Pilot Project: Smart eco-social villages

Final Report

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The United Kingdom withdrew from the European Union as of 1 February 2020. During the transition period, which ends on 31 December 2020, Union law, with a few limited exceptions, continues to be applicable to and in the United Kingdom and any reference to Member States in Union law shall be understood as including the United Kingdom.

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Abstract

The Pilot Project on Smart eco-social villages, initiated by the European Parliament, was completed by a consortium consisting of Ecorys, Origin for Sustainability and R.E.D. between January 2018 and April 2019. The conclusions of the Pilot Project are important for the future use of the Smart Village concept in the EU. The review of opportunities and challenges provides a robust knowledge base, the proposed definition clarifies the concept of Smart Villages, and the interactions with villages in the 15 good practice examples and the six case studies gathers insights from grass roots experience. The Pilot Project identified many examples of villages currently 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. Despite the diversity of situations, many Smart Villages share common features which are reflected in the proposed definition, such as the importance of citizen participation, an adequate governance and the use of an 'anchor' project in steering the strategy towards a specific objective. An appropriate support to the development of Smart Villages should be provided at EU, national and regional levels.

Le projet pilote sur les Villages éco-sociaux intelligents, initié par le Parlement européen, a été mis en œuvre par un consortium composé d'Ecorys, Origin for Sustainability et R.E.D. entre janvier 2018 et avril 2019. Les conclusions du projet pilote sont importantes pour l'utilisation future du concept des Villages Intelligents. L'examen des défis et des opportunités fournit une base de connaissances contextuelles, la définition proposée clarifie le concept de Villages Intelligents et les échanges directs avec les villages dans quinze exemples de bonnes pratiques et six études de cas ont permis de tirer des enseignements de l'expérience sur le terrain. Le projet pilote a identifié de nombreux exemples de villages développant des solutions innovantes visant à surmonter les défis locaux et améliorer la qualité de vie des habitants. Ces solutions couvrent un large éventail de domaines thématiques tels que l'agriculture, l'environnement, l'énergie, la mobilité, la santé, l'éducation, la culture ou le tourisme. Malgré la diversité des situations, de nombreux Villages Intelligents partagent des caractéristiques communes qui se reflètent dans la définition proposée, telles que l'importance de la participation des citoyens, une gouvernance adéquate et l'utilisation d'un projet "d'ancrage" pour orienter la stratégie vers un objectif spécifique. Un soutien approprié au développement des Villages Intelligents doit être apporté aux niveaux européen, national et local.

1 Introduction

The concept of 'Smart Villages' has gained increasing attention recently in the EU. Following the Cork 2.0 European Conference on Rural Development in Ireland organised in September 2016, the European Commission published an '*EU action for Smart Villages'* in April 2017 which reviews the main EU policy areas that already contribute to the development of Smart Villages. It also underlines the need to bring different programmes together in order to build a strategic approach that can foster the development of 'Smart Villages'. Sixteen concrete actions are also described to promote 'Smart Villages' that build on a wide array of EU policies, including rural development, regional development, research, transport, energy and digital policies. The sixth concrete action mentioned is this Pilot Project on Smart eco-social villages, initiated by the European Parliament and implemented under the responsibility of the European Commission (DG AGRI), which aims to "*explore characteristics of smart eco-social villages and identify best practices upon which decision-makers and rural communities can build future development strategies*".

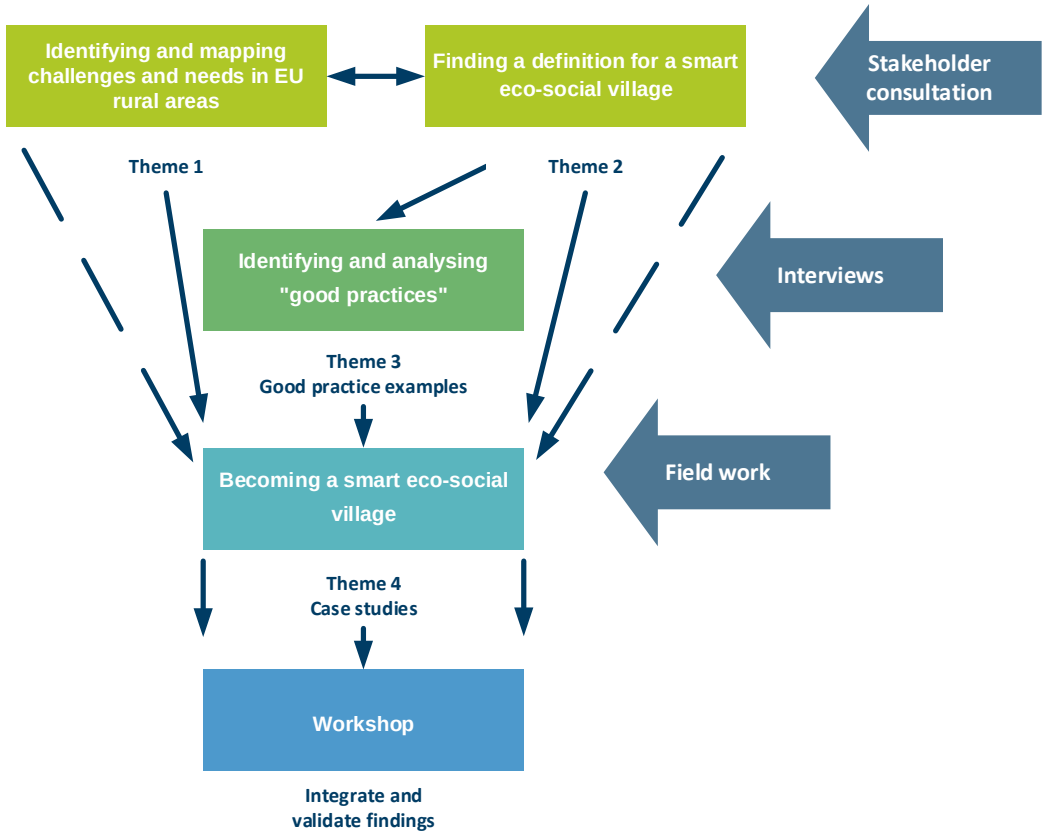
The objectives of the Pilot Project are expressed in its four distinct themes. The first Theme maps opportunities and challenges in rural areas. The second Theme proposes a definition of 'Smart eco-social villages', which is used to define the boundaries of the two further project Themes. The third Theme describes existing practice in detail: 15 best practices are identified, described and analysed. The fourth Theme investigates pathways to development into a Smart Eco-social Village: the process of planning, designing and establishing a Smart Village strategy has been investigated for six villages that expressed an interest in becoming a 'smart eco-social village'. The conclusions were presented and discussed at the final workshop organised at the European Parliament on 21 and 22 February 2019.

This report is structured according to the four themes of the Pilot Project. Following a description of the methodology in chapter 2, the results of first Theme on opportunities and challenges are presented in chapter 3, the definition developed in second Theme is presented in chapter 4, the fifteen practices analysed in the third Theme are presented in chapter 5 and the findings relating to the fourth Theme are analysed in chapter 6. The final workshop is presented in chapter 7 and the conclusions are summarised in chapter 8.

2 Methodology

The overall approach to the study builds on four themes and is presented schematically in the figure below. The themes and the links between them are explained in more detail below.

Figure 1 Overview of the methodology



Source 1 Ecorys

Theme 1 identifies and maps challenges and opportunities in rural areas of the EU. This began by conducting a broad literature review of the opportunities and challenges rural areas face. It was then refined through interaction with key experts and the project Steering Committee, in order to identify a selection of "grand challenges" for rural areas in Europe. The results are illustrated in maps and the information and data collected are presented on the basis of a clustering exercise. This mapping exercise provided a framework that ensured a diverse selection for the case studies conducted under Theme 4.

The description of the activities carried out under Theme 1 and the outcomes are provided in chapter 3 of this report.

Theme 2 concerns the development of a working definition of a smart eco-social village (hereafter we shorten this to "Smart Village"). Combining the existing body of knowledge, recent policy developments and initiatives, as well as stakeholder views, a comprehensive description of relevant characteristics

and criteria to identify a Smart Village has been produced. We implemented a participatory approach to conform with the general principle of stakeholder involvement embedded in recent initiatives such as the Cork 2.0 Conference, the working method of the EIP-AGRI, and the thematic working groups of the ENRD.

During the project, two open consultations have been completed which, along with an expert workshop, had the goal of gathering the views of relevant actors to produce an agreed working definition. Case studies completed during the Pilot Project provided the opportunity to supplement views on the definition from the villages involved.

The description of the activities carried out under Theme 2 and the outcomes are provided in chapter 4 of this report.

Theme 3 focuses on the identification, analyses and reporting of existing good practices. The information collected mostly comes from interviews with key actors involved in current and on-going Smart Village projects. This knowledge allowed the definition to be refined, and provided a base on which to identify the main aspects to be addressed during the implementation of the case studies under Theme 4.

The objectives of Theme 3 were to identify, analyse and describe around 15 concrete examples of innovative initiatives falling within the concept of Smart Village, based on the criteria established under Theme 2. The main aspects covered by the good practice identified in the 15 targeted villages were:

- the identification of innovative solutions to address the challenges of rural areas;
- the diversity of rural territories;
- the accessibility to place-based assets, and the use of the latter in combination with ICT and other technologies;
- the capacity to access funding and identify on-going opportunities/initiatives;
- the involvement of the local population in the development of local development strategy;
- the identification of the most relevant development opportunities.

Chapter 5 of the report describes these best practices and their relevance for the concept of Smart Village.

Theme 4 sets out how the six case studies focusing on communities willing to become a Smart Village were implemented. Information gathered under Theme 1 and Theme 2, and through open consultations, supported selection of the cases. In particular, this has taken into consideration diversity, both in terms of local opportunities and challenges, and in the approaches of the communities aspiring to become a Smart Village. To support the engagement with local communities, field visits – including meetings and workshops with the main community actors – have been completed to identify the main needs of and opportunities for local communities to realise their future development. The participatory approach adopted required a significant level of engagement of the key local actors in each case study. The two principles of our approach were social connectivity (assisting networks with relevant actors), and co-construction (participation of local stakeholders).

Some key elements emerging from the pilot case studies (described more in depth in chapter 6 of this report) are that:

- the involvement of the local authority must be assured from the outset of the case study implementation, to avoid misunderstandings and allow for prompt adaptation measures when necessary;
- the limited time for case study implementation (between two and three months from the first contact to the second visit) is not sufficient to establishing an appropriate participatory approach linked to the project objectives when this is not already in place;
- vigorous and time-consuming effort is required for the "homework" activities between the two visits;
- information sharing and stakeholder engagement are difficult in the absence of in-depth knowledge of the local situation and existing community networks or initiatives;
- it is essential to engage with a local contact person, who needs to be thoroughly familiar with the Pilot Project objective, with the work required and with the local situation; moreover the contact person should have well-established and continuous relations with the local authority.

Taking into consideration the above points we have tailored and adapted the methodology applied in practice, building on:

- a simplified approach, focusing on practical actions rather than hypothetical scenarios;
- a tailored approach (although constructed on a common framework) based on the maturity level of the village, the residents' experience, their capacity and their overall development aims;
- valorisation and recognition of the local experience and past and on-going activities as the basis for future development (and for the identification of development areas);
- a SWOT analysis, focusing specifically on the main development areas as identified by the Pilot Project;
- establishment of direct contacts with the local authority (or project/community leaders) to ensure that project objectives, especially of the case study implementation, are clear and agreed;
- more efficient collection of information reducing the time and resources needed to carry out the "homeworking" activities between the two visits.

The description of the activities carried out under Theme 4 and the outcomes are provided in chapter 6 of this report.

The final element of the Pilot Project was the final workshop (see chapter 7). This provided the opportunity to highlight both existing good practices and the experience of the case studies. By providing a forum of interaction between actors involved in the administration of Smart Villages or relevant key initiatives, as well as high level experts and European level representatives (European Parliament and European Commission), the workshop provided considerable additional value to the Pilot Project outcomes.

3 Rural Europe: the context for Smart Village development

This chapter implements a comprehensive mapping exercise of challenges and opportunities in EU rural areas. A literature review combined with expert consultation enabled the establishment of a database of different indicators in order to map the "grand challenges" rural areas are currently being faced with.

The structure of the chapter is as follows: Section 3.1 provides a review of the rural challenges and development opportunities, Section 3.2 gives an overview of the current knowledge of Smart Villages and Section 3.3 provides a mapping of the challenges and opportunities of the rural areas in the EU.

3.1 Review of rural challenges and development opportunities

Expert attempts to characterise development patterns of rural regions for the OECD (OECD, 2016a) reveal diverse patterns, although most variation can be related to their proximity to cities or urban regions.

The OECD has developed a three-fold typology of rural regions, based on the potential degree of interaction between rural and urban areas:

- Rural areas within a functional urban area are an integral part of the commuting zone of the urban centres and their development is fully integrated with that of the urban areas;
- Rural regions close to a functional urban area are not part of the labour market of the city, but there are flows of goods, environmental services and other economic transactions between them;
- Remote rural regions are distant from urban areas, and their growth comes from absolute and comparative advantage, good connectivity to exports – generally outputs of primary activities, for example tourism, food products.

Each category was then associated with specific challenges and opportunities, in order to design more effective targeted policies (see Table 1).

Table 1 Challenges and opportunities in rural areas according to the OECD (2016a)

	Challenges	Opportunities
Rural areas within a functional urban area	• Service delivery as services concentrate in the core area • Matching the skills to the requirements of the labour market • Managing land-use policy • Keeping rural identity alive	• Capture of the benefits of urban areas and avoid the negative impacts

	Challenges	Opportunities
Rural regions close to a functional urban area	• Competition for land and for landscape between different activities • Conflicts of vision between the old and the new residents	• Potential to attract high-income households • Relative easy access to advanced services and urban culture • Good access to transport
Remote rural regions	• Limited connectivity and large distances increasing the costs of services • Too narrow specialised economies subject to cyclical crisis	• Absolute advantage in production of natural resources • Attractive for firms that need no frequent exchanges with cities • Supply of unique environments

More detail of these challenges and opportunities can be found in discussion below, in subsections 3.1.2 (Current challenges in European rural areas) and 3.1.3 (Development opportunities).

For statistical purposes, OECD proposed in 2011 to distinguish three main categories of rural areas (OECD regional typology, June 2011):

- Predominantly rural region: the rural population accounts for 50% or more of the total population;
- Intermediate region: the rural population accounts for a share between 20% and 50% of the total population. A region which had been classified as predominantly rural by the above criteria becomes an intermediate region if it contains a city of more than 200 000 inhabitants representing at least 25% of the regional population;
- Predominantly urban region: the rural population accounts for less than 20% of the total population. A region, which had been classified as intermediate by the above criteria becomes a predominantly urban region if it contains a city of more than 500 000 inhabitants representing at least 25% of the regional population.

This classification was applied at Territorial Level 3 (TL3), which in the EU nomenclature corresponds to NUTS 3. In this analysis, we consider not only predominantly rural regions but also intermediate regions.

3.1.1 Rural development approaches

Rural development policies have changed considerably, from the typical agricultural and manufacturing subsidy programmes of the past to investment strategies, which promote competitiveness in rural areas. This shift corresponds with the adoption of the OECD promotion of its 'New Rural Paradigm' conceptual framework (OECD, 2006). This acknowledges, firstly, the very diverse and complex socio-economic systems of rural regions, but also the existence of many assets in these regions with low population density that can and should be exploited endogenously, deploying a bottom-up perspective.

Their view was that rural areas close to urban regions are not inevitably going to be more successful; rather, dynamic rural regions prosper on the basis of their good connections and interdependence with cities – mediated, often, by

ICTs – which they have been able to utilise. Current thinking has turned to specific mechanisms for implementation of effective rural policies and practices, resulting in the strategy named "Rural Policy 3.0", endorsed in 2015 (OECD, 2016b).

As the EU service sector now accounts for the largest aggregate share of income and employment, rural areas face a particular challenge in the form of the relatively high costs of service delivery. These costs are driven by several factors, principally accessibility, low levels and density of population, demographic ageing, diminishing subsidies, increasing diversity, and limited numbers of service providers. If rural communities are to play a significant role in our economies in the future, it is important to establish an optimum level of service provision in every region. The expansion and improving quality of ICT connectivity in rural regions has created opportunities for more efficient delivery of a wide range of services for both citizens and businesses. Transformation of these opportunities into improved social, economic and environmental wellbeing is the core task of the Rural Policy 3.0 programme.

At European level, Cohesion Policy was launched in 1988 as a direct continuation of 'Objective 92' - the project to complete the Single Market, and of institutional reform with the Single European Act. The proposal to integrate all existing European funds (EAGGF, EDRF and ESF[1]) for regional development strategies aimed at further reducing regional inequalities was based on the arguments of Tommaso Padoa-Schioppa (Padoa-Schioppa, 1987), commissioned to complement the now widely-known report on the costs of "non-Europe" and the benefits of the single market, written by the team of Paolo Cecchini (Cecchini (coord.), 1989). In his report, Padoa-Schioppa identified the risks of pursuing market integration without parallel progress on macro-economic stability and income redistribution. Given the (then) limited geographic mobility of Europeans, he called for a specific form of redistribution via budgetary solidarity: at other times in history, mobility quickly absorbed socio-economic disparities between regions in a given free-trade area (in the 19th century in Germany or still, for example, currently in North America). In this case, however, persistent or even greater gaps at the national or regional level – despite the opening of national borders – appeared more likely (Krugman, 1987). To ensure that everyone – regions and social segments alike – accepted the disruptions that the single market programme would surely prompt, Padoa-Schioppa concluded that efficiency gains must be shared evenly via specific mechanisms and that policies were needed to promote growth in the regions and for the populations which were less favoured.

The integration of the three funds for supporting territorial development was also a long-standing goal of Jacques Delors. It aimed to use European financing more effectively to support concrete projects meeting socio-economic needs in cities or rural areas, rather than complementing national policies (Delors, 1979). At the time, he presented the creation of Cohesion Policy as a "flanking policy", designed to enhance solidarity between member states by focusing on solidarity between regions and or other areas that shared their social and economic characteristics. EU regional policy aimed at creating a dynamic convergence mechanism by expanding the scope of intra-European solidarity

[1] European Agricultural Guidance and Guarantee Fund (EAGGF), European Regional Development Fund (EDRF), European Social Fund (ESF).

beyond its traditional forms[2], and at "stopping to consider community instruments as components of a financial compensation system" (Delors, 1992). To maximise the effects of EU funds to less-developed regions, cohesion policy was subject to relatively strict rules which were maintained and even strengthened with each new programming period - i.e. multi-annual programming, co-financing by multi-level public authorities, partnership, concentration, evaluation, and additionally (Jouen & La Documentation française, 2011).

Hence, over the first few years, not only did the Single Market obtain good results in terms of growth and employment for the EU12 countries of the time; economic performance results were also significant for recipients of Structural Funds. Various explanations for this success have been offered. Certain experts have questioned the causal role of structural funds, pointing out the small amount they represent in comparison to other national funds, and the extensive impact of other sectorial or national policies on different regions (Sala-i-Martin, 1996). Conversely, other researchers have emphasized the qualitative and quantitative leverage that these European funding instruments have provided (Tödtling-Schönhofer & ÖIR, 2007). Joining the Single Market is generally viewed by evaluators of regional development programs as a determining factor in the creation of new export opportunities for less developed countries and regions. Eliminating borders between these areas also increased imports, due in part to flows generated by major development projects co-funded by structural funds, but in particular thanks to an increase in household purchasing power and domestic consumption (Baudet-Michel & Peyrony, 2003).

3.1.2 Current challenges in European rural areas

Challenges stemming from the socio-economic context or over access to natural resources most often trigger the radical changes involved in the emergence of Smart Villages. An enhanced understanding of factors that may favour or hinder transition pathways from traditional villages to Smart Village status begins from a clear identification of major challenges affecting rural areas in Europe. Those challenges are widely known and have been documented in many policy reports and research papers (see, for example, Eurostat, 2017b; OECD, 2016a).

However, it is important to recall that, because of their diversity, not all rural areas are affected by some or even all of them. As described previously, they are greatly influenced by their relative remoteness (or, conversely, their proximity to urban areas).

Demographic change: depopulation and an ageing population

One major challenge is rural demographic change. Although there are exceptions, many rural areas have experienced continuous depopulation trends and demographic skew as a result of population ageing. Its causes are increasing overall life expectancy and, in many EU Member States, fertility rates below replacement levels (Jentsch & Shucksmith, 2017).

This situation challenges remote rural areas in many ways. The need for core services adapted to an ageing population such as health, long-term care and welfare systems, will increase. As Rechel et al., 2013 argue, this ubiquitous general social trend suggests the need for an integrated approach to help

[2] This refers to solidarity between social categories, usually the remit of the Member States, seen following from the depression in the US (Roosevelt's New Deal) and the post-war Europe (creation of the welfare systems)

people to stay healthy and active in old age, including the creation of policies supporting older workers (2013). In parallel, in eastern Europe and the Baltic Member States, many young people migrate to cities because of a perceived lack of attractiveness of their region, linked to remoteness, lack of activities, low mobility and restricted job markets, for example (Eurostat, 2017b). On the other hand, the current refugee crisis has challenged EU rural areas to integrate young people and families into their community (ENRD, 2016). Therefore, the need for customized services for young people and families is also very significant, since a balanced population age structure is an objective of policies.

Inadequate infrastructure and basic services

More generally, a major challenge in rural areas is the decline or even absence of basic services. Most services are scarce and poorly accessible in more peripheral areas: beyond health and education, infrastructures are mostly unavailable locally, which importantly includes transport facilities to urban centres to access services where they do exist. This phenomenon is closely linked with the demographic trend. When the population decreases, there is no longer a critical mass sufficient to justify government provision of services and infrastructure. This leads to what the OECD calls the 'circle of declining rural regions' (OECD, 2006). Another reason for lagging quality and quantity of services in rural areas is that urban delivery tends to be the norm. New technologies are not always adapted to rural areas, and thus local skills and knowledge are needed to trigger adoption (Esparcia, 2014).

Specifically with respect to digital infrastructure, in 2003 people living in rural areas in most EU Member States had the least access to the internet on a daily basis (Wilthagen & Tros, 2004). Since then, some progress has been made, but in 2017, still only 40% of rural households had next generation access, compared to 76% of total EU households (European Commission, 2017e). Moreover, not all European countries have a smart grid for regular electricity supply, which is the basis for accessing Internet. This rural digital divide creates inequalities in terms of connectivity and access to information, knowledge and services (DiMaggio et al, 2001). Rural areas face substantial barriers that restrict access to high-speed broadband services, and as a result this slows down the digitalisation of activities, constrains access to online services, and produces a widening connectivity gap between lagging rural areas and metropolitan areas (Warren, 2007).

Economic opportunities and labour market attractiveness

Another important challenge throughout Europe, especially in rural areas and even more so in the most peripheral regions, is a lack of jobs. The European Agenda 2020 for new skills and jobs prioritises improvement of employee flexibility, recognising also their need for security and adaptation of skills (combination known as 'flexicurity' (Copus et al., 2006; SEGIRA, 2010). However, unemployment rates vary between northern and western Member States, and eastern Member States. In the rural areas of Eastern Europe countries, primary sector employment is higher (over 25%), indicating underemployment (Eurostat, 2017b) and a lack of alternative job opportunities (ESPON, 2012).

Vulnerability to climate change

Another important challenge that disproportionately affects rural areas is climate change, since they are much more reliant than metropolitan areas on natural resource-based activities: agriculture, forestry and fishing sectors. Alpine areas and Southern Europe are particularly exposed. While this has

prompted awareness of the need to develop appropriate responses at local level, lagging rural areas are hindered by a lower adaptation capacity (Esparcia, 2014). As a result, climate change is believed to affect territorial cohesion more adversely in those territories.

Uptake of new technologies and underdeveloped human and social capitals

Rural governance is ineffective in enabling transmission of knowledge to rural people who need it for establishing and developing new modes of business. A major challenge is to establish effective networks with an R&D resource sufficient to support adoption of socio-technical innovations. In this process, the adaptation capacity of rural communities at local level plays a major role. Adaptation capacity, together with equally important features such as innovation and entrepreneurship, is strongly linked with the strength of the human and social capitals (Dakhli & De Clercq, 2004; Esparcia, 2014; Lee, Florida, & Gates, 2010).

The OECD defines human and social capital, respectively, as:

- "knowledge, skills, competencies and attributes embodied in individuals that facilitate the creation of personal, social and economic well-being" (Keeley & OECD, 2007a, p. 29);
- "networks together with shared norms, values and understandings that facilitate co-operation within or among groups" (Keeley & OECD, 2007b, p. 103).

Because they showcase well-developed human and social capitals, local leaders - or *champions* – can help develop successful rural citizens' initiatives and are driving forces for their community (Coakes & Smith, 2007; Wiseman, 2006). They create new linkages and give access to relevant research and innovation networks.

Improved momentum also requires more effective empowerment of women and young people, and efficient fostering of entrepreneurship in traditional rural domains, as well as in new sectors of the economy (Salemink et al., 2017b, p. 558). However, in almost all Member States the gender gap in employment rates is higher in rural areas than in urban areas. The situation of women with low levels of education is particularly adverse in rural areas (European Commission, 2008). In addition, with lack of skills, socio-cultural perception is another barrier, especially in the rural zones of developing countries (OECD, 2018). Indeed, women face specific difficulties from gender stereotypes, weaker networks, and lack of role models. This can adversely impact on the rate of female entrepreneurship, which is considered an important driver for economic growth. Women account for less than one third of self-employed individuals in the European Union (OECD and European Union, 2017).

The gender gap is particularly striking in computer sciences and the ICT sector. In 2015, only 30% of tertiary graduates in natural sciences, engineering and ICTs were women, and the share of women among tertiary graduates in computer sciences was even lower (OECD, 2017b). Consequently, there is a wide gender gap in ICT specialists: 5.5% of male workers in OECD countries are ICT specialists, but only 1.4% of female workers (OECD 2017a). More

generally, there is significant disadvantage for women in accessing and using ICT effectively. In particular, there is a gender gap in terms of Internet penetration and also in owning and using a mobile phone. Those who own one tend to use it for less complicated tasks than men.

3.1.3 Development opportunities

Despite the wide-ranging challenges they face, rural areas have diverse and substantial untapped assets (social and natural capital, rural-urban linkages, spatial planning analysis, good governance, involvement of women and youth). These extended potential development opportunities could be supported by a smart growth strategy and related radical changes, starting from access to broadband and digitalisation.

Broadband access

In this process, new technologies linked to broadband access offer new opportunities such as the digitalisation of activities and services. Studies indicate that ICT implementation improves the livelihoods of rural communities. As Salemink et al. note: "high-speed broadband is regarded as a prerequisite for people's access to education and information, e-health, recreational purposes, and entrepreneurial and (agro)business activities" (2017b, p. 558). Proper broadband access could help overcome the challenges caused by rural remoteness, enhance connectivity scope and help build bridges with other regions.

