1. INTRODUCTION

This Thematic Briefing is one of the tools developed by the ENRD to assist Managing Authorities and rural stakeholders in designing and implementing Smart Villages initiatives in key domains. The focus of this document is on promoting digital transformation in villages and rural areas. It builds on a previous brief produced by the ENRD Thematic Group Smart Villages entitled ‘Smart Villages – how to ensure that digital strategies benefit rural communities’.

The rationale behind both documents is that government institutions and stakeholders at all levels are putting in place a wide range of strategies to improve digital infrastructure, increase digital usage, enhance digital skills and inclusion, and promote digital innovation in rural areas. However, to optimise the benefits, these initiatives need to engage with and prioritise the needs and concerns of rural communities and stakeholders themselves.

Smart Villages Strategies can help overcome the digital gap by recognising the different starting points of rural areas and villages and co-designing digital pathways from the bottom-up while at the same time building...
bridges with the essential top-down strategies. The long-term aim of Smart Villages Strategies is not just to catch up with urban areas and bridge the digital divide, but also to build partnerships with cities and rural communities. This can encourage rural areas to progress through the various stages of a genuine digital transformation – from digital isolation to connection, and to becoming digital players in their own right.

This Thematic Briefing is targeted firstly at Managing Authorities and other institutional actors involved in preparing the future CAP Strategic Plans (CSP) and other relevant rural development policies. The aim here is to highlight the factors and conditions necessary to ensure that support frameworks for Smart Villages help rural communities engage in a process of digital transformation, whatever their starting point, and become digital innovators as well as creators of economic, social and environmental value.

As Smart Villages Strategies are, by definition, driven by rural communities themselves, this brief also identifies some of the key stages and steps that local actors can take, and provides links to key sources of information and inspiring examples.

2. USING EU RURAL DEVELOPMENT POLICY TO SUPPORT A DIGITAL TRANSFORMATION IN RURAL VILLAGES

The Commission’s proposal for a Regulation on CAP Strategic Plans (3) provides an opportunity to progress towards digital transformation by including a cross-cutting objective for the ‘fostering and sharing of knowledge, innovation and digitalisation in agriculture and rural areas, and encouraging their uptake’. Each CAP Strategic Plan should contain: “A description of the strategy for the development of digital technologies in agriculture and rural areas and for the use of these technologies to improve the effectiveness of the CAP Strategic Plan Interventions”.

To achieve the maximum impact through their CAP Strategic Plans, Member States could follow a series of steps as outlined below (4).

POSSIBLE STEPS FOR ADDRESSING THE DIGITALISATION IN RURAL AREAS IN THE CAP STRATEGIC PLANS

- Map the existing landscape of policy support for the digitalisation of rural areas in your country or region (5).
- Identify the opportunities and needs for using digitisation as an enabler to achieve as many of the nine specific CAP objectives (https://enrd.ec.europa.eu/sites/enrd/files/tg6_smart-villages_eu_jasinska-ostergard.pdf) – through the SWOT analyses.
- Define the priorities for the relevant types of interventions available in the CAP Strategic Plan to meet the needs identified under these objectives, for example:
  - Investments in small scale infrastructure and local services to overcome problems such as the last mile connections;
  - Knowledge exchange and information for training, advice and overcoming the digital skills gap and tackling inclusion (social and economic);
  - Cooperation – including LEADER – for getting stakeholders together, capacity building, feasibility studies, pilots and digital hubs.
- Set targets, allocate budgets and design and implement the necessary interventions.

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(4) These steps were proposed by several Managing Authorities and other stakeholders in a workshop at an EIP-Agri Seminar on Multilevel Strategies for Digitising Agriculture and Rural Areas held in Antwerp on 12 December 2018.
(5) To optimise the value and complementarity of these investments a thorough mapping needs to take place. This mapping must include all existing and planned infrastructure and service development supported through the ERDF and other European, national and local public or private investment.
3. DESIGNING RURAL DEVELOPMENT INTERVENTIONS TO CREATE THE CONDITIONS FOR SMART VILLAGE DIGITAL STRATEGIES

