SMART ERA

Overview of the EU Macro-Regional Strategies:
Fostering smart communities and smart villages

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THE BALTIC INSTITUTE OF FINLAND | SAB

December 2024

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Disclaimer

The EU Strategy for the Adriatic and Ionian Region (EUSAIR) as well as the EU Strategy for the Alpine Region (EUSALP) are currently revising their action plans and this might have an impact on the involvement of smart villages and smart community concepts within the concerned macroregional strategies. The present analysis therefore displays the current state of play, it will be updated as soon as the revised action plans are being published.
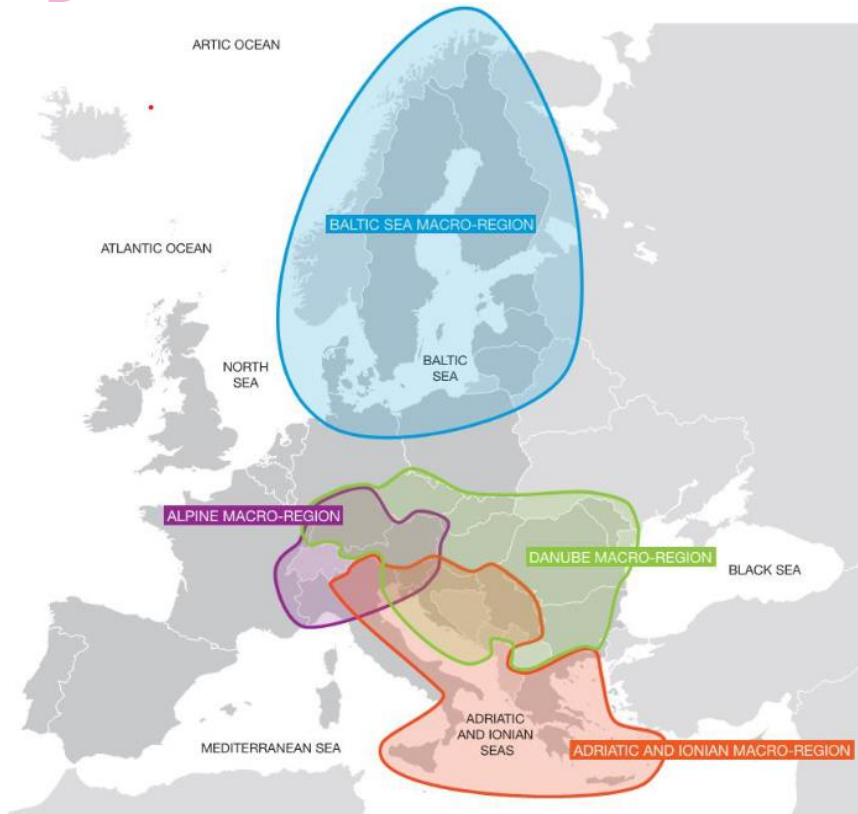
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1. Introduction

The aim of this analysis is to conduct an analysis of EU macro-regional strategies (MRS) with a focus on their role in fostering the development of smart villages and communities. It is meant as a working document that supports partners associated to task "7.5 Macro-regional Networking" of the "Horizon SmartEra" project in designing and performing next steps.

By examining how MRS translates to region-specific initiatives, the study seeks to highlight how these strategies address common challenges faced by rural areas across the EU. Smart villages and communities aim to leverage technology and innovation to address the unique challenges of rural areas, such as depopulation, limited access to services, and economic stagnation (Schuh et al., 2020). Macro-regional strategies provide a structured and collaborative platform for implementing these initiatives, ensuring that rural development policies are not only aligned with broader EU objectives but also tailored to local realities (Böhme et al., 2011).

The European Union (EU) has introduced four macro-regional strategies (MRS) to enhance territorial cohesion, promote collaboration, and address shared challenges among neighbouring regions. These strategies aim to integrate different European policies into the specific territorial contexts of the regions involved, creating a framework for targeted development initiatives. EU macro-regional strategies are designed to maximise the unique strengths and opportunities of geographically connected regions. By fostering cooperation and shared action, MRS provide a pathway for these regions to address their common challenges—whether economic, social, or environmental—while aligning with broader European policies (European Commission, 2020).

The current four macro-regional strategies are:
- The EU Strategy for the Baltic Sea Region (2009)
- The EU Strategy for the Danube Region (2010)
- The EU Strategy for the Adriatic and Ionian Region (2014)
- The EU Strategy for the Alpine Region (2015)

Source: EUSAIR website

The effectiveness of macro-regional strategies stems from several core principles that differentiate them from other policy frameworks. These principles—place-based approaches, cross-sectoral cooperation, and multi-agency collaboration—form the foundation of their success in dealing with the complex realities of European policies (Gänzle & Kern, 2016).

Place-Based Approach: Translating Policies into Spatial Contexts

One of the strengths of the macro-regional strategies is their place-based approach. Unlike one-size-fits-all solutions, MRS considers the unique geographical, social, and economic characteristics of each region. By adapting broader European policies to local contexts, these strategies ensure that implementation is responsive to the specific needs and opportunities of the regions involved (Böhme et al., 2011, Stojanova et al., 2021). In the context of smart villages, this means that solutions are tailored to the challenges faced by rural areas, from infrastructure development to digital innovation and environmental management (European Commission, 2019).

Cross-Sectoral Cooperation: Bridging Policy Areas

Macro-regional strategies aim for a holistic approach by encouraging cooperation across different policy sectors. Traditional policy frameworks often operate within silos, addressing issues like economic development, environmental protection, or social inclusion separately. However, MRS recognizes the interconnected nature of these areas and works to bridge the gaps between them (Böhme et al., 2011). For instance, in the development of smart villages, cross-sectoral cooperation ensures that technology-driven

solutions for connectivity are aligned with sustainability goals, and social programs aimed at rural revitalization are supported by economic development initiatives (Schuh et al., 2020).

Multi-Agency Cooperation: Bringing Together Stakeholders

A distinguishing feature of macro-regional strategies is their emphasis on multi-agency cooperation. These strategies involve multiple levels of governance, from local authorities to national governments, and engage both public and private sector stakeholders (Schymik & Krumrey, 2009). By fostering collaboration between different administrative levels and sectors, MRS creates a comprehensive network of actors capable of addressing complex regional challenges. In the context of smart villages, this means that all relevant parties—including local businesses, municipal governments, NGOs, and EU institutions—work together to craft solutions that are not only effective but also widely supported and sustainable (Gänzle & Kern, 2016).

As part of the analysis, a survey was conducted targeting coordinators of the four EU MRS to better understand the extent to which the concept of smart villages and communities are included in the macro-regional strategies. The survey aimed to evaluate the degree to which smart villages and communities are mentioned in the strategy objectives and action plans and to map the key initiatives or projects under the MRS that focus on or align with smart village and communities development. The detailed survey results are presented in Annex 1 and utilised throughout the text.

1.1. The Concept of smart villages and smart communities

To frame this study, it is essential to define the key concepts of smart villages and smart communities (SV/SC concepts), as these are fundamental to understanding the objectives and scope of EU macro-regional strategies (MRS) in promoting rural innovation. This section also emphasises the participatory, user-centric approach central to the SV/SC concepts, ensuring that local communities take ownership of their development strategies.

Smart Villages: Definition by the European Network for Rural Development (ENRD)

According to the European Network for Rural Development (ENRD), smart villages are rural communities that leverage innovative solutions to enhance their resilience and foster development. These communities build on their local strengths and opportunities by adopting a participatory approach, which ensures that local stakeholders are fully involved in planning and implementing strategies aimed at improving their economic, social, and environmental conditions. This user-centric approach empowers rural communities, allowing them to shape their futures based on their unique needs and aspirations.

A crucial element of the smart village concept is the use of digital technologies to mobilise solutions that address rural challenges. These innovations not only improve connectivity and access to services but also help communities remain competitive in the modern economy. Collaboration and alliances with other communities, whether rural or urban, are also key to smart villages, enabling them to share resources, knowledge, and best practices. Furthermore, smart villages can capitalise on existing initiatives and receive funding from a variety of public and private sources, allowing for flexible and adaptive development.

Smart Communities: Definition by the Interreg SmartCommUnity Project

The concept of smart villages is rooted in a broader understanding of Smart Communities, as defined by the Interreg SmartCommUnity Project https://www.alpine-space.eu/project/smartcommunity/. Smart Communities consist of groups of people, often located in rural or mountainous regions, who are deeply

connected to their identity, culture, and environment. These communities take pride in their local craftsmanship, products, and the social fabric that binds them together. Most importantly, they are active participants in driving the changes necessary for a sustainable future, particularly regarding digital and green transitions.

Smart Communities are committed to being open to innovation, while actively learning and inspiring others to work toward carbon-neutral, smart, and green rural and mountain areas. They aim to ensure that these regions remain lively, attractive, and sustainable, making them desirable places for all age groups to live and work. Like Smart Villages, Smart Communities also emphasize a holistic, user-centric approach—placing the needs, aspirations, and engagement of local residents at the core of their strategies for development and transition.