Furthermore, "[ICTs] have strong potential for the empowerment of women, allowing access to information and knowledge beyond conventional means (European Parliament & Reintke, 2016, p. 6). It is crucial to ensure women's equal participation in the digital age, both for gender equality and for the European economy" (Iclaves S.L et al., 2018). In rural and remote areas, digitalisation and changes in work organization could provide an opportunity to foster women's employment and entrepreneurship, since enterprises in rural areas have difficulties in finding a sufficiently well-qualified workforce locally. As "employment is becoming increasingly flexible and characterized by "liquidity" (OECD, 2017), various types of work contracts - e.g. part-time contracts, self-employment, etc. - could allow women, and more particularly mothers, to realise more flexibility in their life organisation. Also, digitalisation, enabling distance working, helps women to participate in the labour market.

Environmental public goods and services

As stewards of the countryside, rural communities are providers of environmental public goods and services, mainly related to biodiversity, soil, water, renewable energy and climate action. There is potential to make the most of local resources and to use them to increase interactions with other regions (Lindskog, 2004).

Diversification of the rural economy and urban-rural linkages

Diversification of the economy to reduce reliance on the agricultural sector could be achieved through, for example, the concept of the bio-economy, implementation of the virtuous principles of 'circular economy' (e.g. via short food chains), and the silver tourism economy. Diversification offers scope for simultaneous development of rural-urban economic linkages that strengthen

labour markets and offer more opportunities for young rural people (Marsden, 2009). Beneficial links with functional urban areas have implications for jobs, services and infrastructure development, among other considerations.

Place-based and bottom-up approaches

As highlighted in both the Barca report and the outcomes of the Cork Conference 2.0, these opportunities can best be made use of through place-based and bottom-up approaches to local development. In this respect, multiple impacts have been demonstrated from use of Community Led Local Development policy instruments such as LEADER. However, a central issue that arises in this respect is how to link initiatives taken at national and regional levels to the very local level.

3.2 Smart Villages: overview of current knowledge base and policies

3.2.1 Introduction to Smart Villages

Definition of a 'village' in the study

Echoing the definition used in the EU Action for Smart Villages, "the concept of Smart Villages covers human settlements in rural areas as well as the surrounding landscapes" (European Commission, 2008; Hoggart, Black, & Buller, 2014), The size of territories is not given *per se*, and in practice is believed to vary considerably.

'Village' as such is not a well-defined administrative entity according to European law, nor is it a defined entity in member states. A village may be an entire municipality, or only part of it, even a very small part of it. Through time, merging of municipalities has been encouraged and supported by regional and national authorities, to pool resources and decrease the overhead costs of public services delivery. Settlements without their own 'town hall' may, nevertheless, initiate Smart Village Projects.

In this study, flexible boundaries are used to consider the scope of the 'village', which encompasses all forms of 'living rural community' with a working structure of governance able to define and implement strategic projects based on smart principles, necessarily including strong components related to local economic and social development.

As a result, no formal definition can or indeed should be proposed, nor are distinctions made between different territorial entities, which include municipalities, 'communities of municipalities' as defined by French law, the administrative districts in many countries that group several municipalities together, the National or Regional Parks which also combine several municipalities, LEADER regions, and also 'living territories' that may exist for historical reasons or may emerge to take the lead in a specific project.

Setting the scene from the K4G Smart Specialisation concept to the integrated EU Action for Smart Villages

The concept of smart specialisation first emerged in the European Union (EU) through the 'Knowledge for Growth' (K4G) expert group, which was established in 2005 by the former European Commissioner for Science and Research Janez Potočnik. The brief of this K4G group was to propose a policy agenda to increase the European economic growth rate. In response, they produced the 'smart

specialisation' conceptual framework, which has since then been progressively incorporated into major European policies and initiatives (Foray, David, & Hall, 2009; Leoncini, 2016).

An example is the EU's 'Europe 2020' strategy, which set policy orientation for the current decade. Significantly, the smart specialisation concept was directly translated into 'smart growth' as a guiding principle for economic success. It was expressed through three flagship initiatives: 'Innovation Union' to develop an economy based on knowledge and innovation focusing on R&D and innovation policy; 'Youth on the move' targeting young people and promoting student and trainee mobility; and 'A Digital Agenda for Europe' to increase high speed internet infrastructure and broadband access (European Commission, 2010). In 2011, merging previous ideas on the Smart Community with the established concept of Smart City (Lindskog, 2004), the EU launched the Smart Cities and Communities Initiative, which has then evolved into the European Innovation Partnership on Smart Cities and Communities (EIP-SCC). Manville et al. (2014), in a study commissioned by the EU, found that the largest total numbers of Smart Cities are found in the UK, Spain and Italy; in proportion to population, countries with greatest prevalence of Smart Cities are Italy, Austria, Denmark, Norway, Sweden, Estonia and Slovenia.

The scope of major policies contributing to the propagation of smarter cities is very wide, and correspondingly the expected impacts of such support policies are substantial. These hopes are mostly based on the positive, concrete results obtained by municipalities and metropolitan areas that have already implemented policies to support such smart development. Such outcomes serve as a pilot for wider application, or even a model for generalisation, of the smart specialisation dynamic (European Commission, 2008; Hoggart et al., 2014).

Capitalising on experience gained from the early development of smart cities and broadening the scope of the smart concept to rural areas, a reappraisal of rural development models and practices began in the late 2000s. This began through a focus on 'smart regions' at OECD level, which was taken up at European level (the topic first emerged in 2011 in the EU 2020 Strategy) and at national levels by some pioneer Member States including, among others, Italy, France, Spain, the Netherlands and Finland. Since then, it has been incorporated in several EU policy initiatives, such as the establishment of Broadband Competence Offices, the Research and Innovation Strategy for Smart Specialisation (RIS3) materialised under the S3 Platform (S3P) developed in 2015 by the Joint Research Centre (JRC), and the application in Cohesion Policy as part of the Regional Development Fund (ERDF) initiative to develop 'Smart Regions'. Other funds, such as the European Fund for Strategic Investments, also support the EU Digital Agenda.

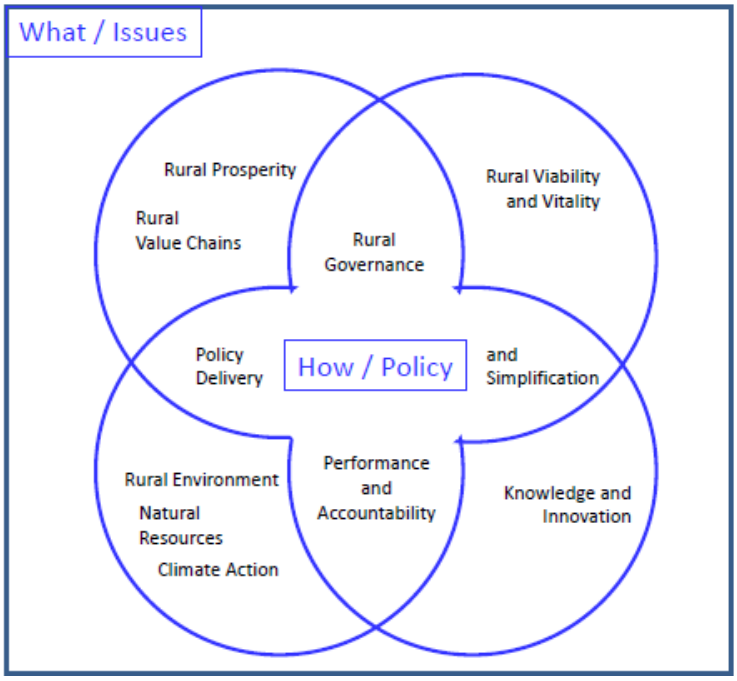
Recent application of the RIS3 to food and agriculture represented an initial attempt to transpose the concept of smart cities to rural communities. The Smart Specialisation Platform for Agri-food (S3P Agri-food) began developing approaches and tools to establish smart specialisation strategies in rural areas

in 2016. Using the concept of a virtuous quadruple helix, it has identified initiatives and built partnerships between regions, in principle facilitating the development of new value chains through the interconnection of regional innovation eco-systems and their actors in specific S3 investment areas. A key point in that transposition is the emphasis on exploiting place-based expertise and industrial skills within the regional innovation eco-system, based on multi-level approaches to experimentally extend and strengthen regional innovation eco-systems (Ciampi Stancova & Cavicchi, 2017).

In parallel, the European Network for Rural Development (ENRD) established 'Smart & Competitive Rural Areas' as one of its Thematic Work areas for the 2014-2020 programming period. This is being developed through three consecutive thematic working groups (Food and Drink Supply Chains, Rural Businesses, and Smart Villages). The 'Smart Villages' Thematic Group began work in September 2017. Focusing on ways of revitalizing rural services through digital and social innovation, it explores how rural services – such as health, social services, education, energy, transport, retail – can be improved through the deployment of Information and Communication Technology (ICT) tools and through community-led actions and projects. It is also reviewing how the Rural Development Programmes (RDPs) can be best used to support this process (European Network for Rural Development, 2017a). ENRD Thematic Group on Smart Villages has provided a number of highly relevant publications and leaflets in 2019. The aim is to raise the awareness of the LEADER/CLLD (Community-led local development) groups about the opportunities of funding through multiple European, regional and local supports, and to show the benefits and positive impacts of such initiatives. The Smart Villages webpage of ENRD website provides all relevant and up-dated information on the activities of the platform.

All these initiatives have gained reinforcement from the Cork 2.0 Rural Development Conference held in 2016. Based on the dialogue between rural experts and practitioners, this generated a comprehensive, participatory identification of specific challenges faced by rural areas, encapsulated in a 10-point programme for future action (see Figure 2).

Figure 2 The relations between the 10 objectives set by the Cork Conference on Rural Development



Source 2 European Union, 2016

Following the Cork conference, the Commissioners for agriculture and rural development, regional policy and transport, Hogan, Cretu and Bulc jointly launched the EU Action for Smart Villages in 2017. It emphasises "…the need for integrated approaches and the interaction between different policy fields in view of increasing complementarity and coherence" to unlock the potential of rural areas. Smart Villages are described in this Action Plan as: "rural areas and communities which build on their existing strengths and assets as well as on developing new opportunities. In Smart Villages, traditional and new networks and services are enhanced by means of digital, telecommunication technologies, innovations and the better use of knowledge, for the benefit of inhabitants and businesses" (European Commission, 2017d, p. 3).

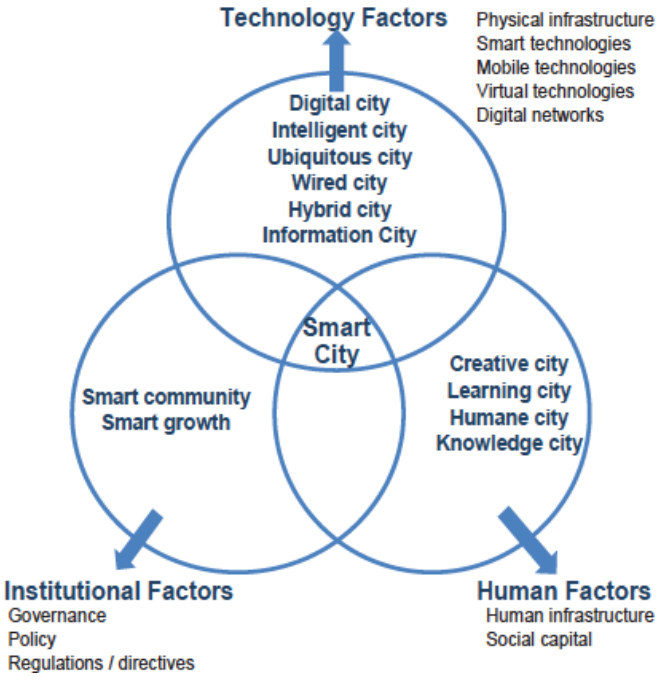
3.2.2 The 'smart' concept in urban areas

The 'smart' concept emerged alongside the rise of the global Internet in the 1990s and highlights the new possibilities created through development of Information and Communications Technologies (ICTs) (Lindskog, 2004). It represents more than the mere exploitation of digital technologies, but aims to respond creatively to the economic, social and political challenges faced by post-industrial societies at the turn of the 21st century. Consequently, in its wider definition, the term has evolved to encompass additional non-technical innovations that contribute to a better and more sustainable city life (Dameri & Rosenthal-Sabroux 2014).

Planning practitioners and policymakers took up the term and it has been at the rhetorical heart of development of many international initiatives. Early on, these were mainly focused on urban areas (Zygiaris, 2013). The birth of the

'smart city' concept was rooted in analyses of innovative socio-technical and socio-economic aspects of growth. These were addressed by several economists in the first decade of this century, for example Atkinson and Castro (2008) and (2003). Shapiro explored the concept in depth in a study of city growth and its drivers in local productivity growth and quality of life aspects (2003). This analysis suggests that although smart growth embraces far more than ICT aspects, it is catalysed by digital technologies combined with democratised access to internet, human capacity-building that further extends utilisation and potential, and enhanced connectivity that gives access to novel fields of innovation. In sum, this makes possible a transition that combines the concepts of: "'green' referring to urban infrastructure for environment protection and reduction of CO2 emission (…), 'intelligent' declaring the capacity to produce added value information from the processing of city's real-time data from sensors and activators, whereas the terms 'innovating', 'knowledge' cities interchangeably refer to the city's ability to raise innovation based on knowledgeable and creative human capital. While each one of these smart city conceptions pictures partially the smart city vision, they all contribute significantly towards growth and sustainability" (Zygiaris, 2013, p. 218). As Figure 3 shows, technology, institutional and human factors are at the core of smart city building processes (Nam & Pardo, 2011).

Figure 3 Fundamental Components of Smart Cities



Source 3 Nam & Pardo, 2011

3.2.3 Smart specialisation in regions

Smart specialisation at regional level forms a major opportunity to rebalance sustainable regional development more coherently and equitably. Several authors (e.g Depraz, 2017; Gkartzios & Scott, 2012) have observed a gentrification trend in the peri-urban rural areas that are well-integrated into

metropolitan systems. This transformation of rural economies has been linked to a new incoming population of affluent 'amenity migrants', for whom a move to the countryside affords an increase of quality of daily life, particularly because they can work partly, or even entirely, from home provided that ICT and high-speed broadband connections are sufficient (Morse, 2014). Notwithstanding, the smart specialisation policy faces a major challenge in encompassing the diversity of regions around Europe in which it must be implemented (Foray et al., 2009).

As noted in the introduction, the Knowledge for Growth expert group was, in 2009, the first to introduce the concept of 'smart' at EU policy level (Mccann & Ortega-Argilés, 2015). Moving beyond cities and urban areas, it has been operationalized at territorial level in the conceptual framework of 'smart specialisation'. In response to the 2008 economic crisis, smart specialisation aims to stimulate growth in the EU Member States by fostering innovation and research & development in the regions. This concept is based on the fundamental idea that each region should identify and exploit appropriate specialisation domains, which will help guide the development of their economy. To do so, public institutions must leave the role of initiating innovative processes to entrepreneurial actors. Public entities should act as a support through what Foray et al. (2009) called the 'entrepreneurial process of discovery' and so enhance the learning process of local entrepreneurs in the discovery of promising areas of future specialisation.

The specialisation of a region is based on its existing characteristics and assets and a realistic appraisal of diversification potential. It is therefore embedded in the local economy (*embeddedness*), takes as a starting point the current technologies used by local industries (*relatedness*), but also capitalises on new linkages to acquire new knowledge (*connectivity*) (Camagni & Capello, 2013). Keys to the process are the maximisation of knowledge spill-overs and learning linkages within and between regions. It should lead to an increase of the innovation capability of an area and an enhancement of the local expertise in knowledge production and use. Smart specialisation at regional level demands a territorial approach and consequently cannot be supported by a 'one-size-fits-all' policy.

Innovation is a collective process that requires the actors involved "to re-interpret continuously the contexts in which they move" (Klerkx, Aarts, & Leeuwis, 2010, p. 390). The innovation pathways[3] are therefore not linear, and are specific to each territory (Camagni & Capello, 2013; Capello & Kroll, 2016; McCann & Ortega-Argilés, 2015). Intangible aspects of the local communities[4] play key roles in knowledge creation. Scholars therefore emphasise the importance of local human capital formation and skills enhancement for the success of smart specialisation strategies (Capello & Kroll, 2016, p. 12). An

[3] The "Innovation pathway" is a socio-economic concept expounded by Geels and Shot in 2007. It explores the social and technical transitions along the process of adoption of innovations, regardless of their complexity. The importance of "paths" was first introduced in economic theory by North D. (1990), *Institutions, Institutional Change and Economic Performance*, Cambridge: Cambridge University Press.

[4] Including entrepreneurial spirit, creativeness and cognitive capability, civic and social virtues, cooperation capabilities and relational attitudes, openness to diversity, and curiosity.

appropriate policy environment is essential to uncover and foster the creation of human capital.

Policy design, policy delivery, and policy evaluation systems require openness and inclusivity to allow the participation of broad range of stakeholders and interested parties. A necessary condition is that local politicians and administrators should be open to and engage with bottom-up and participatory processes. Special care is needed to avoid the smart strategy from resulting in the strengthening of existing monopoly positions and their associated negative lock-in effects. Evaluation and the assessment of emerging initiatives must therefore be conducted on a regular basis to fine-tune and adapt support of promising and viable strategies (particularly, for example, parallel investments in educational and training institutions related to emerging specialisations).

Teräs et al. (2015) examined six case studies of the application of smart specialisation to less densely populated areas and identified lack of scale as potentially reducing effectiveness of the strategy. A sufficiently large population base is required to assemble a critical mass of entrepreneurial actors. Villages in such regions provide the largest concentrations of population that could provide some agglomeration economies. Less densely populated regions could benefit significantly from smart strategies to "mobilize geographically dispersed [and], previously 'untapped' assets of territorial capital, and use them in the most efficient possible ways" (Salemink et al., 2017b). Smart specialisation in 'lagging' areas should be conceived of as more than technological and industrial dimensions and R&D-driven innovation, but also needs to embrace wider concepts of cohesion and territorial development. Territorial assets could include the natural environment, tourism attractions and intangible assets such as the landscape and art of cooking. In this context, ICT investment should be regarded as the catalyst that helps to bridge the urban and rural divide (Cavicchi & Stancova, 2016).

3.2.4 Smart Villages

Scientific literature on the smart concept applied to rural areas is scarce, and Smart Villages do not yet appear to be a very well-established concept; nevertheless, they are an emerging reality. They correspond to an extension of the smart concept to less densely populated territories with their own governing institutions. Smart development can help rural communities to unlock local opportunities under a common strategy framing territorial development. Applying the 'entrepreneurial process of discovery' to untapped local assets provides an avenue for enhancement of the sustainable development of rural areas. However, specific characteristics of Smart Villages are not yet fully identified, and more effort is required to recognise what they are and how they are established.

While, at present, initiatives in Smart Villages appear to be more focused on enhanced rural services delivered or mediated through ICTs[5], the 'ecological'

[5] E.g. high-speed broadband access to the web, wide participation of the local population through the medium of web-connectivity, digital mediation, homework and teleworking, universal on-line public services access, accelerated development of local human capital through enhanced distance learning opportunities, e.g. MOOCs, globally connected exchanges and international relations, etc.

and 'social' dimensions[6] of the concept appear to be equally applicable and appropriate as an integrated element of the 'smart' concept applied to rural areas. Empirical evidence from case study analysis of past and on-going initiatives therefore appears to be fundamental for developing a representation of the situation in the field, and for a better understanding of how the different dimensions interact. Finally, it is interesting to note that the concept of 'Smart Villages' has also been developed outside the European Union by the Smart Villages initiative[7].

[6] E.g. careful and sustainable use of natural resources (smart grids, car-sharing, etc.), low technology, sustainable and bioclimatic housing, eco-villages, eco-citizenship,), knowledge sharing and co-construction, participation, and popular empowerment, rural entrepreneurship, local sourcing for schools and public procurement, well-being and equity, enhanced networking, etc.

[7] Reference: "Smart Villages", a pocket guide to rural energy and "Smart Villages", Cambridge Malaysian Education and Development Trust or the Templeton World Charity Foundation, 2017.

3.2.5 *Policies and funding instruments related to smart development*

The table below sets out conjunctions of policies and related funding instruments that may initiate, support or boost transitions to Smart Villages, by giving examples of funding instruments from the different policy areas.

Table 2 Examples of instruments in the current EU policies that could finance Smart Villages

Policy Areas	Financial Instrument	Type of action funded	Eligibility	Policy background and funds	Implementation	Legal Basis
Various	Community-led local development (CLLD)	Local cooperation projects to design and implement an integrated development strategy	Local Action Groups (LAGs)	European Agricultural Fund for Rural Development (Measure 19)	Implemented under the national and regional RDPs of each EU Member State*	Regulation (EU) No 1303/2013 Regulation (EU) No 1305/2013
				European Regional Development Fund	Supported at national/regional level and managed by Member states	Regulation (EU) No 1303/2013 Regulation (EU) No 1301/2013
				European Maritime and Fisheries Fund	Supported at national/regional level and managed by Member States	Regulation (EU) No 1303/2013 Regulation (EU) No 508/2014
				European Social Fund	Supported at national/regional level and managed by Member States	Regulation (EU) No 1303/2013 Regulation (EU) No 1304/2013
Various	Rural Development Measures (outside LEADER/CLLD)	-Measure 1: knowledge transfer and information -Measure 7: basic services and village renewal in rural areas -Measure 16: cooperation	*	European Agricultural Fund for Rural Development	Projects supported at national/regional level and managed by Member States	Regulation (EU) No 1303/2013 Regulation (EU) No 1305/2013
Various	European Regional Development Fund	General support to broadband investments	Public authorities, private non-profit bodies and in certain cases SMEs	European Regional Development Fund	Projects supported at national/regional level and managed by Member States	Regulation (EU) No 1303/2013 Regulation (EU) No 1301/2013

Various	European Social Fund	General support to digital, entrepreneurial skills	Public authorities, private non-profit bodies and in certain cases SMEs	European Social Fund	Projects supported at national/regional level and managed by Member States	Regulation (EU) No 1303/2013 Regulation (EU) No 1301/2013
Various	European Territorial Cooperation (Interreg programmes) (79)	Cross-border and transnational cooperation projects	Public authorities, private non-profit bodies and in certain cases SMEs	European Regional Development Fund	Projects supported at national/regional level and managed by Member States	Regulation (EU) No 1303/2013 Regulation (EU) No 1299/2013
Various	Cohesion Fund	Trans-European transport networks and to projects falling under EU environmental priorities	*	Cohesion fund	Projects supported at national/regional level and managed by Member states Only for Member States whose Gross National Income per inhabitant less than 90 % of the EU average	Regulation (EU) No 1300/2013 Regulation (EU) No 1303/2013
Broadband	WIFI4EU	EUR 15,000 voucher to offer free Wi-Fi connectivity for citizens and visitors in dedicated hotspots ('centres of public life')	Municipalities or associations formed by Municipalities acting on behalf of their members	Connecting Europe Facility Fund	WiFi4EU Portal from the European Commission	Regulation (EU) No 1316/2013 Regulation (EU) 2017/1953
Broadband	Connecting Europe Broadband Fund (Equity)	Economically and technically viable broadband infrastructure projects	–	Connecting Europe Facility Fund European Fund for Strategic Investments	European Investment Bank	Regulation (EU) No 1316/2013 Regulation (EU) 2015/1017
Culture	Creative Europe Programme	*Examples from 2019 annual work programme C (2018) 6687):* - Support to Training - Support to Market Access - Support to Festival	Private companies, non-profit organisations, associations, charities, foundations, municipalities, individuals	Creative Europe Programme	Education, Audiovisual and Culture Executive Agency	Regulation (EU) No 1295/2013
Education	Erasmus +	Development and networking activities, including capacity building and	Public bodies, universities, schools, education and training providers,	Erasmus+	Education, Audiovisual and Culture Executive Agency	Regulation (EU) No 1288/2013

		transnational cooperative partnerships for knowledge exchange and innovation	non-profit organisations, research organisations, and private businesses			
Energy	European Local Energy Assistance	Technical assistance focused on the implementation of energy efficiency, distributed renewable energy and urban transport projects and programmes	Local, regional or national authorities, transport authorities and operators, social housing operators, or other companies	Horizon 2020	European Investment Bank	Regulation (EU) No 1291/2013 Agreement between the European Commission and the EIB (2017)
Various	European Fund for Strategic Investments	Projects within the investment sectors of the Article 9 of the Regulation (EU) 2015/1017	Private sector entities, public sector entities, banks, funds and any other form of collective investment vehicles	European Fund for Strategic Investments	European Investment Bank	Regulation (EU) 2015/1017

*Depend on the Operational Programmes adopted by the Member States through the Partnership agreement

3.2.6 Update on current policy debates as of April 2019

The Pilot Project has been carried out in parallel to the preparation to the 2021-2027 programming period and during the publication of the Multiannual Financial Framework for 2021-2027 and the publication of the European Commission Proposal for the future CAP (CAP Strategic Plans). In this context, the European Parliament had the opportunity to react with a report[8] on the European Commission's Proposal for a Regulation of the European Parliament and of the Council on the European Regional Development Fund and on the Cohesion Fund. Negotiations and agreements are still to be finalised; therefore, the information in the text below are likely to be subject to further developments.

It is interesting to note that the concept of Smart Villages has been used on several occasions, whether by proposing amendments regarding Smart Villages to the Commission's proposal or by urging the establishment of a Smart Villages Pact. It seems indeed that this political momentum has led to expanded and intensified discussions around the future of Smart Villages.

- An important element of the debate is the proposal to create Pact for rural, mountainous and remote areas (also called Smart Villages Pact). In September 2018, the European Parliament adopted a motion for a resolution on addressing the specific needs of rural, mountainous and remote areas. This motion called for an EU Agenda for rural, mountainous and remote areas and urges the establishment of a Smart Villages Pact. On this occasion, the Commissioner for Regional Policy Corina Cretu acknowledged the needs of rural areas and concluded that "it will be very emotional and beautiful if we end our mandate with a pact for rural areas during the Romanian presidency" and to "work together to put all our ideas in place, and see how we can adapt to all the diversity that we have in these areas".[9]
- Few days later, on 3 October 2018, the European Parliament adopted a resolution on addressing the specific needs of rural, mountainous and remote areas (2018/2720(RSP)). Several points deserve attention. In particular, the European Parliament:
  - Calls for the EU Agenda for Rural, Mountainous and Remote Areas to promote socioeconomic development, economic growth and diversification, social wellbeing, protection of nature, and cooperation and interconnection with urban areas in order to foster cohesion and prevent the risk of territorial fragmentation;
  - Urges the establishment of a Smart Villages Pact, with a view to ensuring a more effective, integrated and coordinated approach to EU policies with an impact on rural areas, involving all levels of government, in accordance with the principle of subsidiarity and the Urban Agenda for Europe set out in the Pact of Amsterdam;
  - Asks, furthermore, for this EU Agenda for Rural, Mountainous and Remote Areas to incorporate a strategic framework for the development of rural, mountainous and remote areas;

[8] Report on the proposal for a regulation of the European Parliament and of the Council on the European Regional Development Fund and on the Cohesion Fund (COM(2018)0372 – C8-0227/2018 – 2018/0197(COD)), available at http://www.europarl.europa.eu/doceo/document/A-8-2019-0094_EN.html#title2

[9] https://www.rumra-intergroup.eu/one-step-closer-towards-the-acknowledgement-of-rural-areas-in-the-european-agenda-2/

  - Encourages rural areas and communities to develop projects such as Smart Villages, building on their existing strengths and assets and developing new opportunities, such as decentralised services, energy solutions, and digital technologies and innovations;
  - Recommends that EAFRD spending continue to be linked with cohesion policy, also with a view to facilitating integrated and complementary funding and to simplifying procedures for beneficiaries, so that regions can draw from different EU sources in order to optimise funding opportunities and invest in rural areas.
- The reference made to the Pact of Amsterdam is noteworthy, in that in May 2016 it created the Urban Agenda for the EU. The Urban Agenda is a new multi-level working method promoting cooperation between Member States, cities, the European Commission and other stakeholders in order to stimulate growth, liveability and innovation in the cities of Europe and to identify and successfully tackle social challenges.[10] This idea of having an equivalent mechanism for rural areas is supported by some MEPs and shows the will to not only give a legal (and thus binding) status to Smart Villages but also to frame the concept in a more structured process.
- As part of its work regarding the Commission's proposal, the REGI committee requested in July 2018 a study titled Research for REGI Committee - Digital Agenda and Cohesion Policy. This study aimed to provide a critical analysis of the contribution of Cohesion Policy and the European Structural Investment Funds to the Digital Agenda for Europe and the Digital Single Market. The report makes reference to Smart Villages as part of the toolkit to address rural challenges with ICT under the umbrella of EAFRD. This link between Smart Villages and the EAFRD has also been made in the resolution adopted in October 2018 (see above).