Previous briefings produced by the ENRD Thematic Group on Smart Villages\(^{(6)}\) have shown that several measures in the current Rural Development Programmes (RDPs), as well as types of interventions foreseen in the future CAP Strategic Plans, can be used to support Smart Villages Strategies\(^{(7)}\) together with those which focus on digitalisation. These include LEADER/CLLD and other forms of cooperation, knowledge transfer and community and private investment. While these cannot on their own solve the underlying challenges of rural digitalisation, they can play several key roles:

- Through a Smart Villages approach, LEADER and other forms of support for cooperation can bring together local, regional and national stakeholders to develop a community vision, with social and business cases for the solutions identified;
- They can be used to test new or alternative solutions and to invest in small-scale but vital last mile digital connections. In turn, this can create the conditions for leveraging in or complementing further public and private funding;
- Finally, it is essential that these interventions are aligned with and leverage in further investments supported by the EU Cohesion Policy, the Digital Europe Programme, Horizon Europe and national programmes supporting broader digital strategies.

4. WHAT ARE THE CONDITIONS THAT MANAGING AUTHORITIES NEED TO ENSURE IN SMART VILLAGES TO SUPPORT DIGITAL TRANSFORMATION?

Digital, economic and social transformation throughout Europe is increasing the pressure on villages and their citizens, businesses and public bodies to innovate and to adapt continuously. They cannot just sit back and wait for digital solutions to come to them. They need to become ‘Smart’ players in their own digital transformation. Managing Authorities need to ensure that several conditions are in place throughout their territory to support villages in their digital transformation. These conditions need to be assessed when developing interventions for supporting Smart Villages:

1. Access to connectivity to fast internet need to be ensured. However, to realise their potential, Smart Villages need to combine access to ‘hard’ infrastructure with the development of other essential ‘soft’ capacities and skills;

2. Mechanisms for involving local stakeholders in the identification of digital needs and in the co-creation of digital solutions need to be in place. The adoption and spread of digital technologies will only take place if local stakeholders recognise their usefulness and have the skills and competences to apply them. This starts by carrying out a needs and competence analysis with residents, public players and businesses, and jointly developing a digitalisation roadmap. The roadmap will generally start with digital literacy and inclusion, intended to equip stakeholders with the appropriate digital information, followed by skills and competences to access existing or planned digital infrastructure, understand and use the resulting services and finally contribute to the co-design of new services and actions;

3. Villages must have access to intermediaries, brokers and ‘spaces’ to support a digital transition. Digital hubs, fab-labs, co-working spaces, living labs and other intermediate bodies can help to develop local capacity to innovate. With their support, villages can create and contribute to new smart products and services designed to benefit rural communities and their stakeholders;

4. Cooperation with other digital players in wider regional and national ecosystems need to be supported. Digital innovations are largely driven by major corporations, research institutions and large metropolitan areas and usually require scale. Rural communities find themselves working within a complex public innovation ecosystem of different territorial and sectoral strategies and players. Each Smart Village must be realistic and position itself within these digitalisation systems according to its level of digital maturity (see below) and build alliances and cooperate with local

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and national political, social and economic structures. A first step is to map out policy competences and players. This will help the locals understand where responsibility lies for each thematic or policy area and the mechanisms that allow them to influence policy and practice.

Managing Authorities need to be aware that each village will have different capacities and readiness to start on the digital transformation pathway. Therefore, each village’s ‘digital maturity’ will need to be factored into the interventions to support the Smart Villages by taking this into account in the selection procedures and criteria.

5. ASSESSING THE DIGITAL MATURITY OF A SMART VILLAGE

When designing their support framework for Smart Villages, Managing Authorities need to consider, among other things, the selection criteria and procedures they will use for selecting Smart Villages Strategies. In the case of Smart Village Strategies targeted at digitalisation, the support framework should not only take into account the digital needs and opportunities of the villages, but also their digital maturity or capacity to successfully implement their proposed strategy. This can be assessed in two ways.

Firstly, the usual method is to assess the level and quality of their digital resources. Secondly, several networks and stakeholders involved in the ENRD Smart Villages Thematic Group have argued that it is also important to assess the digital functions that rural settlements are able to carry out both locally and within wider digital ecosystems. Authorities can then adjust their policies and interventions to support villages to reinforce their digital transformation (see the following section).

