SHERPA

Rural Science-Society-Policy
Interfaces

SHERPA Position Paper

DIGITALISATION IN RURAL AREAS

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1. Introduction

The present Position Paper draws from the specific contributions from the MAPs which dedicated the third SHERPA MAP Cycle to a reflection on digitalisation in rural areas. They have been confronting primarily with the needs and challenges in the area covered by the MAPs, policy interventions and actions implemented, and eventually formulated recommendations for both policy and research, in relation to digitalisation. Each of the MAPs selected digitalisation and relative sub-topics according to their members' interest and to the relevance for the rural area covered by the MAP; therefore, not all the topics included in the Discussion Paper have been further elaborated by individual work of the MAPs. Most attention in the third MAP Cycle was focused on the rural-urban divide in relation to digitalisation; the centrality of human capital; the role of digital technologies in agriculture; and the attraction of investments and new residents in rural areas.

The MAPs' contribution informed this Position Paper reflection on the main themes set out in the Discussion Paper by Brunori et al. (2022), namely: overcoming the digital divide, improving the attractiveness of rural areas, and strengthening rural governance. These themes and relative sub-themes are resumed and explored further, as informed by the reflection and work carried out by individual MAPs. To gather evidence from the MAPs, the SHERPA process undertaken in the Third Cycle organised the MAPs' discussion along four main guiding questions:

- What are the needs of the area covered by the MAP in relation to digitalisation?

- What are the policy interventions already in place, and what are examples of actions taken by local actors addressing these needs implemented in the area covered by the MAP?

- Which policy interventions (i.e. instruments, measures) are recommended by MAP members to be implemented at the local, regional, and/or national level? How can the EU support these interventions?

- What are the knowledge gaps, and what research projects are needed?

2. Key messages

The EU is placing a lot of emphasis on digitalisation via the Long-Term Vision for Rural Areas, primarily through the second area of action, Connected rural areas, where digitalisation is inherent to digital infrastructures and their relevance when dealing with the possibilities to use services. One of the flagship initiatives in this area is 'Rural Digital Futures', with a set of actions including: digital connectivity, digital technology, people, and measuring progress (European Commission, 2021, p. 19).

Such prominent role assigned to digitalisation is confirmed by the Rural Action Plan, and the Digital Compass for the EU's Digital Decade (European Commission, 2021a). This Communication confirms that rural areas are active players for attaining the EU Green Deal, the Farm to Fork strategy and the protection of biodiversity. To reach a level of efficiency capable of improving significantly the quality of life in rural and remote areas, actions are needed. What needs to be primarily eradicated is the digital divide, which causes the phenomenon that has been indicated as 'digital poverty' (European Commission, 2021b).

The set of MAPs addressing the topic of 'Digitalisation in rural areas', as per Brunori et al. (2022), represent a subset of the SHERPA MAPs and of the complex rural geography of Europe. All of them, though, highlighted a range of national, regional, and local policies and bottom-up initiatives showing how a prominent and cross-cutting topic digitalisation is across EU countries and levels of governance.

The present paper acknowledges and highlights the following:

- Even though considerable efforts are being made to achieve digitalisation goals across EU countries, several questions as to how digitalisation may operate as a tool and a catalyst for change in rural areas remain unanswered. These issues will require further investigation;

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- There is the need to address (the risk of) digital exclusion and further exacerbation of the digital divide, paying specific attention to low-skilled and vulnerable groups;

- Public support is essential for ensuring that adequate infrastructures and services are made available to rural inhabitants. To do this, more flexible funding schemes are needed, to adjust to specific local needs and contexts, with a long-term perspective (beyond electoral cycles);

- Coordination and cooperation among different societal groups, policy-makers, businesses, and research are decisive for designing locally adapted strategies, and exchanges between best local practices should be encouraged;

- The availability of, and access to, data is of the essence for genuine development processes and informed decision-making but require coordination among publicly owned databases. Privacy and security issues potentially arising from it are to be carefully considered;

- Many types of policies indirectly affect digitalisation processes in rural areas beyond the specific initiatives which receive more attention in digital strategies: an in-depth assessment of hindering and enabling factors across different sectoral strategies could work as a sort of 'digital rural proofing'

3. Current situation of the MAPs

The present position paper draws from the specific contributions from the four MAPs which dedicated the third MAP Cycle to a reflection on digitalisation. They have been confronting primarily with the needs and challenges in the area covered by the MAPs, policy interventions and actions implemented, and eventually formulated recommendations for both policy and research, in relation to digitalisation. Each of the MAPs selected digitalisation and the relative sub-topics according to their members' interest and to the relevance for the area covered by the MAP; therefore, not all the topics included in the Discussion Paper have been further elaborated by individual work of the MAPs. Most attention in the third MAP Cycle focused on the rural-urban divide in relation to digitalisation; the centrality of human capital; the role of digital technologies in agriculture; and the attraction of investments and new residents in rural areas.

The **AKIS Hungary MAP** recognises the potential role of digitalisation for levelling up the conditions of remote rural areas, lagging in terms of working and living standards, infrastructure, and skills, especially compared to larger cities. Interest in the topic is motivated by the major challenges expected from digital technologies, requiring as such adequate strategic planning and cooperation of multiple actors. As agriculture still plays a decisive role in rural areas of Hungary, and digitalisation is embedded within CAP strategic planning, the MAP has been paying specific attention to this sector and to the practical implementation of the 'smart village' concept.

The **Swedish MAP Norrbotten** selected digitalisation as a topic for the untapped potential of digital services in the large sparsely populated region. Digital exclusion is also a matter of concern for this MAP, as issues of uneven access to fast broadband connectivity may arise with the digital transformation, if the necessary caution is not used along the process. A recent report on access to rural services in Nordic countries by Slätmo et al. (2022) highlights that Finland and Sweden are the European countries with the largest gaps between rural and urban households for access to fast broadband and to next-generation access.

Similarly, the **MAP Finland Suomi** sets out the discussion from acknowledging that Finland features high in both EU and global rankings for digital skills, digital technologies integration, digital transformation of businesses including SMEs, among others. Nevertheless, territorial disparities are also among the highest in Europe for Next Generation Access (NGA) broadband coverage and fixed very high-capacity network (VHCN) coverage. The topic is therefore decisively addressed in various policy initiatives, while the MAP centres its reflections on the challenges and opportunities related to digital skills and capabilities, and the utilisation of information and infrastructure.

The **Centro Portugal MAP** addresses the topic of digitalisation from the perspective of the agricultural sector and related transition challenges. One specific geographic area – the municipality of Fundao – is the focus of the MAP during the third MAP Cycle, as it stands out for its commitment towards the Strategic Plan for Innovation implemented since 2013. The Plan aims at reversing the process of degradation of the municipality's economic fabric and ageing population by implementing innovative and differentiating solutions.

4. Position from the MAPs

This section refers to the main themes set out in the SHERPA Discussion Paper by Brunori et al. (2022), namely: overcoming the digital divide, improving the attractiveness of rural areas, and strengthening rural governance. These themes and relative sub-themes are resumed and explored further, as informed by the reflection and work carried out by individual MAPs.

4.3 Identified needs and challenges

Overcoming the rural digital divide

Dubois and Sielker (2022:2) argue that "the digital divide, often monitored as the difference in access between urban and rural areas, has been outlined as a new layer of spatial inequalities". Digitalisation strategies in rural areas therefore deserve great attention, as the latter are, on average, weaker than urban areas in terms of infrastructures and human capital. Since digitalisation cuts across multiple domains covered by different policies, authorities and responsibilities, policy integration must be targeted by rural digitalisation strategies.

At least three determinants can be identified for the digital divide: connectivity, digital capital, and motivation. The SHERPA MAPs have been addressing all these factors, exploring the specific needs and main challenges faced by rural areas in relation to one or more of them.

Connectivity

Little information is available to measure the rural digital divide at the EU level. Among available data sources, the Digital Economy and Society Index (DESI; European Commission, 2022) analyses the state of digitalisation in Europe, and provides data on connectivity. The DESI report shows that while the internet gap on broadband has decreased in recent years (Figure 1), the gap related to the fixed very high-capacity network (VHCN) has increased (Figure 2). In other words, this demonstrates that the digital divide is a dynamic process, and that proactive approaches are needed for addressing it.