By making specific references to Smart Villages and by proposing stronger measures to be undertaken at EU level to embed Smart Villages in the EU policy framework, it can be clearly seen that there is not only the willingness to support the European Commission's proposals but there is also a political ambition in favour of Smart Villages within the European Parliament.

Nevertheless, some precision regarding the definition of Smart Villages would be welcomed. Even though there are already a number of initiatives to define Smart Villages (including the EU Action Plan for Smart Villages, and the Bled declaration of 2018), European legislators have not yet had the opportunity to vote on the issue. Having a definition would give a clear structure on which to develop Smart Villages strategies, and therefore offer new opportunities to rural areas to develop and tackle current challenges.

The possibilities of the funding of the Smart Villages strategies should increase, with the notable recent proposition of the European Parliament in favour of devoting 17.5% of the 5% national mandatory reserve of the ERDF for rural area to encourage Smart Villages strategies. Indeed, the European Parliament proposed a very important amendment (amendment 110, Article 8 – paragraph 1 a (new) in a report of 27 February 2019[11] addressed to the

[10] https://ec.europa.eu/futurium/en/urban-agenda-eu/what-urban-agenda-eu

[11] European Parliament: Report on the proposal for a regulation of the European Parliament and of the Council on the European Regional Development Fund and on the Cohesion Fund (COM(2018)0372 – C8-0227/2018 – 2018/0197(COD))
Committee on Regional Development

European Commission about the new regulation of the European Regional Development Fund (ERDF) and the Cohesion Fund (CF) in May 2018, which states the following:

"At least 5% of the ERDF resources available at national level under the Investment for jobs and growth goal, other than for technical assistance, shall be allocated to integrated territorial development in non-urban areas with natural, geographic or demographic handicaps or disadvantages or which have difficulty accessing basic services. Out of this amount, at least 17,5% shall be allocated to rural areas and communities taking into account provisions of a Smart Villages Pact to develop projects such as Smart Villages" .

This proposal could be important for "small" Smart Villages. This could be implemented through new procedures, according to the choices made by each Member State. It is possible that some Member States will introduce simplified procedures to encourage local initiatives outside of the LEADER initiative, with a broad scope of potential support for digital innovations in mobility, energy savings, in tele-health and social services, distance working, and so on. It could lead to a "starter policy" or a "catalyst policy", able to boost local initiatives in rural areas and to improve the socio-economic conditions of living (whether or not using digital solutions). It could support areas that have not yet benefited from LEADER initiatives. In fact, the LEADER program is almost 30 years old. In the former 12 EU MS, almost every rural area has been part of it once. However, some villages have never participated in the Programme, or at least have not participated in it for decades. In the newest Member States, the proportion of 'never-covered-by-LEADER' villages is higher. This is despite the LEADER programme's coverage, through the LAGs, of 54% of the total rural population. The Smart Village concept provide a precise and effective focus on these villages, and provide a levelling up mechanism serving the interests of the 46% not yet covered by the LAGs.

http://www.europarl.europa.eu/doceo/document/A-8-2019-0094_EN.html

3.3 Mapping of challenges and opportunities

3.3.1 Indicator selection and data collection

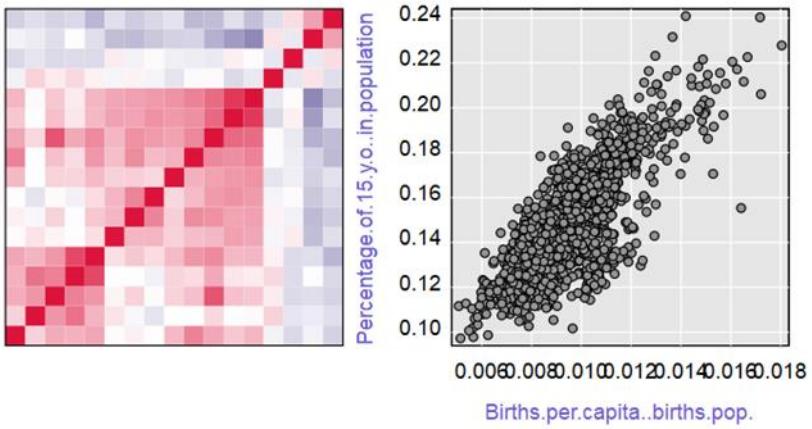
The theoretical framework set out so far in this chapter formed the basis for the subsequent data collection. Following the identification of the challenges, we selected indicators containing factors that mirror these challenges in rural areas. We have amended the list of Eurostat indicators used by the SEGIRA study with new indicators, where relevant. We then interviewed a panel of rural development experts to refine our selection.

Based on the retained indicators, we have carried out a cluster analysis. This exercise underpinned the choice of good practices (Theme 3) and case studies (Theme 4), ensuring a diverse selection for both. This approach was aimed at ensuring that the findings obtained would be applicable in different contexts.

A screening of the Eurostat database was performed to check data availability. To be able to provide sufficient detail for the analysis, it was especially important to ensure access to NUTS3 level data. This also allowed for a better distinction between urban and rural areas, taking advantage of Eurostat's Urban-rural typology. Nevertheless, the availability of data at this NUTS level proved to be limited: to overcome some data gaps, it was sometimes necessary to downscale NUTS2 and NUTS1 data, while some indicators were excluded.

To identify linkages between the selected indicators and to avoid overlaps, a correlation analysis was carried out as a first step. As a result of this analysis, some indicators were dropped to increase the accuracy of the clustering, and to provide a more balanced depiction of regional differences (SEGIRA, 2010).

Figure 4 Correlation analysis with the statistical software R



Source 4 Ecorys

Table 3 Selection of indicators, their availability (in bold) and their NUTS-level

Challenge	Sub-theme	Indicator	Source	NUTS level	Year	Unit
Remoteness	**-**	**Urban-rural typology**	**Eurostat**	**3**	**2016**	**Category**
Demographic change	**Population change**	**Crude rate of net migration plus statistical adjustment**	**Eurostat**	**3**	**2016**	**Per 1000 of the average population**
Demographic change	**Population structure**	**Population on 1 January by broad age group and gender**	**Eurostat**	**3**	**2016**	**Number**
Demographic change	**Population structure**	**Population aged 25-64 by educational attainment level and gender**	**Eurostat**	**2**	**2016**	**% of the population**
Demographic change	**Population structure**	**Aging population rate (2010-2016)**	**Eurostat**	**3**	**2016**	**%**
Demographic change	**Fertility rate**	**Birth rate**	**Eurostat**	**3**	**2016**	**per 1000 of the population**
Services & infrastructures	Broadband	Households with broadband access[12]	Eurostat	2	2016	%
Services & infrastructures	Transport	Access to high-level passenger transport infrastructure	ESPON	3	2012	Minute-equivalents
Services & infrastructures	Education	Pupils and students in all levels of education (ISCED 0-6)	Eurostat	2	2012	%
Services & infrastructures	Health	Health personnel	ESPON	3	2013	Number
Services & infrastructures	Tourism infrastructure	Number of establishments, bedrooms and bed-places	Eurostat	3	2011	Number
Economic opportunities	**Employment rates**	**Total employment rate**	**Eurostat**	**3**	**2015**	**% of the active (aged 25-64) population**
Economic opportunities	**Employment rates**	**Employment in agriculture, forestry and fishery rate**	**Eurostat**	**3**	**2016**	**% of total population**
Economic opportunities	**Productivity**	**Gross domestic product (GDP) at current market**	**Eurostat**	**3**	**2015**	**in Million € PPS per capita)**
Economic opportunities	**Productivity**	**Gross domestic product (GDP) growth rate (2E013-2015)**	**Eurostat**	**3**	**2015**	**%**

[12] NB The Eurostat indicator for Households with broadband access includes all type of internet (households connected xDSL-technology, to a cable network upgraded for internet traffic, or to other broadband technologies including fixed and mobile connections). Therefore, the percentage in rural areas is higher than the one for fast broadband access.

Challenge	Sub-theme	Indicator	Source	NUTS level	Year	Unit
Economic opportunities	Commuting	People working in another region	Eurostat	2	2016	%
Economic opportunities	Liveability	Self-evaluation of life satisfaction	OECD	?	2017	Scale (0-10)
Economic opportunities	Marginality	People at risk of poverty or social exclusion	Eurostat	2	2016	%
Economic opportunities	Productivity	Regional gross domestic product	Eurostat	2	2015	PPS per inhabitant in % of the EU28 average
Climate change	**Climate change**	**Aggregate potential impact to climate change**	**ESPON**	**3**	**2010**	**Combination of several indicators (physical, environmental, social, economic and cultural potential impacts of climate change)**
Social & human capitals	**R&D**	**Patent applications to the EPO**	**Eurostat**	**3**	**2012**	**Number per million inhabitants**
Social capital	Civic Engagement	Voter turnout in general election	OECD	2	Varies	% of the population with voting right
Social capital	Governance	Index of Good Governance	ESPON	2	2016	Aggregate of several indicators

3.3.2 Methodology for clustering

Cluster analysis[13]

Cluster analysis is a statistical method used to identify groups with similar traits. Its aim is to create clusters where the entities are as similar as possible (homogeneous) but differ from entities of other clusters as much as possible (heterogeneous). By using cluster analysis, NUTS3 regions of EU countries were classified into several clusters based on the indicators presented above. To have a stronger clustering of rural areas, urban regions were excluded from the statistical analysis. Urban territories are nevertheless considered in the description as some rural areas can be part of functional urban areas. Urban territories may also still be eligible for funding in regional and rural development policies.

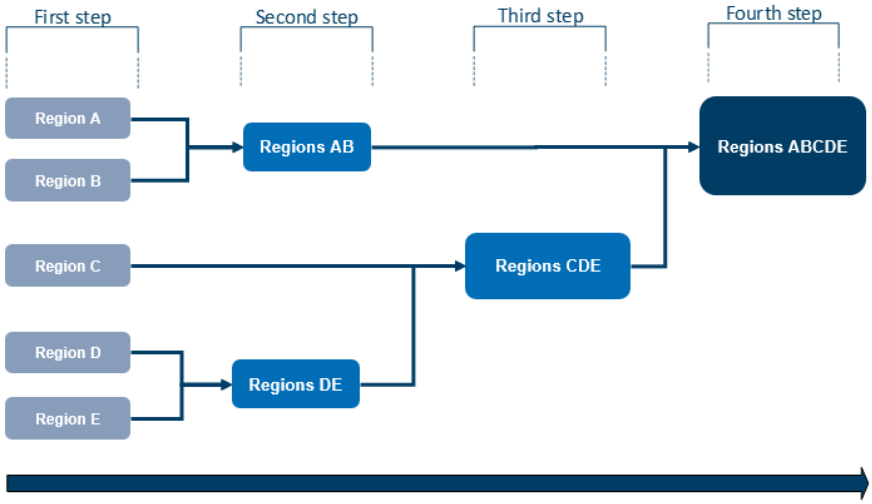
There are several clustering methodologies and algorithms. For the purposes of this assignment, the research team used **hierarchical clustering** to classify

[13] Ecorys (2010) Study on Employment, Growth and Innovation in Rural Areas (SEGIRA); Data Mining (2009) Distances between Clustering, Hierarchical Clustering; kassambara (2017) Agglomerative Clustering Essentials, STHDA, http://www.sthda.com/english/articles/28-hierarchical-clustering-essentials/90-agglomerative-clustering-essentials/

the regions. This method is one of the most widely applied techniques, which essentially groups objects by their similarity. The algorithm is relatively simple:

- Initially, each region is treated as a cluster of its own;
- The algorithm finds the closest pair of clusters;
- Merges them;
- Repeats until there is only one cluster left.

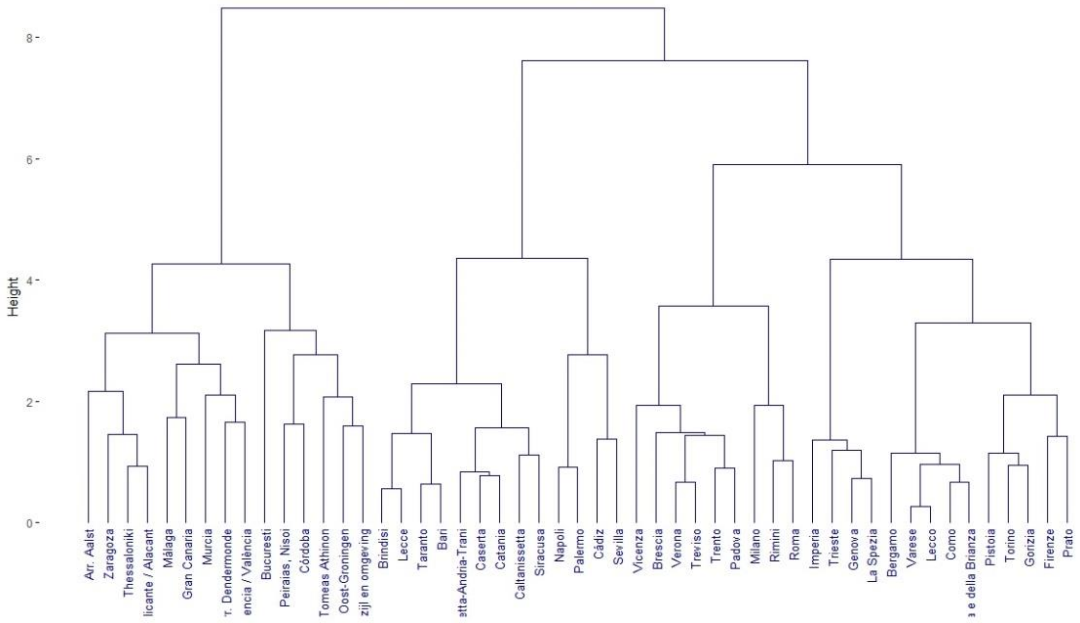
Figure 5 The steps for agglomerative clustering



Source 5 Ecorys

The result of this process is a tree-based representation – a dendrogram – of the clusters. The observations (i.e. the regions) can be cut at the desired level to be divided into separate groups.

Figure 6 Cluster dendrogram



Source 6 Ecorys

The regions were sorted into specific clusters using **Ward's method**. This algorithm classifies regions in a way that minimises within-group variance. Cluster distances are defined as the squared Euclidean distance – the ordinary straight-line distance – between two points. Ward's method merges clusters if the increase in the within-cluster variance is the smallest. As a result, it maximises the homogeneity (similarity) of the groups.

This method was combined with the **k-means++** partitioning algorithm to maximise the similarities within clusters: while the optimal number of clusters was determined with Ward's method, the data was grouped into clusters using K-means. This algorithm creates clusters based on feature similarity and uses an iterative method to assign each data point to one of the pre-determined number of groups. It consists of two steps:

- Assignment: Each observation is assigned to the nearest cluster based on the squared Euclidean distance from its mean (or "centroid");
- Update: The centroids are recalculated from the means of the data points assigned to the cluster.

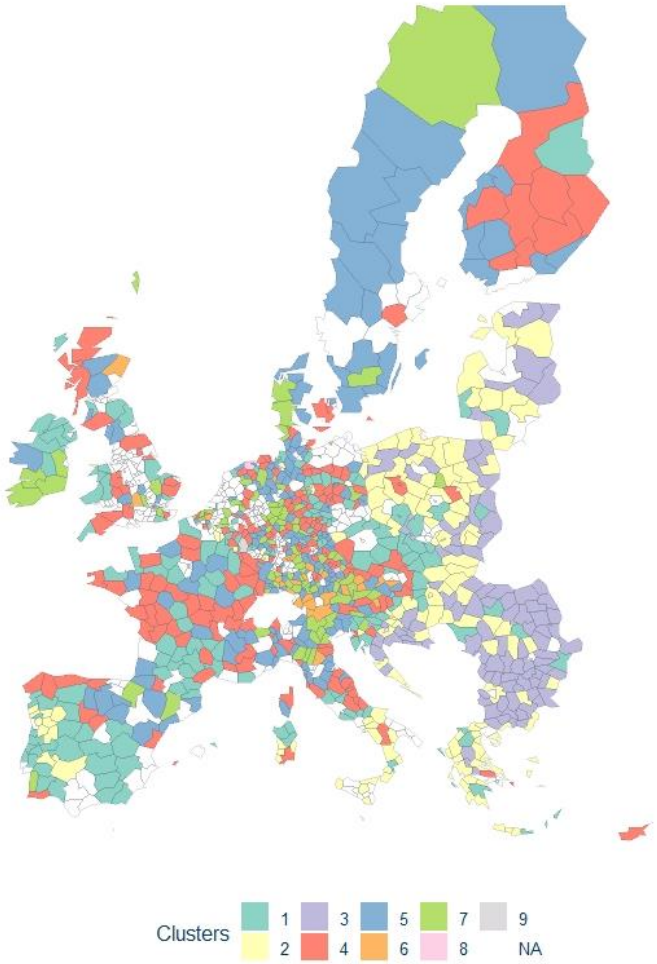
This process is iterated until the assignments remain unchanged.[14]

3.3.3 Clusters

Based on the database described in the previous section, nine clusters were created. The clusters are presented in the map on next page.

[14] MacKay, David (2003). Chapter 20. An Example Inference Task: Clustering., Information Theory, Inference and Learning Algorithms. Cambridge University Press. pp. 284–292., http://www.inference.org.uk/mackay/itprnn/ps/284.292.pdf; Andrea Trevino (2016) Introduction to K-means Clustering, Datascience.com, https://www.datascience.com/blog/k-means-clustering

Figure 7 Map of the clusters



Source 7 Ecorys

Within the nine clusters, five main groups can be distinguished:

- Traditional agricultural regions

Clusters 3, 2 and 1 are the most predominantly rural areas territories (average of 2.5 in urban-rural category). They represent the territories relying the most on agricultural employment with the gradient going from clusters 1 to 3 at the extreme (3% to 11% of the active population). They are also the most lagging territories: they have the lowest GDP (*€21 to €11 billion*), a low employment rate (below 41% of the population) and are the less connected (*below 80% of households with broadband access)*. The population is ageing (6 to 11%), and birth rate is low (below 9,1 per 1000 of the population). In addition, clusters 3 and 1 are the only clusters with out-migration (respectively *-5 and -1 per 1000 of the average population*). The regions belonging to clusters 3 and 2 are mostly in eastern Europe.

- Richest and very connected regions

Clusters 8 and 9 are the richest territories with 9 being at the extreme (*€57 to €96 billion*). However, they show the lowest rate of GDP Growth (*3.2 to 2.5%)*. They have a high number of patent applications that indicate strong innovative capacities (*21 – 33 patent applications per million inhabitants)* and have a broadband access above 90%. They also have the lowest rate of agricultural

employment (below 1% of the total population). They show the highest rate of in-migration (above 10 per 1000 inhabitants). The population is less ageing in those territories than in the other clusters (*2 to 3%).* The regions belonging to the clusters 8 and 9 are mostly in Germany but also in the Netherlands and Luxembourg.

- Rich and connected regions

Clusters 7 and 6 have many characteristics of the 'richest and very connected regions but have a lower GDP per capita (*€34 – €43 billion*) and a more ageing population (above 5%). Their GDP growth is also the highest (above 7.5%). The regions belonging to the cluster 7 are mostly in Western Europe and those in cluster 6 are mainly in the south of Germany and in Austria.

- Connected agricultural regions

The Clusters 4 and 5 are an in-between group. Their population is ageing (9% to 11%) and agricultural employment is above 1,5% of the total population but they are richer (*€25 to €29 per billion)* and more innovative than 'traditional agricultural regions' (*9 and 15 patent's applications per million inhabitants compared to.1 to 5 per million inhabitants)*. Cluster 5 shows a higher employment rate (*53% compared to. 47% of the population*) but a lower GPD growth than Cluster 4 (*5.9% compared to 6.5%)*. The regions belonging to clusters 4 and 5 are mostly in Western Europe and Scandinavia.

- Urban areas

Urban areas (characterised as NA on the map) represent 27% of the total NUTS 3 regions. As expected, they are among the regions with the least agricultural employment (below 1% of the total population). They are the least ageing regions (below 1%), have the highest GDP growth (11.5%) and the female population is the most educated (above 35% female with tertiary education in the active female population). However, the total employment rate is not among the highest (below 60% of the active population) and the GDP is only €34 billion on average.

In addition, Clusters 3 and 6, as well as urban areas, have been identified as potentially the most affected by climate change.

4 What is a smart eco-socio village?

The definition of "Smart Village" was developed in three main stages:

- The first version of the definition was developed through a literature review, a consultation of stakeholders and an expert workshop. The literature review is presented in chapter 3 of this report, the first on-line consultation took place in April 2018 and the expert workshop was organised in Brussels in May.
- Following discussions with the European Commission, the first version was updated and a second on-line consultation was conducted during the summer of 2018.
- The results of this second consultation were used to update the definition which was presented at the final workshop from the Pilot Project organised at the European Parliament in February 2019.

The structure of this chapter is as follows: Section 4.1 provides a review of the context, Section 4.2 describes the results of the first consultation, Section 4.3 the results from the workshop, Section 4.4 the draft working definition proposed in the second interim report and Section 4.5 the definition proposed for consultation. The results of the second consultation are presented in Section 4.6, and Section 4.7 provides the final version of the definition.

4.1 Context: current initiatives and documents relevant to the definition

The development of the definition of "Smart Villages" in this Pilot Project took the context developed in the previous chapter into account. This chapter provides a brief review of the key documents and initiatives available at the time of the preparation of the definition (second half of 2018). It includes (i) the EU Action Plan for Smart Villages published on the 11 April 2017, (ii) the Bled declaration signed on the 13 April 2018, (iii) the on-going activities from the ENRD Thematic Group (TG) on Smart Villages and (iv) the legislative proposal for the CAP after 2020 published by the EC on 7 June 2018.

4.1.1 The EU Action for Smart Villages (April 2017)[15]

Following the Cork Declaration of September 2016, in which one of the ten priorities proposed was "investing in rural viability and vitality", the EC (Commissioners Hogan, Creţu and Bulc) published the document '*EU action for Smart Villages*' on the 11 April 2017. The document presents 16 actions that could be implemented up to 2020 to promote Smart Villages. It also provides indication on the scope of Smart Villages:

"Smart Villages is a relatively new concept within the realm of EU policy making. The emerging concept of Smart Villages refers to rural areas and communities which build on their existing strengths and assets as well as on developing new opportunities. In Smart Villages traditional and new networks and services are enhanced by means of digital, telecommunication technologies, innovations and

[15] https://ec.europa.eu/agriculture/sites/agriculture/files/rural-development-2014-2020/looking-ahead/rur-dev-small-villages_en.pdf

the better use of knowledge, for the benefit of inhabitants and businesses. Digital technologies and innovations may support quality of life, higher standard of living, public services for citizens, better use of resources, less impact on the environment, and new opportunities for rural value chains in terms of products and improved processes. The concept of Smart Villages does not propose a one-size-fits-all solution. It is territorially sensitive, based on the needs and potentials of the respective territory and strategy-led, supported by new or existing territorial strategies. Technology is important as are investments in infrastructure, business development, human capital, capacity and community building. Good governance and citizens involvement is also key. A Smart Village would typically pay attention to e-literacy skills, access to e-health and other basic services, innovative solutions for environmental concerns, circular economy application to agricultural waste, promotion of local products supported by technology and ICT, implementing and taking full benefit of smart specialisation agri-food projects, tourism and cultural activities, etc. The concept of Smart Villages covers human settlements in rural areas as well as the surrounding landscapes."

4.1.2 The Bled declaration (April 2018)[16]

The "Bled Declaration" has been delivered by MEPs Franc Bogovič and Tibor Szanyi, to Commissioners Phil Hogan (agriculture and rural development), Violeta Bulc (transport) and Mariya Gabriel (digital economy and society) during the event '*European Action for Smart Villages'* organised at lake Bled in Slovenia on the 13 April 2018. The declaration calls for further action to digitalise rural areas through the EU's Smart Villages initiative and taking advantage of existing digital tools:

Smart Villages are made up of people who take the initiative to mobilise local assets to solve the challenges and seize the opportunities they face. Digital technologies are a powerful tool for Smart Villages but not the only one. These model villages will offer human capacity-building tools and create synergy between some of the following technological achievements:

- Precision farming: reducing input, while maximising output through the help of sensors and decision support systems and, thereby, improving the food supply chain while protecting resources and the environment;
- Digital platforms offering all essential services, such as e-learning, e-health (better access to medical care), e-administration, transport, gastronomy, social services, P2C platforms circumventing oligopolistic retail structures and increasing quality and choice of products;
- Shared economy for expensive technical solutions and equipment;
- Circular economy reducing waste and saving resources;
- Biobased economy through the evolution of research, innovation and technology;
- Renewable energy is especially relevant in rural areas where there is not only space but also easy access to the necessary natural resources (wind, sun, water, soil, wood, biomass);

[16] https://ec.europa.eu/info/news/european-commission-supports-call-smarter-future-rural-areas-2018-apr-13_en

- Rural tourism, which includes eco-, health- farming- and recreational-tourism, has the potential to create new and high-value jobs on a large scale;
- Social innovation in rural services and entrepreneurship.

4.1.3 The ENRD Thematic Group (TG) on Smart Villages (on-going)[17]

Since September 2017, the European Network for Rural Development (ENRD) has organised a Thematic Group (TG) on "Smart Villages" within the sub-theme of the broader ENRD thematic work on "Smart and competitive rural areas". The TG contributes to the "EU Action for Smart Villages" by enabling exchange on Smart Villages, and by exploring how Rural Development Programmes can be used to support this concept. During the first year, the TG focused on ways to revitalise rural services through digital and social innovation and explores how rural services – such as health, social services, education, energy, transport, retail – can be improved and made more sustainable through the deployment of Information and Communication Technology (ICT) tools and through community-led actions and projects. In the second year, between September 2018 and July 2019, the TG worked towards helping Smart Villages emerge and develop by acting as a board for developing practical orientations for using all the policy tools available.