The table below is based on methodologies developed by the ERUDITE (8) and CARPE DIGEM (9) Interreg Europe projects to support digital service development in rural areas. The table can be used as reference for a simulation exercise (or for direct stakeholder consultation), of needs analysis and service planning. For each building block a scoring system from 1 – 5 will indicate the current state of play. The same scoring system can be used to rate its digital ambitions and its interaction with external stakeholders/players (10).

Table 1. Matrix for assessing the digital maturity of a village or rural area

<table>
<thead>
<tr>
<th>A. The extent and quality of digital resources and skills</th>
<th>Score (1-5)</th>
<th>Score (1-5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Digital infrastructure (incl. WIFI) and public access points</td>
<td>Score (1-5)</td>
<td>Score (1-5)</td>
</tr>
<tr>
<td>The existence of creative, work, innovation and maker spaces/hubs</td>
<td>Score (1-5)</td>
<td>Score (1-5)</td>
</tr>
<tr>
<td>Coordination by a multi-skilled individual/ team (within a wider network)</td>
<td>Score (1-5)</td>
<td>Score (1-5)</td>
</tr>
<tr>
<td>Local &amp; networked experts, skills, technical support &amp; equipment pool</td>
<td>Score (1-5)</td>
<td>Score (1-5)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>B. The types of digital functions that the village can carry out</th>
<th>Score (1-5)</th>
<th>Score (1-5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facilitation of social and economic digital inclusion of local stakeholders</td>
<td>Score (1-5)</td>
<td>Score (1-5)</td>
</tr>
<tr>
<td>Support to digital and social innovation and co-creation in coordination with external policy-makers/service deliverers</td>
<td>Score (1-5)</td>
<td>Score (1-5)</td>
</tr>
<tr>
<td>Mediation/brokerage services to enable the village to access external Research, Technological Development and Innovation (RTDI)</td>
<td>Score (1-5)</td>
<td>Score (1-5)</td>
</tr>
<tr>
<td>Relay for national and regional Digital Innovation Hubs (DIH) and Incubator/Accelerator networks</td>
<td>Score (1-5)</td>
<td>Score (1-5)</td>
</tr>
</tbody>
</table>

While many digital strategies take into account the level and quality of digital resources available in different rural areas, it is less common for them to assess the types of digital functions that the villages can carry out. The following section provides examples of each function.

(8) https://www.interreg-europe.eu/erudite/
(9) https://www.interreg-europe.eu/carpedigem/
(10) Further information on Smart Villages can be found here: https://www.interreg-europe.eu/erudite/smart-villages/
Facilitating the social and economic digital inclusion of local stakeholders

Village stakeholders need locally accessible and tailored support to ensure everyone has the same opportunities and no one is left behind. This function can range from delivering entry level to ‘state of the art’ digital training/competence acquisition, literacy skills and digital ‘helplines’ to help take advantage of the latest/most widespread technologies and new or planned public and business services.

Supporting digital and social innovation and co-creation in coordination with external policy-makers/service deliverers

In order to keep up with change, villages need to mobilise their key resource: people. This function involves creating local intermediaries that empower local people to co-design solutions with the support of external policy-makers and service deliverers.

CONNECTED SCHOOL CAMPUS KAUHAJOKI (FINLAND)

In a town of 15,000 inhabitants, a municipal company, established by seed funding from a consortium of local authorities from the local region, built a Fiber-to-the-home (FTTH) network to provide mega speeds to homes, businesses and communities. As a result, a school campus has been created. It brings together 1,000 children and pupils from kindergarten to high school with a 1Gbits/s connection and 130 teachers and professionals, in a digital and environmental structure designed to encourage educational autonomy and learning. In the Kauhajoki campus, an FTTH pilot was launched in the early 2010’s to connect all classrooms with optical fibre. Tools such as interactive whiteboards, large video screens (for tablets for the children and students and for the communication network that allows exchanges between teachers and parents) are used on a daily basis. The curriculum also ensures that the students become digitally skilled from an early age.