Figure 1. Fixed broadband coverage in the EU (% of households) 2014-2021. Source: EC (2022)
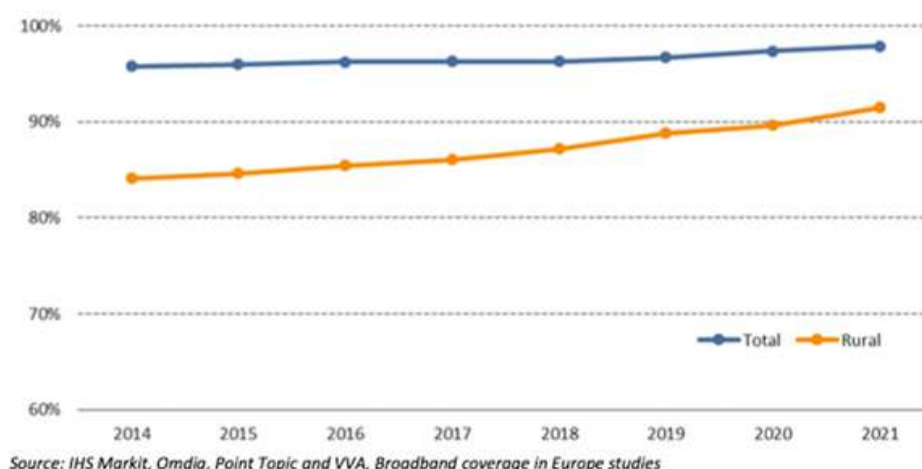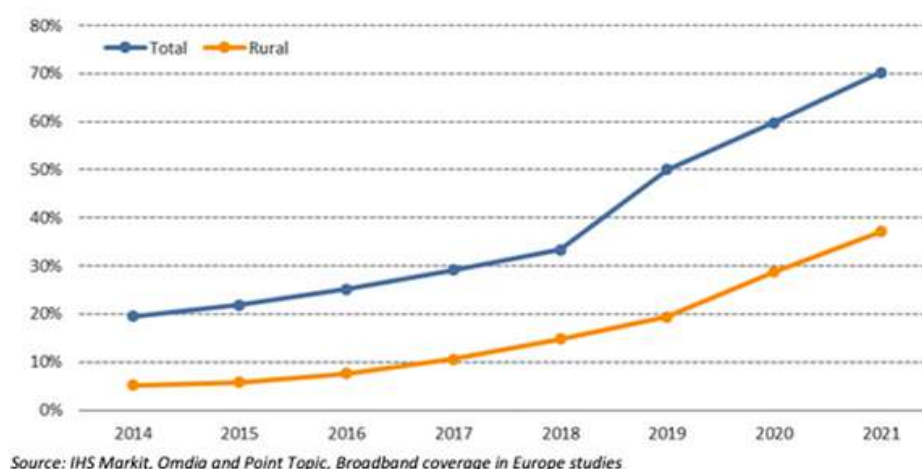

Source: IHS Markit, Omdia, Point Topic and VVA, Broadband coverage in Europe studies

Figure 2 - Fixed very high-capacity network (VHCN) coverage (% of households) in the EU, 2014-2021. Source: EC (2022).

Source: IHS Markit, Omdia and Point Topic, Broadband coverage in Europe studies

All the four MAPs confirm the trend towards a high or increasing digital divide between rural and urban areas, although some acknowledge that progress have been made.

In Finland, the **MAP Finland Suomi** highlights that considerable differences exist between rural and urban areas but also within (rural) regions, as results from several studies and projects on the impact of broadband availability on rural development (Lehtonen, 2020; Kurvinen et al., 2018; Antikainen et al. 2017; Honkaniemi & Luoto 2016). They found that the availability of broadband reduces depopulation in remote and sparsely populated areas and increases the attractiveness of such areas as place to live and develop businesses, including agriculture. A mapping of digital services by the Finnish Ministry of Finance (2020) confirmed that municipalities with a larger population exceed others in terms of both quality and quantity of digital services.

The connectivity gap is a case of market failure: in areas with a low and unstable user base, the demand is insufficient for redeeming the costs of the infrastructure investment. In fact, the digital divide can be represented as a chicken-egg problem: the lack of infrastructure implies little or no demand for internet-based services, and the lack of demand does not encourage internet providers to invest. In addition, the problem is dynamic and evolves as much as connectivity is subject to technological innovation, making the continuous upgrade of infrastructures necessary.

Market-driven digitalisation tends to broaden the digital divide and public support is needed to address market failures, either with top-down or bottom-up initiatives. Randall et al. (2020) indicate municipalities and public-private partnerships as important drivers of digitalisation. Different policies exist in OECD countries for reducing the digital divide; these might include regulation-imposing providers to cover rural areas, financial support, planning and monitoring. For instance, bottom-up models to finance and deploy high-speed networks led by municipalities or community-run enterprises have been effective in some rural areas, e.g., in Sweden, where nearly 50% of local fibre networks are owned by such bottom-up enterprises (EU Rural Review No. 26, 2018).

These concerns have been carefully examined by **MAP Norrbotten**, stressing that a procurement failure underlies the slow implementation of digital infrastructures in Swedish rural areas. Since the process is driven by IT-companies with no interest to invest in small rural towns and villages, and policy actors do not take enough responsibilities, the result is an ineffective use of resources:

> The policy actors have placed too much responsibility on the individual and on "the local market" to implement digital infrastructure and services. This happens for example when the IT-companies that win the procurements in different areas do not coordinate with each other. In addition, the IT-agreements for installation of broadband are described as "a nightmare", as the content and obligations of the agreements are often unclear […] There is a lack of trust towards IT-companies, and they are therefore not perceived as the right actor to communicate with the rural inhabitants on why they should install broadband **(MAP Norrbotten, 2022).**

MAP Norrbotten raises therefore the need for public actors to closely monitor the procurements, implementation, and agreements for the instalment of broadband. Further, potential security issues related to the ownership of digital infrastructure make the need for public authorities even more salient.

Digital capital

The use of digital technologies by individuals or households requires relevant resources, that can be grouped into the concept of digital capital. Ragnedda (2018) defines digital capital as "the accumulation of digital competences (information, communication, safety, content-creation, and problem solving), and technology". Higher age and lower levels of education make the human capital of rural areas poorer than in urban areas. In addition, rural areas have lower incomes on average than urban areas, and tariffs for internet services and digital equipment could be a barrier to access.

The **AKIS Hungary MAP** emphasised the **need for education and knowledge transfer.** Digital skills are often developed in school education but would be much needed in vocational training and in teachers' training, to help people meet the labour market's expectations and requirements. Since adequate infrastructures and resources for this kind of extra-school training are scarce or missing, the MAP highlights the opportunities from e-learning, although the latter is still problematic for older adults. In this MAP's view, e-learning services for trainers and advisors are important in agriculture, as they may help transfer knowledge and change farmers' attitude towards digital tools.
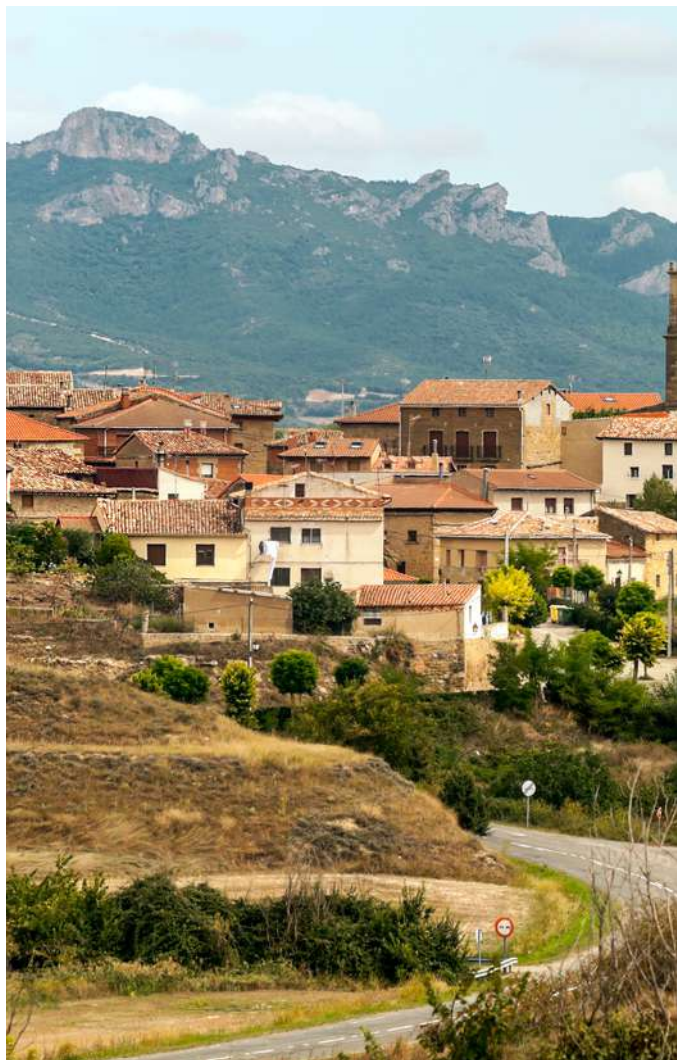
Similarly, the **Centro Portugal MAP** explains how **human capital retention and attraction** is at the heart of the Strategic Plan for Innovation of the Municipality of Fundão, implemented since 2013 with the aim of reversing the process of degradation of the economic fabric and demographic ageing, through the implementation of innovative and differentiating solutions. Targeting digital literacy, the Plan introduced computer programming in all public schools of the municipality, starting from children aged six and upwards.