4.1.4 The EC legislative proposal for the CAP after 2020[18]

On 1 June 2018 the EC published its legislative proposals for the CAP after 2020. The proposal for a Regulation on CAP Strategic Plans included three general objectives and nine specific objectives, as well as one crosscutting objective on Modernisation (Fostering knowledge, innovation and digitalisation in agriculture and rural areas and encouraging their uptake):

General objective "to foster a smart, resilient and diversified agricultural sector ensuring food security" with three specific objectives:

- Support viable farm income and resilience across the EU territory to enhance food security;
- Enhance market orientation and increase competitiveness including greater focus on research, technology and digitalisation;
- Improve farmers' position in the value chain;

General Objective "to bolster environmental care and climate action and to contribute to the environmental- and climate-related objectives of the Union;" with three specific objectives:

- Contribute to climate change mitigation and adaptation, as well as sustainable energy;
- Foster sustainable development and efficient management of natural resources such as water, soil and air;
- Contribute to the protection of biodiversity, enhance ecosystem services and preserve habitats and landscapes.

General Objective "to strengthen the socio-economic fabric of rural areas" with three specific objectives:

[17] https://enrd.ec.europa.eu/smart-and-competitive-rural-areas/smart-villages_en

[18] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2018%3A392%3AFIN

- Attract young farmers and facilitate business development in rural areas;
- Promote employment, growth, social inclusion and local development in rural areas, including bio-economy and sustainable forestry;
- Improve the response of EU agriculture to societal demands on food and health, including safe, nutritious and sustainable food, as well as animal welfare.

Smart Villages are mentioned in recital 16 as well as in the Annex 1 of the proposal on "impact, results and output indicators" - Result Indicator "R.33 Digitising the rural economy: Rural population covered by a supported **Smart Villages strategy**" (related to the EU specific objective "*Promote employment, growth, social inclusion and local development in rural areas, including bio-economy and 'sustainable forestry*"

4.2 Results from the first on-line consultation

A stakeholder consultation was organised between 1 and 27 April 2018, which took the form of an on-line survey. Stakeholders were invited to reply to a questionnaire (18 closed question and 8 open questions) available on our project website http://www.pilotproject-smartvillages.eu/. In total, 79 contributions were received from 22 countries.

Table 4 Country of origin of the respondents to the first consultation on the definition

Member States	Total	%
Austria	0	0%
Belgium	8	10%
Bulgaria	0	0%
Croatia	1	1%
Cyprus	0	0%
Czech Republic	0	0%
Denmark	0	0%
Estonia	4	5%
Finland	4	5%
France	13	16%
Germany	3	4%
Greece	1	1%
Hungary	2	3%
Iceland	0	0%
Ireland	5	6%
Italy	4	5%
Latvia	1	1%
Lithuania	1	1%
Luxembourg	0	0%
Malta	0	0%
Netherlands	3	4%
Norway	1	1%
Poland	1	1%
Portugal	3	4%
Romania	5	6%
Slovak Republic	0	0%
Slovenia	2	3%
Spain	4	5%
Sweden	7	9%
Switzerland	1	1%
United Kingdom	5	6%
Total	**79**	**100%**

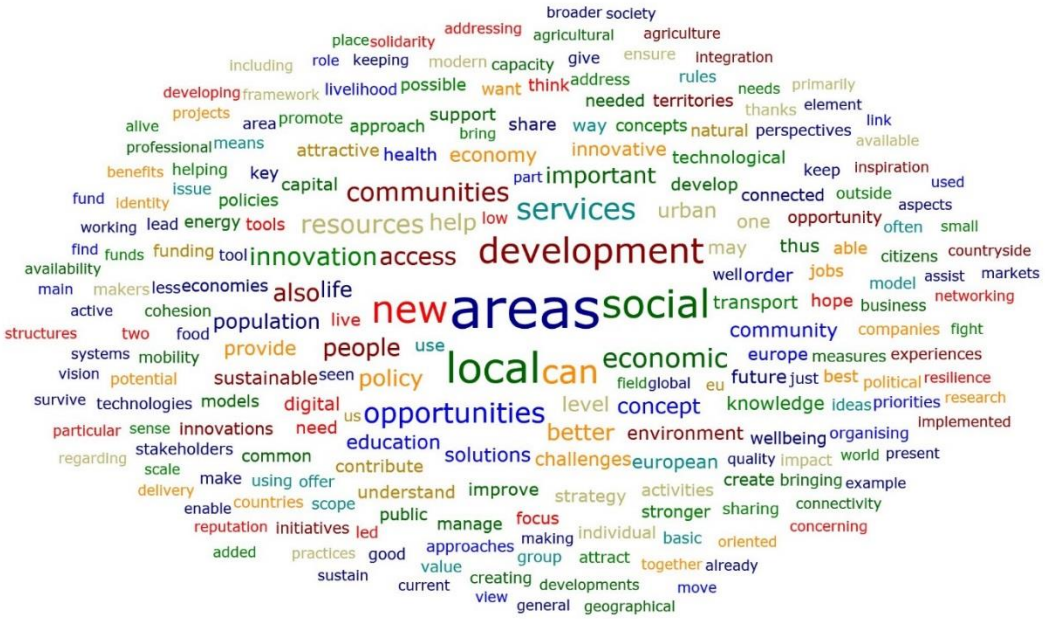
4.2.1 Scope, topics and themes

The following section provides the key findings from the on-line consultation on the topics, the themes and the scope of 'Smart Villages'.

"Smart Villages" can bring a wide range of contributions to rural areas and the local population

As illustrated in the Word cloud below, the respondents indicated a wide range of ideas regarding the potential contributions of 'Smart Villages' to rural areas and the local population.

Figure 8 Contributions of 'Smart Villages' to rural areas and the local population

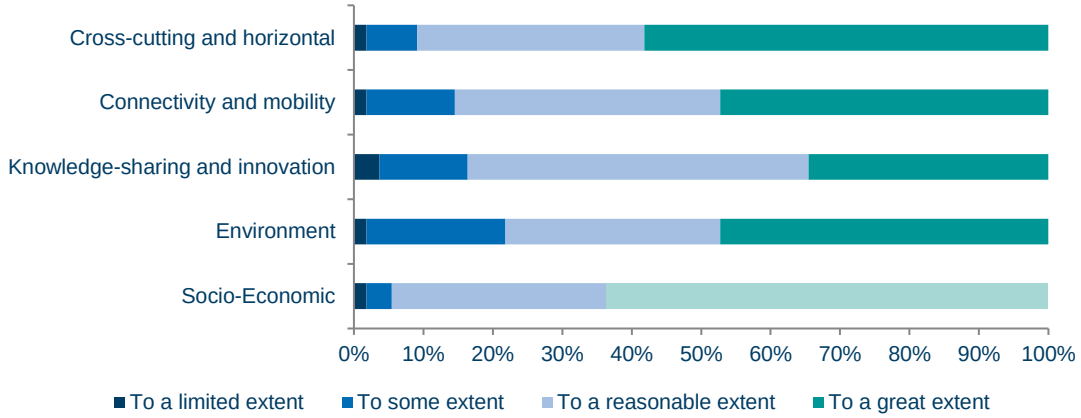


Source 8 Ecorys on-line consultation

Several thematic areas should be covered by "Smart Villages", without any strong preference for any particular area

According to the respondents, "Smart Villages" should cover a variety of thematic areas (socio-economic, connectivity and mobility, environment, knowledge-sharing and innovation, cross-cutting and horizontal themes) as illustrated in the figure below.

Figure 9 Opinions of respondents on thematic areas to be covered by "Smart Villages"



Source 9 Ecorys on-line consultation

Socio-economic themes proposed include (i) the provision of services including health and social services and education and training, (ii) the availability and accessibility of markets for inhabitants of rural areas, (iii) enhancing the quality of life, (iv) support to create and maintain employment and (v) support for the shared economy for technologies and services.

Environment themes proposed include (i) the application of a sustainable approach to natural resource management, (ii) support for the circular economy, (iii) support for the bio-based economy and (iv) the use of renewable energy, and shared economy for technologies and services.

Knowledge-sharing and innovation themes proposed include (i) creating and supporting access to research and development and (ii) supporting knowledge-sharing.

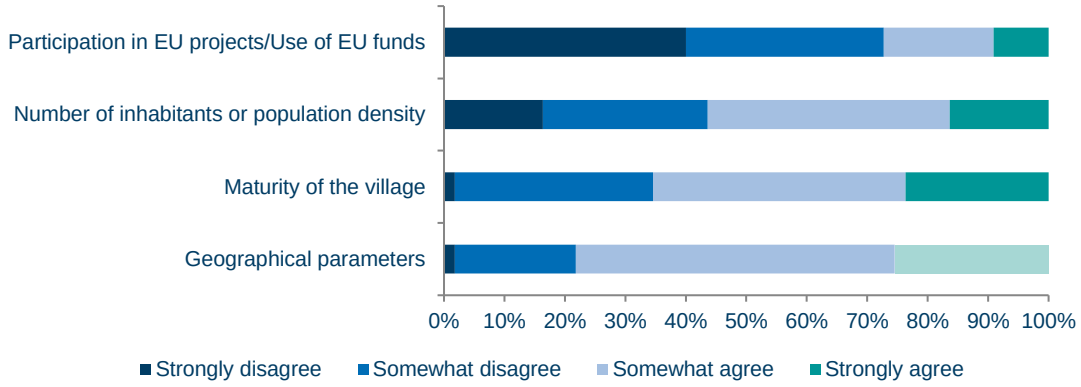
Connectivity and mobility themes proposed include (i) improving mobility and transport and (ii) applying digital technologies and ICT combined with IT support.

Cross-cutting and horizontal themes proposed include (i) ensuring citizen participation and participatory local governance, (ii) providing support for cultural heritage and tourism, (iii) supporting beneficial rural- urban linkages, (iv) ensuring involvement of women and youth.

No consensus regarding the scope of 'Smart Villages'

There was no consensus among the respondents regarding the parameters that should be used to characterise 'Smart Villages' as illustrated in the figure below.

Figure 10 Opinions of respondents on the specific characteristics of "Smart Villages"

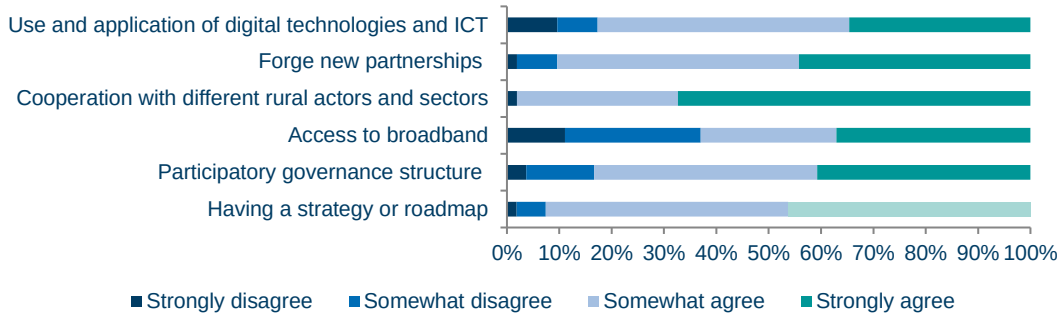


Source 10 Ecorys on-line consultation

A strategy and a governance structure perceived as the most important minimum criteria

As illustrated in the Figure on next page, a larger majority of respondents indicated that governance structure and strategy are more desirable minimum criteria than the access to broadband:

Figure 11 Opinions on the minimum criteria in the definition

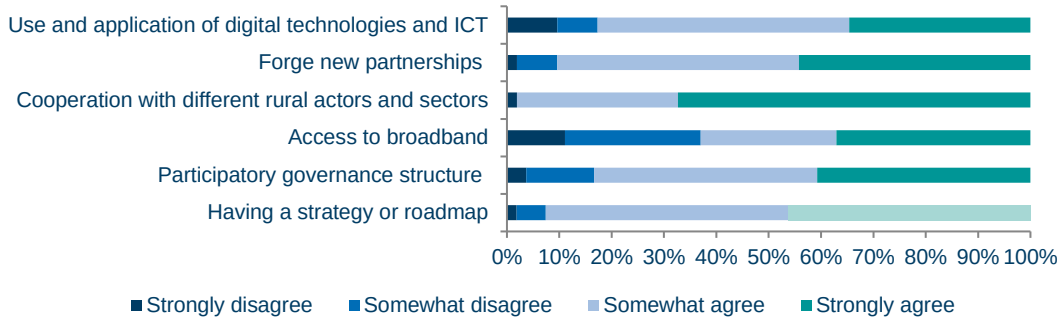


Source 11 Ecorys on-line consultation

Cooperation and partnership are important

As illustrated in the Figure below, there is a consensus among the respondents that, for the optional criteria, cooperation and partnerships are important. The use of ICT and digital technologies is also considered important by a majority of respondents.

Figure 12 Opinions on optional criteria in the definition



Source 12 Ecorys on-line consultation

4.2.2 Advantages and disadvantages of defining "Smart Villages"

Respondents indicated the main advantages and disadvantages of having a definition of 'Smart Villages'. The most frequent advantages mentioned by the respondents include:

- Increasing awareness of these types of activities and on how to identify potentials (INSPIRATION);
- Opportunity to attract and target funding and to provide clarity on terms and conditions;
- Opportunity to build networks between 'Smart Villages' if the concept is clarified;
- Can improve policy integration and capacity-development.

Respondents also mentioned some risks or disadvantages of an EU definition:

- It should not be a status of an 'elite'/exclusive;
- Tools/policies should go hand in hand with this.

4.2.3 Key findings: three main messages from the consultation

The main messages from the consultation are the following ones:

- The definition should not be restrictive but rather aim to inspire and provide a vision to aspire to;
- The access to broadband and the use of digital technology can be both a result from and a precondition for 'Smart Villages';
- A strategic framework, long-term development framework and integrated approach were recognised as key ingredients.

4.3 Results from the workshop on the definition

The workshop took place on 4 May 2018 in Brussels with 10 participants from DG AGRI, DG REGIO, the ENRD, R.E.D., Euromontana and Ecorys. The workshop started with a presentation of the outcome of the on-line consultation and continued with a structured discussion around four building blocks of 'Smart Villages' (i) Human, social, natural and financial capital, (ii) Challenges and opportunities, needs, demands, (iii) Current and future solutions and (iv) Desired outcomes. The results from the discussions are summarised in the Table below.

Table 5 Outcome of the workshop discussion in the four building blocks

<table>
<tr><th>First ideas</th><th>Horizontal ideas</th><th>Key concepts to be included</th></tr>
<tr><td>Human, social, natural and financial capital
People: citizens, smart people, vision, leadership, participatory, creative capacity, local skills, demography
Social: networks, cooperation, partnership, solidarity, trust wider than a village
Natural: natural resources, local assets, geographical capital, nature, landscape
Financial: finance available, place-based economies, digital maturity, infrastructure (broad sense)</td><td rowspan="2">Empowering rural citizens

Careful not to exclude

Bottom-up

Rural-urban connection</td><td rowspan="2">Local assets

Participation and empowerment of people

Digitalisation

Participation and engagement of people

Integrated development strategy

Partnerships/collaboration

Creativity

Long-term strategy

Socio-digital innovation

Mobilising assets</td></tr>
<tr><td>Challenges, opportunities, needs and demands
Digital transformation and technological change: broadband networks, e-literacy skills, connectivity, digitalisation, urban-rural linkages, data governance,</td></tr>
</table>

Population trends: depopulation, energy, ageing population, retain/attract talent, migration, **(Basic) Services**: access and availability to services **Governance**: spatial planning, political willingness, inclusive, shared-sense of responsibility **Economic**: lack of jobs, access to markets, food and agriculture **Green**: environmental and sustainability, energy **Financial:** investment, attractiveness of investments		Enabling a sustainable transformation Well-being Employment Strategic development happens! Better services, connectivity and opportunities Social inclusion
Desired outcomes Quality of life, local development, sustainability, socio-economic environment, territorial cohesion, unlock potential **Economic**: employment, life-long learning, new value chains, shared-economy, bio-based economy **Social**: increase attractiveness of rural areas, availability of services, well-being, equality, immigration access to information, improved governance, inclusion, improved connectivity **Environmental**: improved bio-diversity, improved environmental quality, waste as resource, low carbon economy, mitigation/adaptation climate change, energy efficiency		

In a second session, the workshop participants collectively developed the following draft definition:

Smart Villages are rural areas and communities which build on their existing strengths and local assets and empower citizens to achieve sustainable transformation. They use a participatory approach to develop a long-term vision and an integrated strategy aimed at improving their social, economic and environmental conditions (quality of life, public services, resource efficiency etc.) They do so by applying innovative social, digital and environmental solutions which respond to rural challenges and needs, and seize opportunities.

Smart Villages do not work in isolation. They engage in new forms of cooperation and alliances which build bridges between (…).

4.4 First draft working definition

We based our first proposal for a draft working definition of 'Smart Villages' on the on-line consultation and on the workshop organised within the Pilot Project, taking into account the wider context (including the EU Action for Smart Village, the Bled Declaration and also the Commission proposal for the CAP after 2020). The draft working definition is composed of two parts: the core definition and an explanation of the key terms:

Smart Villages are communities in rural areas that rely on a participatory and citizen-based approach to develop their social and environmental strategy. Smart Village strategies supports an economic transition towards a more ecological and community-based model by mobilizing in particular the opportunities offered by digital technologies. Smart Villages actively seek cooperation and alliances with other communities and actors in rural and urban areas. The initiation and the implementation of Smart Village strategies can be funded by a variety of public and private sources and may build on existing initiatives such as LEADER approaches.

Communities in rural areas can include one or several small cities, without any restrictions regarding the number of habitants. Rural areas are defined as "predominantly rural areas" according to the urban-rural typology used by the OECD and EUROSTAT for the classification of regions (more than 50% of the population lives in rural areas). The "intermediate region" (20 to 50% of the population lives in rural areas) and the "predominantly urban region" (less than 20% of the population lives in rural areas) are not concerned.

A participatory and citizen-based approach means an active participation of the civil society in the decision-making regarding the Smart Village strategy.

The social and environmental strategies of Smart Villages respond to the challenges and needs of their territory by building on their local strengths and assets. Strategies must determine short, medium and long term goals. Progress must be measurable through performance indicators that will be set in a roadmap. These roadmaps should be reviewed at regular intervals to allow continuous improvement. Strategies may aim, for example, to improve access to services (in various fields such as health, training or transport), to a better valorisation of the cultural heritage for a greater tourist attractiveness, to the development of renewable energies, to development of a circular economy, to a better exploitation of natural resources, to adapt to climate change, to preserve the environment and biodiversity, etc.

Digital technologies include for example information and communication technologies, the exploitation of big data or innovations related to the use of the Internet of Things. They act as a lever that enables Smart Villages to become more agile, make better use of their resources and improve the attractiveness of rural areas and the quality of life of rural residents.

4.5 Working definition proposed for consultation

The draft definition prepared for the second interim report was discussed at the Steering Group meeting held on 28 June 2018. The Steering Group recalled that, in establishing the definition, account should be taken of its intended use, e.g. the question of eligibility for EU support which would determine whether a more open or exclusive approach should apply. The steering group also requested a clearer emphasis on development and sustainability in economic terms (jobs, growth) is an objective of Smart Villages. It was also noted that inclusion of LEADER in the definition may be confusing as the two concept needs to be distinguishable (Smart Villages will not be a measure for rural development grants, but is likely to be a more general concept with various sources of public/private funding).

Following the exchange with the Steering Group, the following definition was prepared and published for consultation. This second consultation aimed to collect stakeholders' views on the main advantages and disadvantages of the proposed definition.

Smart Villages are communities in rural areas that develop smart solutions to deal with challenges in their local context. They build on existing local strengths and opportunities to engage in a process of sustainable development of their territories. They rely on a participatory approach to develop and implement their strategies to improve their economic, social and environmental conditions, in particular by promoting innovation and mobilizing 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.

Communities in rural areas can include one or several human settlements, without any restrictions regarding the number of habitants. Rural areas are defined as "predominantly rural areas" according to the urban-rural typology used by the OECD and EUROSTAT for the classification of regions (more than 50% of the population lives in rural areas). The "intermediate region" (20 to 50% of the population lives in rural areas) and the "predominantly urban region" (less than 20% of the population lives in rural areas) are not concerned http://ec.europa.eu/eurostat/web/rural-development/methodology

A participatory approach means an active participation of the civil society in the drawing-up and decision-making regarding the Smart Village strategy.

Digital technologies include for example information and communication technologies, the exploitation of big data or innovations related to the use of the Internet of Things. They act as a lever that enables Smart Villages to become more agile, make better use of their resources and improve the attractiveness of rural areas and the quality of life of rural residents.

The Smart Village strategies respond to the challenges and needs of their territory by building on their local strengths and assets. Strategies must determine short, medium and long term goals. Progress must be measurable through performance indicators that will be set in a roadmap. These roadmaps

should be reviewed at regular intervals to allow continuous improvement. Strategies may aim, for example, to improve access to services (in various fields such as health, training or transport), to a better valorisation of the cultural heritage for a greater tourist attractiveness, to enhance business opportunities and create jobs, to the development of renewable energies, to development of a circular economy, to a better exploitation of natural resources, to adapt to climate change, to preserve the environment and biodiversity, etc.

4.6 Results of the second on-line consultation

4.6.1 Introduction

The second on-line consultation was launched on 25 July and remained open until 31 August 2018. The working definition was published on the Pilot Project website (http://www.pilotproject-smartvillages.eu/). Stakeholders were invited to share their views in four open questions:

1) One of the main outcome of the consultation organised in April 2018 is that the definition should be not be restrictive and that it should be inclusive. Do you think that the working definition is sufficiently open and inclusive?

2) The first consultation also revealed that for a large majority of respondents the use of digital technologies should not be a mandatory requirement of the Smart Villages strategies. Do you think that this is well reflected in the working definition?

3) According to you, what are the main advantages and disadvantages of the working definition?

4) Do you have other comments?

4.6.2 Profile of the respondents

We received 50 replies from stakeholders originating from 19 different countries as report in the Table below.

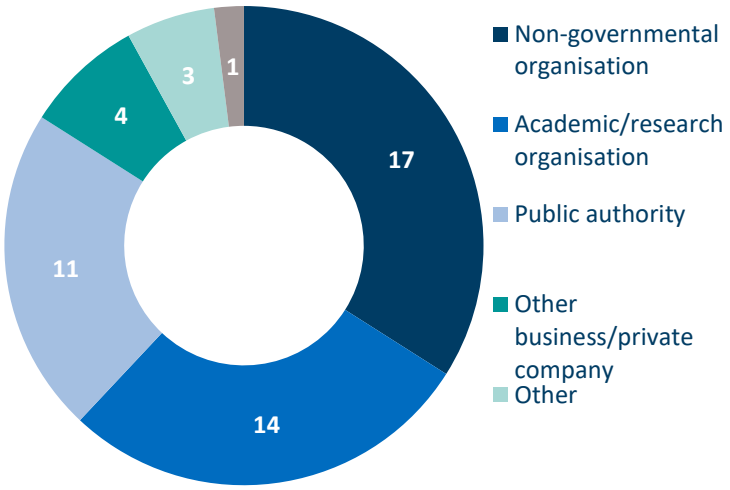
Table 11 Country of origin of the respondents to the second consultation on the draft definition

Member States	Total	%
Austria	2	4%
Belgium	9	18%
Czech Republic	1	2%
Estonia	3	6%
Finland	3	6%
France	4	8%
Germany	4	8%
Greece	1	2%
Hungary	1	2%
Ireland	3	6%
Italy	3	6%

Netherlands	1	2%
Poland	1	2%
Romania	2	4%
Slovenia	1	2%
Spain	6	12%
Sweden	1	2%
United Kingdom	3	6%
Other Non-EU Country	1	2%
Total	**50**	**100%**

Almost all respondents (49 our 50 replies) indicated a professional activity related to rural development. Almost 75% of the respondents declared that they have already worked on the topic of 'Smart Villages'. As illustrated in the Figure below, about one third (28%) of the respondents declared to work for an academic or research organisations, 34% for a NGO and 22% for a public authority.

Figure 13 Professional occupation declared by the respondents



Source 13 Ecorys on-line consultation

4.6.3 Main results of the consultation

The format of the definition is validated

Respondents welcomed the proposed structure (i.e. a short text with the core definition followed by explanations of the key terms. There was no criticism of the format, on the other hand some respondents explained that it is a good approach:

"The definition is rather short but it includes all the key-components. Giving the possibility of 2 levels of reading with 4 additional explanations is probably the best way to proceed. In particular, the examples of the issues that may be the focus of strategies plus the explanation of what is a strategy (different from a series of projects) is very important".

Stakeholders disagree on the importance of digitalisation

The consultation reveals that there is a divergence of views regarding the importance of the digitalisation. Some respondents indicated that the definition should put less emphasis on its importance while others contend that the

reference to digitalisation is not sufficient. The arguments provided are the following:
For respondents considering that digitalisation should be more important, the main argument is that with the current version of the definition, the 'external coherence' (i.e. the coherence of the Smart Village initiative with other policies/initiatives) is weak. Respondents included reference to smart cities and to smart specialisation:

"This definition seems to indicate that rural areas are not in great demand of e-development to value their potential. If we compare the 'smart cities' and 'Smart Villages', we have the impression of two worlds with very different strategies. Who will be credible in the face of decision makers and investors?"

"Smart Village discussion is part of the wider discussion of smart areas. In that discussion and developing technology (and/or digitalization) has a clear and characteristic role, and that is why Smart Village strategies cannot be outside of this 'requirement'. It is not the main issue, but it is mandatory in this context. Otherwise 'smart' is too much everything, and finally nothing special."

Another criticism from respondents considering that digitalisation should play a more important role is the differentiation from LEADER. This is also related to the 'external coherence' of the Smart Village initiatives. The concern is that the Smart Villages concept overlaps with LEADER.

"The existence of the infrastructure for digital technologies is a must, smart solutions make a settlement smart. If not, we can call them 'eco', 'Leader', etc. settlements but not smart. Better to say that not all the elements of a smart strategy have to related to digital technologies, but these strategies definitely should be based on that"

"Digitalisation is the ground, the base on which smart strategies are built. It is the same as a road – a basic infrastructure on which you build further smart solutions and concepts."

The main arguments of respondents considering that digitalisation should be less important is that territories without broadband access will be excluded from the initiative.

"Yes I completely agree that having existing broadband should not be a condition of accessing any Smart Village initiative. Many rural villages do not have access to Broadband at present. I think this is clear in the working definition."

Other respondents disagree with the association between digital and smart:

"The disadvantage is the aforementioned focus on digital as being implicitly 'smart' in itself. I suggest that more emphasis could have been placed on the integration of services and the sharing/cross-learning of approaches from one sector to the other (e.g. how can the platform from one rural service support another) would have elevated the concept above a technology to a broader way of thinking."

