European Network for Rural Development

Stakeholder reflections

Smart Villages and the European Green Deal: making the connections

This document contains the personal reflections of Professor Bill Slee on the links between Smart Villages and the European Green Deal. As an active member of the ENRD Thematic Group on Smart Villages, he argues that smart rural communities are already providing many inspiring examples of how to address each of the challenges identified in the European Green Deal at local level. A just transition is called for in the European Green Deal and this is explicit in the transformational changes observed among various types of smart communities - in ecovillages and in collaborative environmental partnerships addressing water quality and biodiversity, renewable energy communities, in local food systems, and initiatives for sustainable mobility. Smart Villages focus on inclusive development. They seek to leave no one behind. They mobilise local communities and draw on collaborative arrangements with researchers to co-design more sustainable futures.

By Bill Slee, The Rural Development Company and Emeritus Fellow, The James Hutton Institute (UK).

Introduction

In December 2019, the European Commission published the Europe Green Deal, which is the centrepiece of European policy for the foreseeable future. Its relevance will extend into the coming decades as the climate crisis assumes centre stage. The Green Deal spells out the principles and actions that need to be undertaken to meet the commitments for limiting Europe's greenhouse emissions to make the European Union carbon neutral by 2050 and meet its sustainable development goals. To achieve the policy ambitions of the Green Deal a fundamental reframing of all European policies is needed. The CAP is a major part of the EU's expenditure and both Pillar 1 and Pillar 2 of the CAP must respond. Rural Europe can be a trail setter in making progress towards Green Deal aims. Smart Villages initiatives, which are being actively recommended as part of the CAP Strategic Plans, can play a crucial role in enabling rural communities to make a just transition to a greener Europe.

At present Europe faces the coronavirus pandemic, which has led some politicians to argue for dropping the Green Deal in the short term and concentrate exclusively on the recovery.

Frans Timmermans, the European Commission vice-president in charge of the Green Deal, argued on 24th March 2020 that we must tackle both the short-term and the long-term problems at the same time. Indeed, we might learn something from the crisis management to address the even bigger threat of climate change. And in some of the short-term adjustments may lie clues to the longer-term adjustment possibilities.

The Europe Green Deal requires a significant response from rural Europe. The farm sector is a major emitter of greenhouse gases and is deeply implicated in the decline of European biodiversity and threats to water quality. It can play a major role in the transition. The response to the Green Deal challenges is already well under way in "climate-smart" villages and towns. The great diversity of conditions in rural Europe and in policy design already enables the exploration of good practice in supporting emissions reduction, biodiversity recovery and reduced pollution and meeting the Green Deal imperatives. Smart Villages can provide a highly suitable entry point to identifying the key elements of success and finding appropriate ways of enabling rural communities to deepen and extend the transition.