Motivation

Brunori et al. (2022) identified another important factor of the digital divide in the motivation for the use of digital technologies. In general, in rural areas there is a lower level of acceptance of digital technologies compared to urban areas. However, when a need is clear, and the solutions are available, uptake can be high, and motivation to learn and to use digital technologies can increase sensibly.

TThe actors involved in the Swedish MAP Norrbotten argue that rural inhabitants are willing to learn how to use digital solutions, if properly introduced and needed. There is no lack of motivation to use digital tools in rural Norrbotten, rather a limited access to digital services, e.g., hybrid delivery services, health and elderly care solutions, and digital grocery stores are not available in those villages or households that do not have access to internet or do not possess a bank-id. Even though MAP members tone down the importance of digital capital and motivation as explanatory factors for the (lack of) use of digital services in Norrbotten, they agree that some groups are more excluded than others. For instance, older adults may not perceive the need to invest in digital infrastructures for and in their households, since they feel they have managed well without.

Promoting the development of local government policies and community-led initiatives can potentially facilitate and reduce the costs of last-mile broadband provision in the absence of sufficient private supply. According to the recent OECD Report Bridging the Rural Digital Divide (2018), policies addressing the digital divide should consider the following challenges:

Improving the attractiveness of rural areas

By 2040, rural areas are vibrant, attract newcomers and offer qualified jobs with decent salaries. Rural areas are fully connected to urban areas, and population flows occur two-ways. The challenge for rural areas is to become places that can be chosen to live, to work, to visit, or all the three. Four main factors of attractiveness can be identified for a place: the quality of the rural environment, the quality of social relations, the quality of work, and the quality of services. Digitalisation can support all these goals.

Quality of the rural environment

Rural environment includes both natural and cultural components of rural places. The quality of the natural and cultural environment provides benefits to individuals such as quality of air, water, attractive landscapes, open green spaces, good food, knowledge, and spirituality. These characteristics can be turned into economic value as they become part of the tourist experience, and as 'parts' of the place they are embodied into local products. Digital technologies can help to raise awareness about local natural resources, to promote the place and its products: social media can be a powerful instrument in promoting the destination; geographical information systems available to all through smartphones have the potential to make places visible and expand the tourists' experience. Virtual reality may be used to create new activities in the area and to support promotion strategies. Citizen science can contribute to the accumulation of knowledge about the place by sharing information into common repositories, and at the same time citizen science tools can encourage people's participation in building a territorial identity.

At the same time, rural areas are vulnerable to natural disasters such as extreme weather events, wildfires, floods, landslides. Digital technologies can contribute to enhance the quality of environmental information and to manage natural resources. Data from different sources, including that provided by citizens themselves, can be integrated into monitoring systems that provide regular update on the current state of the environment. Public administrations may use this information to improve the way they manage natural resources, private business to link the quality of the environment to their products, and civil society can have a stake into environmental management.

- **Measurement:** Collecting and making available standardised and comparable data on actual broadband gaps. Measurement can help the analysis of the gap, and information available to users can back the pressure on authorities to improve the infrastructures. Figure 3 shows a grid for the assessment of digital maturity of a village. Digital maturity is an important indicator to design digitalisation strategies.

- **Coherence:** Lack of coordination is often the cause of delays and higher costs. Improved coordination of different levels of government can eliminate administrative redundancies. In some cases, the establishment of an entity to coordinate the administrative bodies would be necessary. They could carry out functions such as strategy development, networking, monitoring.

- **Efficiency:** Plurality of actors leads to duplications. These could be prevented by stimulating the sharing of infrastructure and investments. Developing and implementing common regulations for laying cables may further reduce costs.

- **Context sensitiveness:** Different rural areas have different needs. Digitalisation pathways should depend on the vision that communities have on the development of their territory. Areas with high incidence of retired people could have different priorities than areas with high productive specialisation. Different requirements according to the different type of the users should be considered. For example, business, schools, hospitals have specific needs. Evolving demand should consider including upload speed targets to roads and connected objects. Issues related to use of broadband-services, such as awareness, affordability, digital literacy, relevant content, and trust, should receive attention.

Figure 3 - Grid for assessing the digital maturity of a village or rural area. Source: ENRD Thematic briefing on Smart Villages and rural digital transformation, no date).

		Score (1-5)	Score (1-5)
A. The extent and quality of digital resources and skills	Digital infrastructure (incl. WIFI) and public access points	Score (1-5)	Score (1-5)
	The existence of creative, work, innovation and maker spaces/hubs	Score (1-5)	Score (1-5)
	Coordination by a multi-skilled individual/ team (within a wider network)	Score (1-5)	Score (1-5)
	Local & networked experts, skills, technical support & equipment pool	Score (1-5)	Score (1-5)
B. The types of digital functions that the village can carry out	Facilitation of social and economic digital inclusion of local stakeholders	Score (1-5)	Score (1-5)
	Support to digital and social innovation and co-creation in coordination with external policy-makers/service deliverers	Score (1-5)	Score (1-5)
	Mediation/brokerage services to enable the village to access external Research, Technological Development and Innovation (RTDI)	Score (1-5)	Score (1-5)
	Relay for national and regional Digital Innovation Hubs (DIH) and Incubator/Accelerator networks	Score (1-5)	Score (1-5)

Improving the attractiveness of rural areas

By 2040, rural areas are vibrant, attract newcomers and offer qualified jobs with decent salaries. Rural areas are fully connected to urban areas, and population flows occur two-ways. The challenge for rural areas is to become places that can be chosen to live, to work, to visit, or all the three. Four main factors of attractiveness can be identified for a place: the quality of the rural environment, the quality of social relations, the quality of work, and the quality of services. Digitalisation can support all these goals.

One example comes from **MAP Finland Suomi**, where the AVOTDIGI[1] project aims at strengthening the digital capital of rural residents and communities and expanding the interactions between rural residents and public authorities in land use and planning themes. A participatory GIS is meant to collect the residents' experience on the sense of place, needs and drawbacks, but also valuable natural and cultural sites. Experiences from residents about, for example, the sense of place, its drawbacks or development needs, or valuable natural and cultural sites are to be collected through participatory GIS.

The digitalisation of agriculture also relies on data and, in this regard, the **AKIS Hungary MAP** raises the necessity to enhance access to databases owned by the public administration. In agriculture, some data are generated at the farm level, but a significant amount of data are public – e.g., soil conditions, meteorological data, land parcels information, market prices – collected by 13 different public agencies and stored in 48 databases, but unavailable for farm-level decision support applications which do not have access to it (Milics et al., 2022).

Quality of social relations

Life in rural areas can benefit from a stronger sense of community, strengthened by frequent face-to-face relationships and a limited number of members of the community. However, the size of the community and the distances can be perceived as a limitation by some. On one side, digital technology can strengthen the building of social capital within a community by intensifying the interaction and avoiding unnecessary travels, and on the other side, it can multiply the contacts with distant people.

Creating and maintaining the feeling of a community is of primary importance in Nordic sparsely populated areas, as **MAP Norrbotten** points out. For instance, this could be facilitated by making it easier for newcomers to feel at home as they can keep contacts with family and friends from faraway while at the same time establishing a new life in Norrbotten or other rural areas. The sense of community which is often linked to rural attractiveness can be upheld by digitalising common village meetings (in Swedish: byamöten), where people can log in while not physically present, and this may contribute to increase both knowledge sharing and the engagement in the village. Local village associations and meetings are also considered by MAP members the main space for engagement of rural citizens, much more than in processes led by the regional and municipal authorities.