Other initiatives:


DIGITAL VILLAGES (GERMANY)

The Fraunhofer Institute tested a holistic approach for the digitalisation of rural services in several pilot villages in Germany. They worked in a bottom up way with residents, firms and the public sector to consider all aspects of the local digital ecosystem – the infrastructure, the technical platform, domain specific applications, society (needs and skills) and the organisational system. Through the creation of a common digital platform, the Institute is developing new digital solutions in a variety of fields such as the supply of local goods, communication, mobility and e-government. The platform enables the creation of shared services and common rules, and the incorporation of basic tools such as payments, login, data usage controls and partner networks. Local residents work with interdisciplinary teams to create a range of user-friendly apps.

Providing mediation/brokerage services to enable villages to access external Research, Technological Development and Innovation (RTDI)

A third function is that of mediation or brokerage to enable villages to identify and act upon technology, social and market trends and create mutually beneficial partnerships with RTDI stakeholders such as universities, tech companies and government research agencies (11).

**DIGITAL TRANSFORMATION ECOSYSTEMS IN COUNTY DONEGAL (IRELAND)**

Donegal (Ireland) is implementing a county-wide digital transformation strategy, based on the partnership of key players, that aims to i) increase digital research; ii) build a strong digital community; and iii) strengthen county and local digital clusters. They are creating a hierarchical network of digital hubs, such as the one created through the ERUDITE Interreg project, that act as digital enablers and access points, providing a range of digital services and capacity building to enable more remote rural areas to host and foster high-tech companies and extend highly skilled digital employment opportunities in to all corners of the county. The next ambition of this network is to match the supply of digital skills with emerging jobs in the area, accessing knowledge and research emerging in other EU regions and build on the wider EU network ERNACT - European Regions Network for the Application of Communications Technology - of which Donegal is a key member.


**DIGITAL INNOVATION HUB (DIH) (SLOVENIA)**

4PDH is a digital innovation hub based in the capital of Slovenia. Through its partnership with the national Fab-Lab network of Slovenia and the Association of Municipalities and Towns of Slovenia, it is closely connected to rural municipalities and communities. The Fab-Lab network (80 % are members located in rural areas) offers communities physical spaces for prototyping and developing digital competences. Within 4PDH, a Public-Private-People-Partnership Digital Innovation Hub within the CARPE DIGEM Interreg project designed an interactive tool to visualize the digitalisation priorities of the Slovenian municipalities.

A web tool ‘Pomoč na Dlani’ (Helping Hand) is available to connect people who need help - such as elderly people needing food or pharmacies, or people requiring childcare with people and organisations who offer this help free of charge. Together with the Association of Municipalities, the Laboratory of Telecommunications of the University of Ljubljana (LTFE) has designed a service that supports the municipalities and their public administrators in their remote meetings. Both services have become especially relevant during the COVID-19 lockdowns.


The assessment of the digital functions is just the starting point for the development of a roadmap for the digital transformation of a village or group of villages. The following section provides insights into the key stages of such a transformation to help Managing Authorities to plan their interventions and villages to prepare their strategies and applications for support.


(13) As the Roundtable on Digitising European Industry. Working Group 1 – Digital Innovation Hubs states: “Digital Innovation Hubs must cater for a wide spectrum of needs and as such will have multiple facets. They must be agile and demand-led; and build sustainable innovation ecosystems, not just gateways to services. While there can be no one-fit-all approach, Hubs should be united by common values based on independence, a commitment to excellence and customer service, and a proactive, innovative approach.”
6. THE DIGITAL TRANSFORMATION OF RURAL VILLAGES

Smart Villages addressing rural digitalisation embark on a journey which not only requires ‘catching up’ with more urbanised areas in terms of digital resources but also designing digital solutions from a rural perspective and carving out of digital functions that the village can carry out to become a realistic player within a wider digital ecosystem.

The transformation process described in the diagram below is based on the ERUDITE and CARPE DIGEM INTERREG projects, as well as on the Smart Villages journeys undertaken by some of the longest running Smart Village examples such as Lormes (FR), Murat- South Ostrobothnia (FI), Donegal (IE).