Funded by the European Commission

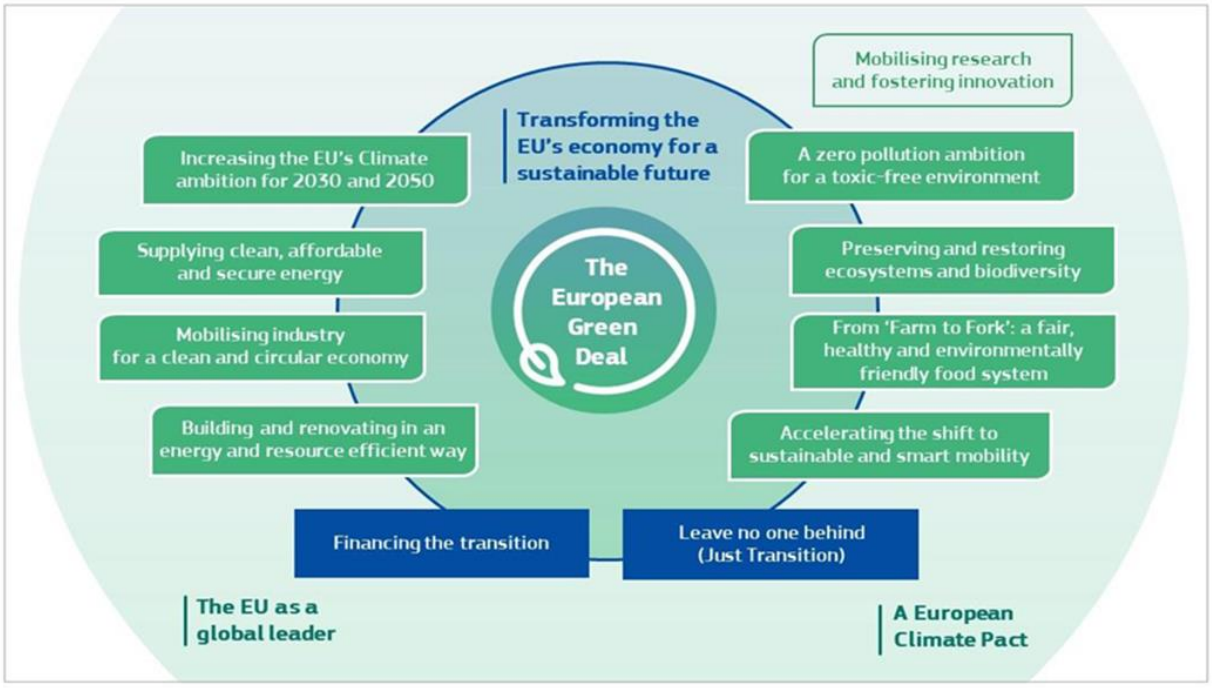
Rural areas and communities are well placed to engage with the Europe Green Deal.

At a recent ARC2020 meeting, in January 2020, it was argued that: "a rural agenda should propose a set of integrated policies which enable and empower rural communities to turn challenges into advantages such as decarbonisation, climate measures, digitalisation, generational change, integration of new entrants, social innovations, etc)[1]." Smart Villages are already significant actors in responding to the Green Deal at local level. They are often the leading edge of rural social innovation which is seen as key to addressing sustainability challenges.[2]

The idea of Smart Villages has evolved from the idea of Smart Cities, but these are more associated with technical solutions. Smart Villages also exploit the opportunities provided by new technology but put more emphasis on the potential for social innovation to bring major improvements in well-being. Smart Villages are, therefore, more than the country cousin of Smart Cities. They bring together ideas about bottom-up development and social innovation that have underpinned some facets of rural development policy for many years and combine this with smart information and communication technology (ICT) and further investments to provide a platform for innovation.

To a degree, Smart Villages comprise an application of community-led local development (CLLD) principles at a more local scale than most Leader Groups. However, Smart Villages has put a renewed emphasis on building sustainable local business models, smart regional specialisation, and more joined up policy thinking to leverage in further investments. It may well make sense to formally embed the smart village principles within the LAG strategy and, in this case, LAGs may become one of the main instruments for supporting Smart Villages. However, in order to be able to fulfil this role they need to be equipped to do so.

Figure 1: Diagrammatic representation of the Europe Green Deal 2019z



Source: Communication from the European Commission, The European Green Deal, December 2019

[1] https://www.arc2020.eu/rural-europe-which-way-to-go/

[2] Repo, P. and Matschoss, K. (2020) Social Innovation for Sustainability Challenges. *Sustainability*, *12*(1), p.319.

The ENRD Thematic Group meetings on Smart Villages run by the European Network for Rural Development have already built up a stock of knowledge of good practice on Green Deal issues. There has been an enthusiastic response from policy and practice communities to learning from case studies, first about what different places have done and second to try to identify the mix of factors that drives success. We draw on these and other examples to show just how important Smart Villages can be as exemplars of the transition to a post-carbon Europe.

In this paper, we will explore the potential contribution of Smart Villages and social innovation to the delivery of each of the 10 EU Green Deal priorities (in the diagram above). We will explain the connection by reference to general principles and use examples to illustrate how initiatives in what can be thought of as Smart Villages are already delivering to the Green Deal strategic objectives.