Finally, one respondent proposed to resolve the divergence of views by adding a reference to levelling up digital opportunities for communities in rural areas:

"The use of digital technologies, while certainly not mandatory, is however often considered pivotal in any smart transition: in this sense, the definition works well. The solutions offered by digital technologies, however, assume that the (latest) infrastructure in digital technologies is in place and available in all aspirant Smart Villages: this is not necessarily the case. Perhaps a further note can be added to this end, highlighting the need to guarantee equal digital opportunities to communities in rural areas."

The exclusion of intermediate regions is criticised

The urban-rural typology used by the OECD and EUROSTAT for the classification of regions excludes the 'intermediate region' (where 20 to 50% of the population live in rural areas). This exclusion has been criticised by several respondents:

"The definition is too restrictive if it is restricted to predominantly rural NUTS3. There are too many rural communities excluded in NUTS3 of ample extension but with a very urban capital that concentrates the majority of the population of that NUTS. That is why the definition should be extended to intermediate rural areas."

"Why specify that "Rural areas are defined as 'predominantly rural areas' according to the urban-rural typology used by the OECD and EUROSTAT for the classification of regions (more than 50% of the population lives in rural areas)"? Why limit the notion of Smart Eco-social village to this category? Are there no villages in intermediate recognized areas? It means the weakening of our rural arguments: only 27.9% of European population live in these essentially rural areas."

The first sentence needs to be changed

The first sentence of the definition is "*Smart Villages are communities in rural areas that develop smart solutions*" is criticised because of the use of the terms 'smart solutions' to define 'Smart Village'.

The definition appears to be circular because it does not define 'smart' in any way that is not self-referential. An explanation of what "smart" actually means is needed or the sentence needs to be changed. A second criticism for this sentence concerns the use of the term 'development' in the sentence: the community do not necessarily develop themselves the solutions – but also and most importantly about the adoption and the use of such solutions.

4.6.4 Other considerations raised by respondents

Potential problem for the implementation/operationalisation

Operationally it may be difficult to distinguish the definition from what LEADER groups are meant to do already. If LEADER groups deliver Smart Village strategies, it will be necessary to provide them with incentives and tools to support innovative solutions more effectively.

Lack of clarity about the reference to "improve their economic, social and environmental conditions": is it compulsory to develop actions on the three dimensions (economic, social and environmental); or can it be on two dimensions only?

Some respondents indicated that the definition was too broad: a too generic and open definition can limit the degree of innovation.

"The definition could even be too open, because everybody will support all the noble goals that are to be achieved here. But what are the differences between 'smart' and other villages?"
Difference with 'smart cities': smart cities do not engage in a process of sustainable development.
"The difference between smart cities and Smart Villages is one of the following: environment, agriculture, food production. The second and third are not even mentioned."

Suggestions of additions or replacement

- A reference to "local skills and capacity building" is missing;
- Add 'social innovation': "They rely on a participatory approach to develop and implement their strategies to improve their economic, social and environmental conditions, in particular by promoting 'social' innovation and mobilizing solutions offered by digital technologies;
- Use the word 'resilient' instead of 'sustainable'. Since the whole 'sustainable development' discourse has become out of date due to the current ecological crisis – the resilience approach is more fruitful. I also think that many smart European villages do not need economic development - often understood as growth. This also connects to resilience – Smart Villages should aim for a sufficient, prosperous economic level – and not necessarily to economic growth.";
- Add more reference to 'people' – inhabitants, employees, young people, public administrators;
- More focus on eco-innovation, co-operative activities, supporting small enterprises in the rural areas, developing green/blue economy/activities and promoting clean environment, organic food production etc.;
- Include a mention on the need to safeguard and ensure funds is not mentioned;
- Community: there is a difference between 'village' and 'community', in particular when it comes to research. The former refers to geography, while the latter to sociology.

4.7 Proposed definition

The consultation revealed that overall, the stakeholders welcome the proposed definition, that the structure is adequate and that it is generally sufficiently open and inclusive. The consultations also revealed that some elements of the definition need to be changed, in particular the first sentence (replace 'smart solution' with an alternative expression such as, for example, 'innovative solution') and the geographical coverage extended with the inclusion of intermediate regions. A justification of the choice made regarding digitalisation is needed to address the concerns raised during this consultation. This could be done in a text introducing the purpose of the definition. Finally, some key terms have been changed to take into account suggestions made by the respondents (in particular 'resilience' instead of 'sustainable development').

Based on the input from the consultation and discussions in the steering group, the following definition is established:

Definition of Smart Villages

Smart Villages are 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.

Communities in rural areas can include one or several human settlements, without any restrictions regarding the administrative boundaries or the number of inhabitants. As regards eligibility conditions for support, Member States may use definitions of rural areas as provided for by the OECD, EUROSTAT or other definitions.

A participatory approach means an active participation of the local community in the drawing up and decision-making regarding the Smart Village strategy. During the implementation phase, the participatory approach will ensure that the needs for capacity building and for training of people are properly addressed.

Digital technologies include, for example, information and communication technologies, the exploitation of big data or innovations related to the use of the Internet of Things (IoT). They act as a lever to enable Smart Villages to become more agile, make better use of their resources and improve the attractiveness of rural areas and the quality of life of rural residents. The use of digital technologies is not a precondition for becoming a Smart Village. Where possible, high-speed broadband will facilitate the deployment of the digital solutions.

Smart Village strategies respond to the challenges and needs of their territory by building on their local strengths and assets. Strategies may aim, for example: to improve access to services (in various fields such as health, training or transport), to enhance business opportunities and create jobs, to the development of short food supply chains and farming practices, to the development of renewable energies, to development of a circular economy, to a better exploitation of natural resources, to adapt to climate change, to preserve the environment and biodiversity, to a better valorisation of the cultural heritage for a greater tourist attractiveness etc.

5 Current initiatives: lessons learned from good practices

The identification of 'good practices' of existing initiatives has been achieved through Theme 3 of this study. The objective has been to identify, analyse and report on concrete examples of good practices, based on the criteria and set of characteristics established under Theme 2. Two main principles were used here:

- The **first principle** relates to the diversity of rural territories, in terms of contexts, the different levels of access to place-based assets, and their use in combination with ICT and other technologies;
- The **second principle**, of social connectivity, establishes the types of networks best practices actors have with research centres in order to understand their innovation process.

This chapter is divided in three sections: section 5.1 gives an overview of the good practices, which are then presented in more details in section 5.2 and section 5.3 provides the key findings from the good practices.

5.1 Overview

The identification of 'good practices' emerged from two approaches:

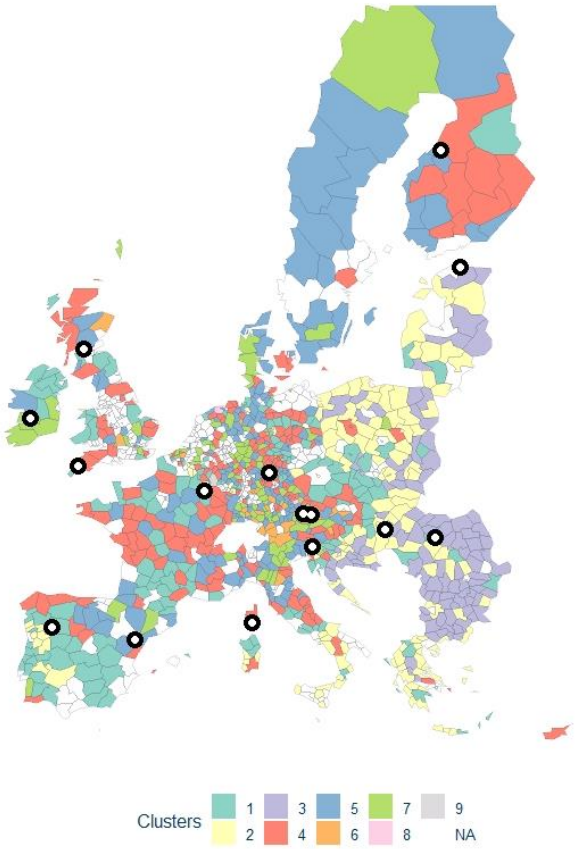
- The **active approach** involved contact with knowledge brokers and other experts through networks available to the core project team. These experts were asked to search for self-initiated projects implemented in their own their Member State that could potentially be included in the list of 'good practice examples'. This initial list was further complemented with internet and other literature source searches;
- The **passive approach** used an invitation on the Pilot Project website for stakeholders to suggest their own project or village, through completion of a form.

Selection of the final 'good practice' examples of projects relevant to 'Smart eco-social villages' was achieved through three successive steps. At the conclusion of the search process described above, 'good practice' examples or projects were identified. From these, a pre-selection of 30 'good practice' examples was made. Of those, the final selection of the 10+5 most relevant 'good practice' examples were chosen for analysis.

In total, the following 15 villages were selected: [Munderfing (AT); Seeham (AT); Hofheim (DE); Kolga (EE); Aragón Infoenergía (ES); Eskola (FI); Bras-sur-Meuse (FR); Cozzano (FR), Ceglédbercel (HU); O'Gonnelloe (IE); Pinela (PT), Cluj-Nap (RO); Bohinj (SI); Fintry (UK); Superfast Cornwall (UK)] where key actors were interviewed to gather detailed information on the form of their Smart Village projects and activities. The locations of the selected examples are presented the map below; this shows the geographical spread and the type of

cluster of the 'good practice' examples; brief descriptions are provided in the following section.

Figure 14 Overview of the 15 most relevant 'good practices' examples on the map of clusters of regions



Source 14 Ecorys

The descriptions of the good practices highlight aspects of the project related to the key parts of the definition. The table below presents the focus of the research team when analysing the information collected. Aspects highlighted in dark blue denote the main focus of the text, and light blue refers to the items mentioned. While it does not necessarily provide a holistic overview on the focus of the actual projects or initiatives, it gives a partial indication of the reasons for their inclusion in the sample.

Table 6 Main focus of the good practices

Good practice	Involvement of the local population	Use of digital technologies	Contribution to local economy	Social dimension	Environmental dimension	Strategy development	Cooperation
Munderfing	■			▒	▒		▒
Seeham	■		▒	▒	▒	■	▒
Hofheim	▒		▒	▒	▒		■
Kolga	▒	■	■	■			▒
Aragon	▒				■		▒
Eskola	▒	▒		■		▒	■
Bras-sur-Meuse	▒	■	▒	▒			
Cozzano		■			■	■	
Ceglédbercel	■	■					▒
O'Gonneloe		■					
Pinela		▒	▒	■			
Cluj-Napoca		▒	■				
Bohinj	■				■		▒
Fintry	■		▒		■		
Superfast Cornwall	■	■	▒				▒

Note: Dark blue refers to the main focus of good practice descriptions, while light blue indicates that the text mentions the respective element.

5.2 The 15 good practices of the Pilot Project

5.2.1 Munderfing (AT)

1. Main focus: Involvement of the local population

2. Munderfing is a municipality located in the state of Upper Austria. The project was initiated in the villages following a three-day workshop, which provided citizens with the opportunity to actively participate in the renovation of an old brewery (which had been disused for 40 years).

From this beginning it was decided to set up a development project based on social, economic, environmental and ICT objectives.

Main characteristics

- Organising **workshops** with the citizens in order to collect ideas for the building renovation and to communicate about the project "Brewery";
- Formulating a **"multivariate" project** linked to **citizens' needs** (culture, gastronomy) and an **economic purpose** (co-working, seminars, events, apartments);
- Renovating the building with a **sustainable approach** (i.e. energy) in close collaboration with experts (architects and cultural heritage experts) and local stakeholders;
- **Economic impact** in the village: setting-up of co-working spaces and new activities (housing services, conferences, etc.).

Main challenges

- Involving all the population in the co-creation process and evolution of the project;
- Making the place more attractive for all inhabitants;
- Developing more social purposes to improve the liveliness of the village centre;
- Considering the 'brewery' building as a central point of communication.

Lessons learned

- Working with citizens to gather ideas and needs. The added value of a successful project should be to make people aware of it;
- The more precise is the key concept/idea, the easier is the implementation of the project;
- Important to speak to the right people wo can have a crucial role in the project implementation;
- Important to establish a friendly environment;
- Having one team which carries out the project;
- Demonstrating and showing the downsides of not implementing the project.

5.2.2 Seeham (AT)

1. Main focus: Involvement of the local population, Strategy development

2. Seeham is a municipality located in the state of Salzburg. This project also started with a three-day workshop with citizens, initiated to address the challenges encountered by the village. As a follow-up, the village has developed a long-term ecologically innovative, socially oriented vision, summarised in its title "Bio-Village under One Roof". The current development strategy focuses on five themes: village community, social cohesion, education, environment and economy.

Main characteristics

- Thinking ahead to realise a **development strategy** that pursues an **ecological and social approach**. This creates a positive, healthy living environment and strengthens people's resilience;
- Pursuing a development strategy based on **five pillars**: citizens, education, social, environment and economy;

- Developing **new economic and social opportunities** to encourage young people to remain and also to attract new entrepreneurs and stakeholders (i.e. organic agriculture and commerce of local products);
- Preserving the environment with a high level of **sustainable energy actions** and preservation of **bio-diversity**;
- Building a flexible and reliable **social network** that involves all age groups in their diverse needs (services, culture, education, etc.);
- Working in cooperation with stakeholders inside and outside the village.

Main challenges

- Consolidating the social network inside the village and the collaboration with the population;
- Negotiating financing at different institutional levels;
- Recognition as 'certified' bio-village;
- Developing job opportunities with new economic potential.

Lessons learned

- Acting in collaboration with the population fosters innovative dynamic forward-thinking working approaches but also develops projects responding to community's needs;
- Acting in line with the societal challenges (environmental/economic/energy/cultural).

5.2.3 Hofheim (DE)

1. Main focus: Cooperation

2. Hofheim, which is located in the south of the state of Bavaria, initiated its project to tackle the challenges encountered in the Bavarian countryside. The first step established a collaboration strategy between seven villages to build a cooperative alliance to manage the development of the projects defined in the strategy. The first project, implemented to stimulate economic dynamism, involved renovation of vacant buildings and the installation of a fibre-optic network. With the active engagement of the citizens, the Allianz cooperation used this foundation to develop activities, in other sectors such as energy, mobility, tourism and culture.

Main characteristics

- **Setting up a network cooperation** called "Allianz Hofheimer Land" and defining an integrated development concept for the seven associated villages;
- Setting up an **efficient management structure** to investigate funding resources (at the European, national & regional level) and external collaborations (universities, start-ups);
- Developing projects to **respond to citizens' needs and challenges of rural territories**. Projects are designed to ensure a better quality of life and to promote public services;
- Working to **decrease vacant building spaces** and to **increase the attractiveness of the community**. The high-speed broadband network encourages development of economic activities and attracts people to work remotely;
- Working in **cooperation with stakeholders** inside and outside the village and the region.

Main challenges

- Rebuilding a 'positive' image of villages and attracting new inhabitants;
- Developing a building strategy to decrease building vacancies and to develop public services/applications;
- Establishing a structure to perpetuate long-term partnerships between municipalities and the projects. The Allianz is the starting point for all projects and organises workshops to visualise the future in the region and municipalities;
- Consolidating the social network inside the village and the collaboration with the population;
- Negotiating financing at different institutional levels.

Lessons learned

- Acting in line with societal challenges, notably taking into account working attitude and the economic and cultural situation;
- Listening to citizens' needs and proposing sustainable and social solutions.

5.2.4 Kolga (EE)

1. Main focus: Use of digital technologies, Contribution to local economy, Social dimension

2. Kolga is a small village in northern Estonia, in the territory of Lahemaa National Park. Two EU-funded projects were conducted simultaneously to develop the Smart Centre of Kolga. The first, "Choices & Balance", supported the re-integration of parents with young children into the labour market. The second sought to develop models of teleworking and flexible work arrangements on the islands of Estonia. The idea was to connect telework centres in rural areas and offer support for organisation of distance work arrangements in order to improve the quality of life and achieve a better work-life balance for families.

Main characteristics

- Realising a survey, financed by ESF, to identify the needs and the challenges of rural territories and to collect best practices from other countries;
- **Setting up an association** called "Smart Work Association" that connects telework centres in rural areas and offers support for organisation of distance-working arrangements;
- Working in cooperation with as many relevant institutions as possible from **state, local, private and non-profit-making sector;**
- Working with mobile data (3G and 4G), and subsequently using **the broadband connection**;
- Creating new pilot centres in other small villages in Estonia.

Main challenges

- Organising meetings with local population to find leaders and other NGOs to build a smart centre;
- Convincing state institutions to mainstream the smart work through concrete policy fields, incl. ICT, regional development, labour market, etc;
- Consolidating the social network inside the village and the collaboration with the population;
- Raising Leader funding to manage a building restoration (specific project);
- Financing equipment (information system, computer, etc.) through their own application (through NGOs, citizens, freelancers, etc.);
- Creating pilot centres in small villages with the support of public service.

Lessons learned

- Acting in line with the societal challenges (working attitude/economic/energy/cultural);
- Equipment is not as important as people. Connecting people that get along well is fundamental, in order to ensure good teamwork;
- A crucial element to get the centre started was organising events, training and meetings to get people together;
- It is important to be aware of all possible financing possibilities at different levels (local/regional/European).

5.2.5 Aragón Infoenergía (ES)

1. Main focus: Environmental dimension

2. Aragón Infoenergía is a network of eight LEADER LAGs that jointly implemented a project to promote an energy transition through the use of local and renewable resources. The Local Action Group Bajo Aragon-Matarrana initiated the project, which subsequently expanded to include seven other LAGs. The collective project was established through a number of specific actions such as including information provision, conferences, and advisory services.

Main characteristics

- The actors have known each for a long time and they have a **good knowledge of the stakeholders and the territory**;
- Setting up a communication strategy to make local entities and companies aware of the project;
- Creating an info energy point and specific digital management tools;
- **Receiving advice from auditors and experts** for local entities and citizens on better energy solutions to reduce the energy consumption;
- **Partnership** with the "Sensu Lato" technology (energy analysis tool).

Main challenges

- Managing a partnership of 8 Local Action Groups;
- Involving the whole population in a defined territory;
- Setting up an appropriate communication strategy (seminars, conferences, etc.);
- Combining energy solutions with local resources.

Lessons learned

- Identifying the needs of the territory and proposing improvements by integrating new technologies (in the areas of digital, environmental, social, etc.) regarding the quality of life;
- Conceiving the project and setting up a financial model before implementing it;
- Using new technologies as a tool and not as the final goal.

5.2.6 Eskola (FI)

1. Main focus: Social dimension, Cooperation

2. Rural out-migration from the remote village of Eskola in Southern Finland created a number of serious challenges, including the sudden closure of the village school and day-care. Parents formed a company, "ESKOLA Village Services Ltd", to re-organise school activities. Over time, the company evolved into a larger organisation providing social and innovative services. In addition to day-care, this includes restaurants and catering, domestic services and apartment rental. The company has implemented digital technologies to experiment with innovative teaching processes, and also has a digital cash system.

Main characteristics

- Creating a **village non-profit company** aimed at **social & education projects** (maintaining a classroom, taking care of the school building and the food services);
- Cooperation with the village of Lapinjärvi in a digital and educational **Pilot-project** (testing **digital teaching solutions** to keep schools in small remote villages in activity, with a reduced team of teachers);
- In a further development, the "Eskola Village Service Ltd." has started to provide many **social services**, such as day-care, restaurant, catering, domestic services, renting apartments, and non-medical aid for the elderly;
- Fibre-optic broadband access has been provided after challenging negotiations with the national operator;
- Providing a digital cash system to manage the company (easiest way to secure payments).

Main challenges

- Finding partners and getting funds;
- Achieving a reasonable turnover of citizens in the Village Society and the Company board;
- Fighting against conservative entities and Finnish norms;
- Becoming recognised at different institutional levels (local and national).

Lessons learned

- Difficulties in finding volunteer staff;
- Growing the project on the basis of well-identified strengths and needs;
- Acting according the citizens ideas and suggestions;
- Relying on networking, lobbying, education;
- Finding partners to balance the budget.

5.2.7 Bras-sur-Meuse (FR)

1. Main focus: Use of digital technologies

2. Bras-sur-Meuse is a commune located in the Meuse department in Grand Est in north-eastern France. It has used European funding to create telework centres offering high-speed broadband, training for silver surfers, a co-working space, and many activities for citizens. The main aim has been to stimulate entrepreneurship and to fight unemployment and social exclusion in its rural territory.

Main characteristics

- **Establishment of broadband access** at local level which led to the **creation of new types of services** (telecentres, co-working spaces, training, etc.) as there was very little awareness of digital tools before this initiative;
- **Strong involvement of citizens in all projects**, which is perceived as a condition for success;
- **A step by step approach**. For instance, Bras-sur-Meuse has developed and will be developing four main projects:
  - Digital management of the commune through a dedicated structure and specific mechanisms such as: open agenda before meeting on which citizens can comment via a webpage (http://www.placedelamairie.com/), use of different applications ("Better Street" and "Trello"), the Council table is replaced by a Tablet and, at administrative level, all tasks are digitised. Security software is installed on all devices;
  - Educate and raise awareness on digital tools through a wide range of training courses (with preferential rates for citizens of Bras-sur-Meuse) which take place at a dedicated training centre (Numeripole). To date, the centre has trained more than 500 people. In 2014 and 2015, the range of Numeripole's activities has expanded to a 'FabLab' (breakdown services for digital devices);
  - Economy and attractiveness of the area: creation of co-working space with common areas (kitchen, shower, etc.);
  - Homecare services for elderly: the project is to build 6 houses connected with social services to get access to certain services such as medical support.

Main challenges

- Difficulty in accessing EU funding. Application is perceived as too complex and the required innovative aspect of the project makes the application process more difficult.

Lessons learned

- Digital is seen (and used as such) as a catalyst which boosts access to services and civic participation and also an opportunity for rural areas;
- Audacity and political willingness are considered as been an important factor to succeed.

5.2.8 Cozzano (FR)

1. Main focus: Use of digital technologies, Environment dimension, Strategy development

2. Cozzano is a village located in the mountainous southern part of Corsica, which has faced decreasing population. From 2000, the strategy aimed to develop of new services and infrastructures integrating sustainable development. Since 2016, the project had taken a new direction with the partnership with the local University. The goal was to implement a "Smart Village strategy" including new technologies. New technologies are viewed as a tool to bring the village into the digital era. The project also aims to involve the local population, education and social cohesion.

Main characteristics

- Developing infrastructures and services with a sustainable development 'attitude'; becoming a 'positive energy territory';
- **Using new technologies to develop a 'Smart Village'** and build a connected network between environment and economic activities in partnership with the University;
- Becoming a "Pilot Project";
- **Developing a 'Smart attitude',** through a collective intelligence strategy, responding to needs and opportunities, with the participation of University students and involving the entire population (including the young and seniors);
- **Raising awareness** of the population and initiating innovative visions to increase social cohesion and territorial development.

Main challenges

- Facing the development challenges of the village and the decreasing population;
- Building a new enthusiasm through an integrated development strategy, including firstly a sustainable attitude, and secondly the "Smart Village strategy";
- Getting a good cooperation between political management and researchers;
- Connecting all the projects together and creating monitoring accessible to the commune management and the population;
- Being understood by the population and building mutual trust between actors.

Lessons learned

- Starting with well-defined strategies and goals;
- Building a good cooperation between policy makers and researchers;
- Raising awareness and sharing information with the population and all actors.

5.2.9 Ceglédbercel (HU)

1. Main focus: Involvement of the local population, Use of digital technologies

2. Ceglédbercel is a village in Pest County that is implementing a project designed to promote social cohesion in the community and a liveable place. The Mayor organised workshops with citizens to develop and share a vision for the village. The municipality is keen to secure the resources for investment in technology to serve the community, improving social and environmental sustainability, and also providing a new channel for communication.

Main characteristics

- **Involvement of the citizens**: cooperation between the Mayor, the Mayor's office and the community to understand needs and respond to requests;
- **Using digital tools to involve citizens in the decision-making process** but also to improve the quality of life (public lighting infrastructure, security of public spaces, Wi-Fi hotspot, traffic management);
- Using digital tools to develop the **attractiveness of the village** (applications informing locals and tourists);
- Working with experts but also local stakeholders;
- Setting up collaboration with research centres and Budapest University.

Main challenges

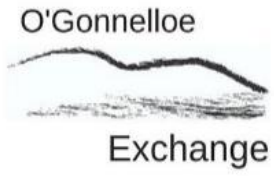
- Building good cooperation and communication with the citizens;
- Prioritising the main development into a planning process;
- Combining technical progress with needs and financial priorities through partnership between the stakeholders;
- Creating a realistic model for anticipated developments to pursue social cohesion in the village.

Lessons learned

- Establishing a good dialogue within the community to channel needs and to receive feedback;
- Sharing information with the citizens at each stage of the project;
- Working with specialised and local stakeholders who know specific circumstances of the village, but also to educate them in new technologies;
- Developing digital solutions in cooperation with researchers.

5.2.10 O'Gonnelloe (IE)

1. Main focus: Use of digital technologies



2. O'Gonnelloe is a small village located in east County Clare in Ireland. Originally, the project was implemented by residents who wanted address a significant population decrease which had migrated to large cities. The initial, small project aimed at improved communication between the inhabitants and a better way to enjoy the natural scenic environment provided a catalyst to a establish more collaborative processes, mainly aimed at developing infrastructure.

Main characteristics

- Setting up an approach built on the **individual's ideas** in a community perspective by organising **workshops** (called "Pow Wow"), which are the starting points of the concept of "O'Gonnelloe Exchange";
- Prioritising projects and privileging the project with **realistic feasibility and an affordable budget**;
- **Growing by stages**: opening a Saturday "pop up café" to provide a meeting place to the Community; choosing innovative locations and activities to connect the community for recreation and education; renovating of the old "Community hall";
- Working with a professional to produce good communication documents;
- Converting the old "Community hall" into "**Community hub**" (co-working space) with EU funds (LEADER) that harnesses the entrepreneurial spirit of the village and aims to attract (young) entrepreneurs;
- Working with **local stakeholders** for building restoration and applying rules of sustainable development;
- Decision-making process based on collaborative and exchange approaches.

Main challenges

- Working in stages on projects with local funds, focused on local interests and beneficial for the population;
- Working step-by-step to increase trust and recognition by local and regional authorities;
- Creating good cooperation with local stakeholders;

- Keeping the vision relevant and connected to citizens who wish to benefit from the outcomes;
- Balancing activities in an effort to keep (where possible) all aspects of the community involved;
- Developing a "culture based on a sense of purpose rather than a sense of perfection".

Lessons learned

- It is easier to set up projects if there is willingness from citizens and exchanges with them;
- Involving the citizens is essential: if the ideas come from them, it is then easier to accept changes;
- Moving forward with a step-by-step approach through small, locally-funded projects;
- Flexibility is crucial for Smart Development;
- Taking the diversity of inhabitants into account;
- Inputs from outside are important to strengthen confidence in the overall vision.