The macroregional strategies: Expanding on the smart communities concept

In addition to the definitions provided by ENRD and the Interreg SmartCommUnity Project, it is worth noting that the SV/SC concepts also feature prominently in macro-regional strategies such as EUSALP (EU Strategy for the Alpine Region). EUSALP promotes the development of smart, sustainable, and inclusive communities in mountain areas by fostering digital innovation, green growth, and social resilience via its nine action groups (AGs) research and innovation, economic development, labour market, education and training, mobility, connectivity and accessibility, resources, green infrastructure, risk governance and energy. Within EUSALP, Smart Communities not only focus on local development but also aim to ensure that mountain regions remain competitive, interconnected, and sustainable in the long term. By integrating the smart communities concept from EUSALP, the study gains a broader perspective on how different EU macro-regional strategies adapt the principles of participation, resilience, and innovation to varying geographical and social contexts, ensuring that both rural and mountainous areas can thrive.

The EU Strategy for the Danube Region (EUSDR) addresses a wide range of issues; these are divided among 4 pillars: 1. Strengthening the region, 2. Connecting the region, 3. Building Prosperity and 4. Protecting the environment. These pillars include 12 Priority Areas (PAs) of which each is managed by at least two countries as Priority Area Coordinators (PACs). The EUSDR targets are structured along the PAs and do mention SV/SC topics via the willingness of working in a participatory way with local and regional actors and making the best use of technologies such as for risk monitoring and training.

Central to the EU Strategy for the Adriatic and Ionian Region's (EUSAIR) framework are four key pillars—Blue Growth, Connecting the Region, Environmental Quality, and Sustainable Tourism—each with tailored objectives to foster diversified, sustainable economic growth across the Adriatic-Ionian region. The EUSAIR aims to foster collaboration across countries in the Adriatic-Ionian region, targeting sustainable growth and development in various areas. While EUSAIR does not explicitly label projects under a "smart villages" framework, its goals align with the principles of SV/SC concepts.

The EU Strategy for the Baltic Sea Region (EUSBSR) consists of 14 policy areas, each playing a unique role in addressing the region's key challenges, promoting sustainable growth, and enhancing cooperation. They are PA Bioeconomy, PA Culture, PA Education, PA Energy, PA Hazards, PA Health, PA Innovation, PA Nutri, PA Safe, PA Secure, PA Ship, PA Spatial panning, PA Tourism and PA Transport. Several EUSBSR policy areas have included smart communities and rural development in their action plans, each focusing on different aspects to enhance sustainability, connectivity, and economic resilience in rural regions. Many EUSBSR Policy Areas are closely connected, working in complementary fields that align to support overarching regional goals. This interconnectedness is also visible in projects focusing on SV/SC concepts. These close relationships foster collaboration and joint initiatives, such as projects on digital innovation, clean energy, or sustainable rural development, demonstrating that smart village-related efforts often require contributions from several PAs working together. This shared effort makes it challenging to isolate specific

PAs as the "most relevant" to the smart village approach, as success often stems from their combined expertise and actions. That's why in the following chapter EUSBSR projects are not linked to particular PAs but to clustered categories.

2. Aims and objectives of macro-regional strategies towards the smart villages

This section gives an overview of the specific aims and objectives of EU macro-regional strategies concerning the development of smart villages. In addition to the overview of aims and objectives, the subsections explore the implementation and impact of macro-regional strategies on smart villages and communities via successful project cases and initiatives. The list is not exhaustive, and some of the projects mentioned have concluded.

All of the four macroregional strategies in Europe and namely their carrying pillars such as the 11 priority areas (PAs) of EUSDR, the 9 action groups of EUSALP, the 14 policy areas of EUBSR and the 5 pillars of EUSSAIR have been screened smart villages/smart communities approaches in strategies and projects according the subsequent categories 1) Economic Development and Diversification, 2) Social inclusion and well-being 3) Environmental Sustainability, 4) Governance and 5) Mobility. In order to perform the categorization the MRS initiatives were assessed in terms of their ability to:

- Foster local resilience through innovation and participatory, user-driven strategies.
- Promote economic, social, and environmental improvements, particularly through digital transformation and green initiatives.
- Encourage cooperation and alliances between rural and urban areas, as well as across different sectors, promoting synergies for development.
- Support the empowerment of rural communities, enabling them to take ownership of their development and shape their future.
- Drive the green and digital transitions that are critical for creating sustainable, connected, and vibrant rural regions.

On one side this screening took place through a web research of the Baltic Institute of Finland (BIF) and the Swiss Centre for Mountain Regions (SAB) as well as a survey and a crossmacroregional workshop in the framework of the EUSALP AG5 DigitalAlps Conference during the Mediterranean Coast and Macro-Regional Strategies Week in Izola September 2024. The below sections give an overview on the implementation of SV/SC concepts in a macroregional context, the lists are not exhaustive.

2.1. Economic Development and Diversification

This subsection analyses how macro-regional strategies aim to increase economic growth and diversification in rural areas through initiatives such as entrepreneurship support, infrastructure development and value chain enhancement.

Strategy for the Danube Region (EUSDR)

To our knowledge mainly four priority areas (PA) Within the EUSDR deal with SV/SC concepts:

At first this is "**PA 10 institutional capacity and cooperation".** In its workplan PA 10 states under action 8: To enhance capacities of cities and municipalities to facilitate local and regional development. In several projects this approach has been implemented namely the Interreg **RurAll** project https://interreg-danube.eu/projects/rurall and the **SmartERA Horizon project** SMART ERA - Your community, our future in which PA10 is an associated partner.

The second priority area active in SV/SC related activities is **"PA 3 culture and tourism"** via ACTION 4: it has the aim of developping a "Smart Destination Danube" and in its activities many small and medium projects are being supported in the field of culture and tourism involving local and rural partners in a participative way https://cultureandtourism.danube-region.eu/projects-and-financing-opportunities/pa3-projects/

Furthermore it helps in evaluating and granting small projects in the framework of the **Danube Small project fund** https://www.danubeculturalcluster.eu/project/danube-small-project-fund

Thirdly the "**PA 4 Water Quality"** with its **cleandanube** project (cleandanube.org; www.interreg-danube.eu/savegreen) and the "**PA 8 Competitiveness of Enterprises"** with the **DECIDE** project https://competitiveness.danube-region.eu/pa8-flagship-project-2024-decide/ have to be mentioned among SV/SC implementation activities.

Strategy for the Alpine Region (EUSALP)

Within EUSALP it is mainly "**AG 5 Connectivity and accessibility"** that deals with SV/SC issues in this category. In their workplan 2023-25 a main focus is laid on Digital Transformation of Rural and Mountain Territories on mainstreaming the Smart Villages approach as well as communication, exchange of good practice, and capacity building actions via the Smart Alps network. AG5 was the initiator of the Interreg ASP project "SmartVillages" and a partner of the ongoing Interreg ASP project "SmartCommUnity" these 2 projects are considered by the AG5 LP Valle Aosta as transversal and being potentially part of the categories Economic development and diversification, Social inclusion and living, Environmental sustainability, as well as Governance and Mobility. They are thoroughly described under section " 2.2 Social inclusion and living" where the they have their major impact.

Two Interreg ASP project of **"AG2 Economic development"** - the **LiveAlps** Project https://alpine-region.eu/action-groups-projects/livealpsproject and the **HEALPS2** project https://www.alpine-space.eu/project/healps-2/ are dealing with smart villages / smart communities issues. AG2 was also involved with AG5 into the ASP SMartVillages project and put its focus on Economic Development and Diversification (Survey).

EU Strategy for the Baltic Sea Region (EUSBSR)

In the context of Economic Development and Diversification, the EUSBSR policy areas of PA Innovation, PA Bioeconomy, PA Tourism, and PA Nutri are placing an emphasis on these themes within their action plans and projects.

PA Innovation promotes a globally competitive position within innovation for sustainable economic growth in the BSR, and provides a platform for collaborative ecosystems for innovation, research, SMEs and digitalization. Emphasising challenge-driven innovation, PA Innovation aligns with the EU's Smart Specialisation (S3) framework, which supports interregional collaboration. This approach enables regions to align their S3 priorities and investment efforts, share strengths and address common challenges to create new, innovation-focused value chains. By promoting entrepreneurship and digital solutions, encouraging new business models and driving local economic growth and modernising traditional industries like agriculture and forestry through digital tools, it also aims to develop rural economies.

PA Bioeconomy encourages the sustainable use of local resources, such as forestry, agriculture, and fisheries, to drive rural development. It promotes the circular economy, supporting initiatives that add value locally and create jobs in bio-based industries and sustainable agriculture. A key focus is improving agricultural practices for sustainability and climate adaptation within a resilient bioeconomy.

PA Tourism focuses on promoting sustainable tourism development also in remote areas across the Baltic Sea Region. By supporting tourism in disconnected cities, islands, and rural communities, BSR PA Tourism aims to distribute tourism benefits more evenly. This strategy not only encourages visitor spending in these areas but also stimulates job creation, infrastructure improvements, and better living conditions, enhancing local services. In turn, these developments can reduce rural-to-urban migration, fostering resilient, sustainable communities throughout the region. The approach emphasises protecting local ecosystems and environments, ensuring long-term viability and quality of life in both rural and urban areas.