MAP Finland Suomi recognises that digitalisation is linked to several unanswered questions regarding the future of rural areas, **both as a tool and as a catalyst for change.** However, they emphasise the urgency to explicitly address digital exclusion, to prevent the risk of benefitting only one group instead of the whole society. In fact, in this MAP's view, smart energy communities, e-inclusion and co-creation are viable solutions through which digitalisation can help promote a transition to a more just and sustainable society, but for these solutions to be fully exploited.

It is crucial to bring people together to discuss the needs and views of different population groups, acknowledging aspects such as gender, age, and ethnic background. Inclusive dialogue is necessary for revealing challenges such as the male dominance in the knowledge economy. More broadly, tapping into the full potential of digitalisation to benefit different parts of society more equally remains as a key challenge (MAP Finland Suomi, 2022).

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[1] The project is one among the many activities by the network of 54 Local Action Groups operating in Finland, as registered associations working in rural development projects and supporting local enterprises. The application is pending (Source: MAP Finland Suomi).

Quality of work

COVID-19 has accelerated a process of rethinking the role of rural areas as attractors of working professionals who can work at a distance. According to a study of McKinsey Global Institute (2020), more than 20% of the workforce could work remotely three to five days a week as effectively as they would do working from an office. That would mean three to four times as many people working from home than before the pandemic, and would have a profound impact on urban economies, transportation, and consumer spending. Italy had 20 million commuters before COVID-19, nearly half of which were travelling from different municipalities. Commuting has a relevant impact on rural economies, as it keeps incomes in the area and activates demand for goods and services (Andersson et al., 2018). The challenge is to replace at least a part of commuting – e.g., the one employed in information intensive work areas – with smart working that would generate substantial savings in terms of time, energy and improve the employees' quality of life (Adobati and Debernardi, 2022). The most diffused digital platforms, providing workspace for real-time collaboration and communication, meetings, file, and app sharing, have strongly improved during the COVID-19 pandemic. Learning processes have contributed to reduce the productivity gap between working at a distance and working in presence.

COVID-19 has been a driver for digitalisation but has also increased the digital divide in Hungary, according to the **AKIS Hungary MAP** members.

They agree that digitalisation has the potential to mitigate many rural problems – shrinking depopulation, out-migration, and employment gaps – but it can hardly solve all problems and may in fact raise new issues such as privacy, data security, data management, and the digital divide, whether among inhabitants or companies.

Location-independent work, remote work and remote working hubs, distance learning and, more broadly, multi-locality have come to the fore in the public Finnish debate in recent years. For instance, the Finnish Government's Spring 2022 Decision of Principle on the promotion of multi-locational work, study and housing contains objectives and proposals that are strongly linked to the digitalisation of rural areas. The private sector also has an important role in developing job opportunities in rural areas in the context of the knowledge economy and multi-locality. The **MAP Finland SUOMI** appreciate the potential role of remote **working hubs and the development of the sharing economy** for the attractiveness and connectivity of rural areas. One such initiative is the Etätyöpisteet elinvoiman kasvualustoina, which supports multi-locality by creating a network of remote working hubs spanning throughout Finland, with the aim of boosting local vitality and knowledge and acting as platforms for knowledge sharing and development, encouraging new business models.

The Swedish **MAP Norrbotten** sees a need for employers to **allow remote work and encourage multi-locality.** In this regard, the new investments in Norrbotten in data storage, mining and energy come with possibilities of newcomers, jobs, and new tax revenues. However, the new jobs may require new expertise from outside rural areas, and these experts may decide to live in Norrbotten only for short periods, in a "fly in-fly out" work mode, or to live in urban areas working remotely in rural areas. MAP members from Norrbotten invite therefore to consider in advance all the pros and cons of digitalisation as a societal process for regional and local development.

Indeed, improving the attractiveness of rural areas for smart working is related to both technology and non-technology factors. Good or excellent connectivity is a prerequisite, as well as the further development of digital workspaces. However, smart workers would choose rural places when other factors, above all quality and cost of life, will be competitive with other locations. Services as co-working spaces could increase the attractiveness, as they combine the advantages of smart working with the possibility of enjoying social life and avoiding pressure on home spaces.

Digitalisation can also contribute to improve quality of work in traditionally rural activities, such as agriculture. In this regard, automatisation of heavier operations and simplification of administrative burden can relieve a workforce that has a high average age and can make agricultural work more attractive for young people. Availability of adequate technological infrastructures can also be an attractiveness factor for new rural entrepreneurs, as the RUBIZMO H2020 project has put into evidence in the Guidelines for creating supportive business environment (2021).

Digitalisation in agriculture is one of the priorities for the **Centro Portugal MAP.** Here, the Des Agro 4.0 project[2] is being carried out for empowering Small and Medium Enterprises (SMEs) of the agro-food and agro-industrial sector of the territories of Douro Verde and Cova da Beira. The core idea is to provide SMEs with the skills and knowledge necessary for the adoption of intelligent business models, such as those based on the Internet of Things (IoT) and the concept "Industry 4.0". The project responds to the necessity of filling the gaps identified in the sector, primarily the lack of updated knowledge by the local SMEs.

One similar example illustrated by **MAP Suomi in Finland** is AgriHub, a farm business competence network that gathers Finnish agriculture and horticulture operators such as farmers, advisors, educators, and researchers to collaborate, with the aim of improving farmers' long-term profitability, sustainability and risk management skills. The network is centred on building business management skills to **support smart farming uptake and a better use of data sources by agri-food operators.**

[1]The Des Agro 4.0 project, co-financed through the FEDER programme and promoted by DOLMEN, RUDE, UTAD and IPCB.

Quality of services

A crucial drawback, affecting profoundly the other dimensions of rural areas' attractiveness, is the general lack of, or limited access to, adequate service provision. For instance, in most rural areas, mobility relies on private cars, a low user base puts commercial services at risk, and leisure and entertainment are often limited. In addition, people may have to travel long distance to access administrative, education and healthcare services. Soon, initiatives based on sharing models would be able to address the lack of mobility services, as it is true that digitalisation is rapidly changing some of the gaps in commercial services: e-commerce makes all types of commodities available in a few days; home banking has already revolutionised the relation between citizens and their bank; home entertainment (streaming TV, games) provides at least a partial replacement of traditional entertainment services.

Many municipalities in Norrbotten have been experiencing a recent decline in services in general, and public welfare services such as care facilities and schools. **MAP Norrbotten** acknowledges that implementing digital services such as e-health solutions can be a way to use resources more efficiently and providing opportunities for people to live in rural areas. Digital school hubs could also serve to attract or maintain young people and families. This kind of e-learning services are considered important especially for special or advanced subjects, and for second languages. However, the MAP raises the question of the risk of reduced service quality or even an increase in the digital gap, which makes it even more necessary to pay close attention to how they are implemented.

Digital services provided by public administrations will avoid trips and long queues to obtain a certificate or information. Some of these services do not need personnel in place, as they can be provided by centralised platforms. Distant learning can support rural households to provide supplementary skills to children, even though it cannot replace many of the functions that school plays in the development of children and therefore needs to be integrated with school in presence. E-health, if not considered just as a component of a cost-reduction strategy, can get rural populations closer to the health system, providing collaborative tools to support the relationship and behavioural changes through monitoring and offering feedback to patients.

Strengthening local governance

One of the four areas of the Long-Term Vision for Rural Areas is related to the capacity of local actors to align their objectives around strategic areas. Old governance patterns, based on sectoral specialisation and hierarchical relations, are unfit to challenges that are by their nature cross-sectoral and require integrated approaches. Top-down and bottom-up processes can establish 'weak' ties between rural actors by improving communication between administrations at different levels and between local levels, and by sharing resources and initiatives. Trust and co-operative relationship with the private sector, civil society, and other communities can facilitate the alignment of objectives and incentives.

Information and communication are key to an improved governance. In fact, they open up new ways for policy-making in all phases of the policy cycle, from problem definition to policy evaluation. At the problem setting stage, information can change the way governments engage with citizens. Providing detailed information can help civil society to raise issues in the public debate and encourage administrators to act. Information can also help citizens to make informed choices, and to make it just as feasible as direct feedback mechanisms. Citizens, in turn, can have the opportunity to provide feedback on plans and policies in development.

According to the **AKIS Hungary MAP:**

> greater emphasis should be placed on communication, to ensure that the local community understands what can be considered smart development and what its benefits are, but also to increase the public acceptance of the initiatives undertaken. Unplanned developments and under-utilisation of newly introduced services can lead to failure of smart village initiatives, among others (AKIS Hungary MAP).

One of the flagship initiatives of the Long-Term Vision for Rural Areas is "a rural revitalisation platform ... as a one-stop shop for rural communities, rural project holders and local authorities alike to collaborate" (European Commission, 2021).