5.2.11 Pinela (PT)

1. Main focus: Social dimension

CENTRO INTERPRETATIVO DA CERÂMICA DE PINELA

2. Pinela is a village located in the North of Portugal. The project was initiated to address the decreasing population and to involve the first generation of the population living outside of Portugal. The project aimed to build a cultural identity around a traditional handcraft and to reorganise social activities around the old village school transformed in a Ceramic Centre. New technologies are a tool to build a new image of the village, communicate, educate and facilitate social cohesion.

Main characteristics

- Developing cultural and social projects around a regional specialty, the Pinela Ceramic;
- **Using new technologies** to communicate the "Smart attitude" of the Village and to raise awareness around the project but also to initiate innovative visions;
- **Developing activities responding to citizens' needs** (education, leisure, well-being, etc.); combining them to achieve more social cohesion;
- Renewing the old school building with a sustainable approach.

Main challenges

- Consolidating the social network inside the village and collaboration with the population;
- Strengthening the sense of belonging at the local level but also outside the village;
- Bringing people together around a centre of interest;
- Connecting the population of the village to the rest of the world through social networks.

Lessons learned

- "Thinking the present without forgetting the past and while looking to the future";

- Using new technologies as a tool to combine past/present/future and establish social cohesion;
- Motivation makes the difference, not the money.

5.2.12 Cluj-Nap (RO)

1. Main focus: Contribution to local economy

2. Cluj-Napoca is a Pilot Project that has been developed in the framework of a national project that aimed to create a local distribution network. Following market research in different regions of Romania, pilot Food Hubs were developed in different regions with, in parallel, the intention to create an replicable networked economic model. The project aimed to decrease economic pressure on farmers and enable consumers to eat in a healthier and more responsible way. This is designed to address an important challenge for small and medium sized Romanian farmers, which is market access, notably whilst facing Europe-wide competition.

Main characteristics

- Developing a viable economic model for food hubs;
- Developing local partnerships with farmers, restaurant owners and consumers of local products;
- **Creating a local Network** involving consumers and farmers in a short-supply chain, by giving added value to the current distribution system (home delivery, HORECA, specific points of selling, chain stores, markets and fairs);
- **Using new technologies to develop an innovative economic model**, by connecting suppliers and consumers (through social media and website);
- **Providing education and assistance for farmers** (food safety and certification, marketing, communication, etc.) in accordance with business and marketing plans;
- **Organizing events, farms visits and online communication** to boost the relationship between stakeholders and consumers.

Main challenges

- Starting with food culture to develop social and economic activities in a rural area;
- Promoting a local short supply chain for small and medium-sized farmers;
- Raise awareness among citizens and local communities on local food production (healthier and sustainable food);
- Gathering all stakeholders at local level and building a long-term trust-based relationship;
- Providing the opportunity to shape the services offered and to develop different services (by catalysing the role of the initial Food Hub project);
- Becoming an innovative pilot initiative that can inspire other entrepreneurs.

Lessons learned

- Focusing on food safety and certification is needed to reinforce trust among stakeholders;
- Involving passionate and committed individuals eases the effort in all projects;
- Understanding and acknowledging the strong assets of the village and, later on, building on them.

5.2.13 Bohinj (SI)

1. Main focus: Involvement of the local population, Environmental dimension

BOHINJ | SLOVENIA

2. This project in the municipality of Bohinj was initially founded by the Interreg Project Micropol, which aimed to develop smart solutions in rural areas and in the villages near and within Triglav National park. Bohinj is located in an area well known for its natural environment in the Julian Alps, especially its lake and forest. Tourist activity in the summer involves outdoor leisure and recreation; in the winter its attractions are mainly winter sports (skiing and ice-skating). To conserve the natural environment and reduce the negative effects of seasonal traffic, the Municipality has introduced several transport measures. Many events are organised throughout the year, each of which requires specific mobility solutions. In 2018, mobile social services were also introduced for the elderly population.

Main characteristics

- Project originated in an **Interreg project**, partly funded by the EU;
- Preserving the aim of the village and his identity (landscape, environment, fauna and flora);
- Proposing **innovative mobility solutions** in a touristic area to preserve the nature, the landscape and the quality of life;
- A bottom-up approach for preparation, with the involvement of inhabitants and diverse stakeholders – including SMEs, NGOs, institutions and the local tourist board.

Main challenge

- Protecting the social and natural environment of the Triglav National Park from tourist activities, mainly the burden of seasonal traffic.

5.2.14 Fintry (UK)

1. Main focus: Involvement of the local population, Environmental dimension

FDT FINTRY DEVELOPMENT TRUST

2. Fintry is a small village in central Scotland where a citizen-driven community management project has been implemented, based on the reduction of carbon emissions and development of sustainable energy. This action was initiated by citizens and managed by the Fintry Development Trust, which is based on a democratic organisation involving citizens' active representation of and engagement with the local population. The aim of the project is to involve the local community in the development of a sustainable energy project based on the funding of one windmill in a larger (15 turbine) wind farm. The financial resources produced by the windmill have allowed extension of the project to develop other actions directly related to sustainable energy.

Main characteristics

- Initially, a loan was secured by the community for the funding of 1/15th of a new 15-mill wind farm development. The return on investment was the source of funds to set up additional projects focused on energy;

- The revenue has repaid the loan over about 4 years, and covered all operational costs;
- In a second phase, the Trust has set up a **global strategy oriented towards enhanced sustainable energy**. It has also involved citizens and advised them on energy sustainability and improvement of household energy efficiency;
- The return on investment been invested in improved village wellbeing, with the construction of a sports hall, a shop as well as other energy improvements such as solar panels;
- The organization of the Trust involves the **participation of 250 citizens** (out of a population of 700);
- The Trust is collaborating with several Universities and external experts.

Main challenges

- Development by a community-based organisation to meet the objectives of making Fintry a zero waste, zero carbon and sustainable community;
- Collaborative Management by the Fintry Development Trust/Community Trust with strong citizen involvement.

Lessons learned

- Focusing on a single domain, in this case Energy efficiency;
- Involving citizens and setting good communication within the Community through efficient channels;
- Working step-by-step and project-by-project, exploiting contacts with other Communities or Research centres (University);
- Achieving a concrete outcome related to citizen wishes and needs;
- Considering the diversity of population attitudes, knowledge and behaviour.

5.2.15 Superfast Cornwall (UK)

1. Main focus: Involvement of the local population, Use of digital technologies

2. Superfast Cornwall aims to improve connectivity in the region of Cornwall by developing broadband and fibre connections in rural areas. So far, this project has equipped 85% of households with broadband connections, of which about 30% are at fibre optic speed. In order to increase uptake, the project has made several efforts including (i) engagement with local businesses, communities and citizens, (ii) conducting marketing and communication activities and (iii) undertaking digital inclusion activities by organising informal training to introduce internet to people who have no experience of it.

Main characteristics

- **Establishment of broadband and fibre access** to improve connectivity, as Cornwall region is largely rural;
- **Strong involvement of local people** as volunteers and participants in training is perceived as a condition for success;
- Implementation of digital inclusion activities developed through a **step-by-step training process**:
  - First, selected experts set up the courses and/or sessions in the community centres of the area to train volunteers from the local community;
  - These trained people later took over the training sessions on a voluntary basis;

- Local experts set up discussion sessions focusing on a number of different topics, such as how to save money by doing online shopping (e.g. via digital commerce), or how to use Skype to talk with relatives who have moved away, and how to find jobs using the internet.

Main challenges

- Sometimes difficulties were encountered in attracting young people in the digital inclusion activities;
- Inability of project team to wholly supervise the activities, as the training relies heavily on volunteers;
- Lack of transportation services in rural areas to enable people to attend training.

Lessons learned

- It is important not to try to impose ideas to the local community, but instead to slowly introduce them and find something which provides benefits to local people.

5.3 Key findings from the good practices

The interviews with key actors reveal a diversity of examples among these 15 villages and initiatives. They have common characteristics but also many differences. Four main observations can be made regarding the similarities of the villages and initiatives contacted.

5.3.1 Conservation of the village and/or ambition to improve the quality of life

The interviews indicate two types of rationale for the activities carried out. Some villages have experienced challenging situations and **the development of new activities is a reaction to these challenges**. These mostly relate to demographic challenges (depopulation and ageing population). This is particularly the case for the village of Eskola (FI) and Pinela (PT), where the quality of services had deteriorated and many young people had migrated to urban areas. The village of Cozzano (FR) also faced depopulation issues in the early 1990s and is now, as a result of a specific strategy, reversing the demographic curve. The concept underpinning the Superfast Cornwall (UK) project was also to limit depopulation in villages, especially of young people. The goal of the German project (Hofheim, DE) is similarly addressing demographic challenges such as emigration to urban areas and an ageing population. Access to job opportunities were an issue (Kolga, EE), and poor infrastructure leading to substandard connectivity prompted local-level solutions, for instance in the case in the village of O'Gonnelloe (IE) where the initial objective of the project was the collaborative construction of a 3km path to connect local amenities.

The other stimulus is where some villages see **transformation as an opportunity to improve their quality of life** through projects and activities which are not a response or a solution to a problem; rather the initiative has focused on a specific matter such as energy, tourism or education. For instance, the village of Fintry (Scotland, UK) created the Fintry Development Trust to develop a Community Energy Project. Since then, the Trust has employed an energy advisor and has offered residents free roof and cavity wall insulation and solar panel installation. Finally, the Romanian example involves improvement of access to local products (Cluj-Nap, RO).

5.3.2 *Involvement of the local population is fundamental to ensure long-term impact*

A common characteristic of all of the examples described is that the **citizens play a key role**, not only in the initiation of the project or activity, but also in its implementation. For instance, workshops were organised in Munderfing (AT). In Bras-sur-Meuse (FR), the Mayor indicated that citizen participation is a 'condition for success'. Moreover, the sustainability of the project or activity is, in most of cases, assured by a strong leader, or by a highly engaged and motivated group of people. One key actor indicated that the project was trying to promote a 'culture of togetherness' (Seeham, AT), which helps to create a happy and healthy living and working environment. An innovative way to involve the population is to mobilise the research sector and work in partnership with a University. The village of Cozzano has adopted this approach by organising meetings and interviews conducted by students with the local population and representatives of the University of Corsica had meetings with key actors of the village (local administration, organic saffron, pig breeder, firefighters). In addition, citizens are involved in the oral exams that students take after spending several weeks in the village.

What varies among the different good practices is how the involvement of people is organised: it can be around a specific platform (Agenda 21 in Seeham, AT), existing structures (Local Action Group in Aragón Infoenergía, ES), steering committees (Hofheim), pilot centres (Kolga, EE), informal meetings (Ceglédbercel, HU) or through digital communication (Bras-sur-Meuse, FR). In some cases, such as in the Romanian example (Cluj-Nap) a **combination of different means of interaction** is organised: monthly events, online communication and daily commercial transactions.

Finally, in most cases, whether the villages conducted several activities or a single specific project, there has been a **dedicated approach or strategy to ensure its effective implementation**. The most advanced illustration, in terms of scope and structure, is the village of Seeham (AT), where the Local Agenda 21 strategy, prepared in 2015, focuses on five themes: village community, education, social, environment and economy.

5.3.3 *Use of different sources of funding*

Another main observation is that there are **different ways of funding projects and activities**. The sources of financing identified are described in the table below.

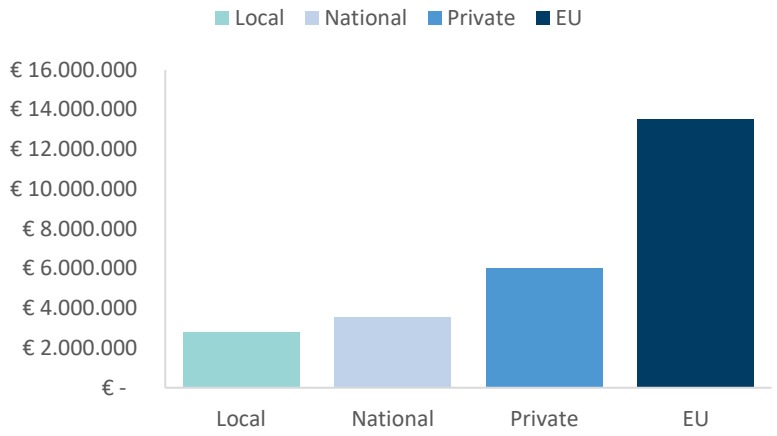
Table 7 Sources of financing

European	National	Local	Private	Other
• EAFRD (LEADER) • ERDF • ESF • EEA funds • INTERREG	• (Federal) State program • Govern-mental depart-ment	• Local adminis-tration • Commu-nity funds agency • Incomes from events and	• Local associa-tion(s) • Individuals • Private company (e.g. telecommu-nication company) •	• Public Private partnership • Foundation s • Incomes from events and activities organised

European	National	Local	Private	Other
		activities organi-sed in the village		in the village

According to the good practices examined, the majority of the sources of financing are either European or private. Member States are indeed rarely involved financially and the role of the private actors is very much dependant on the local economy and opportunities.

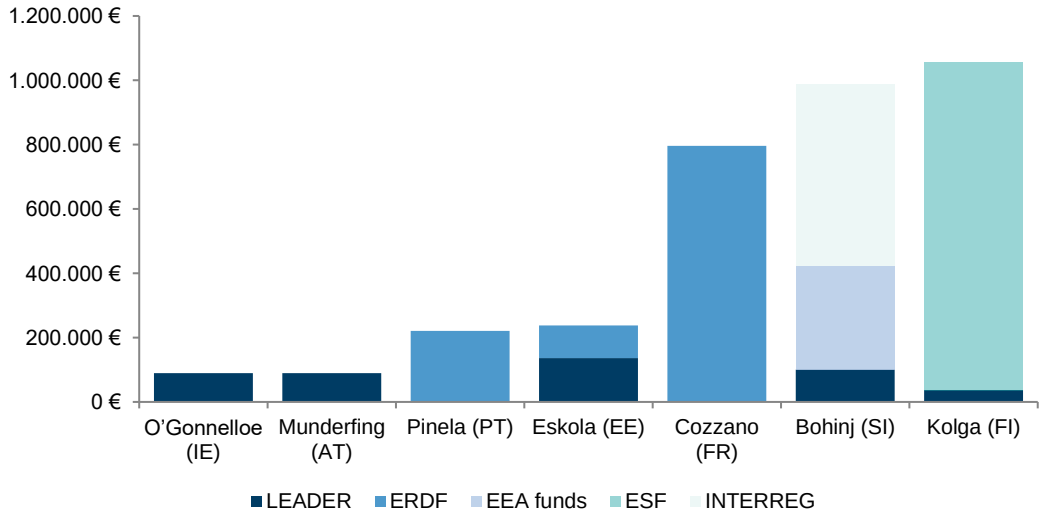
Figure 15 Funding sources for 9 examined Smart Village initiatives



Source 15 Ecorys, based on data from good practices. Note: Data only includes nine initiatives

If we look more closely at the EU funds, we can clearly see that LEADER financed by the EAFRD and ERDF funds are the most frequent in support for Smart Village strategies. Ranging from EUR 37,000 to EUR 136,013, five good practices interviewed benefited from EAFRD/LEADER funds. Regarding ERDF, the amounts allocated were more significant, ranging from EUR 101,700 to EUR 796,000.

Figure 16 EU funding sources in 7 Smart Villages



Source 16 Ecorys, based on data from good practices. Note: Data only includes seven villages; as regional initiatives, Superfast Cornwall and Aragón Infoenergía is not included here.

Several key actors noted that **access to funding could be challenging**. Some of the villages facing difficulties in finding funding also mentioned the complexities involved in accessing funding from EU instruments (O'Gonnelloe, Bras-sur-Meuse, Eskola, Seeham and Aragón Infoenergía). Lastly, one of the major issues frequently mentioned was financial risk, in particular for Ceglédbercel (Hungary), where it was challenging to find the resources for the mid- and long-term implementation of the project.

5.3.4 Digital technologies as a useful tool but not necessarily 'an end in itself'

Of the 15 examples, six use **digital or ICT related tools as an instrument to achieve their goals**. In Bras-sur-Meuse (FR), for instance, once the broadband connection was established, the digital system for management of the Municipal council was installed to educate and raise awareness of digital tools. Similarly, for Superfast Cornwall (UK), the main objective is to improve broadband connection and then to undertake digital inclusion activities such as training. In Scotland, Fintry has developed an online real time energy dashboard, which displays different features (e.g. type of energy, current availability, weather forecast, etc.). Ceglédbercel has developed a mobile application which aims to provide information on the village and on the services it offers. It is used by both citizens and tourists who are thus able to learn about the village. It offers the possibility to collect citizens' opinions via an online voting system, and also has a system of health or safety emergency alerts.

Cozzano (FR) considers new technologies as a tool, a vector of transformation. For instance, a digital infrastructure has been put in place through a wireless sensor network based on a LoRaWAN network. The sensors collect data regarding public buildings, water quality, air quality, weather and agricultural data. This data is then stored in a database and algorithms are being used to help predict the evolution of the observed systems. In addition, environmental data of the village is displayed through a billboard in the village.

Similarly, the Slovenian example highlighted how the project provided a good opportunity to learn how ICT can support the development of public services and products (Bohinj, SI). Pinela also emphasised that new technologies serve

as a tool to build a new image of the village, facilitate communication, educate and support social cohesion.

Most of the good practice villages also use digital tools in a traditional way for conventional purposes (website, Facebook page) or also by implementing free WIFI in central locations (Hofheim). However, although recognised as a useful tool, it was noted that technology is not "an end in itself" (Aragón Infoenergía). According to Superfast Cornwall for instance, introducing technologies and internet connections in rural areas has not been an "effortless process": it is a very lengthy process to get people to use the technology for the first time, to accept this type of project and engage them in the initiative. This was one of the major challenges that Superfast Cornwall encountered during its first phase of implementation. Moreover, this process can be frustrating from an activist's viewpoint: they are impatient for progress, but it takes time to engage the part of the community who is approaching the internet for the very first time.

6 How to become a smart-eco-social village: lessons learned from the case studies

Six case studies were carried out as part of the Pilot Project. Case studies were instrumental for the project team to examine the Smart Village concept more closely, and observe and investigate what is currently happening on the ground. The project team had the opportunity to experience and observe, first hand, the concrete realities from a variety of cases, with varying characteristics due to geographic location, economic and social activities and demographic background. These case studies allowed in-depth investigation of the process of planning, designing and establishing a Smart Village strategy.

This structure of this chapter is as follows: section 6.1 gives an overview of the approach, section 6.2 presents the case studies and section 6.3 provides the key findings from the case studies.

6.1 Overview

The six case studies examined here are keen to implement a Smart Village strategy, although they have not yet fully achieved this objective. Comparatively, the 15 good practice examples analysed in the context of this Pilot Project in the previous chapter were not necessarily seeking to develop a Smart Village approach, but were implementing one or more projects or initiatives that could be embedded in a Smart Village strategy, according to the definition provided in the Pilot Project. They could be considered as good practice in one of the highlighted aspects of the project related to the key parts of the definition. Thus, their experiences can be taken as good starting point for villages wishing to become 'Smart'.

The case studies were carried out between July 2018 and January 2019. Two pilot case studies were implemented during summer 2018. These two case studies were instrumental for the project team to test the methodology and identify actions to improve the approach. Moreover, the pilot case studies provided valuable feedback in regard to understanding of and expectation from projects by the villages involved and their communities.

Following the selection and implementation of the first two pilot case studies, a call for expressions of interest was launched during August 2018. The call was open to villages, municipalities, networks and communities willing to develop a strategy to become Smart Villages. 58 applications were submitted, originating from 16 Member States. The selection process was carried out through an assessment made by the project team, taking into account the information submitted and, when necessary, supplemented by preliminary phone calls. The selection was made to ensure balanced geographical distribution, cluster distribution, diversity in terms of sectors and/or topics already in place and a variety of themes regarding the projects/initiatives to be carried out.

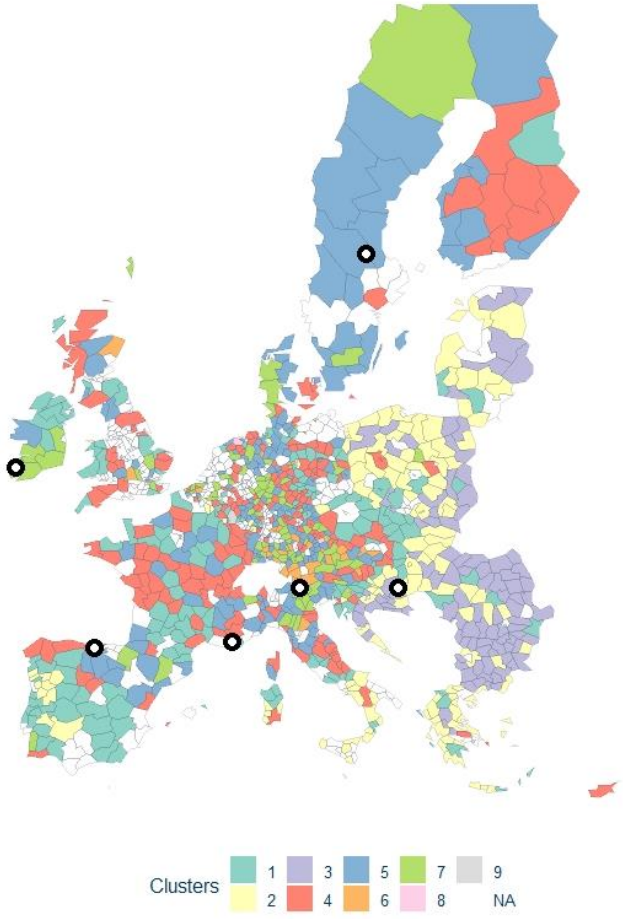
The methodology used during the case study implementation was, although based on a common framework, tailored to each village's characteristics and needs. Therefore, the project team adapted its approach to the different cases, mainly by basing the method on the preliminary information collected, the

maturity of the village, its experience, capacity and overall development objective. Thus, for some case studies, two field-visits were necessary, while for others one was sufficient.

The approach used in carrying out the activities prior, during and after the field visit(s) was also tailored to the village's features. Nevertheless, as the methodology was based on a common framework, some elements were always put in place while implementing the case studies. These included preliminary phone call(s), establishment of direct contacts with the local authority (or project/community leaders), interviews in the field and workshops with a limited number of local actors. Moreover, the recognition and valorisation of local experience and past/ongoing activities was always the basis for planning the future developments and identifying the main development areas.

The figure below shows the locations of the six case studies analysed in the context of the Pilot Project; it shows the geographical spread and the type of clusters of the case studies. Descriptions are provided in the following section.

Figure 17 Location of the case studies on the map of clusters of regions.



Source 17 Ecorys

6.2 The six case studies of the Pilot Project

6.2.1 Alsómocsolád (HU)

Background information on the village

Source 18 Ecorys

Alsómocsolád is a village situated in the northern tip of Baranya county. The urban centres of the three neighbouring counties (Pécs, Kaposvár, Szekszárd) are located at roughly equal distance (~50km) from it. It is surrounded by hills from the east and ponds from the west. There is no traffic flowing through the village, but the main road connecting Dombóvár to Bonyhád can be reached through a seven km road, renovated in 2013. Moreover, access to public transport in the village is limited. The settlement shares a railway station with the nearby Mágocs.

There has been a steady decrease in the number of inhabitants from the 1960s onwards. From approx. 600 in the 1970s, the number of inhabitants has dropped below 300. This is mainly due to constant migration of younger generations to larger cities, as well as low birth rates.

Following the local elections held in the 1990s, an independent municipality was created marking an important milestone in the life of the village.

Projects aimed at developing the village were implemented in several areas, focusing on:

- Local economy (introduction of a local currency, support to entrepreneurs, etc.);
- human resources and culture (telehouse, initiatives for the youth, etc.);
- infrastructure (access to electricity, gas, broadband, solar panels, "house of health", etc.);
- social development (initiatives to eradicate extreme poverty, environmental and health consciousness, etc.);
- tourism (student hostel, planetarium, etc.).

The initiation of the Smart Village strategy

- After decades of decline, the aim was to reverse the trend and to create a vibrant community that encourages locals to stay in place and attracts others;
- The main challenge is to address the steady fall in population numbers, and the risk of **depopulation**;
- The level of **involvement and motivation of local inhabitants**, as well as the businesses is not always sufficiently high;
- There is a shortage in skilled labour;
- The process so far has involved several elements, including improving the quality of life, provision of services, sustainability, education and constant investment in the local economy and jobs.

The activities

- The actions identified during the two field visits form a coherent strategy that builds on the SWOT analysis. The roadmap, developed under the guidance of the project team, consists of 11 actions, addressing various issues;
- The **perception shaping programme** is the key enabler for the projects to follow;
- Projects related to **quality of life** form the largest group.

How to overcome the challenges

- The actions listed in the roadmap target all the challenges that the village faces, by trying to further engage the community and to provide a **comprehensive framework** to tackle the weaknesses and threats identified in the SWOT;
- For instance, the **perception shaping programme** provides a good opportunity to increase the level of involvement of local populations in the area, as well as, to the extent possible, addressing labour shortages by investing in human capital;
- Another measure to overcome challenges is to **pool resources** through more cooperation with surrounding communities.

6.2.2 Correns (FR)

Background information on the village

Source 19 Ecorys

Correns is a village located in South Est of France (Provence-Alpes-Côte d'Azur region) in a forest area. There are 950 inhabitants and the closest urban area is Brignoles (20km distance from Correns). Access to public transport is rather limited as there are two buses making the connection to Brignoles twice a day (early morning and midday) and there are no train station. There is however a plan to introduce car-sharing.

In 1996, farmers and winemakers united and decided to try to produce organics products only. The underlying objective was to revitalise the community and give the opportunity to the villagers to invent a future for themselves on their territory. As a result, Correns is today the first organic village in France. Since then, the village has been part of a global approach to sustainable development: development of sustainable tourism, promotion eco-building, creation of responsible enterprises, actions in the field of renewable energies, organic school catering and fight against waste. Citizen participation is the cornerstone of the village's life. All activities are constantly based on active involvement of civil society, inhabitants, retailers, etc. This high engagement has materialized through the creation of an Agenda 21, supported by the independent association Correns 21. Agenda 21 aims at:

- Fighting climate change and maintaining the quality of the environment;
- Preserving biodiversity and protecting natural resources;
- Ensuring the fulfilment of all human beings;
- Promoting social cohesion and solidarity between territories and generations
- Stimulating the development of production methods and responsible consumption.

- Furthermore, thanks to its 25 associations, Correns is a relatively active village in a wide range of thematic areas: agriculture, environment and biodiversity, culture, sport, etc.

Finally, Correns is also active outside of its Region and France, as it is a founding member of Europe Organic Cities Network[19] and member of Città del Bio, an association that brings together municipalities and territorial areas that 'share the choice of promoting organic farming, not only intended as an agricultural model, but also as a cultural project'[20].

The initiation of the Smart Village strategy

- **Climate change, economic development and social progress** are the main challenges identified by the village. Therefore, through a strong participatory approach, Correns developed a strategy (Agenda 21), which embeds a series of activities and milestones;
- Willingness to **diversify agricultural activities** and to build on the success of being the first organic village of France;
  - Key starting points, when initiating a (smart) village strategy, are a good knowledge of the village's strengths and weaknesses, combined with a clear vision embedded in a strategy.