Projects connected to the EUSBSR and targeting rural development. Projects are funded by the Interreg BSR during the two financing periods of 2014-2020 and 2021-2027.

RDI2Club project focused on developing bioeconomy innovation ecosystems in rural areas. By creating bioeconomy clusters, it supported economic diversification and aligns with the Smart Specialisation Strategy (S3), leveraging regional bioeconomy strengths to encourage entrepreneurship and sustainable business models in rural regions.

eRural Resilience project empowers local authorities and businesses and support organisations to help rural SMEs enhance their digital literacy in e-marketing of bio-products, opening new business opportunities in bio-based industries.

EU Strategy for the Adriatic and Ionian Region (EUSAIR)

EUSAIR's approach to economic development and diversification emphasises the rural economies, promoting sectors like sustainable tourism, fisheries, agriculture, and renewable energy via its four pillars: Blue Growth, Connecting the Region, Environmental Quality, and Sustainable Tourism.

Blue Growth pillar focuses on sustainable economic growth in the marine and maritime sectors, especially in fisheries, and marine research. For coastal and rural villages within EUSAIR's scope, Blue Growth brings opportunities for sustainable job creation and resource management. Villages and communities benefit from sustainable models that boost local economies without harming marine ecosystems. Initiatives encourage sustainable fishing practices and provide funding for local businesses to reduce their environmental impact. Through education and tech integration, small communities are encouraged to innovate in marine-based industries, attracting skilled young professionals and preventing rural depopulation

Connecting the Region pillar promotes improved transport and energy connectivity within the Adriatic-Ionian region, addressing accessibility challenges that rural and remote communities often face. By supporting digital infrastructure projects, this pillar helps bridge the digital divide, enabling rural villages to participate in digital economies. Enhanced transport links make rural and remote villages more accessible, encouraging economic activities such as tourism, and improving residents' access to essential services and goods.

Environmental Quality pillar drives economic stability and growth by promoting sustainable resource management and pollution reduction, which are foundational for long-term economic health in rural areas. Through sustainable land and water management, it provides small communities with practices like organic farming, waste management, and water conservation, which help sustain local economies by reducing

dependence on external resources and boosting local agricultural productivity. In addition, focus on disaster resilience strengthens economic security by preparing villages to withstand climate-related challenges, such as floods or droughts, which can otherwise cause severe economic losses in communities with limited resources for recovery.

The sustainable tourism pillar recognises tourism as a vital economic driver and promotes models that respect environmental boundaries and cultural heritage by supporting community-led tourism initiatives and encouraging villages to develop local tourism experiences, like agritourism, eco-tourism, and cultural tours, which empower residents to manage tourism for direct community benefit. Additionally, the pillar bolsters tourism infrastructure and skills development, enabling small communities to establish competitive, sustainable tourism sectors that draw visitors while preserving their unique character. To enhance year-round economic stability, pillar promotes strategies to reduce seasonality, such as diversifying tourism offerings and highlighting lesser-known destinations, helping villages build resilient, balanced tourism economies.

As an example a project called **CruiseAir** - (Destination Management Plans´ preparation for Cruise destinations) aims to develop Destination Management Plans for sustainable tourism in Cruise, River, and Lake destinations within the A-I region. This includes coastal areas as well as lakes and rivers, expanding the tourism season throughout the year. The project focuses on achieving efficient, integrated, and sustainable growth and management by considering market supply and needs, local community requirements, and destination characteristics. By engaging the community, managing congestion, reducing seasonality, and diversifying products, the project aligns with the principles of sustainability and capacity. Destination management is considered essential for the development of sustainable tourism, ensuring the well-being of visitors and local communities alike.

2.2. Social inclusion and well-being

Here, the focus is on how the macro-regional strategies to promote social cohesion, equity, and well-being in smart villages by improving access to essential services, fostering community engagement and addressing demographic challenges.

EU Strategy for the Danube Region (EUSDR)

PA 10 is the most active PA in this category with two actions. **Action 2**: To facilitate the administrative cooperation of communities living in border regions as well as **Action 8**: To enhance capacities of cities and municipalities. Within action 8, PA10 facilitates the local and regional development of a Network **"Empowerment Roma"** together with PA 9 through at least one stakeholder meeting per year.
Furthermore **PA 10** is implementing a Network on "Fighting Trafficking in Human Beings" together with **PA 11** (through at least one stakeholder meeting per year).

The project **«D-CARE Labs»** https://dtp.interreg-danube.eu/approved-projects/d-carelabs and its successor the project **«Caring Communities»** https://interreg-danube.eu/projects/caring-communities are both involving different PAs and are funded by the Interreg Danube Region Programme. They address community-centered service provision in rural/depopulated areas in the area of care, thereby using digital tools to facilitate care services .

EU Strategy for the Alpine Region (EUSALP)

According to **AG5** mountain areas lack connectivity and services compared to more populated areas. The AG5 is committed to bringing the benefits of digitisation to rural and mountain areas, through the dissemination of SV/SC concepts, dissemination of good practices in the Alpine Space and synergy with

other actions. In parallel, AG5 is emphasising the importance of transnational connectivity in remote areas and the relevance of data.

Projects:
Since 2016, AG5 has been actively involved in two significant projects: **Smart Villages and SmartCommUnity.** Additionally, AG5 has engaged in a cross-sectoral initiative on Smart Villages and a cross-cutting priority (CCP1) focused on **"Promoting Digitalisation of the Alps."**

The journey began with the definition and adoption of the Smart Villages concept, specifically tailored for mountain areas. Initially, AG5 adopted the European Commission's definition and subsequently developed a specific strategic implementation initiative. This initiative aimed to address the unique challenges faced by mountain communities.

One of the key actions was the implementation of the Alpine Space Programme project, Smart Villages. This project was designed to combat depopulation in the Alps by providing new digital services, reducing brain drain, and improving infrastructure. Since 2020, AG5 has leveraged digital technologies and new participative approaches to make Alpine rural areas more attractive places to live and work, particularly for young people.

AG5 has also developed policy recommendations that have been integrated into the priorities of EUSALP. Building on the success of the Smart Villages project, AG5 launched a second Alpine Space project, SmartCommUnity, to further advance the digital transformation of mountain communities.

In addition to these projects, AG5 has created the **"Smart Alps"** network https://smart-alps.eu/ that facilitates the dialogue with similar initiatives across Europe and promotes the sharing of good practices and tools between more advanced and less developed areas.

Since 2023, EUSALP Cross-cutting Priorities have been initiated, with AG5 leading CCP1, "Promoting the Digitalisation of the Alps." This priority integrates the results achieved by the ASP SmartVillages and SmartCommUnity projects. AG5 collaborates with other Action Groups, including AG 1, AG 2, AG 3, and AG 9, to support local communities and economic players in their digitalisation efforts. The participating Action Groups collect and disseminate best practices, explore the potential of data and the data economy, and promote the adoption of remote working, training, and learning practices. Last but not least AG5 is the organiser of the **Digital Alps conference (DAC).** The aim of the DAC is to organize a recurring event to bring together all initiatives and projects dealing with digitalization in the Alpine region and to unleash the potential of digitisation.

EU Strategy for the Baltic Sea Region (EUSBSR)

EUSBSR enhances well-being by improving access to education, healthcare, and cultural activities. Mainly active in this context are Policy areas PA Education, PA Health, PA Culture and PA Save. These policy areas help retain populations in rural regions, foster social cohesion, and improve quality of life. This contributes to social inclusion by ensuring that rural areas have access to the skills and infrastructure necessary for full participation in the regional economy.

PA Education contributes to an increased prosperity that presupposes access to quality education and training for all, an effective and inclusive welfare system and a well-functioning labour market supporting geographical, professional and socio-economic mobility. It enhances access to quality education and digital literacy for rural residents, equipping them with skills for emerging industries and digital jobs. (https://eusbsr.eu/policy-area-education/) **PA Health** improves rural healthcare services through cross-border initiatives, digital health tools, and mobile health units, which enhance access to care in remote areas. This is essential for both population retention and quality of life in rural communities. **PA Culture** strengthens cultural identity and supports community initiatives that enhance rural well-being. It funds cultural events, local heritage preservation, and community-building activities, promoting inclusivity and inter-generational ties.

Projects:
BSR Cultural Pearls, which helps smaller cities and regions be more attractive to live in and improve their quality of life by engaging people in cultural activities and developing a stronger sense of commonship. This project is coordinated by PA Culture in cooperation with PA Tourism and PA Spatial Planning.

Strategy for the Adriatic and Ionian Region (EUSAIR)

EUSAIR aims to enhance social inclusion by investing in community services and improving living conditions in rural areas, also through tourism site development. Pillars focused on social inclusion work to combat rural depopulation by creating local job opportunities, improving healthcare, and increasing digital literacy.