In this regard, it is worth mentioning the initiative of the Living Lab Cova da Beira (LLCB) illustrated by the **Centro Portugal MAP**. According to the Strategic Plan for Innovation of the Municipality of Fundão, the Living Lab has started a process of cooperative work between different stakeholders based on principles of openness, dialogue, and community empowerment. The Living Lab is centred around two main topics: i) the attraction of investment; and ii) the creation of a favourable environment for the development of companies and their potential to create wealth and employment. The Living Lab entails and open ecosystem where different local agents operate through different areas of knowledge and services involved in the whole innovation process. The MAP members selected the Fundão region, where the Living Lab takes place, for its successful strategy of investment and innovation, and highlight that:

> the concept of innovation linked to this region does not consist only in technological factors but is intended to be applied to a diversity of domains and implies the construction of synergies and convergence platforms that promote opportunities for success, such as Living Labs. The creation of these spaces, physical or digital, in the region of Fundão is essentially related to the opportunity to create territorial cooperation networks, a fundamental factor to spread innovative and integrated logics that provide a dynamic flow (Centro Portugal MAP).

As it often occurs, in Sweden **civil society organizations** are the most committed to preparing rural communities for the implementation of broadband and digital solutions. **MAP Norrbotten** maintains: "they [civil society organisations] are working in the gaps, with persons and issues that the public sector has not yet grasped or created policy around, or before the private sector sees a growth potential".

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Even though this commitment is seen as valuable, there are cases when the value of such initiatives is not yet recognised and might eventually be discouraged. For instance, local villages associations working for the implementation of broadband in rural areas are often just self-organised groups of people carrying out community functions. Nonetheless, IT companies in charge of broadband services categorise these associations as companies, charging higher tariffs for connections compared to households. In addition, the MAP raises the **importance of participatory processes for rural areas, to help bridge the distance from decision-makers.** Such distance may translate in a lack of accurate data and statistics on rural localities, but also in the failure to understand the specific needs and experiences of people in specific places and, eventually, into a lack of trust between local actors and central or regional governments, as studies confirm (Beer, 2014; Lewis, 2018; Slätmo et al. 2021).

Better information is also important to effective policy monitoring and evaluation, which in turn is key to improved governance. Moreover, access of researchers to data can improve evidence production and better science-policy interaction. To harness the potential of data (environmental, administrative), a strong effort to create a common data space for public intent, wherein business, administrative, environmental, statistical, and citizens-generated databases are made interoperable. This would provide the opportunity for local actors to increase the value of single databases. This goal requires strong coordination and ad-hoc governance structures.

The **AKIS Hungary MAP** raises the importance of access to data and online services, as it forms the basis for development. Citizens and businesses demand online services for public administration, public services, waste management, and market-related information. Local authorities and rural policymakers should have a geographic information system that integrates the rural data collected by different institutions.

The <u>World Bank report 'Data for better lives</u>' envisages integrated data system that produce high-quality data and then make data open "in a way that it is both protected and accessible to be shared and reused by all stakeholders" (p. 41). This goal can be achieved through the following steps:

- Establishing fundamentals (a high-level strategic document, data protection regulations, improving technical capacity in the administrations);

- Initiating data flows (establish a culture of data use in ministries and among policy makers and legislators, prioritise open data for development and use of common standards throughout the data life cycle, establish a secure, integrated digital platform); and

- Optimising the system (charge an existing or new government unit with responsibility for overseeing and reporting on implementation of a national data strategy, define clear institutional mandates for the various government institutions).

4.4 Existing interventions and actions

Digitalisation is high on the agenda in the national, regional, and local strategies of the four MAPs involved in the SHERPA process connected to this topic. While a detailed list of actions and initiatives undertaken by a variety of actors in these areas is provided in **Annex 1 (Examples of actions taken by local actors)**, this section makes an overview of public-led initiatives on digitalisation implemented at the country and regional level. For a detailed account of the policy landscape, this is illustrated more extensively in the Position Papers of MAP Suomi Finland, MAP Norrbotten, Centro Portugal MAP and AKIS Hungary MAP. An overview of the European policy context is provided in the SHERPA Discussion Paper by Brunori et al. (2022).

At the country level, some national initiatives are explicitly aligned with the EU Digital Compass and the four main areas identified under this framework (skills, digital infrastructure, digitalisation of businesses, and digital public services). For instance, **Finland** is currently preparing the Finland's Digital Compass, a national strategic roadmap guiding national digitalisation and data economy transition development. Finland's Digital Compass includes national targets related to the EU objectives as well as goals and themes that complement the EU Compass and are necessary for accelerating Finland's digital development until 2030. The Government's objective of increasing the technological and digital capabilities of the public sector and promoting cooperation between public and private sectors are implemented according to a Programme for the Promotion of Digitalisation and fall under the responsibilities of a Coordination Group for Digitalisation, both under the remit of the Ministry of Finance (MAP Finland Suomi).

In Hungary, the National Digitalisation Strategy, launched in 2021 and working as an umbrella for all the other strategies (Digital Education Strategy, Digital Export Development Strategy, Digital Start-up Strategy, Digital Workforce Program, and Digital Healthcare Development Strategy, all initiated within the Digital Success Programme, DSP) is also structured around the Digital Compass pillars. The Digital Hungary Agency established in 2022 is meant for integrating several institutions and is responsible for the operation of e-public administration and IT systems, and the creation of digital citizenship on a single platform. The aim is that by 2025 everyone will be able to manage their official affairs using a mobile phone (Hungary Posts, 2022) (AKIS Hungary MAP). Among the set of programmes implemented under the DSP, it is worth mentioning the Digital Agricultural Strategy and its flagship project Digital Agricultural Academy, providing a catalogue of digital public services and a database of digital demonstration farms, and the Digital Village Programme launched in 2021 to improve the attractiveness and liveability of small settlements through different digital or smart solutions. Within this framework, the Digital Village of the Year Award goes to Hungarian villages (less than 5000 inhabitants) that stand out in four categories: innovative settlement environment, innovative and social community well-being, sustainable built and natural environment, and innovative economic ecosystem (AKIS Hungary MAP).

An Agency for Digital Government (DIGG) has the mission to coordinate and support digitalisation in the public sector also **in Sweden**, where two main strategies form the basis of the national policy for digitalisation: the National Digital Strategy and the Swedish Government Broadband Strategy. The aim of the latter is that Sweden should have full access to connection in 2025.

The National Strategy provides a framework for the 21 regions, many activities of which are in turn coordinated by the Swedish Agency for Economic and Regional Growth. It is highlighted by the MAP Norrbotten that beyond the specific initiatives targeting digitalisation in rural areas, many types of support schemes from the Swedish Agency indirectly affect digitalisation, such as supporting schemes for commercial services, support to democratic activities, and local action groups working for the digital transformation. In addition, it is worth emphasising that Swedish public libraries have the mission to promote the use of information technology for knowledge, learning and participation in cultural life, and currently 80 % of all public libraries have activities to increase the digital competence (MAP Norrbotten, 2022).

The alignment between digitalisation goals of EU policies, the new Strategic Plans for the Common Agricultural Policy 2023-2027, the national Action Plan for Digital Transition, and the Strategic Vision for the Economic Recovery Plan for Portugal 2020-2030 is also discussed by the **Centro Portugal MAP,** which stresses the regional level focusing on the Fundão region. The selection of the latter is motivated by the comprehensive approach to the promotion of digitalisation, entailing a set of strategies and plans implemented at the regional level and operationalised through coordinated projects and actions - the Strategic Plan for Innovation of the Municipality of Fundão; the Living Lab Cova da Beira; Digital Innovation Hubs (DIH4Sm@rtRegions; PT.DIGMAKING.IH and EDIH-F4S); Des Agro 4.0 Project; Agrotech IoT Centre; Incubator A Praça; EU SOU DIGITAL - Digital Training Programme for Adults; viii) Agricultural Innovation Fair; ix) AgroTech Challenge.

4.3 Recommendations from the MAPs

The four SHERPA MAPs who carried out the discussion on digitalisation in rural areas developed a set of recommendations which are meant to inform both future policy and research at local, national and European level. For a detailed account of MAPs' recommendations, refer to the MAP Position Papers available at the SHERPA website.

The present Position Paper summarises the recommendations from the MAPs in the light of the set of principles to guide digitalisation processes toward desired futures developed by Brunori et al. (2021) in the DESIRA H2020 project to the purpose of informing future research, debate and practice in agriculture, forestry and rural areas. These are briefly illustrated below:

1. Creating the basic conditions for digitalisation, these being technological infrastructure, human capital, and economic gains

2. Anchoring digitalisation to sustainable development, that is: digitalisation can drive sustainable development but only if processes and strategies are aligned with Sustainable Development Goals (SDGs).