The activities

- **A diversified yet common approach** is seen as the best way to carry out activities in the village. Agriculture is one of the main activities of the village but the need to diversify it is acknowledged by the population. This diversification is now perceived as the core element to be included in the village strategy;
- **Several areas to be addressed have been identified**, such as agriculture (e.g. forest agriculture, food autonomy, cooperative of organic farmers), connectivity (high speed internet), mobility (e.g. car-sharing, electric cars), tourism (e.g. agro-tourism, green tourism, guesthouses), housing, waste management, and local services;
- **Digital technologies** are perceived as not necessarily indispensable but as a support for the implementation of activities.

How to overcome the challenges

- **Diversification of activities is seen as one of the main solutions to overcome challenges** (e.g. lack of diversification in agriculture, mobility/accessibility issues). New technologies are not considered to be the principal means of overcoming such challenges.

[19] https://www.ifoam-eu.org/en/news/2018/02/15/press-release-organic-cities-ifoam-eu-join-forces-bring-organic-every-table-europe

https://www.ifoam-eu.org/en/news/2018/02/15/press-release-organic-cities-ifoam-eu-join-forces-bring-organic-every-table-europe

[20] http://www.cittadelbio.it/

6.2.3 Ville d'Anaunia (IT)

Background information on the village

Source 20 Ecorys

Comune di Ville d'Anaunia is a municipality situated in the North of Italy in Trentino Alto-Adige region. It is located within the Alps and its territory comprehends two valleys, Val di Non and Val di Tovel. Ville d'Anaunia was established in 2016 due to the merger of three former municipalities, namely Nanno, Tassullo and Tuenno.

In recent years the municipality has experienced a steady decrease of the number of younger people between 30 and 34 years old, which are constantly migrating to larger cities once they complete their university studies. Thus, this diminishing number causes a low birth rate and an overall depopulation of the municipality.

The territory of Ville d'Anaunia is characterised by cultivated landscape and natural heritage, due to the presence of the Alps. Tourism sector is in fact an important part of the local economy, notably thanks to Tovel Lake, which is located 20 km far from Tuenno. This also causes serious mobility issues, notably during the high tourism season, as streets are not equipped for a big number of people. Nonetheless, tourism can be further exploited, in particular if compared to the neighbourhood areas.

The local economy gravitates to a large extent on the agricultural sector, with involves also induced activities, in particular in the service sector, commercial activities, public exercises and crafts. The agricultural sector is mainly monoculture of apples, which entails the presence of one of the Italian leading consortium of apple producers whose vital structure is made up of member farmers from Val di Non.

Due to the recent merger, the administration has faced several challenges in the governance of the new established municipality. Thus, the municipal authority has started and/or is going to start different initiatives in several areas to tackle the issues that Ville d'Anaunia is encountering and to improve the quality of life of its citizens. Among these initiatives, there are:

- The digitalisation of the administrative processes, documents and data, mainly through the municipality website;
- The creation of a shared calendar among citizens to book and reserve common rooms available in the municipality;
- A system of committees (called "Consulte") from each of the 11 small villages forming the municipality. Their threefold political, community and managerial functions allow them to represent the smaller communities in the municipality;
- SensorVille, a digital system which collects reports of malfunctions of streets and/or public areas directly from citizens;
- OpenAgenda, a shared calendar including all the activities carried out within Ville d'Anaunia.

The initiation of the Smart Village strategy

- The main issue encountered in Ville d'Anaunia is the **steady decrease of the population** aged between 30 and 34 years, especially linked to a **lack of diversity in employment opportunities**;
- Thus, the administration wants to create opportunities for young entrepreneurs to support the development of new business opportunities and therefore incentivise them to stay in Ville d'Anaunia;
- As the municipality of Ville d'Anaunia has only been recently established by merging three former autonomous municipalities, this has led to a variety of opportunities but also to some difficulties linked to the **creation of a common sense of identity** and to **citizen involvement**;
- The local administration is therefore willing to look for **'smart' solutions** to involve the entire population into the municipality decision-making process;
- Improving and further developing tourism has been identified has a crucial opportunity for local development;
- **The agricultural sector is the main pillar of the local economy** but requires better and more transparent management. This should take into consideration the needs of the population (e.g. avoiding use of pesticides close to households) and the opportunities for **diversification of activities**;
- Overall, the rationale behind the initiation of the Smart Village strategy is to **improve the quality of life** of Ville d'Anaunia's citizens and to **create opportunities** to avoid depopulation.

The activities

- Actions were identified within **three development areas**, namely the development of tourism sector, the relationship between agriculture, tourism and citizens, and social capital;
- At the same time, the **activities proposed tackle the main challenges** that the municipality currently faces (depopulation, especially concerning young people, and the lack of diversity in employment opportunities);
- These actions also aim to **improve the quality of life** of the citizens.

How to overcome the challenges

- It is crucial to establish an **innovative working method** to develop and implement the activities identified;
- The strategy must be based on a **participatory approach** and a **strategic and shared vision** towards the objectives;
- The main goal is the **provision of new and innovative services** for the local community.

6.2.4 Killorglin (IE)

Background information on the village

Source 21 Ecorys

Killorglin is located in the South and West Kerry Municipal District. The distance from the closest urban areas – Tralee and Killarney – is 20-25km, while larger centres such as Cork and Limerick are roughly 100-120km distant by road. It has a strategic location on the Ring of Kerry, a popular tourist route, as well as the Wild Atlantic Way.

Killorglin has a population of roughly 2200, with an overall 4355 in the Killorglin Electoral Division. The past two decades were marked by a steady growth in the number of inhabitants, which even outstripped the national average population growth.

The town has a very high employment density, with 2.2 jobs per town resident, the highest figure in the state. The largest employers work in the financial services, technology, pharmaceutical and healthcare sectors.

Local government functions are exercised by Kerry County Council, which is responsible for the provision and administration of a wide range of services in all of the county of Kerry. The Killorglin Chamber Alliance (KCA) was founded in 2015 to represent the commercial, industrial and professional community of Killorglin.

The town has an ongoing planning and strategy process, which started in spring 2018, and will be finished in 2019, with the KCA having a key role in driving both the planning and implementation phases. Public participation was ensured through several means, e.g. public meetings, workshops, surveys, online engagement through emails and social media, etc. An open information meeting was organised with about 80 local stakeholders. One of the outcomes of this meeting included a prioritisation of development areas. It also contributed to the subsequent development of a SWOT analysis. The Socio-Economic Plan for Killorglin was created based on this ranking of thematic areas with the help of a consultant. The document contains 95 actions that reflect the goals the community has set for itself.

The initiation of the Smart Village strategy

- Although Killorglin benefitted from good natural and cultural capital, as well as a vibrant economic environment, the town was **unable to harness its assets and missed out on opportunities**;
- To counter this, the Smart Village strategy process resulted from the cooperation of local government, industry and citizen initiatives;
- The aim was to **work towards higher-level goals** (i.e. climate change, smart development, EU developments, Brexit).

The activities

- The socio-economic plan for Killorglin was elaborated with the **involvement of the local population and the private sector**. The public sector played the role of facilitator in this process;
- While the current strategy outlines the main focus areas of the actions to be undertaken in the future, the final list actions are still to be elaborated in more detail.

How to overcome the challenges

- The SWOT identifies several threats and challenges to the development of Killorglin. Nevertheless, the town possesses **unique resources** and has embarked on a **development process** that takes these challenges into account;
- A potential problem could be that the final list of actions remains too long, or that they are too poorly specified. In the first case, the village will struggle to implement the plan, while in the second, there is a risk that there will be no one responsible for seeing the actions through. However, the stakeholders are aware of these risks, and intend to tackle them by **further refining the proposed plan**. They have set up a Smart Village working group for this purpose.

6.2.5 Red de Municipios Intelligentes y Sostenibles (ES)

Background information on the village

Source 22 Ecorys

The Red de Municipios Intelligentes y Sostenibles (Network of Smart and Sustainable Municipalities, "RMIS" hereafter) comprises a group of municipalities situated in Northern Spain, specifically in the regions of Cantabria and Castille and Leon. Altogether they represent approximately 30,000 inhabitants.

Although each municipality works independently from the others, they all have in common three elements:

1. the need to change their public lightning system;
2. a vision of the future based on the use of new technologies to face social, environmental and economic challenges;
3. a private company (Zwit Project) that has not only participated in the structuring of structured the rural strategy of the municipality, but also encouraged the creation of the Network.

Such vision stems from the combination of the smart and sustainable development model proposed by Zwit Project and the municipalities' need to find solutions to the serious challenges they are facing.

The smart and sustainable development model is based on the generation of a public Smart Management Network (SMN) for the efficient management of municipal infrastructures (lighting, water, waste, etc.) as well as for the offering of new services to citizens. In order to do so, they use the implementation of LED technology in the public lighting system of each municipality (a process considered a priority for the municipalities regardless of Zwit's proposal) as leverage to create the SMN. In brief, the anchor project (the creation of the Smart Management Network) aims to:

- better manage the municipal infrastructures;
- provide the necessary connectivity to launch other projects of social and environmental nature, such as socio-health initiatives, connected tourism, or smart industries;
- guarantee that the necessary resources, to achieve the above (publicly-owned hardware and open-source software), stay public in order to ensure the affordability of the municipalities' smart management.

The determination to fight the (risk of) depopulation, the enthusiasm to manage resources with a new approach and the relative easiness and good timing to implement the anchor project have made possible that these five municipalities structure their ideas around sustainable rural development in their villages in one single objective as the Smart Management Network, proposed by the private initiative Zwit Project. The creation of the network is the natural progress of the collaboration between the mayors and councillors who aim at sharing knowledge and experiences, share possible costs, access finance and encourage others to join. The municipalities are currently discussing the rules and regulations of the future organisation.

The initiation of the Smart Village strategy

- **A self-critical exercise** is needed to identify the problems of today, and of those to come;
- Isolated actions and the debates conducted have no coherent "**backbone strategy**" and thus fail to address the real problems. A new approach is required in order to change this fragmented environment;
- Municipalities have encountered difficulties and bottlenecks in the past when implementing initiatives/projects for rural development (e.g. through the LEADER project). An innovative example, however, can bring **hope** and lay the foundations **for change**.

The activities

- **Analyse the reality and future** prospects of the municipality;
- **Find a common vision** agreed with different representatives of the municipality and political parties;
- **Develop a strategy** with objectives and aims in the short and medium term. Involve citizens in the process to establish priorities and decide on implementation phases;
- **Find an anchor project** that can represent a concrete change for better and that can prepare the ground for more extensive actions and subsequent changes.

How to overcome the challenges

- Involve representatives from the municipality and other political parties in the village: **create a team**;

- **Involve team members** in the project, facilitating ownership and responsibility;
- Present, explain and intensively promote the vision and changes to come in the village. **Involve citizens in the project**, facilitating ownership and survival of the project throughout time, regardless of any political changes at the municipality.

6.2.6 Svärdsjö (SE)

Background information on the village

Source 23 Ecorys

Svärdsjö is located in the middle of Dalarna region (Central Sweden) and it is part of the municipality of Falun. Svärdsjö is the largest village situated in the area, with a population of 4261 total inhabitants. It is located 25 kilometres from Falun. Svärdsjö is cooperating with other villages, and it is part of Rural Sweden, a national civil society organization for rural development. In Svärdsjö and its countryside there are currently more than 300 companies and enterprises of varying size, which is due to the great entrepreneurial spirit which characterised the village.

The village is currently facing several challenges, notably:

- Increase of aging population;
- Lack of attractiveness for younger people to stay in the village;
- Lack of housing services;
- Lack of financing.

- To tackle these issues, the village is implementing several initiatives, which are mainly organized and carried out by local associations. Indeed, the local community of Svärdsjö is actively engaged in several associations, which are working in cooperation with the municipality, in particular for what concerns the organisation and the provision of social activities. These initiatives aim at gathering the community and making people actively engaged in the activities carried out at the local level.

- One of the most important local association of Svärdsjö is Svärdsjö Intresseförening. It was created in 1991 with the aim of:
  - Acting as a forum for companies and associations;
  - Developing housing services;
  - Developing conditions to allow businesses to establish in the village;
  - Collecting and gathering the interests of small communities and acting as a spokesperson in front of the authorities (notably, the municipality).

- In this context, Svärdsjö Intresseförening is currently developing several initiatives. One of the most significant measures was the re-opening of the gas station of the village, in cooperation with the local community. The

closure of the previous (and unique) gas station had indeed had a negative impact on the mobility of the local community and on the life of the village as whole. All profits coming from the gas station will be used by the local community. Revenues will indeed financially support projects, proposed by local associations and/or single individuals, which are beneficial to the community itself.

At the time being, these projects are partly financed by revenues coming from windmills installation in the common forestland. The windmills were installed as part of the Fakts Jadraas Vindkraft Park project, which settled part of its windmills in the forestland in Svärdsjö's surroundings. The land is currently owned by a shared-owned company that puts together around 800 single land-owners. The company has an agreement with Svärdsjö Intresseförening, which states that 6-7% of its revenues have to be in the village and the local community.

The initiation of the Smart Village strategy

- One of the main issues encountered in Svärdsjö is the large **divergence between urban and rural areas**, notably concerning the provision of services;
- Thus, local associations, in cooperation with the municipality, are working to **diminish these differences** and **improve the quality of life** of people living in the village; this is done mainly by securing existing social and public services, but also creating new ones;
- **Improving mobility** (within the village and to the city) **and housing services** have been identified as crucial opportunities/solutions for local development;
- Overall, the rationale behind the initiation of a Smart Village strategy in Svärdsjö is to improve the quality of life of citizens, make the village a place favourable for further business and economic opportunities and boost its attractiveness.

The activities

- The village, in cooperation with the municipality has developed a **local development plan**, which aims to bring the population closer to the municipality and make them feel involved in the decisions that are taken;
- In parallel, local associations in the village are carrying out several initiatives, which are mainly aiming at **securing public services**. One of the most important is the **establishment of the local petrol station**, which is entirely owned by the local association;
- Digital technologies and digitalization activities are not currently being addressed, but they could represent an area to further exploit and develop.

How to overcome the challenges

- The local development strategy must be strongly based on involvement of the local population, through a **participatory approach** and a **strategic and shared vision** to achieve its goals;
- The main objective is to **secure the provision of social and public services** (notably concerning housing), thus **improving the quality of life** of people living in the village.

6.3 Key findings from the case studies

The implementation of the case studies resulted in a diversity of experiences among these villages; however, four main observations can be made regarding the similarities in the processes applied in the villages analysed.

6.3.1 Developing a strategy: the first milestone of a Smart Village

- Regardless of the size of the village or the number of beneficiaries, 'smart' does not necessarily imply that economies of scale or access to large markets are required to have an impact on the quality of life of the population in rural areas. Any Smart Village strategy is built on and for a vibrant community. **There are two main reasons for developing a Smart Village strategy**. In correspondence with the good practice illustrations, case study examples demonstrated two key incentives for the initiation of a Smart Village strategy:
- **Responding to a challenging or negative situation**. Demographic challenges such as depopulation or an ageing population are often the main reason why a village decides to react and start a new strategy. For instance, the villages of Alsómocsolád (HU) and Ville d'Anaunia (IT) both face a decrease in their population, notably among people aged under 35 years. In Italy, the lack of diversity in employment opportunities also encouraged the commune to respond to this situation. In Spain, the villages were facing administrative bottlenecks, which hindered access to funding.
- **Seizing the opportunity to transform the life of the village**. Some villages develop a Smart Village strategy simply to improve the quality of life of their citizens, provide better services and boost the attractiveness of the village. The case studies confirmed this approach. For instance, the village of Killorglin (IE) developed a strategy to work towards higher level goals – such as EU developments and climate change – to be able to take advantage of the opportunities and to be prepared to face the upcoming challenges.

- Whether the aim is to respond to a challenge or to improve the life of the village by focusing on a specific area, there are some common elements that characterise villages embarking on such undertakings. These include, for instance, the presence of a group of motivated people, inspiring examples to build on, a vision and a willingness to change and improve the life of the community.

- Several conditions will have a significant influence on the implementation of the Smart Village strategy, such as:
- The need to establish strong leadership for the process, as well as adequate capacity to see it through;
- An active and engaged local community, essential for success;
- A Smart Village strategy that aims for simplicity, and tries to avoid duplicating existing initiatives and strategies;
- Clear prioritisation of the areas of action, and eventually even the actions;
- Support and training from other communities, such as the research community;
- Working with a consultant, or with a network of experts.

When conducting the case studies, the study team observed that most of the selected villages were well advanced in their use of planning and participatory tools, and have already developed a clear strategy outlining the needs and the main goals to be achieved. However, practical roadmaps related to the specific aspects of implementation were not common.

We observed that there were some similarities in terms of process and methodology of how to develop a strategy:

- **Initiation phase:** The aim is to raise awareness among locals and to try to involve them in planning and the identification of the areas for action. This could include:
  - Awareness raising through multiple channels;
  - A call for participation in the programme;
  - Creation of a dedicated "Smart Working Group";

- **Stocktaking phase:** During this phase, the community collects feedback and identifies a way forward. An assessment of the needs is considered to be the most important outcome of this stage. The most common tools used are:
  - SWOT analysis (Alsómocsolád, Killorglin, Red de Municipios Rurales Intelligentes y Sostenibles (ES) and Svärdsjö (SE)) which helps to identify the strengths and the weaknesses of the village while at the same time looking for opportunities and threats faced;
  - Workshops;
  - Online survey (Svärdsjö, via Facebook);
  - Informal meetings.

During this phase, the group of people involved is relatively large

- **Identification of areas and prioritisation of actions:** This is achieved with a smaller group of people, albeit building on the feedback of the local population.

The information collected during this phase should feed into a shared vision elaborated as part of a strategy (Correns (FR), Ville d'Anaunia, Red de Municipios Rurales Intelligentes y Sostenibles and Svärdsjö). Nonetheless, the minimum is to have the actions integrated in a comprehensive framework (all).

Drafting of the strategy: Having a leading case ('anchor project'), driven by a key actor, can be used as a source for inspiration (Red de Municipios Rurales Intelligentes y Sostenibles).

- **Iteration of the stocktaking and prioritisation phases:** Because of the rapid pace of change in the environment (in terms of needs, the financial and regulatory environment, and also technological change) Smart Village initiatives should aim to minimise the time between design and implementation. Therefore, the stocktaking and prioritisation phases should be reiterated periodically to assess whether the actual needs are still targeted by the actions outlined, and to check if there are other, more effective or efficient options available (Alsómocsolád – as outlined in the most recent micro-regional strategy)[21]. In addition, the results of projects implemented should be compared against initial expectations to measure the progress achieved to date, and to see whether adjustment in the approach is needed.

[21] Észak-Hegyháti Mikrotérségi Unió (2019) Okos Hegyhát Stratégia

6.3.2 Participatory approach coupled with strong leadership as key drivers of a Smart Village

The engagement of local populations is a key requirement for success. All of the case studies examined have used some sort of **engagement strategy to involve local citizens.** They have all emphasised the importance of the participatory approach, not least because it ensures a sense of ownership among those involved.

Nonetheless, their **experiences vary considerably**. In Ville d'Anaunia or Killorglin, a very pro-active local community made it relatively easy to rely on a participatory approach. Conversely, involving citizens in decision-making proved to be more challenging in Alsómocsolád, despite constant awareness-raising campaigns and series of dedicated events. A common element, however, is that the key features of the visions or strategies arise from workshops or events where local people could make their voices heard. In most cases (e.g. Alsómocsolád, Killorglin), even specific project elements of the strategy are identified using participatory methods.

Case studies have shown that **strong political leadership is at the heart of a prosperous Smart Village**. The local administration, and in most cases, the figure of the mayor, proved to be a decisive factor. This latter is especially relevant in the cases of Correns and Alsómocsolád, where the mayor played a pivotal role in driving strategic planning and innovative initiatives, while trying to set up an inclusive framework that involved the local community. In Ville d'Anaunia, the main actor is the local administration, which is carrying out several initiatives to support local development and to foster the involvement the local community. In countries where no lower (i.e. local) level of government exists, this leadership can come from the civil sector or the private society. The public sector can play a role in fostering the creation of such structures. For instance, Kerry County Council helped create an organisation in Killorglin that represents the interests of the local community, and which is at the forefront of the development process.

Local populations can be organised in different ways, from small groups meeting informally to more structured and established organisations. For instance, locals can be mobilised through existing structures, such as LAGs, meetings or workshops (Killorglin) or around a specific platform (Agenda 21 in Correns). Participation is generally not restricted to citizens, with organisations and local companies often playing a prominent role in the process. Our case studies revealed that the involvement of local businesses can make a strong contribution and provide a more solid financial basis for project implementation; for example, Public-Private Partnerships provide a good framework for enterprises to contribute to local development in this context. However, citizens should remain the main driving force behind the whole exercise.

- Furthermore, it is important to emphasise that in the majority of the cases, the work provided by the local population is voluntary and based on trust between the local population and their political leaders. While this can mean participation in the dedicated workshops, in some cases (Svardsjö and Killorglin) even the body at the fore of the Smart development process could consist of volunteers. Nonetheless, a high level of involvement from volunteers runs the inherent risk that they might become inactive in critical stages of the process, leading to a loss of momentum.

- Finally, it should be noted that a participatory approach and the need for a strong leadership are mainly **based upon personal relationships and trust**. In addition, the successful implementation of the strategy as well as the motivation of the local population is often very dependent on the **involvement of one individual** (in most cases the Mayor) and this person's cooperation with the local community. Smart Village strategies with a long-term vision provide a tool to mitigate this risk, as well as the establishment of a governance structure that ensures continuity.

6.3.3 Implementing innovative services and activities as ways to ensure better living

One of the main common features from the case studies is the **aim to provide new and innovative services to the local community**. This is often due to the fact that rural areas have experienced a decline in the range of services available. In this context, discovering and implementing new solutions to address these local challenges is one of the key characteristics of Smart Villages, which is observed in the case studies. Innovative services are also often developed and implemented with the aim of improving the quality of life of the local population.

Smart Villages innovate in various areas and in very diverse ways, mostly depending on their local assets, opportunities and challenges, which stem from their local context. In one third of the of cases analysed, an **'anchor' project proved useful in steering the local strategy** towards a specific objective. This is the case of Red de Municipios Intelligentes y Sostenibles, which implemented an innovative way of managing municipal infrastructure, through changing public lights into LED technology. Likewise, Ville d'Anaunia is making use of digital technology to manage the local administration in an innovative way, by developing a set of services to share information regarding the local government.

Villages can develop a wide range of creative and innovative solutions to overcome different challenges and diversify their activities by building on their own local assets. In Correns, agriculture is one of the main activities of the village, but the local population acknowledges the need to diversify these activities. Thus, diversification of services and sectors is perceived as the core element to be included in the development strategy. The same need for diversifying activities is recognised in Ville d'Anaunia, where the local economy is dominated to a large extent by the agricultural sector.

The design and implementation of innovative services and activities involves several people and/or organisations, which can include locals (internal stakeholders) and supporting actors from the outside (external stakeholders). Private companies often demonstrate flexibility and innovation, which can bring added value in the provision of services to the local community. This was observed in the case of Killorglin, where the local authority, in close collaboration with a private company and university, is developing an innovative hub for the local population.

Creative solutions are also necessary to ensure that local communities can benefit from a relatively wide range of services. In this regard, **combining services can maximise the efficiency of service provision and delivery**. This is the case of Ville d'Anaunia, which established an online platform for sharing goods and services to support local organisation and citizens in implementing their activities, in a cost and time efficient way. This avoided duplication of services and tools (including infrastructure and equipment).

Implementation of activities and public services can also be financed in a variety of innovative ways. For example, the main local association of Svärdsjö is carrying out several initiatives, mainly aiming at ensuring the continuity of public services for the local community. One of the most important is the establishment of the local petrol station, which was financed from different sources, both private and public. The petrol station is now completely owned by the local association itself, which returns revenues generated to the local population by financing projects and initiatives for community benefit. Likewise, Alsómocsolád is also exploiting a combination of private and public financing sources to fund its public services and initiatives.

6.3.4 Cooperation and alliances can enrich the Smart Village approach

According to all case studies examined, **cooperation with the surrounding communities is perceived not only as enriching but also indispensable**. More cooperation, both internal and external, is deemed necessary for further development.

It was observed that there are **different types of cooperation**. Smart Villages can exploit alliances with external entities, such as other villages, communities and/or the private sector. For instance, the Red de Municipios Intelligentes y Sostenibles created a network to bring forward a common development strategy, which is based on the same smart and sustainable model. In addition, cooperation can also be with other types of authorities, such as regions, cities or municipality. This is the case of Svärdsjö, which, for a number of years, has cooperated extensively with municipalities in different areas. It was observed that collaboration with the municipality can range from financial opportunities to political support. Svärdsjö is also part of a national network, allowing the village to exchange good practices and to further enrich its development strategy.

Smart Villages can also cooperate with the private sector. The case studies analysed show that the involvement of the private sector can improve the development of the Smart Village strategy. **Mixed solutions** (also in terms of financing) between public and private **are deemed to incentivise the establishment of a Smart Village strategy**. This is the case in Killorglin, which has developed some Public-Private Partnerships (PPPs) that are supporting the process and thus the implementation of the local strategy, notably through the opening of an innovation hub, in collaboration with the local government and the university. Thus, **links to the research and academic community** can strongly benefit the establishment of a Smart Village strategy.

Entities from the private sector can also be key actors in the provision of innovative services. This is the case of both Red de Municipios Intelligentes y Sostenibles and Svärdsjö; in the former, some public services were partly financed from revenues coming from windmill installation in the common forestland. Likewise, the creation of the network Red de Municipios Intelligentes y Sostenibles was strongly encouraged by a private company, which then participated in the design and structuring of the rural strategy. In this case, the private sector was also the initiator of the 'anchor' project that initiated the whole Smart Village strategy for the villages that are part of the network.

Nevertheless, a Smart Village does not only cooperate with external entities, but it also profits from internal cooperation, meant as collaboration among the local community. As observed in the examined case studies, **internal cooperation is often key in the design and planning of a local development strategy**, as well as its implementation. Internal cooperation is

often expressed as a strong associative culture within the village. This is the case of Svärdsjö, Correns and Ville d'Anaunia, which, in different ways, have managed to strongly engage and involve the local community (which is often organised in associations and/or groups). This is also a way to further improve the participatory approach and engage citizens in the decision-making process of the village.

7 Workshop: The Smart eco-social villages Pilot Project and the future of Smart Villages

On 21 and 22 February 2019, the project team, in collaboration with the European Commission and the European Parliament, organised a workshop entitled "The Smart eco-social villages Pilot Project and the future of Smart Villages". The event, held at the European Parliament, had the objective of presenting and discussing the preliminary conclusions of the Pilot Project with relevant stakeholders and European Commission's representatives. The workshop attracted more than 100 participants, 18 speakers and panellists and 10 representatives of the case studies of the project.