Sustainable Tourism pillar helps rural communities preserve their unique identities while benefiting economically from tourism by promoting tourism models that respect cultural heritage and environmental limits. In addition, it fosters community-led tourism initiatives such as agritourism and cultural tourism, that allow rural residents to actively shape and benefit from local tourism. This approach includes skill-building programs to equip locals with the expertise needed for tourism-related jobs, enhancing employment prospects and reducing inequalities. An example project for this is **DES_ AIR** (Integrated Sustainable Management of Tourism Des-tinations in AIR) the aim is to improve education in sustainable destination management, enhancing the competitiveness of EUSAIR countries. Integrated destination management is crucial for smart specialization, diversification of tourism offerings, and the sustainability of local communities. By improving destination management and providing targeted education, the project aims to promote innovation, attract investments, and raise competitiveness in the Adriatic-Ionian region.

Connecting the Region pillar aims to bridge the digital divide and improve transport connectivity, which are critical for isolated rural areas. Improved digital infrastructure, such as high-speed internet, empowers rural residents to access e-health, e-learning, and e-government services, essential for overcoming geographical barriers and enhancing social inclusion.

Blue Growth pillar encourages community engagement in marine conservation and eco-tourism projects, which boosts local pride and fosters a shared sense of responsibility toward the environment. This approach not only helps maintain healthy ecosystems but also improves the quality of life by creating recreational and educational opportunities in these rural areas.

Environmental Quality pillar supports community-driven environmental initiatives, such as waste management and water conservation, pillar encourages broad community involvement, empowering residents to take an active role in protecting their local environment and building social cohesion. In addition, a disaster resilience programs within this pillar enhance quality of life by safeguarding communities from natural disasters, which disproportionately affect rural and isolated areas. Focus on clean water, pollution reduction, and ecosystem health also ensures that rural residents can enjoy a safe and healthy environment, which is essential for long-term community stability and well-being.

2.3. Environmental Sustainability

This subsection examines the role of macro-regional strategies in fostering environmental sustainability in rural communities through measures such as renewable energy, natural resource management and climate resilience.

EU Strategy for the Danube Region (EUSDR)

The Danube Strategy Flagship covers activities that address various technical and socioeconomic aspects of creating appropriate conditions for renewable energy communities in the Danube Region. https://danube-region.eu/promote-local-low-carbon-energy/

Promote local low-carbon energy actions in the EUSDR: The collective and citizen-driven energy actions are key elements of the energy transition, however less widespread in the Danube Region, especially in its eastern part. The Danube Strategy Flagship covers activities that address various technical and socioeconomic aspects of creating appropriate conditions for renewable energy communities in the Danube Region. https://danube-region.eu/promote-local-low-carbon-energy/

PA 5 Environmental Risks contributed in the past few years to the elaboration of the "ICPDR Climate Change Adaptation Strategy Update 2018", supported project elaboration and implementation in the field of drought management and climate change related spatial planning, disseminate scientific results to anticipate regional and local impacts of climate change through research. These results contributed to the Danube Flood Risk Management Plan *https://www.icpdr.org/tasks-topics/tasks/flood-risk-management/danube-flood-risk-management-plan-2021*

PA 6 Biodiversity, Landscapes and Air & Soil Quality worked closely together with the Danube parks in locally well anchored projects including participatory and community building processes *https://danubeparks.org/*

EU Strategy for the Alpine Region (EUSALP)

EUSALP AG9 Energy resides in endorsing energy efficiency and endorsing the local production and utilization of renewable energy in the Alpine Region. The public and the private domains serve as the dual pillars that could propel the energy revolution. Within the specific objective "**Support energy management systems in the Alpine Region",** AG9 is developing, sharing and installing energy efficiency and decentralised monitoring systems at the local level and is promoting regional energy monitoring.

AG8 Risk governance: Sustainable and effective protection from natural hazards is an essential predisposition for settling, as well as, socio-economic development in the Alps. Limited settlement space and climate change lead to increasing exposure and damage risk of private property and infrastructure in the Alps. The interests of economic development, social welfare, mobility and tourism need to balance risk reduction and safety management. This requires new risk governance instruments and processes with a view to find the optimal approach for multiple land use demands.

Projects: AG8 establishes an exchange and a collaboration with the Interreg Alpine Space project **MOSAIC** to support the collection, harmonisation and sharing of data on Alpine climate-related disasters and Work Plan 2023-2025 of Action Group and trends and to raise awareness among foresters, risk managers, decision-makers and the public through an Alpine network of forest living labs.
AG8 will also closely collaborate with the Alpine Space Project **X-Risk-CC**, for example, to develop local action plans and transnational guidelines as well as a digital library on past and future weather extremes.

EU Strategy for the Baltic Sea Region (EUSBSR)

EUSBSR's focus on environmental sustainability supports long-term viability. Through sustainable agriculture, pollution control, and resource protection, it ensures that rural communities have access to clean environments and healthy ecosystems, which are crucial for sustainable development.

Policy areas such as **PA Nutri, PA Bioeconomy, PA Hazards,** and **PA Ship** are particularly focused on advancing sustainable development goals in rural areas.

PA Nutri focuses on nutrient management in agriculture, promoting sustainable practices that enhance productivity while safeguarding natural resources. It prioritizes the reduction of nutrient emissions from agriculture and other diffuse sources. **PA Bioeconomy** advocates for sustainable resource management, supporting eco-friendly agricultural and forestry practices that reduce carbon footprints and environmental impacts. **PA Hazards** focuses on reducing hazardous substances in the environment. Its initiatives help prevent contamination of land and water in rural areas as well as flood prevention, supporting the sustainability of natural resources. **PA Ship** works on making maritime transport environmentally friendly, which is vital for coastal rural communities that rely on fishing, aquaculture, and tourism. Sustainable shipping practices also contribute to improved water quality.

Projects:

BREC (Baltic Region Circular Economy Initiative): BREC is designed to enhance education and innovation in circular bioeconomy, particularly by supporting agricultural schools and institutions. It emphasises creating an "information bank" that connects circular technologies with agricultural challenges, benefiting farmers and educators. The project also includes developing a biorefinery model to showcase circular bioeconomy principles, targeting rural regions with education on sustainable practices.

Strategy for the Adriatic and Ionian Region (EUSAIR)

EUSAIR prioritizes environmental sustainability through projects that support biodiversity, water management, and climate resilience in rural and coastal areas. By promoting green practices in agriculture, waste management, and forestry, EUSAIR contributes to sustainable land use and ecosystem protection.

Connecting the Region, Green Energy: Investments in clean energy networks empower small communities to adopt sustainable energy solutions, such as solar or wind energy. These initiatives not only reduce environmental impact but also lower energy costs for residents, fostering more self-sufficient communities.

The environmental quality pillar prioritises ecosystem preservation and pollution reduction, focusing on sustainable management of natural resources, such as water quality and waste reduction. By promoting sustainable land and water management, EUSAIR equips small communities with tools and funding for practices like organic farming, waste management, and water conservation, essential for preserving local resources and improving residents' quality of life. It also strengthens disaster resilience, helping villages prepare for climate-related challenges like floods and droughts—critical support for communities with limited resources to recover from such hazards. Furthermore, EUSAIR backs the preservation of natural and cultural heritage, empowering smart villages to protect their unique identities and attract eco-conscious visitors, all while weaving cultural and environmental preservation into sustainable community plans.

2.4. Governance

Governance is crucial for the effective implementation of smart village initiatives. This section discusses how macro regional strategies aim to strengthen governance structures, policy innovation as well as the adoption and integration of digital technologies and data-driven solutions to enhance various aspects of rural life and governance.

EU Strategy for the Danube Region (EUSDR)

PA 5 Environmental Risks: The main focus of the work is to address the challenges of water scarcity and droughts in line with the Danube River Basin Management Plan, the report on the impacts of droughts in the Danube Basin in 2015 (due in 2016) and the ongoing work in the field of climate adaptation.

Projects: PA 5 Environmental Risks is part of the **DANURELY-WS project**, developed by the Global Water Partnership – Central and Eastern Europe (GWP-CEE), is making remarkable strides in water management and regional cooperation. The selected project proposal creates strategically aligned youth-targeted activities supporting the EUSDR Strategy Action Points of the Priority Areas Water Quality (PA4), Environmental Risks (PA5), Knowledge Society (PA7) in a mid-term, and through partners and Danube Youth Council Members is linked to Waterways Mobility (PA 1A) and People and Skills (PA9). This initiative promises to enhance water security and resilience in communities. it is one of the 36 seed money projects *https://environmentalrisks.danube-region.eu/36-new-seed-money-facility-projects-approved/*

PA 10 Institutional capacities and cooperation:has defined the following actions to improve governance on local, regional, national and transnational level:
-   ACTION 1: To improve institutional capacities in order to provide high-quality public services
-   ACTION 6: To foster cooperation built on mutual trust between state and non-state actors to enhance well-being for the inhabitants of the Danube Region
-   ACTION 7: To strengthen the involvement of civil society and local actors in the Danube Region
The actions are completed with targets and corresponding projects.

Projects:
PA10 implements **National Participation Days** that address involvement of civil society in decision-making and policy implementation as well as participatory governance at local, regional, national, and macro-regional level.