3. Adapting digitalisation to different contexts, by means of participatory and place-based approaches to ensure that digital solutions are adapted to, and address the diverse needs of, local people and territories.

4. Favouring digital inclusion, implementing active policies to prevent uneven development of, and ensure equal access to, opportunities from digitalisation.

5. Developing digital ecosystems, whereby 'connectors' can operate to ensure the coordination of local actors, infrastructures, digital application systems, data and services.

6. Developing adaptive governance models, namely proactive multi-actor governance models able to integrate and engage science and innovation with policy-makers, civil society and citizens, in the co-creation process for digitalisation, while balancing power.

7. Designing policy tools for sustainable digitalisation, starting from a revision of the whole set of policies that affect rural areas, agriculture and forestry in the light of the threats and opportunities of digitalisation, and assigning new competences to dedicated bodies from regional to the EU level (Brunori et al., 2021, p. 5-7).

Such guiding principles can be enacted by implementing action in four key development domains: i) Human capital; ii) Innovation; iii) Investments; and iv) Governance.

4.3.1. Recommendations for future rural policies

- Future rural policies should focus on:

- Promote and ensure the deployment of adequate resources for the continuous generation and update of **basic digital competences** in rural areas, paying specific attention to the **digital inclusion** of low-skilled and vulnerable groups (e.g., migrants and refugees, the elderly, the hard-to-reach), to ensure the process benefits the whole society

- Ensure **public support to investments for basic digital infrastructure**

- To ensure an effective use of available resources, promote a culture of **efficiency, coordination and cooperation** among and within public administration and societal levels, through adequate public-led monitoring.

- Design more **flexible and long-term orientated funding schemes**, to better adapt available resources to specific needs and contexts

- Promote **opportunities for scaling out regional/local best practices,** by favouring exchanges between different rural towns and villages

- Promote coordination among public agencies owning or involved in collecting and storing data, to enhance public data-sharing and facilitate decision-making

- Facilitate processes and/or promote the creation of spaces for the **co-design of locally adapted strategies** including members and organisations from from civil society, policy, businesses and researchers

- Promote the provision of **technical assistance and need-based services** dedicated to crucial sectors identified at the local level (e.g. agriculture, forestry, tourism and leisure) through the establishment of competence centres.

4.3.1. Recommendations for research agendas

Future research should investigate further on focus on:

- The constant monitoring and review of **DESI indicators**;

- The characteristics of rural digital ecosystems and their role in the reduction of the costs for uptake of digital technologies;

- Digital readiness of individuals, households, territories and its link with the uptake of digital technologies

- The role of digitalisation in increasing the attractiveness of rural areas.

- **Digital innovations and related phenomena,** with their impacts on the environment, society and economy of rural areas;

- **Development projects with, and not about, local actors,** engaging rural municipalities and their policy-makers and civil society representatives. Their role and participation in the digital society needs to be further explored;

- Retaining **young people** in rural areas, by paying specific attention to their needs and expectations;

- **Rural-urban differences in relation to the digital capital;**

- The relationship between **rural attractiveness and transport services** for goods and people;

- **Knowledge gaps** in automation, interoperability between different equipment, and decision support models for agriculture;

- **Working and living conditions in rural areas, with a focus on remote working.**

5. Contributions from the SHERPA EU MAP

The EU-level MAP met in November 2022 to discuss the topic of digitalisation in rural areas, informed by the results of the MAP Position Papers of the SHERPA national and regional MAPs. During the meeting, members of the EU-level MAP reflected on the recommendations developed by the MAPs and discussed how these recommendations, regarding rural policies related to digitalisation in rural areas can be supported at the EU level, as well as which research gaps and needs to be addressed by EU programming. The reflections of the meeting are summarised below.

The importance of digital inclusion

The importance of digital inclusion was recognised, and a crucial element of this is the continuous generation and updating of basic digital literacy of rural citizens, including low-skilled and vulnerable groups. A 'continuous'updating of digital skills is needed: digital technologies and services are constantly evolving so digital education and training have to occur frequently and regularly for rural citizens to remain digital literate. A critical caveat here is that such digital education and training (i.e. provision of digital knowledge) has to be made available in multiple EU languages. Most basic digital knowledge in rural areas is related to the ability of rural citizens to understand the English language to a certain level, which creates the risk of exclusion for those that do not.

Furthermore, digital inclusion is also seen as important due to the fact that digitalisation is a key element for green & smart mobility solutions for rural areas. Mobility is a key aspect for rural communities, as the majority of essential services are located at some distance (e.g. education, supermarket, health services). However, due to limited availability of public transport or other shared mobility options, rural citizens are dependent on cars for their mobility needs and run the risk of isolation when they have no access to this form of transportation. Therefore, providing smarter and more sustainable forms of mobility in rural areas can improve the quality of life for rural citizens, as well as make an important contribution to mitigating the effects of climate change.

Another important element for digital inclusion in rural areas is the necessity of having high-capacity digital infrastructure everywhere so that everyone has access to high-speed internet. This is seen as a right, and is one of the 20 principles of the European Pillars of Social Rights that functions as 'a beacon guiding the EU towards a strong social Europe that is fair, inclusive, and full of opportunity'[3]. Having well-connected rural areas is also one of the areas of actions of the Long-Term Vision for Rural Areas, which specifically mentions the need of deepening digital infrastructures as essential to ensuring better-connected EU rural areas. Furthermore, access to high-capacity broadband is a critical area for rural development, as Artificial Intelligence (AI) and blockchains are becoming more prominent.

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[3]The European Pillar of Social Rights in 20 principles

For rural areas to be included and benefit from these digital developments, high-speed internet is a necessity. High-capacity networks have to be widened and made more accessible for rural areas in order to ensure that rural citizens can also benefit from 5G. The EU established the European Broadband Competence Offices Network which unites EU Member States' national and regional public authorities in charge of broadband deployment and supports their exchange of knowledge and good practices with the goal of ensuring that all EU citizens have access to high-speed broadband and to benefit equally from opportunities that digital connectivity brings. The annual European Broadband Awards recognises outstanding broadband deployment projects in Europe and highlights successful infrastructures by showcasing best practices and examples of fast and innovative broadband roll-out.

The need for adequate funding & technical assistance

One way to achieve digital inclusion in rural areas is via funding schemes at multiple levels, including at EU-level. What is supported by existing funding schemes is not always in line with the most recent/appropriate technology, which creates a funding deficit. Therefore, these funding schemes need to be flexible and provide for technology-proof investments, so that they can keep up with always changing and developing digital technologies relevant for rural areas. Something else to be kept in mind is adapting funding schemes to the various geographical features that would make it more difficult to access high-speed internet (i.e. remote areas or mountainous areas) and pay special attention to this.

Another way to speed up the digitalisation in rural areas is via the provision of specific technical assistance and need-based services by the EU and national authorities. Rural areas are working to align with the current digital context, but it is of the highest importance for future rural development to prioritise the digital agenda and plan actions accordingly. Digitalisation is a major opportunity to improve the quality of life and wellbeing of rural citizens via the delivery of essential services (e.g. e-healthcare), and to strengthen the local economy (e.g. e-commerce). Both of these aspects could be improved with the provision of different kinds of technical assistance adapted to the needs of rural areas. The organisation and establishment of structures developed for people to improve their digital competences within rural areas (hackathons, Living Labs, competence centres, digital innovation hubs, knowledge hubs, etc) can contribute to improve digitalisation in rural areas, as well as well-being and quality of life of rural citizens.

Place-based digital strategies

For digitalisation of rural areas to further develop, it is important to create digital strategies adapted to the local needs by using a co-designing approach including rural stakeholders. This will ensure that the digital strategies address actual local issues and support local economies (e.g. locally grown/crafted products). One way to develop and implement place-based digital strategies the 'Smart Village' concept. Smart Villages are defined as

> "communities in rural areas that use innovative solutions to improve their resilience, building on local strengths and opportunities. They rely on a participatory approach to develop and implement their strategy to improve their economic, social and/or environmental conditions, in particular by mobilising solutions offered by digital technologies. Smart Villages benefit from cooperation and alliances with other communities and actors in rural and urban areas. The initiation and the implementation of Smart Village strategies may build on existing initiatives and can be funded by a variety of public and private sources" (European Commission, 2020).