**Figure 1. Key stages in the digital transformation of rural areas**

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Excluded</td>
<td>• Poor or no mobile and broadband&lt;br&gt;• Low/no skills&lt;br&gt;• Low/no public-private services&lt;br&gt;• Low/no inclusion</td>
</tr>
<tr>
<td>2. Connected</td>
<td>• Basic Broadband&lt;br&gt;• Elementary capacity building&lt;br&gt;• Entry level digital literacy/inclusion&lt;br&gt;• Engage target stakeholders and co-identify priority actions</td>
</tr>
<tr>
<td>3. Engaged</td>
<td>• Widespread digital literacy &amp; service use&lt;br&gt;• Local access to training, education, public &amp; business services&lt;br&gt;• Stakeholder input to services design, roll out &amp; monitoring</td>
</tr>
<tr>
<td>4. Experienced</td>
<td>• Fibre broadband&lt;br&gt;• Business/citizen capacity to exploit digital innovation&lt;br&gt;• Cooperators in territorial digital transformation&lt;br&gt;• Full equivalency of service access with metropolitan areas</td>
</tr>
<tr>
<td>5. Player</td>
<td>• Full technical, economic and social capacity to innovation &amp; contribute to digital + sustainable economy and society&lt;br&gt;• Village (co)owner of its data &amp; shares in added value created&lt;br&gt;• Partner in the development of new products and services</td>
</tr>
</tbody>
</table>

The diagram illustrates that in the early stages there is a stronger need to support hard physical investments to bring internet and digital infrastructure to rural areas, together with soft interventions for capacity building in digital skills to take advantage of the investments made. As villages move towards more advanced stages, the interventions focus increasingly on the combination of soft and hard actions to enable villages and their actors to become digital players within wider regional and national ecosystems.
The digital transformation of Lormes - the petite "village du future" (France)

Lormes illustrates the timescale and steps that are required for a village to become a "player" in a wider digital ecosystem. Lormes is a small market town (1,300 residents) located in the Morvan area, in the county of Nièvre, Burgundy (France). The 'village du futur' project was initiated in 2015. This is the latest step in its digital and social journey towards being a village of the future, which began in the early 2000s. The main stages were as follows:

1. **Excluded**: Lormes began its digital and social journey with a ground-breaking district-level digital policy to foster the economic and social potential that ICT and the Internet could bring to remote rural areas, therefore avoiding exclusion;

2. **Connected**: Lormes/Pays Nivernais Morvan set up the first 'Digital Mission' association in 2003, to provide digital inclusion and education support services to the community and initiated the 'Digital passport for everyone' programme (14);

3. **Engaged**: In 2007-2008, the Rural Hub 'Portes du Morvan' (15) was created, providing eight offices with connection to the high-speed broadband network (FTTH fibre-optic 100 Mb), technical support, meeting rooms, videoconferencing facilities, loan of equipment, VoIP telephones, network server and expansion of digital inclusion and mediation services;

4. **Experienced**: between 2014-2016, the first rural FTTH pilot was conducted in Burgundy together with a community consultation to prioritise new digital services to accompany the deployment of FTTH, the expansion of Rural Hub and the launch of the 'Villages of the Future' process focusing on wider community-led social and economic regeneration;

5. **Player**: In 2017, the 'Village of the future' (16) process got financial support from France’s rural contracts (17) (signed in March 2017). The Rural Hub or ‘Mission’ started to act as a competence centre for the business, public and community sectors by delivering training and mediation services on behalf of the county and regional government through two agreements. Lormes Rural Hub has inspired others to follow a similar digital transformation path as in the case of the Slovenian National Fab-Lab Network (see more information below).

The digital journey of Lormes has taken over 20 years. Other villages will have different starting points – and no journey is ever the same. Nevertheless, the smart solutions implemented by Lormes show that a genuine digital transformation of rural areas requires more than overcoming the divide in terms of infrastructure and skills. It requires an ongoing partnership with and between locals to co-design digital services which meet local needs and a realistic “smart” assessment of the role that the village can play in wider territorial development (18). The support frameworks for Smart Village Strategies focusing on rural digitalisation should take account of these lessons.

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(14) In the early 2000’s in cooperation with France Telecom the ‘Pays’ organised a series of digital literacy workshops in accessible public locations (e.g. village halls) based on ‘learning pathways’ to give citizens and business the basic skills to use the Internet and ICT. Each participant received a ‘passport’ detailing the ‘pathways’ they had followed and the skills acquired.

(15) https://www.nivernaismorvan.net/


(17) https://www.cnrt.gouv.fr/actualites/contrat-de-ruralite

(18) See the example above of the Digital Innovation Hub (DIH) in Slovenia.