PA10 is also an associated partner of the **"SmartERA Horizon" project** that has the aim to foster green transformation, potentially reversing migration trends. SMART ERA is set to breathe new life into rural landscapes through smart innovation packages (SIPs), combating depopulation and addressing socio-economic and environmental challenges https://smartera-project.eu/.

EU Strategy for the Alpine Region EUSALP

AG5: The main target groups that the AG5 aims to reach and involve within the field of governance via its projects (see section 2.2 for description) are:

• Local public authorities: to share regularly relevant information for knowledge implementation and exchange, to raise awareness of its role in the smart transition, to discover and test digital tools, to test innovative and smart solutions, to actively participate in the network of smart Alpine communities, to participate to the DigitalAlps conference (DAC).

• Regional and national public authorities: to share regularly relevant information for knowledge implementation and exchange, to discover and test digital tools, to test innovative and smart solutions, to develop new policies on smart transition, to stimulate the participation of local authority and citizens in the network of smart Alpine communities, to strengthen relations with EUSALP and other European strategies dedicated to rural areas, to participate to the DAC.

Projects: In the period from 2023 to 2025, the AG5 wants to continue its activities to involve young people and to increase the number of opportunities for discussion and exchange of ideas. Youth involvement will therefore take the form of specific activities within the **AG5 flagship initiative**, involvement of the youth council in AG5 meetings on specific topics, participation in the DAC and inclusion in cross-cutting initiatives. Moreover, within the SmartCommUnity project, Regional Stakeholders Groups in the test areas were created and include at least one youth to have his visions, ideas and perspective on the themes of the Digital transition of Alpine territories.

AG6: In accordance with the "Protocol on Spatial Planning and Sustainable Development" of the Alpine Convention, the harmonisation of economic interests with the need to protect the environment should be the core aim of planning activities in the Alpine Region. AG6 contributed substantially to the AlpGov2 strategic priority policy area "Spatial planning" also by enabling a regular exchange of information with the Thematic Working Body "Spatial Planning and Sustainable Development" of the Alpine Convention. In this respect, AG6 particularly has supported safeguarding and managing the diversity of natural and rural sites, productive landscapes, traditional practices, cultural heritage, and also urban locations of value.

Projects: AG6 is the leader of the cross-cutting priority **"Promoting a Joint Water Management Transition"**. The group also involves AG 1, AG 2, AG 5, AG 7 and AG 8.
Given the challenges associated with water management, particularly water scarcity and flooding, in most Alpine regions, the participating Action Groups have decided to set up a EUSALP Task Force on water management transition to secure and preserve resources. This Task Force will help enhance the transition to a EUSALP water-smart society with advice, exchanges, and capitalisation activities.

AG9: The policy framework of the activities of the Action Group is provided by, inter alia, the European Union's energy directives, the EU goals for 2020 and 2030, and the Energy Union Package, the aforementioned REPowerEU plan as well as national and regional policies. The AG is a network of regions and states to foster good public policy making based on scientific evidence and piloting activities. The group is determined to foster well-informed dialogue and decision-making following a multi-level energy policy approach in the Alps. The goal of the group is to undertake concerted actions through commonly developed activities and projects.

Projects:
AG9 is part of the Interreg **ASP AMETHyST project that** aims to support the deployment of local Alpine green hydrogen ecosystems to pave the way for a post-carbon lifestyle in the Alps. The project partners will reinforce the role of public authorities by increasing their capacity, designing support services to roll out green hydrogen solutions and including green hydrogen in local and regional energy strategies and plans.

EU Strategy for the Baltic Sea Region (EUSBSR)

EUSBSR has supported goals in advancing digital governance and responsive policies, including in rural areas. Key initiatives focus on smart digital solutions to enhance governance efficiency and public service delivery across the region.

PA Secure: focuses on enhancing coordination across different governance levels to improve public safety and resilience. This policy area promotes cross-border cooperation and alignment between local, regional, and national governments, which helps streamline decision-making processes and ensures cohesive approaches to governance challenges. It encourages the use of digital tools and data analytics to monitor and manage public safety, supporting data-driven decision-making that enhances governance responsiveness and resource allocation.

PA Innovation advocates for the adoption of digital solutions, such as e-governance platforms, that streamline administrative processes, make public services more accessible, and empower residents to

participate in governance. These tools improve transparency, reduce bureaucracy, and enhance the effectiveness of local governance structures.

PA Education promotes community engagement in governance by supporting educational programs that increase awareness of participatory governance models. Through these programs, residents gain a stronger voice in local decision-making

PA Health encourages the use of digital health governance tools, such as telemedicine and mobile health units, which enhance healthcare access and responsiveness. By integrating health data systems, this policy area improves the efficiency of health governance, ensuring that healthcare delivery is well-coordinated and meets community needs.

Projects:

We make transition! project enhances collaboration between local authorities, various civil society actors and entrepreneurs to foster ecological and social sustainability. We focus on topics, such as sustainable lifestyle, circular economy, sustainable food and biodiversity. Partners from Finland, Estonia, Latvia, Poland, Germany and Norway cooperate with altogether 12 cities and municipalities in implementing local transition arena workshop processes. Transition arena is a series of workshops including co-creation of a joint vision, pathways towards the vision, concrete actions and initiatives. Topics of the arena processes are related e.g. on 1) sustainable lifestyle, 2) agriculture & food, 3) biodiversity and 4) circular & sharing economy.

The Connecting Remote Areas (CORA) project is an Interreg North Sea Region funded initiative, which brings together 18 public authorities, universities and private sector organisations to identify common challenges to help improve and empower rural areas through the topics of digital infrastructure, services and skills. The project enables partners to exchange experiences and test innovative solutions to create an advanced digital environment. The aim is to support rural areas in becoming more inclusive, sustainable, and connected to regional and global opportunities.

Strategy for the Adriatic and Ionian Region (EUSAIR)

The Blue Growth pillar encourages rural areas, especially coastal and island communities, to sustainably manage marine resources and develop blue economy sectors, such as small-scale fisheries and coastal tourism. This approach enhances local governance by promoting policy alignment and collaboration between rural municipalities, coastal authorities, and stakeholders, empowering them to make sustainable economic decisions that balance growth with environmental protection.

Connecting the Region pillar by focusing on regional connectivity, this pillar strengthens governance in rural areas through improved transport infrastructure, digital connectivity, and cross-border collaboration. Enhanced connectivity allows rural governments to deliver public services more effectively, ensures remote communities have access to essential services, and promotes economic development by linking rural areas with urban hubs.

The Environmental Quality pillar supports rural governance by providing tools and strategies to manage natural resources, conserve biodiversity, and address pollution. By promoting sustainable land and water practices, it helps rural areas create policies that protect local ecosystems and improve residents' quality of life. It also strengthens resilience to climate-related challenges, empowering local governments to develop disaster preparedness and resource conservation plans.

Sustainable Tourism pillar promotes community-led, sustainable tourism in rural areas, allowing local governments to capitalise on cultural and natural assets without overburdening resources. By supporting

governance that involves community stakeholders in tourism planning, it helps create economic opportunities while preserving local identities and reducing the environmental impacts of tourism. Local authorities receive guidance on managing seasonality, diversifying tourism offerings, and encouraging eco-friendly tourism that benefits residents year-round.

2.5. Mobility

Mobility plays a vital role in connecting rural communities and enabling access to services. This subsection explores how macro-regional strategies aim to enhance connectivity and promote sustainable mobility solutions in rural areas.

EU Strategy for the Danube Region (EUSDR)

The mobility topic is splitted, within EUSDR, in two sections "**PA 1a Waterways Mobility"** and **"PA 1b Rail-Road-Air Mobility"** however SV/SC concepts seem not be very relevant in these two priority areas.

EU Strategy for the Alpine Region EUSALP

AG 4 is an Alpine wide platform of states, regions and stakeholders working to coordinate and harmonise their activities for a sustainable transport and mobility system. Its mission is to build a common understanding of transport policy and mobility, to define common objectives and to launch specific activities and projects.Further information on the EUSALP AG4

Project: The **iMONITRAF**! network is a political network of Alpine regions along the major alpine crossing transit corridors. Its aim is to harmonise the modal shift policy along the corridors, with the objective of reducing environmental burdens of transalpine transport. In the frame of previous Interreg projects, the iMONITRAF! WebGIS was developed to include annual data collection on selected indicators. Continuous data collection since 2005 is analysed and published in the iMONITRAF! annual report.

In all its projects **AG5** deals with the accessibility of services of general interest and is promoting new and sustainable forms of mobility.

EU Strategy for the Baltic Sea Region (EUSBSR)

The EU Strategy for the Baltic Sea Region (EUSBSR) has made significant strides in enhancing rural mobility and sustainability through various transport infrastructure initiatives. EUSBSR promotes innovation in maritime sectors by aligning S3 with regional priorities, thereby fostering competitiveness in industries like blue growth and sustainable energy.

PA Transport is key to connecting rural areas with urban centers. It supports transport infrastructure improvements, including roads, public transit, and cross-border connectivity, enabling better access to jobs, markets, and services. It is still of key importance to ensure effective physical and functional access of the urban nodes and farther located rural & peripheral regions to the three core network corridors crossing the Baltic Sea Region.

