstracts

2.1 Video: Assessing Regional Innovation Potential: A Novel Approach Using OpenStreetMaps Data

This segment highlights how rural-urban communities can harness open citizen science data - particularly from OpenStreetMap (OSM) - to better understand, compare, and ultimately enhance their innovation potential. By deploying kernel density estimation (KDE) and other advanced spatial analyses, PoliRuralPlus provides a fine-grained look at the distribution of innovation-related assets - such as research institutions, technology hubs, and digital infrastructure - within and across nine pilot regions ranging from Ireland to Latvia.

Traditional methods often rely on broad, aggregated statistics that obscure local nuances. In contrast, PoliRuralPlus's geospatial approach **pinpoints specific innovation "hotspots"** and spotlights areas requiring further investment or collaboration. **Communities benefit directly** from these insights by identifying tangible opportunities - such as clustering similar enterprises, establishing shared R&D facilities, or enhancing connectivity - and pursuing **tailored policy interventions** based on **real-time, crowd-sourced** data from OSM.

Furthermore, these open datasets **pave the way for future AI-driven applications** within PoliRuralPlus and beyond. Machine-learning tools, for instance, can draw on these spatial indicators to forecast shifts in regional development, evaluate policy impacts, or suggest new ventures. By **merging citizen science data, geospatial analysis, and AI**, the video underlines a forward-looking strategy to **bridge the innovation gap** between urban and rural areas, thereby promoting more balanced and evidence-based territorial growth.

YOUTUBE link: https://youtu.be/Jybshpa6W4A

2.2 Video: GEO AI - Enhancing rural development decision-making with PoliRuralPlus

Centered around strengthening rural-urban linkages, this video demonstrates how integrated data analysis - powered by geospatial and AI components - can help policymakers and local communities gain a more holistic view of regional development prospects. At the core of the approach is JackDaw, a geo-enabled chat agent that merges location-specific data with large language model (LLM) reasoning.

Key themes and features

- **Multi-dimensional spatial insights**: By gathering structured data on a variety of spatial attributes - ranging from population distribution to the presence of cultural sites - JackDaw helps users assess the interdependencies between rural and urban areas, highlighting mutual benefits such as tourism flows or service accessibility.
- **Rural-urban linkage analysis**: One exemplary scenario shows how to evaluate a location's **weekend tourism potential**, taking into account the number of nearby urban residents, local amenities, and driving distances. This **data-driven lens** underscores the extent to which rural areas can attract visitors (and thus investment) from surrounding cities.
- **Real-time, context-aware decision support**: Unlike generic AI solutions, JackDaw dynamically retrieves **up-to-date geospatial information** before advising on policy or strategic investments. This ensures the conversation remains **contextually grounded** in **current** rural-urban realities, whether in planning new facilities or aligning local services with urban demand.
- **Bridging analytical gaps**: The video illustrates how bridging the **information asymmetry** between rural and urban territories can spur proactive solutions - like improved transport connections or marketing campaigns - ultimately enhancing the **well-being** of both communities.

By demonstrating how **robust data analysis** can expose latent development opportunities - particularly in the context of rural-urban synergies - this video reinforces PoliRuralPlus's broader goal of **empowering decision-makers** to adopt **targeted, evidence-based measures** that foster balanced, sustainable growth in Europe's diverse regions.

YOUTUBE link: https://youtu.be/H7ubA7s4AYs

2.3. Video: GeoAI meets LLMs – Intelligent agents for enhanced decision-making

This video compares pure large language model (LLM) outputs, such as those generated by ChatGPT, with the JackDaw (agentic tool-calling) approach. Through three real-world use cases, viewers see how incorporating domain-specific data and specialized tools yields more accurate, context-aware, and actionable answers:

1. **Weather Query**
    - *Pure LLM*: Provides only a generic explanation or refers to external sources, lacking direct real-time data.
    - *JackDaw (Agentic System)*: Dynamically calls a weather API tied to a specific area on the map, integrating real-time geospatial information. This ensures precise, **location-focused** forecasts rather than vague or outdated responses.
2. **Agricultural Suitability Analysis**
    - *Pure LLM*: Offers broad advice for potato farming, without factoring in specific local attributes like climate or soil characteristics.
    - *JackDaw*: Merges **real-time environmental data** (land cover, elevation, weather) and LLM reasoning to assess whether a **particular plot** is suitable for potatoes. By pinpointing topographical and meteorological conditions, it delivers targeted, evidence-based recommendations.
3. **Identifying Water Bodies**
    - *Pure LLM*: May produce incorrect or incomplete references (e.g., citing the wrong river or distant city).
    - *JackDaw*: Leverages **land cover tools** to examine hydrological layers in the specified area, accurately detecting water features. This results in **data-driven, localized** insights and avoids errors that arise when relying on a general model alone.

Overall, the video illustrates how the **JackDaw** approach outperforms a standard LLM in terms of **reliability, specificity, and practical utility**. By integrating specialized data sources and real-time analysis into the decision-making workflow, the agent-based system consistently delivers **more relevant, location-aware** responses—demonstrating a clear advantage over purely text-based AI outputs.

YOUTUBE link: https://youtu.be/Xu6lkjlGx5g

3. Purpose and Impact

The practice abstracts fulfill a range of objectives, spanning the dissemination of advanced knowledge to the stimulation of collaborative innovation within PoliRuralPlus. In particular, they seek to:

- **Disseminate innovative knowledge**
  Concise, practitioner-oriented content highlights breakthrough findings, tools, and methods relevant to rural-urban development. Policymakers, researchers, and on-the-ground practitioners gain immediate insights into proven techniques for evidence-based regional planning.
- **Promote practical applications**
  By showcasing real-world usage scenarios of foresight methodologies, digital solutions, and governance models, the abstracts encourage informed, data-driven decisions among regional authorities and other stakeholders. This accelerates tangible improvements in policy and practice.
- **Facilitate knowledge exchange**
  Serving as a conduit between project stakeholders, pilot teams, Open Call participants, and the broader European community, the abstracts foster dialogue and mutual learning. Local authorities, businesses, and community organizations can adapt showcased approaches to suit their own contexts.
- **Support Open Call initiatives**
  Participants and winners in Mobilise, Develop & Enhance Open Calls can leverage these materials for inspiration, technical guidance, and feedback. Best practices and case examples spark new ideas for further platform enhancements or extended use of AI-driven applications.
- **Provide technical feedback and idea generation**
  Technical staff, AI specialists, and development teams benefit from exposure to real-world analytics, geospatial innovations, and advanced collaboration methods. This encourages iterative improvements and fresh solution concepts, expanding the ecosystem of tools available under PoliRuralPlus.
- **Reach broader audiences**
  Beyond immediate project participants, these abstracts serve as targeted dissemination materials for external communities - especially those engaged in technology, AI research, or rural-urban development. Submitting the abstracts to the EIP-AGRI platform ensures that a broad audience of planners, local authorities, businesses, and community organizations can discover and adopt the featured innovations

Annex

REFERENCES

1. Horizon Europe, EU Grants, AGA - Annotated Grant Agreement, EU Funding Programmes 2021-2027, version 1.0, 01052024, https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/common/guidance/aga_en.pdf
2. PoliRuralPlus, Grant Agreement