This concept has received a lot of attention in recent years; they are mentioned in the Common Agricultural Policy programming 2023-2027, part of LEADER, and the European Commission has launched various projects focused on Smart Villages in recent years. For instance, there was the Smart Eco-social Villages Pilot Project, which identified examples of villages engaged in initiatives to address challenges or improve the quality of life of inhabitants, formulating innovative, smart solutions that cover a wide range of thematic areas, including agriculture, environment, energy, mobility, health, education, culture or tourism. This pilot project was followed by Smart Rural 21, which had the overall aim to promote and inspire villages to develop and implement Smart Village approaches and strategies across Europe, and to draw conclusions and support future policy interventions on smart villages and Smart Rural 27 with the aim to prepare Member States and rural communities for the implementation of the Common Agricultural Policy (CAP) post-2020 as well as other EU policies and initiatives, which could potentially support the emergence of additional Smart Villages across the European Union.

Place-based digital strategies

Keeping in mind the numerous themes that are already covered by research within EU programming, there are several additional research areas that could be addressed for the benefit of digitalisation in rural areas:

- The role of digitalisation in increasing the attractiveness, well-being, and the functionality of rural areas.

- How digitalisation influences working and living conditions in rural areas when considering remote working.

- How digitalisation could improve education in rural areas.

- The long-term impact of digital innovation on sustainability and just transition in rural areas.

- The digital readiness of rural areas and the link with the uptake of digital.

- Address the knowledge gaps in relation to automation and interoperability of technologies.

Research projects should also continue to involve rural actors using a participatory approach, including rural citizens, youth, rural researchers, rural businesses, etc.

The contribution of the SHERPA EU-level MAP has been developed based on oral and written comments from its members, each participating in a personal capacity as an individual expert.

6. Concluding remarks

Taking the results from previous research and providing them as materials for discussion at the local, regional or national level, SHERPA allows the dissemination of research and the development of recommendations which are broad enough to fit to generalise to many contexts and levels but specific enough to reflect specific needs.

The present position paper draws from the specific contributions from the four MAPs which dedicated the third MAP Cycle to a reflection on digitalisation in rural areas. They represent a subset of the SHERPA MAPs and of the complex rural geography of Europe. All of them highlighted a range of national, regional, and local policies and bottom-up initiatives showing how a prominent and cross-cutting topic digitalisation is across EU countries and levels of governance. The MAPs assessed the needs and the main challenges in their rural areas, the policy interventions and actions implemented, and eventually formulated recommendations for both policy and research, in relation to digitalisation.

The present position paper emphasised the significance of preventing digital exclusion in the first place and the requirement for public authorities to take on greater responsibility in supporting long-term goals and adequate and flexible funding. Even though significant efforts are being made to achieve digitalisation goals across the EU, key components like data availability and access still require improvement and caution regarding the threats to privacy and security. Although there is optimism regarding the role of digitalisation as a catalyst for change in rural areas, further work is necessary to ensure that its advantages are widely distributed. The MAPs concur that more work should be done to improve coordination and cooperation between different societal groups, policymakers, businesses, and science in order to evaluate all the enabling and impeding factors influencing digitalisation processes in rural areas ('digital rural proofing') and to co-design locally adapted digital strategies.
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Annex 1 Examples of actions taken by local actors

MAP AKIS Hungary

Digital Future Settlement Network

The network was set up in 2016, led by the town of Budaörs (more than 28,000 inhabitants) and the village of Alsómocsolád (around 280 inhabitants that time). The aim was to create a community platform for testing and upscaling inclusive smart projects and the exchange of best practices.

North Hegyhát Micro-Regional Union

The municipalities, economic partners, institutions and NGOs of the settlements of Alsómocsolád, Bikal, Mágocs, Mekényes, Nagyhajmás (southern part of Hungary, Baranya County) decided in 2014 to work out a joint development program, and the Union was born from this initiative. Now the Union intends to create the first 'Smart Area' of Hungary, connecting the participating municipalities and community resources with the information technology tools. This can break down the boundaries between the modern metropolitan world and the rural life and helps to reach demographic balance.

Link 1 (In Hungarian), link 2 (summary in English)

Digital developments of Alsómocsolád

In addition to the above-mentioned projects, the digital developments of Alsómocsolád are worth highlighting in more detail. Four information points form smart community spaces, with free Wi-Fi coverage within a radius of 80 metres. The village has a regional interactive public transport support system called HazaTér. Tourism services are supported by a planetarium, a Boeing simulator and a QR code walking trail. The village received the Digital Village of the Year award in 2021 in the category of Innovative municipal environment. The settlement has a smart village strategy available also in English.

Link 1 (in Hungarian), Smart village strategy of Alsómocsolád (in English)

Developments of Füzérradvány

Füzérradvány is a small village with ab out 250 residents in the tourist region of Northern Hungary, in Borsod-Abaúj-Zemplén County. The village received the Digital Village of the Year award in 2021 in the category of Innovative Social and Community Well-being. Despite the small population, three Digital Success Programme points have already been established, and organise digital media literacy events for parents and grandparents. In addition, cameras were installed in the municipality for better and more effective public safety, the local church was equipped with solar panel and inverter, and the amount of solar energy produced can be digitally tracked.

Link 1 (In Hungarian)

Elderly care system in Tamási

Tamási is a small town with less than 8,000 inhabitants in Tolna County. In collaboration with Antenna Hungaria, a state-owned telecommunications operator in Hungary, an elderly care system has been set up in 2018. The IoT network uses LoRaWAN sensors to monitor the environment of the most deprived persons, so that an emergency (in this case, unheatedness of the property) can be detected in time and the social worker responsible for the area can be informed. The municipality has gained valuable experience on the heating habits of care recipients, which will help in planning the provision of social firewood in winter.

Link 1 (in Hungarian), link 2 (summary in English)

Digitalization survey of local businesses in Balatonmáriafürdő

The digitalization survey of local businesses started at the end of 2018 in Balatonmáriafürdő (settlement with about 870 inhabitants, at lake Balaton), led by T-Alfasystem Economic and Business Consultant Ltd. The main concept of the municipal cooperation is to make an up-to-date list of the services and companies in the settlement, which can be found on the website of the Balatonmáriafürdő Municipality. In addition, organizations participating in the digitalisation survey will receive a customized IT project proposal to help them increase their digital competence.

Link 1 (in Hungarian), link 2 (summary in English)

Ceglédbercel, the smart village

Ceglédbercel is located in Pest County, its population is around 4,200 inhabitants. In cooperation with Invitech Solutions IT company, the settlement become a smart village in 2018. As a first step, an eight-unit Full HD camera system has been installed, which can send photos of high-frequency public spaces to the local police and civilian guard. In addition, a WiFi hotspot has been set up at two of the most visited locations. As a next step they developed a mobile application, which helps locals and visiting tourists to get the needed information, such as services of local entrepreneurs or program opportunities happening in the village. The next step is to build the IoT network by deploying environmental sensors, which can improve the energy efficiency of public lighting and provide information about the traffic.

Link 1 (in Hungarian), link 2 (summary in English)

Development of Baksa village

Baksa is a village in Baranya County with about 800 inhabitants. The Municipality actively works on developing the village and its facilities. For safe transport, a traffic slower lane and surveillance cameras were installed. There are two smart benches at the two ends of the village, providing free Wi-Fi hotspot and a charger for laptops and mobile phones. For its retired people, the municipality have set up a monitoring system that can provide help via satellite if necessary.

Link 1 (summary in English)

MAP Centro Portugal

Incubator A Praça

It consists of a set of spaces and services that have been made available by the Municipality of Fundão to give way to new business initiatives. The Incubator is duly accredited to provide services in the scope of Vale Incubação and recognized before the National Incubator Network. Its main objective is the creation of territorial cooperation networks, to spread innovative logics, technological hosting, and innovative entrepreneurship.

Link 1

Agrotech IoT Centre

Its objectives are: i) promote the integration of IoT solutions in the economy, especially in rural-based activities; ii) attract new entrepreneurs and investors, reinforcing the connection to universities and polytechnics; iii) strengthen the conditions to host teams to develop products and solutions based on technological processes; iv) consolidate an ecosystem of IoT technology development and validation that serves as an interface between research and the market; v) unblock financial constraints for the development of entrepreneurial initiatives based on IoT technology; vi) disseminate best practices in the development and application of IoT in rural-based businesses; vii) create and boost a wide networking network.