PA Innovation Emerging digital technologies are key tools to tackle more sustainable, usable and vital living environments and infrastructures. PA Innovation fosters partnerships that encourage innovation and collaboration between cities, local governments, research institutions, and private sector stakeholders. For example, it supports cross-regional partnerships that develop smart, multimodal transportation solutions,

emphasizing environmental sustainability and technological adaptation.

Projects:

MARA project improved accessibility and mobility for residents and tourists in remote touristic areas of the Baltic Sea region. Many rural areas lack good mobility services, which hampers their economic development. Introducing innovative mobility solutions other than motorised private transport require relevant competences among the public authorities and a better overview of the actual mobility needs. Confronting the mobility demand of residents and tourists with the current mobility offers, and increasing the capacity of transport actors could be a response to the challenge.

MAMBA project introduced innovative mobility solutions making public transport, welfare services and goods delivery more convenient and accessible in rural areas across the Baltic Sea region.

Strategy for the Adriatic and Ionian Region (EUSAIR)

Connecting the region Pillar aims to improve the region's transport connectivity through a coordinated approach for boosting maritime transport and for creating efficient intermodal ports to integrate maritime transport with rail and road. This improves mobility and also access to services in rural regions.

Sustainable tourism Pillar promotes accessible tourism, ensuring tourist attractions are available to everyone, including those with mobility and sensory impairments, as well as other vulnerable groups such as seniors, youth, schools, low-income families, and families with children. Aim to establish a significant number of 'year-round' accessible destinations, attractions, sights, and high-quality tourism services across the Region.

3. Conclusions

The conclusion summarises the key findings of the comparative study, emphasizing the success cases and challenges on the implementation of the macro-regional strategy actions to the rural areas. They can be structured into 6 sections.

Smart Villages / Smart community concepts: MRS achievements and gaps

Awareness of the smart village and smart community concepts is notably high, as evidenced by the survey. Among the 19 macro-regional strategy coordinators who participated, 79% were already familiar with the concept, and 63% indicated that these initiatives have been integrated into their current action plans.

All four Macro-Regional Strategies incorporate SV/SC concepts to some extent, though they often do not explicitly label them as such, with the exception of EUSALP. Specifically, EUSALP AG5 and AG9 are leading in the conceptualization and implementation of SV/SC concepts. Other EUSALP Action Groups, however, appear to place less emphasis on local stakeholder engagement and community building, combined with the benefits of digitalization. Unfortunately, the limited information available on the new EUSALP website about project activities hindered a more comprehensive assessment of the current implementation status of SV/SC concepts.

The European Union Strategy for the Baltic Sea Region (EUSBSR) focuses on rural development through digitalisation and sustainability. It promotes cross-border and cross-sector collaboration to tackle specific regional challenges, such as enhancing digital infrastructure and fostering green innovations in rural

communities. While EUSBSR addresses several key elements related to SV/SC concepts in its strategies and action plans, it seems that in implementation it has not a significant higher rate than other MRS.

The EUSAIR (EU Strategy for the Adriatic and Ionian Region) integrates aspects of SV/SC concepts but focuses more broadly on sustainable development themes such as blue growth, connectivity, environmental quality, and sustainable tourism. While EUSAIR has not specifically emphasized SV/SC concepts in the same detailed manner as some other macro-regional strategies, its pillars provide a foundation for rural innovation and community development.

With regard to overall targets of the EUSDR priority areas it can be said that mainly PA10 includes SV/SC concepts via its particular involvement of local actors in socioeconomical processes. Nevertheless, further EUSDR PAs lay focus on participation and the use of new digital technologies mainly in the field of environmental sustainability. Namely PA2 sustainable energy with its collective and citizen-driven energy actions and PA5 Environmental risks by doing monitoring and prevention activities in the framework of the flood risk management plan. All in all it can be said that the ground for a further implementation of SV/SC concepts in the 4 MRS is well prepared.

From crosscutting to macroregional cooperation

Macro-regional strategies highlight a need for ongoing focus on digitalisation. The push for digitalisation is a cross-cutting effort within EUSBSR, as well as across other macro-regional strategies. Another Initiative to be mentioned in this context is the EUSALP cross-cutting priority "Digitalisation of the Alps". Creating synergy and collaboration across macro-regional strategies could enhance the effectiveness of these efforts, with Interreg Europe, Horizon Europe and other EU funding programs serving as vital enablers for Europe-wide projects. Looking ahead, one of the themes for cross macro-region cooperation may include securing resilient production chains and addressing food security, especially in light of increasing vulnerabilities. With regard to cooperation. It seems that EUSBSR has a lot of naturally grown interlinkages among policy areas and common crosscutting projects. In the other three MRS this is rather an exception, however it is very probable that intra-macroregional cooperation is a good starting pont to initiate crossmacroregional cooperation. This is an open door for task 7.5 of the "SmartEra Horizon"project to establish new bridges and links between the four MRS in Europe.

Synergies to be further exploited

This analysis detected some synergies to be further exploited in the framework of SmartEra's task 7.5. This is the case for synergies between EUSAIR (pillar 4: Sustainable tourism) and EUBSR (PA Tourism) in terms of tourism, EUSAIR (Pillar 2: connecting the region) and EUSALP (AG 5: connectivity and accessibility) EUSDR (PA2 Sustainable Energy), EUSALP (AG9: Energy) and EUSAIR (Connecting the region) in terms of energy and EUSBSR (PA energy). EUSALP (AG8: risk governance), EUSBSR (PA hazards) and EUSDR (PA5 environmental risks. EUBSR (PA Innovation) with EUSALP (AG 5: connectivity and accessibility), and EUSDR (PA 10: institutional capacity and cooperation).
All four MRS, supported also by the four related Interreg transnational programmes, present an ambitious goal to achieve the implementation of the European Green Deal and the European Digital Strategy in the coming years. This opens at the same time fields for crossmacroregional cooperation and the implementation of SV/SC concepts.

Strong involvement of civil society in decision-making process

The role of civil society organisations seems to be a solid base for policy making in all four MRS. In particular on youth involvement, the MRS are pioneers in creating youth councils and youth summer camps, to make sure young generation are at the heart of the policy shaping for the future of their

regions. In 2021, the EUSBSR recognised the role of youth for the implementation of the strategy in its revised Action Plan and the EUSALP was the first to set up a youth council. The initiative has been recognised by the other MRS who are in the process of following EUSALP's example (eg. EUSDR Danube: Youth Council, Danube Youth Organisations Network as well as the EUSAIR youth council). Furthermore EUSDR PA10 established the Danube Participation Day (a platform for civil society and local/regional stakeholders) as side-event of the Annual Forum. In addition PA 10 supports the National Participation Day, providing a platform for civil society and local actors.

The «SmartEra Horizon project» activities should build on this when working on macroregional cooperation in the field of SV/SC concepts.

The role of communication

One of the themes emerging from the survey results is the lack of effective communication, which is essential to ensure that information reaches relevant stakeholders and encourages broader participation in the development of smart villages and communities. Although limited in scope, the recent survey carried out as part of this study has aimed to lay a foundation that could encourage respondents to prioritise smart village and community themes in their future action plans and projects. The majority of macro-strategy coordinators who participated in the survey expressed strong support for expanding smart village initiatives. Among respondents, 57.9% strongly agreed (50% EUSALP, 75% EUSDR, 50% EUSAIR) and 36.8% (84% of EUSBSR, 50% EUSALP, 25% EUSDR and 50% EUSAIR) agreed that these initiatives should play a more prominent role in the framework of EU macro-regional strategies compared to their current position. No respondend disagreed on the statement that smart villages and communities should play a more important role. In upcoming action plans and the next EU financing period, it is hoped that the theme of smart villages and communities will receive even greater focus. The "SmartEra" activities target already into this direction, sensibilisation work led already to consideration of integrating SV/SC approaches into the drafting of the action plan of EUSAIR.

Further support for SV/SC initiatives

A high percentage of the survey respondents considers lack of funding (78.9%) as a crucial challenge for launching and advancing cross-border and cross-macroregional smart village and communities initiatives, especially in rural areas lacking independent funding. Rural areas struggle to keep pace with urban areas, where innovation policies, funding, and project activities are more concentrated. In the Danube region, dedicated funding exists for small community projects—raising the question of whether similar resources could be introduced in EUSBSR to further support the SV and SC framework.

The small project funding initiative of EUSDR and EUBSR or events such as the DigtalAlps Conference of EUSALP and the Danube Participation day of EUSDR are formats that could be replicated in other MRS in order to support SV/SC concepts.

The efforts to embed the priorities of the MRS in relevant EU funding programmes 2021-2027 progressed well. In the EUSDR, the "Embedding Tool" https://danube-region.eu/projects-and-funding/embedding-2021-2027/ helps managing authorities to align their programmes with the actions of the Danube strategy. This exists in addition to the Network of Managing Authorities in the four EU MRS who are mobilising the relevant funds namely the European Regional Development Fund (ERDF), the Instrument for Pre-accession Assistance (IPA), the Neighbourhood, Development and International Cooperation Instrument (NDICI) as well as the Cohesion Fund (CF) for the purpose of funding projects.