The workshop was organised over two consecutive days in February 2019. The programme agenda began with a formal opening. The four major sessions that followed provide the opportunity to focus on the most important findings and issues arising from the Pilot Project. These sessions discussed innovative services in Smart Villages; the role and importance of digital technologies; how to develop a Smart Village strategy; and how to finance Smart Villages. Each of these included a keynote presentation to outline the topic and its relevance, presentations from the case study villages and a broader panel discussion which included opportunities for all participants to contribute. The final session of the workshop summarised its main conclusions and identified priorities for a way forward, both for action at the grass roots level and for an enhancement of the policy framework that could coordinate actions at the various tiers of government across Europe.

7.1 Main outcomes of the workshop

Introduction
The European Commission opened the meeting by highlighting the increasing support that the concept of Smart Villages continues to gain at the European level. New technologies can help rural areas to develop skills and tools; connectivity is therefore seen as a key characteristic of Smart Villages. It is important to ensure that rural areas are not left out of the process of enhanced and extended connectivity, and the Smart Village concept could provide a vehicle to counter this trend. In this regard, the Multiannual Financial Framework (MFF) will play a very important role. The preparatory work regarding the Smart Villages initiative should start very soon and Member States will have the opportunity to be involved and to support its development.

Although until now the idea of Smart Villages has been concentrated in the Central European area, the European Parliament stressed the involvement of all European countries. Smart Villages are playing an important role in resolving current global issues and strengthening solidarity. In this regard, the inter-institutional group to host the concept of Smart Villages was mentioned. This

role of the European Parliament (EP) in the successive steps that have led to the construction of the Smart Villages concept has been crucial. For instance, and as a step forward towards strengthening the concept, on 3rd October 2018 the EP adopted a resolution on addressing the specific needs of rural, mountainous and remote areas, in which it urged the establishment of a Smart Villages Pact in accordance with the principle of subsidiarity and the Urban Agenda for Europe set out in the Pact of Amsterdam. Finally, the importance of digitalisation (e.g. telemedicine) was stressed as a key characteristic of Smart Villages.

The Pilot Project on Smart Eco-social villages was then introduced. One of the early tasks of the project was the establishment of a definition to clarify the concept of Smart Villages. Following input received from stakeholders, the definition developed by the Pilot Project has sought to embrace the width of current activities and future possibilities, as well as the need for flexibility to facilitate its use in diverse national and local contexts. The definition also considers the policy context, in particular the proposal for the Common Agricultural Policy (CAP) after 2020, which anticipates greater flexibility in policy choices for Member States. The proposal's intention is to allow Member States to align policy with, and focus it on, their specific needs, which would include scope for the design and implementation of interventions for support to Smart Villages. The purpose of the definition is therefore to inspire, and to promote the potential of the concept; both for communities in rural areas to take action, as well as for policy makers to make decisions on future support of Smart Villages.

First Panel: Innovative services in Smart Villages

One of the key characteristics of Smart Villages is their ability to discover and implement new solutions to address local challenges. Smart Villages can innovate in various areas and in very diverse ways, depending on the opportunities and challenges stemming from their local contexts and needs. To implement innovative services, important aspects to take into consideration are organisation and coordination. This contributes to the formation of a critical mass of smart activity in rural areas. Additionally, small rural communities can face difficulties in finding specialised workers and mobilising financial resources. Therefore, having integrated services not only facilitates their implementation but also enhances their efficiency. Combining a bottom-up approach with expertise from outside is also a good way to move forward. Private companies often demonstrate flexibility and innovation, which can bring added value in the provision of services to the local community. Whether or not external stakeholders are involved, innovation cannot happen unless capacity and a strong organisational process exist to see it through.

One of the case studies carried out in the context of the Pilot Project, **Comune di Ville d'Aunania,** seeks to provide its citizens with plenty of opportunities for their future. Innovative solutions are applied to ensure the provision of public services. Two examples were presented: "Spazi Comuni", which allows people to organise events by reserving a meeting room and/or equipment; and "GestiAmo", a platform which enables people to interact with public authorities and to pose questions on certain issues. Similarly, the **Fintry Development Trust** aims to enhance the sustainability of its rural community through climate change mitigation and alleviation of fuel poverty, and provides an ongoing energy advice service to local homes and businesses. In 2007, Fintry became the first community in the UK to enter into partnership agreement with a windfarm developer (Falck Renewables).

The **panel discussion** focussed on:

- the importance of mobility, especially in rural areas. A reference to the SMARTA project as a tool to promote mobility was also made;
- the relevance of participatory approach and sustainable use of energy, as important characteristics of Smart Villages;
- the European Commission proposal regarding ERDF, which refers to Smart Villages and provides an enabling framework. In this regard, governance is very important, and should be based upon bottom-up, participatory and integrated approach;
- the importance of digital technologies as tools for rural areas, as they facilitate social and technical innovation;
- a warm welcome for European Parliament's engagement regarding Smart Villages, as it recognises that Smart Villages are a major opportunity for rural areas.

Second Panel: Role and importance of digital technologies

The 'Smart' concept arises from the IT community, and so it seems natural to include digital technologies in the concept of Smart Village. Even so, digitisation is not a goal *per se*, it is more a tool to help realise rural development objectives. Rural communities exhibit heterogeneity in the use of digital tools, with some areas being more advanced than others that often lack appropriate engineering. Digitalisation in rural areas should be accompanied by awareness-raising among citizens and provision of training opportunities. Digitalisation should foster networking among people, support creation of short supply chains, improve accessibility to public services, empower citizens, provide access to training and education for young people and promote sustainable construction practices. Moreover, digitalisation can facilitate the active participation of the population through bottom-up approaches. Cities and rural areas are not competitors, rather they can cooperate within a framework of Smart territories.

As example, **Los Corrales de Buelna** use new digital technologies as crucial tools to tackle the challenges of rural areas (for example, an ageing population and progressive population loss). Through installation of integrated lighting and telecommunication infrastructures, the municipality aims to reduce the digital divide. Fostering connectivity in rural areas provides all citizens, regardless of the age group, the opportunity to access new and innovative services. Also, **Bras-sur-Meuse** makes full use of the new opportunities accessible through digital technologies, which provide, for instance, support for homecare services for elderly as well as increased attractiveness of the village through the establishment of co-working spaces and FabLab facilities. By exploiting new technology opportunities, the municipality has improved civic participation, for instance by providing training, and has fostered social cohesion including intergenerational dialogue.

The **panel discussion** focussed on:

- how "digital" should be part of the definition of Smart Villages, as it is about efficiency, transparency, participation and inclusion;
- the essential role of connectivity, which is an element to keep young people in rural areas. The uptake of digital technologies requires skills and competence development especially for the older cohorts of the population;
- the need to enable local communities to use new technologies and support digital social innovation practices. A one-stop-shop to showcase benefits of digital technologies is one way to support this; moreover, the next MFF will provide additional support for digital innovation;

- the role of national broadband competence centres, which can provide advice for training and existing opportunities;
- access to the best available connection for rural areas to fully exploit the potential of digital farming;
- the costs of infrastructures, which, although decreasing, are still burdensome for rural communities. In this regard, possible opportunities of mixed private public solutions as well as potential synergies between EU Funds were identified as possible solutions.

Third Panel: How to develop a Smart Village strategy

1. Successful villages appear to share several common features. They only focus on a few actions at a time, and these are intended to address the needs and challenges of the community while building on the assets available. An effective governance structure and adequate human capacity are vital for a successful Smart Village initiative. The municipality is generally in the vanguard of the initiatives, and animators have a key role to play in the initiation and development of the strategy. However, they should seek input from the local population and make residents' views and needs central to the development process. The active engagement of local people, not only in initiating the planning processes but also in delivering on planned actions, is an essential feature of successful Smart Villages. Strategies should focus on a shared objective, based on a common understanding of needs. They should aim for simplicity and avoid duplicating other strategies. Finally, links with the research community can go a long way in helping to make a success of Smart Village strategies.

In this context, **Svärdsjö** built its strategy on a shared common vision and developed it by cooperating with different local actors. The involvement of residents in the actual implementation was essential, as reaching goals together creates a special bond between people. Structure and leadership during the development and implementation of projects are also crucial factors of success. Similarly, **Killorglin** used extensive community engagement for the development of its strategy. Effective community planning and a community-led collaborative approach towards development were critical factors for the town's work.

The **panel discussion** focussed on:

- the several initiatives currently under way, which provide foundation of experience for future initiatives, rather than have them try to 'invent' something completely new;
- the actions with tangible benefits local rural people want, rather than strategies. Therefore, strategies must remain flexible;
- avoiding duplication of existing structures and programmes;
- good practices must provide inspiration and could be replicated on a broader scale;
- that successive LEADER programmes have already achieved positive results in rural development, but that the role of Smart Village initiatives should be complementary, rather than overlap with it;
- Smart Village initiatives as a less formalised way to achieve development goals;
- the often-difficult alignment between the diverse sets of interests that exist among local people. In this regard, prioritisation exercises in identifying the key needs and interests of locals were mentioned in some case study examples as possible solutions.

Fourth Panel: How to finance Smart Villages
Financial support to Smart Villages needs to be adapted and tailored to the scale and level of development of the individual village. Consequently, combinations of packages of financial support can improve and support the resilience of villages by allowing them to become self-supporting. The administrative framework should be simplified and streamlined: as a result, there is no need to set up another European fund, but rather, to make better use of already existing funding sources. In this regard, a network of Smart Village advisors could help relatively disadvantaged areas. Nevertheless, Member States need to provide backing for this support, and also contribute to upscaling of the concept of Smart Villages. Moreover, considering the new flexibility envisaged for Member States, interested stakeholders should press the case for construction of a tailored framework of support.

Comillas provides an illustration of the need for an appropriate, tailored framework of financial support. It has faced difficulties in managing village infrastructures and offering new services to the population. Moreover, several demographic changes have been affecting the village, including aging of the population. To counteract these challenges, the village has, in cooperation with other municipalities, implemented a business model entailing a plan for the Smart Development of the territory. The project involves a Smart Management Network (SMNet), which was financed with public grants on energy efficiency. The income earned from SMNet is then allocated to fund new Smart services. Likewise, **Alsómocsolád** has been making use of several funds (both European and national) to finance village development and offer new services to residents. Access to information and knowledge is pivotal when designing smart solutions, which need to be based on the needs and aspirations of the local population. In this regard, a one-stop-shop solution for integrated development based on EU-level regulations is needed to provide tailored responses to each village's needs. The Smart Village concept should be used as a tool to improve the quality of life of the local population.

The **panel discussion** focussed on:
- the relatively small amount of money needed in most instances to stimulate the inception stage of the Smart Village strategy. For this reason, public money has a catalytic role, as well as a possible one-stop-shop for villages, which would be key in supporting local communities in the understanding and exploitation of funding sources;
- the discussion of simplification regarding funding instruments in the new Common Agriculture Policy (CAP). In practice, though, there are still major differences in this regard throughout the European Union;
- the key role of participation of citizens in making better use of the financial tools available and their important role in seeking funds. In this regard, Smart Villages should find inspiration one from the other; the importance of combining different funding instruments for the Smart Village strategy, especially because European funds do not work in isolation;
- the important role of cooperation (also with the private sector) and the financial engagement of local people. Nevertheless, the current complexity in combining different types of financing sources was emphasised. In this regard, it would be key to have a network of experts.

8 Conclusion

8.1 Key findings from the Pilot Project

Innovative services in Smart Villages

Over time, many rural areas have experienced a decline in the range of services available. Changing demographic structures, public sector cutbacks and the impact of climate change can stimulate local communities to step in and fill the gap. Discovering and implementing new solutions to address local challenges is therefore one of the key characteristics of Smart Villages. The definition proposed by this Pilot Project states that Smart Villages "use innovative solutions to improve their resilience, building on local strengths and opportunities." This, as highlighted by the findings of the Pilot Project and during the final workshop discussion, includes innovative services that act as a catalyst for improving the quality of life in a village.

Villages are developing a wide range of creative solutions to overcome challenges and/or improve the citizens' quality of life. Smart Villages innovate in various areas and in very diverse ways, depending on the opportunities and challenges arising from their local contexts. Findings from the Pilot Project, corresponding closely with those from case studies investigated by the European Network for Rural Development (ENRD), illustrate the wide diversity of scope, scale, and type of innovative services developed by villages. Some villages experienced challenging situations and, as a reaction, responded by developing activities and services. In other examples, villages have developed new and innovative services to improve the quality of life their communities. The Pilot Project found that, in these circumstances, services and activities are often focused on a specific issue, such as energy, tourism or education. During the workshop, the importance of sustainable mobility initiatives for rural areas was also emphasised.

Smart Villages innovate in various areas and in very diverse ways but often exhibit some common features. Innovative solutions often build on the local assets of the village, offering tailored solutions to the local population. However, some common features were observed in the implementation and further provision of services. For instance, in many cases analysed by the Pilot Project, an 'anchor' project proved useful in steering the local strategy towards a specific objective. Common features also occurred in implementation methods and working arrangements, supported by strong leadership and a participatory approach involving the local population.

Working arrangements are changing. One of the common features of Smart Villages' innovative services is that their design and implementation involves several people or organisations, which can arise locally and/or involve supporting actors from outside. In this regard, the private sector can play an important role in the implementation of innovative services. Private companies often demonstrate flexibility and innovation. Whether or not external stakeholders are involved, sufficient capacity and strong organisational process would facilitate innovative processes. As emphasised both during the workshop and from the good practices studied, organisation and coordination are important aspects to take into consideration when implementing services innovation, particularly because of the frequent lack of specialised workers and

limited access to financial resources in small communities. Governance is a very important element of the implementation process and should be based on a bottom-up, participatory and integrated approach.

Integrating services enhances efficiency. Combining services can go a long way to maximising their efficiency. Small communities in rural areas face difficulties in finding specialised workers and mobilising financial resources. Therefore, creative solutions are necessary to ensure that they benefit from a relatively wide range of services. The workshop highlighted that digital technologies can also be a tool for rural areas to enhance efficiency and facilitate social and technical innovation.

Role and importance of digital technologies

Digital tools and connectivity are closely associated with the 'smart' concept and innovation, as it originally arises from the IT community. Unsurprisingly, digital technologies are widely used within Smart Village development, and "act as a lever that enables Smart Villages to become more agile, make better use of their resources and improve the attractiveness of rural areas and the quality of life of rural residents." Nevertheless, the findings of the Pilot Projects show that becoming a Smart Village is not limited to increased levels of digitalisation or connectivity. Instead, 'Smartness' stems from the use of digital technologies as a vehicle for local development goals and to improve the quality of life of citizens.

Some rural areas are more advanced than others in the use of digital tools. Many villages make use of opportunities offered by digital technologies, whereas others are less advanced. Pilot Project case studies identified multiple examples of such projects. For instance, depopulation can be tackled by exploiting digital technologies to create work opportunities that reduce the need for working-age adults to leave the community. Most of the good practices examined use digital tools in a traditional way and for conventional purposes (e.g. use of social networks or implementation of Wi-Fi technologies). Nonetheless, the findings of the Pilot Project confirm that connectivity remains a crucial enabling factor for the utilisation of digital solutions. In this regard, the workshop raised the issue of the cost of infrastructure, which can be a heavy burden for some small communities.

Digitalisation is a tool, but not a goal in itself. The usage of digital technologies is not what defines a Smart Village, nor is digital technology the only way to achieve development objectives. It is clear that solutions also use a wide range of non-digital tools. Nevertheless, digital technologies will in many cases be part of the package of measures helping to achieve the objectives of a Smart Village in the most efficient and effective way. The workshop discussion also confirmed that digitalisation is a tool to be used to realise rural development objectives, to foster networking among people, support the creation of short supply chains, improve accessibility to public services and empower citizens by facilitating active participation of the population through bottom-up approaches.

Awareness raising and training should accompany the introduction of new technologies. As with other aspects of Smart Villages, citizens' involvement in rolling out digital solutions is an essential component for success. Citizens need to be able to use digital technologies to their full potential and recognise their added value for improving the quality of their lives. This is particularly true for rural communities with an ageing population. Moreover, local communities (including at the local government level) need to be aware

of the opportunities these technologies provide. In this regard, the workshop highlighted two important elements in raising awareness: a one-stop-shop to showcase the benefits of digital technologies; and the national broadband competence centres, whose role is to provide advice on existing training opportunities. In addition, the European Union can have a key role in facilitating the use of digital technologies in rural areas through the provision of funding support.

How to develop a Smart Village strategy

A Smart Village strategy aims to channel the resources of its community to deal with key problems faced within their local context. Typically, the strategy offers new solutions to local challenges by "building on their local strengths and assets". Strategies can be initiated as a reaction to a particularly challenging situation, such as demographic decline. They can also arise from scope to capture an opportunity to improve local conditions and quality of life. The diversity of local contexts, starting points and triggers of change all indicate that there is no one-size-fits-all approach leading to the formation of a Smart Village. However, there are common elements that characterise most of the initiatives examined by the Pilot Project, with four enabling conditions identified as essential for the development and implementation of Smart Village strategies:

Establishing good governance structures and adequate capacity is the first step. An effective governance structure is vital for a successful Smart Village initiative. The process can be instigated through existing structures, or alternatively it can be steered by a group of active citizens. It should be open and inclusive, engaging with a wide range of relevant stakeholders to ensure that all voices are being heard when making strategic decisions[22]. Local authorities can play a crucial role in this process, as they are in a strategic position to liaise between and coordinate different interest groups. Ensuring sufficient capacity to follow through on plans is essential. Especially, having people with first-hand experience and know-how engaged can be a real advantage. While it might be challenging to involve a sufficient number of such experts, capacity building could be considered as a possible solution in these situations. The case studies reveal that successful implementation of the strategy, as well as the level of motivation of the local population, often hinged on one individual (in most cases the Mayor) and their cooperation with the local community. In this respect, a good governance structure also ensures continuity.

An active and engaged local community is crucial for success. The active engagement of locals – not only in initiating the planning processes but also in delivering on planned actions – is a familiar feature of successful Smart Villages. Involving citizens from an early stage helps establish a common understanding of needs and opportunities, thereby ensuring the development of a strategic plan founded on a shared vision for the future. In addition, participation creates a sense of ownership, which can prove to be a key driver during the implementation stage. In the majority of the cases examined, the input provided by local people was voluntary and based on trust between the local population and their political leaders. In some cases volunteers were at the forefront of the Smart development process. However, this high level of

[22] ENRD (2018) How to support Smart Village Strategies which effectively empower rural communities?

voluntary involvement runs an inherent risk of falling away at critical stages of the process, leading to a loss of momentum. Nevertheless, the voluntary element is crucial. Smart Village strategies – along with a supportive governance structure to implement them – provide a means for mitigating this risk.

Strategies should aim for simplicity. The end goals of Smart Village initiatives should be clear from the beginning: people want actions with tangible benefits, not abstract or vague statements of intent. Therefore, strategies should be rooted in a shared understanding of needs, and be conceived as a sequence of actions aimed at a clear goal. It is important that the strategies do not duplicate efforts that have already been formulated as part of other strategies, whether national, regional or local. Instead they should focus on smaller-scale development goals that correspond to the most direct needs of the community that created them. Based on the discussion during the workshop, identifying overlaps and focusing on potential synergies is especially important in the case of LEADER. Participants saw the added value of Smart Village initiatives in the less formalised approach they bring to achieve development goals. If designed carefully, they can complement existing LEADER structures.

Cooperation and alliances can enrich the Smart Village approach. Cooperation with the surrounding communities is perceived as an indispensable part of Smart Village initiatives. This cooperation can (and should) have both internal (e.g. village's associations) and external elements (other villages, organisations or the private sector). Involving external actors can help to address some of the key challenges. It can provide sufficient capacity to implement plans, to secure the financing needed and creates a venue to share know-how and good practices. In addition, links with the research community can go a long way in helping to make a success story out of strategic planning processes. As the Smart Village concept gains increasing traction, there is a growing body of scientific literature dealing with the issue. Initiating, designing and implementing Smart Village strategies is at the very core of this research, which as a consequence can help to furnish practical solutions to the problems frequently encountered by local planners.

How to finance Smart Villages

Securing funding for the implementation of projects is an important component of a successful Smart Village strategy. The Pilot Project found a wide variety of financing models, building on, as the definition says, "a variety of public and private sources." However, some solutions require no, or only minimal, funding. Overall, the most prevalent financing approach observed is the leverage of funding opportunities from different institutional levels, including EU, national and regional sources when possible. The villages studied and the workshop discussion revealed a number of challenges in finding and applying for funding. There are multiple potential financing sources available, but mapping of these opportunities is a challenging and time-consuming exercise. Moreover, application processes for EU and, in some cases, even national funds are perceived as complicated and cumbersome, discouraging some potential applicants. Therefore, future public funding schemes should consider the following:

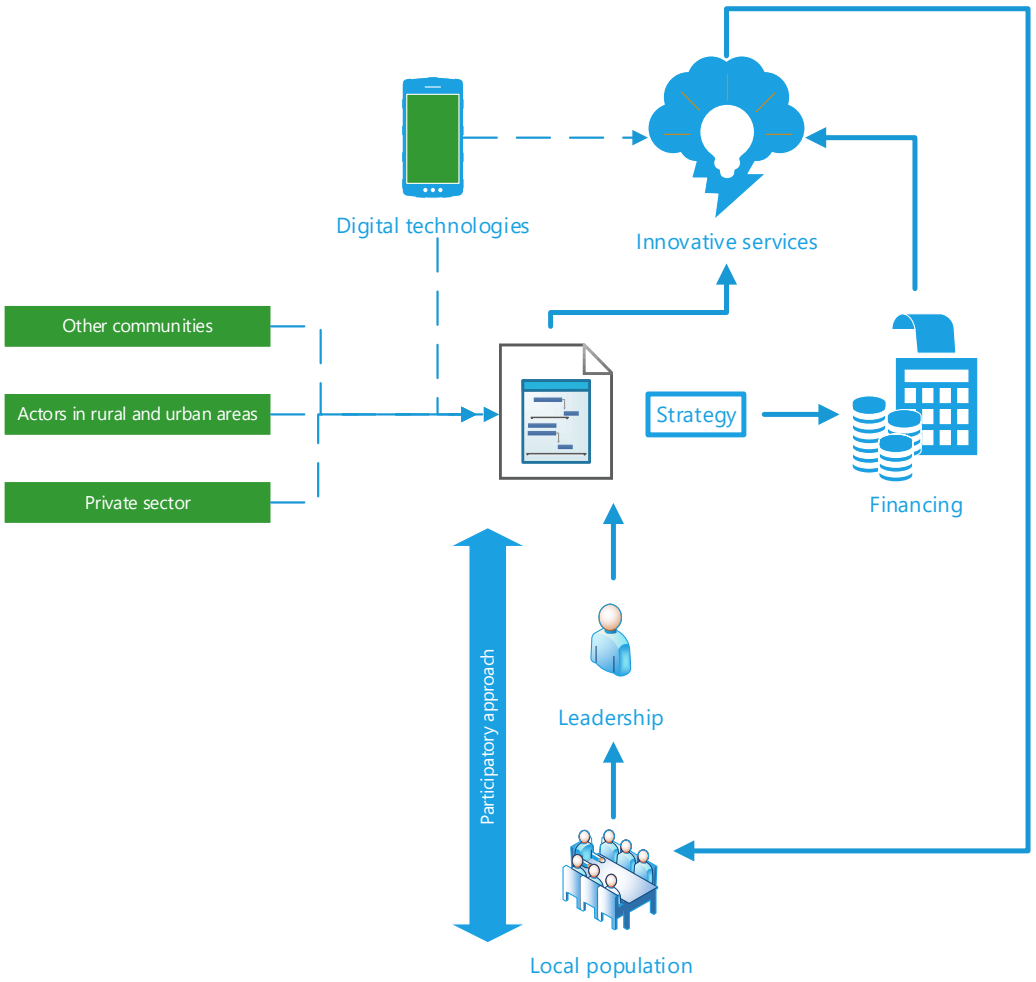
Support should be adapted to the scale and level of development. Even when targeting larger areas, Smart Village strategies initially require relatively small-scale investments. Nonetheless, these can also be part of larger cooperative efforts, which require a different financing model. Hence, being able

to unlock financing adapted to the specific project scale for subsequent implementation stages would make it easier to manage the financial aspects of these processes. In addition, specific stages of development require tailored funding opportunities. For instance, stimulating the inception stage of the Smart Village strategy does not require large investment, and public money has a catalytic role in this context. However, building up administrative capacity to plan and implement strategies calls for a different type of support than is required for actual execution of projects.

The administrative setup should be simplified and streamlined. As small communities have limited resources, the relatively high level of administrative burden associated with European Structural Investment Funds puts severe constraints on their abilities to follow through on Smart Village initiatives. Funding schemes should consider this, and aim to reduce administrative complexity to a minimum. A potential solution would be the creation of a streamlined "one-stop-shop" solution. To eliminate the need to deal with multiple layers and instruments, beneficiaries should be able to access the resources required to implement Smart Village strategies in one place.

A network of Smart Village advisors could help relatively disadvantaged areas. Embarking on a Smart Village trajectory requires specialised knowledge and expertise. Being able to use experts active in local development and financing can help to unlock opportunities for those areas most in need of support. It can also speed up the exchange of experiences by providing a forum for sharing of best practices and enhancing cooperation between communities.

Figure 18 Visualisation of the Smart Villages' main characteristics



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8.2 Overall conclusion: considerations for the future developments of Smart Villages

The conclusions of the Pilot Project are important for the future use of the Smart Village concept in terms of inspiration, both for stakeholders and for decision-makers in the field of public support. The review of opportunities and challenges provides a robust and up-to-date knowledge base that highlights the current situation of wide variation between regions in terms of levels of development. The proposed definition is an important advance as it clarifies the concept of Smart Villages. The interactions with villages in the fifteen good practice examples and the six case studies gathers insights from grass roots experience. Overall, three main lessons can be drawn from the project:

A first lesson is that, although the concept of the Smart Village is relatively recent, a wide range of initiatives are already under way in EU rural areas. The Pilot Project identified many examples of villages currently engaged in initiatives to address challenges or improve the quality of life of inhabitants. They are formulating innovative, Smart solutions that cover a wide range of

relevant thematic areas, including agriculture, environment, energy, mobility, health, education, culture or tourism.

A second lesson is that, despite the diversity of situations across the EU, many Smart Villages share common features. These prominent features are reflected in our definition, and often include the importance of citizen participation, the presence of adequate governance and the use of an 'anchor' project in steering the strategy towards a specific objective.

The third lesson is that appropriate support to the development of Smart Villages must be provided at EU, national and regional levels. The development of a supporting framework at these three essential tiers of government could be structured as follows:

- Primarily, the overall European framework should be flexible enough to take into account the diversity of rural territories: guidance at European level must remain flexible and stimulate national and regional policies that will encourage the emergence and reinforce the development of Smart Villages;
- National and regional support measures should be targeted: the need for intervention is more urgent for the least favoured rural areas. Particular effort is needed in the rural areas that do not yet have access to high-speed broadband. In this way, Smart Villages can really make a difference to improve social cohesion in rural territories;
- Financial support should be adapted to the socio-economic scale of the Smart Villages: there are many sources of funding available, but there are concerns that the complexity and bureaucracy involved, not only in applications but in subsequent project administration, will be an obstacle for many villages. Small-scale investments need to be made available, and access to finance by Smart Villages needs to be simplified with, for example, the creation of one-stop-shops for funding.

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