Website

FAB LAB Schist Villages

It is a space for low-cost creation and experimentation, where there are no limits to creativity. This laboratory was the first to be born in the region of Fundão, in which the City Hall is the main promoter, betting on a strategy of innovation and entrepreneurship. This space provides advanced technology that is available to the common citizen to find the best way to materialize the projects. The idea is to provide help in finding the most appropriate solutions for those who seek new creative and entrepreneurial paths.

Website

EU SOU DIGITAL - Digital training programme for adults

This programme aims to eradicate the digital illiteracy of one million adults in Portugal, through a national network of thousands of volunteers and 1,500 spaces spread across the country. It aims to promote digital literacy, teaching adults who have never used the Internet to do so. Fundão was in the spotlight at the launch of the programme EU SOU DIGITAL - Programa de Capacitação Digital de Adultos, which took place on 06 July 2021.

Website

Agricultural Innovation Fair

The 1st edition of this event was held this year, 2022, in the region of Fundão. It was attended by experts, members of academia, technology companies and strategic decision-makers in the sphere of local and agricultural development policies, with a programme that included conferences, lectures, round tables, debate panels, networking moments and, demonstration actions of innovative technologies applicable to the development of a smarter agriculture.

Website

AgroTech Challenge

It is an initiative of the Municipality of Fundão, CCILB - Câmara do Comércio e Indústria Luso-Brasileira, CIEBI - Centro de Inovação Empresarial da Beira Interior, VeraTech Company and the Brazilian Embassy in Portugal and aims to promote the development of integrated and customized solutions for agriculture, from the presentation of answers to 4 challenges: 1) development of agronomic indexes based on aerial images; 2) publication of agricultural activities in blockchain; 3) frost forecasting using artificial intelligence; 4) almond counting using Machine Vision.

Website

MAP Finland Suomi

AgriHub

Agrihub is a networking project coordinated by the Natural Resources Institute Finland (Luke) that gathers Finnish agriculture and horticulture operators such as farmers, advisors, educators, and researchers to collaborate, with the aim of improving farmers' long-term profitability, sustainability, and risk management. It is part of the rural network's (Maaseutuverkosto) thematic group for green growth during 2021–2022.

Finland's Smartest Village

The purpose of the "Finland's Smartest Village" competition was to uncover new solutions for providing services in areas such as healthcare, education, food and energy production, mobility, retail, leisure, and culture. 33 villages from all over Finland participated in the competition organised by the Rural Network (European Agricultural Fund for Rural Development) in cooperation with the numerous partners ranging from the EU-level to the national, regional, and local levels. The competition ended in 2019 with Vuolijoki from the sparsely populated region of Kajaani winning the competition. The jury pointed out the visibility of digitalisation in everyday life in the village.

KYLILLE II

The overall aim of the KYLILLE II project was to increase inclusion, well-being, and health among rural residents, improve the quality and effectiveness of services and reduce regional disparities between rural and urban areas. Among the more concrete activities organised were digital cafés, where older adults were taught to use smartphones, important applications, and other digital communication tools to promote the use of digital devices and services in everyday life. Project activities were organised by local LEADER groups in Southern Ostrobothnia during 2017–2022.

TUUMA

TUUMA is a networking project for promoting new opportunities for work and entrepreneurship in rural Finland. The network highlights rural solutions for entrepreneurship and a sustainable society, to strengthen skills and increase competitiveness and vitality in rural areas. The network includes the University of Helsinki's Ruralia Institute, the University of Turku's Brahea Centre, the University of Vaasa's Innolab platform and the Aisapari LAG. TUUMA is one of the networks operating under the Rural Policy Council network 2021–2023.

MAP Norrbotten

Local digital service to increase liveability and attractiveness

The digital local store in Moskosel was opened in December 2020. Earlier the same year Moskosel was ranked as having the worst societal services in Sweden (SVT,2020). The people living in the village were tired of seeing services disappear and organized themselves to finance the store, which in practice meant they did not have to drive long distances for groceries. The store is unmanned and open all hours. To enter the store, you scan a QR code and sign in with Bank-id. If Bank-Id is not possible for some reason, other options are available. The store is run by an economic association (in Swedish: ekonomisk förening).

Link

DigiBy - Digital services in villages

The project will carry out pilot tests of new digital solutions for service points in villages in Norrbotten. The project aims to increase knowledge about methods and applicability of digitalisation opportunities for service development in rural areas. The project is coordinated by Luleå University and is run in cooperation with Region Norrbotten, municipalities in Norrbotten and the Country Administrative Board in Norrbotten.

Digital hub to create smart and digital rural areas

The hub in Skaulo in Gällivare municipality was started as part of a nationwide digital service network called Digidel, which was a campaign to increase digital participation in 2013. After this the network continued receiving governmental missions in 2018 and 2019. Today there are 26 DigidelCenters in Sweden.
The digital hub is today run by Soutujärvibygden (an economic umbrella organization with aim to further cooperation and the member's economic interests as well as strengthen service in the Soutujärvi-area). The idea is to be a center where all citizens can come and receive digital support with no cost, to be a center for municipal citizen service and be part of a national quality management (in Swedish: kvalitetsarbete) within digital supervising, digital competence and digitalisation.

Servicekontor – Soutujärvibygden (soutujarvi.se)

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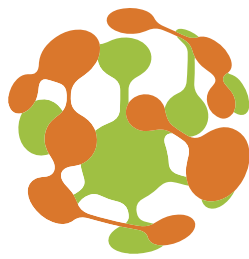
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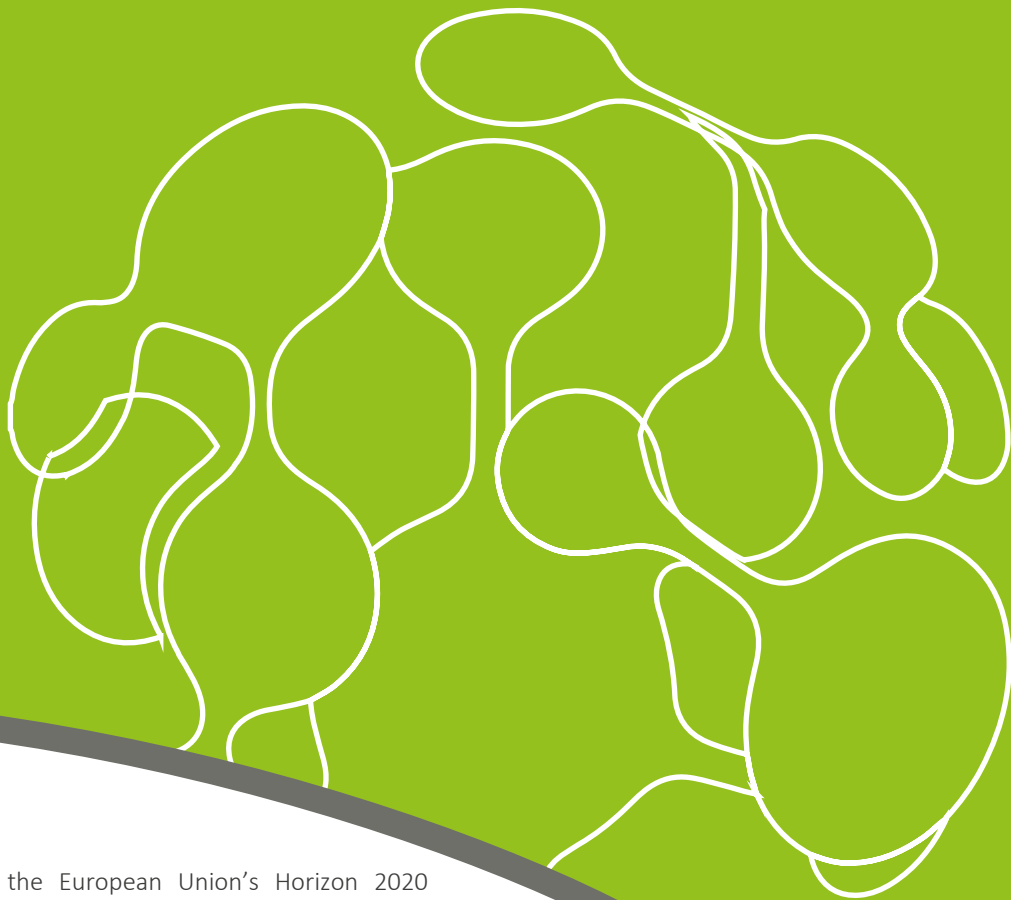University of Ljubljana EUROPEAN RURAL ALMA MATER STUDIORUM USC UNIVERSIDADE DE SANTIAGO DE COMPOSTELA CONSULAI www.consulai.com ALDA European Association for Local Democracy

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