In this context, we would also like to refer to the funding database EuroAccess Macro-regions https://www.euro-access.eu/en/macroregions. The funding database has been initiated by EUSDR PA10 and is now continued by the Danube Strategy Point. In addition to the Network of ERDF-IPA-NDICI-CF MAs, the EUSDR also has a ESF Network that also includes IPA and NDICI programmes that implement social policies. The network addresses issues such as of youth employment, labour market, education at national

and regional level. This information is relevant as an inspiration for the launch of the "SmartEra" Horizon follower projects call in late summer 2025.

Open question: SV/SC initiatives and enterprises

A question that arises from our analysis is how can enterprises benefit from smart communities?
By leveraging better broadband, improved transportation and logistics, enterprises can more effectively reach rural and remote markets. This connectivity fosters direct relationships with local farmers and producers, creating opportunities for better supply chains and tailored local partnerships. Smart communities often prioritize circular economy practices, giving enterprises an access to sustainable resources and recycling opportunities. This not only reduces waste but also enhances a company's reputation among environmentally conscious consumers, aligning business operations with growing demand for sustainability.

All the lessons learnt above are of great help in order to plan the next steps in the "SmartEra" Horizon project in terms of networking between the MRS, developing joint formats and for the preparation of the upcoming call for SmartERA follower pilot areas.

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Awareness of the smart village and smart community concepts is already high according to the survey, with 79% of macro-regional strategy coordinators, who took part in the survey already being familiar with the concept, and 63.2% answering that these initiatives have been incorporated into their current action plans. The survey highlights strong support among macro-strategy coordinators for expanding smart village initiatives, with 57.9% strongly agreeing and 36.8% agreeing on this.

Challenges

According to the survey, the macro-regional strategy coordinators consider that there are still various challenges in implementing strategies in rural areas. The main challenges are shaped by limited resources, capacity, and awareness, which slow adoption and effective action. A high percentage of macro-region strategy coordinators considers lack of funding (78.9%) as a crucial challenge for launching and advancing smart village initiatives, especially in rural areas lacking independent funding. Poor infrastructure was emphasised by 41,2% of the survey respondents as a challenge and Insufficient governance by 57,9% of the respondents. Rural areas struggle to keep pace with urban areas, where innovation policies, funding, and project activities are more concentrated. Additionally, rural communities face challenges in climate adaptation, particularly in managing issues like floods and droughts, due to limited knowledge and infrastructure.

Advancing smart village and community initiatives

The survey results reveal that all areas (financial support, community training, policy and regulatory support, infrastructure development) are needed for advancing smart village and community initiatives. A clear majority emphasizes the need for financial support (78.9%). Ensuring easy access to available funds is crucial to overcoming this barrier. A significant portion of respondents (68.4%) also highlights the importance of community training.
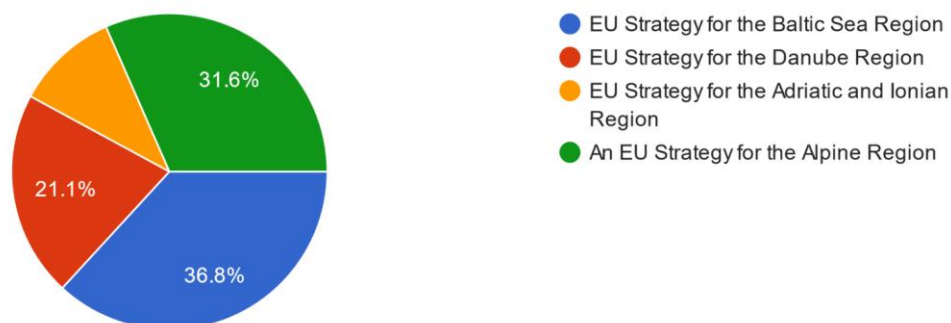
52.6% of the respondents think that Policy and Regulatory Support is a key for advancing smart village and community initiatives. However, according to the survey replies, smart village / smart communities initiatives are cross-sectoral on various fields and that is why it is difficult to establish policy and regulatory support that can work on the various territories of the Macro-regional Strategy. Therefore cooperation within the strategy areas should be strengthened so that initiatives are made known and properly supported. Efficient infrastructure is foundational for smart village projects, yet many rural areas face outdated or insufficient systems. This is why 52.6% of the respondents highlighted the importance of Infrastructure Development.

According to the survey it is also important in order to advance smart village and smart community initiatives to support local actors by building networks and creating policies that encourage collaboration across regions. Survey respondents also brought up smart villages as a focus area in policy areas' action plans and activities between MRS's, like in Smart Era project. It is also important to learn from the ground, participate in other EU projects bringing concrete examples and translate these lessons learnt into action

Overview of the replies to the survey:

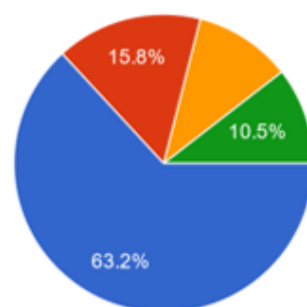Which macro-regional strategy are you representing?

19 responses

- EU Strategy for the Baltic Sea Region
- EU Strategy for the Danube Region
- EU Strategy for the Adriatic and Ionian Region
- An EU Strategy for the Alpine Region

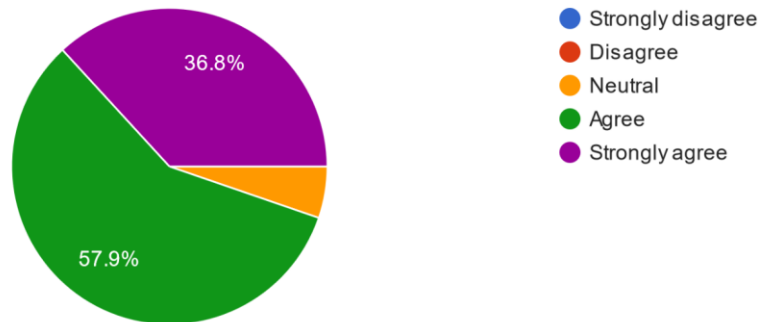Awareness smart villages and smart communities concept Which of the following statements does apply to you?

19 responses

- I have heard about the smart villages and smart community concept and it has already been applied in the macroregional strategy context.
- I have heard about the smart villages and smart community concept but it has not yet been applied in the macroregional strategy context.
- The smart villages and the smart communities concept is new to me but it has already been applied in the macroregional strategy context.
- The smart villages and the smart communities concept is new to me and it has not yet been applied in the macroregional strategy context.

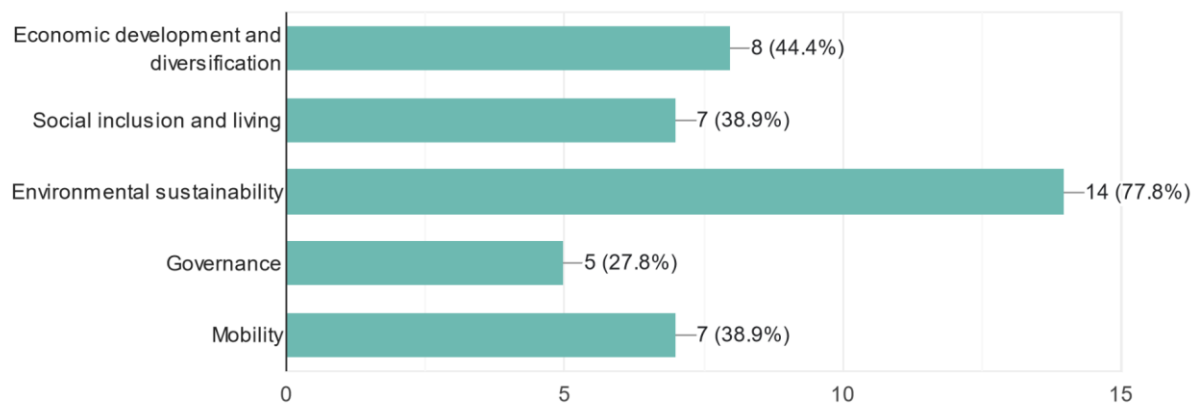Role of Smart Villages in EU macro-regional strategies Do you agree that smart villages/smart communities should have a bigger role than they currently do in EU macro-regional strategies?

19 responses

- Strongly disagree
- Disagree
- Neutral
- Agree
- Strongly agree

Activities in Macro-Regional Strategies Does your policy area/priority area/pillar or action group deals with smart villages / smart communities activ...n be allocated to any of the following categories?
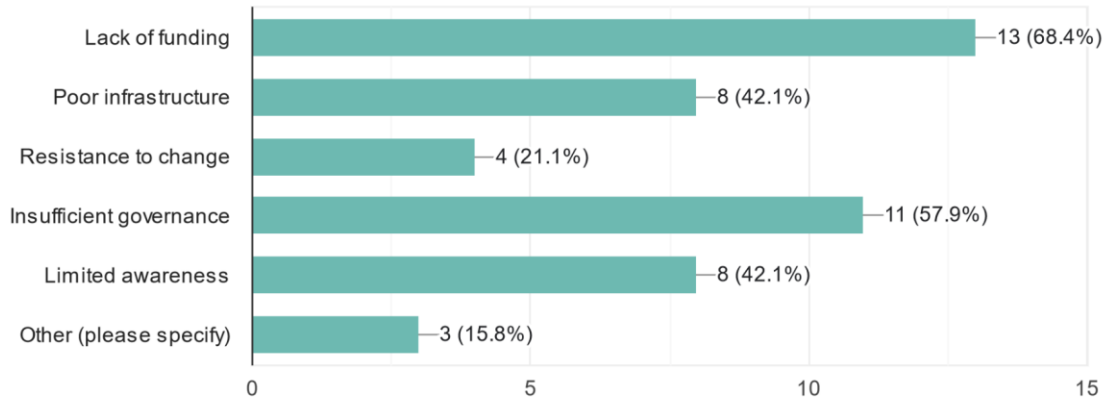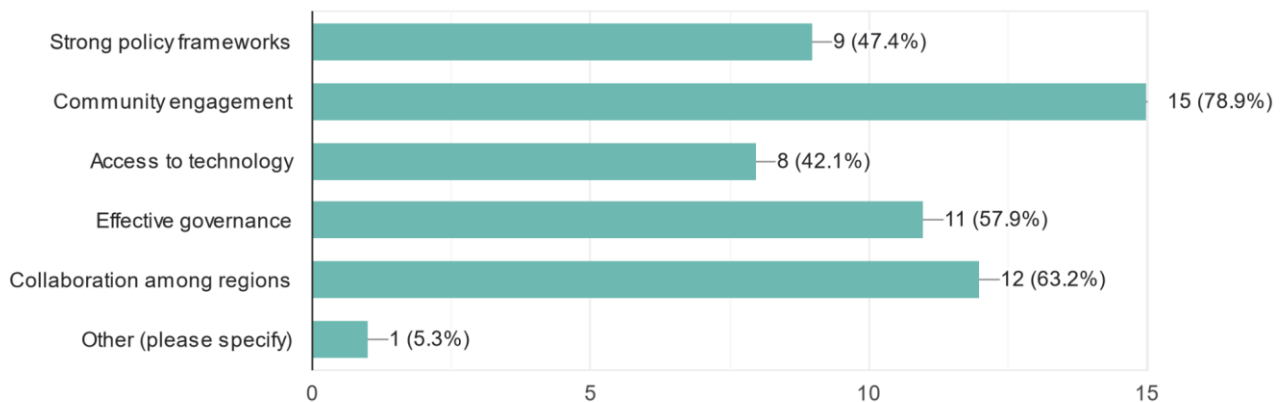
18 responses

Challenges in Implementing Strategies in Rural Areas Based on your knowledge, what are the main challenges in implementing macro-regional strategy actions in rural areas? (Select all that apply)
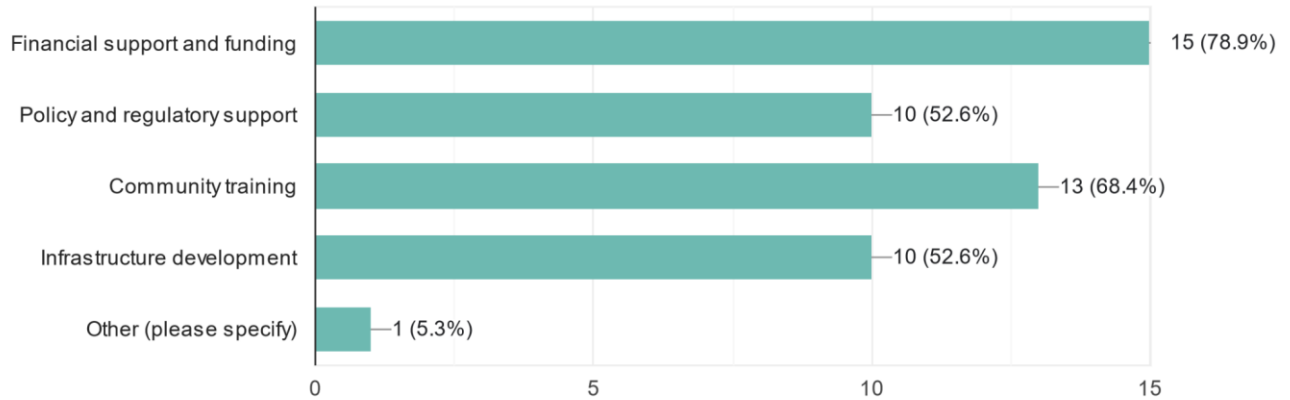
19 responses

Key Success Factors for Smart Villages In your opinion, what are the key factors for the success of macro-regional strategies in fostering smart villages / smart communities? (Select all that apply)
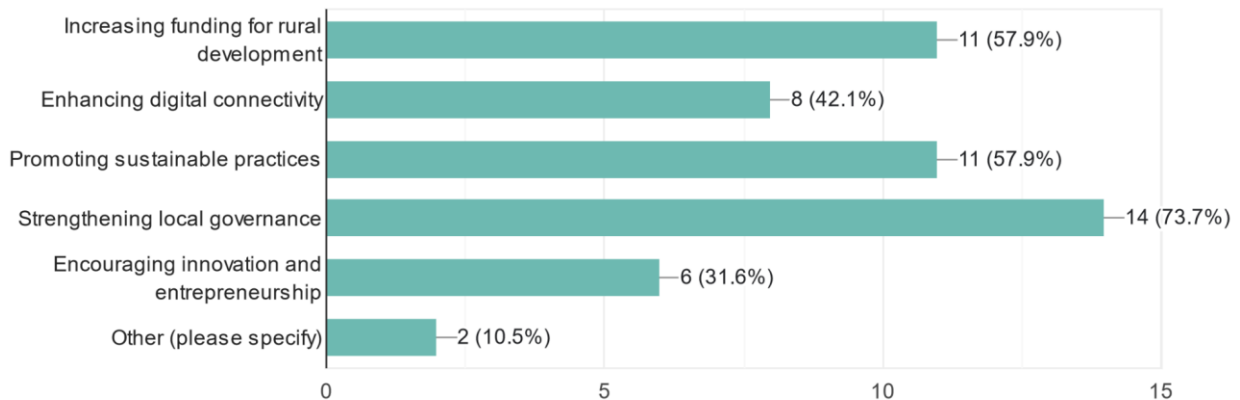
19 responses

Support for Smart Village Initiatives What kind of support do you think is most needed to advance smart village / smart communities initiatives? (Select all that apply)

19 responses

Category	Value
Financial support and funding	15 (78.9%)
Policy and regulatory support	10 (52.6%)
Community training	13 (68.4%)
Infrastructure development	10 (52.6%)
Other (please specify)	1 (5.3%)

Future Priorities What should be the top priorities for future EU macro-regional strategies concerning smart villages/smart communities? (Select all that apply)

19 responses

Category	Value
Increasing funding for rural development	11 (57.9%)
Enhancing digital connectivity	8 (42.1%)
Promoting sustainable practices	11 (57.9%)
Strengthening local governance	14 (73.7%)
Encouraging innovation and entrepreneurship	6 (31.6%)
Other (please specify)	2 (10.5%)

Annex 2: EU Commission level policy frameworks and networks

Here are listed some of the relevant policy frameworks and networks to be utilised in the further actions in the SmartEra project.

EU Smart Villages initiative: The European Union has developed the Smart Villages initiative as part of its broader Common Agricultural Policy (CAP). This initiative focuses on promoting rural development through digitalisation, enhancing public services, fostering entrepreneurship, and supporting environmentally sustainable practices. Cooperation across EU member states is encouraged for sharing best practices and innovations.

Digital Agenda for Europe: This agenda includes measures to improve rural broadband access and integrate digital technologies into all aspects of rural life, from agriculture to public services. CAP aligns with these objectives by incentivising digital innovation in rural regions.

European Network for Rural Development (ENRD): ENRD plays a key role in promoting smart village policies by connecting stakeholders across Europe, sharing knowledge, and fostering collaboration. It helps disseminate successful smart village case studies, acting as a knowledge hub for rural stakeholders.

Rural Pact: Part of the Long-Term Vision for Rural Areas (LTVRA), the Rural Pact aims to strengthen cooperation at all levels (EU, national, regional, and local) to address rural challenges. It encourages the active involvement of rural communities in shaping smart village projects and aligns policies related to the green and digital transitions with rural development goals.

EU Commission's priorities for 2024-2029: The "Right to Stay" principle ensures access to basic services (public or private) regardless of location, supporting the goals of smart villages and maintaining population in rural areas. A new Vision on EU Agriculture and Food is expected by 2025, focusing on competitiveness, innovation and sustainability, where investment in smart technologies, organic farming, decarbonization and biodiversity is encouraged, aligning with smart village initiatives in sustainable agriculture. Cohesion policy aims to address regional disparities, supporting green and digital transitions in rural areas.

The Green Deal seeks to achieve climate neutrality and promotes sustainable practices across sectors. For rural areas, this includes initiatives aimed at reducing emissions, conserving biodiversity, and promoting sustainable land and water management.