Although the Smart Villages Initiative has drawn together innovative individuals to share and disseminate good practice, those developing the initiatives at local scale would rarely think of themselves as smart, nor of their communities as Smart Villages. However, they are smart in the sense that they are delivering innovative and imaginative local responses to local needs and to the long-term challenges identified by the Green Deal. They are led by, and actively engage, local stakeholders in cooperation with outside agencies to lever in both finance and expertise. In the next European programming period, policies for Smart Villages could provide further support to these kinds of initiatives and empower rural communities to contribute far more to the Green Deal. By these examples, we illustrate the type of initiative that can be implanted in Smart Villages actions.

Societal Outcome 1: Increasing the EU's Climate Ambition by 2030 and 2050

Climate ambitions about reducing emissions and managing the transition are established through international agreements, European acts and national implementation strategies among others. Additionally, some cities and city regions have adopted even more ambitious strategies for transition, for example through the Covenant of Mayors[3], and transition communities provide a third sector-driven approach with similar aims, often at a much smaller scale. These bottom-up approaches show that planning for reduced emissions cuts across whole communities and that different groups must be purposefully engaged in actions to reduce emissions while, at the same time, many of these actions are helping to build a platform for future prosperity. Rural Europe contains many good examples of ecovillages and transition communities which have been implementing more ambitious emissions reduction targets than anything specified in international treaties or European strategies. Their actions go beyond community energy and take a wide-ranging look at living with a lighter ecological footprint[4].

Cloughjordan, Ireland

With its membership motivated by deep concern over the state of the environment, **Cloughjordan** in Ireland set out to become an ecovillage in the early 2000s. This happened long before the financial crisis which dented its progress, but its members are still driving the project forward. The original plan was for 130 homes on a 67-acre site. Currently, it has a community centre and 55 eco-homes, some self-built and some professionally built and another 20 plots have been sold. Cloughjordan also has a farm for food production with a number of polytunnels, a district heating plant and a community bakery.

Source: http://www.thevillage.ie/

[3] https://www.covenantofmayors.eu/

[4] https://www.ecolise.eu/

Societal Outcome 2: Supplying clean, reliable and affordable energy

Europe has been at the forefront of developing community energy policies, with both EU and some Member States providing significant support for community engagement in renewable energy systems. These community energy developments take many forms from community heating initiatives which are well developed in Germany, to shared ownership of community renewables in Scotland and Denmark.

Many of these developments are place-based, led by community activists who use crowdsourcing or commercial lending to develop community-owned renewable energy. They include community heating from wood, biogas developments (often with electricity generation), wind turbines, photovoltaic power and hydropower. The revised Renewable Energy Directive provides many opportunities for strengthening these initiatives.[5]

Oberrosphe Hesse, Germany

Oberrosphe is a village of 240 households in Hesse, Germany. A number of inhabitants were concerned about fluctuating oil prices and rising energy costs as well as climate change. In 2005 they began thinking about a community heating scheme as a means of delivering energy independence and as a means of building community solidarity. In 2006, a project team began to work on the project and it was launched in 2007 at cost of EUR 3.7 million. At the beginning, 35% of all households signed up to get their energy from the community heating scheme based on using local wood energy. Those who did not join either had recently upgraded their oil boilers or lacked the financial means – the joining fee cost between EUR 7 000 and EUR 12 000 but a housing association offered cheap loans to help with this. By 2020 almost half of all households have now signed up. In 2008-9 they added 155 kW of photovoltaic power and in 2017 a local farmer developed a combined heat and power plant. The heating coop now purchases the waste heat from that CHP plant to provide about 50% of its heat needs. About 700 tonnes of carbon emissions are saved annually. The community heat-connected households connected have no need for oil, their houses are more valuable, and they face no maintenance costs for oil boilers. Both the environment and the community win. Care must be taken to use efficient technology and minimise particulate emissions. Not all wood energy is good energy.

Source: Presentation at ENRD Thematic Group meeting on Smart Villages, Ulrich Pfeiffer, Bioenergiedorf Oberrosphe: A village is getting rid of oil and gas (Germany). January 2020. https://enrd.ec.europa.eu/sites/enrd/files/7_tg10_smart-villages_oberrosphe_de_pfeiffer.pdf

[5] ENRD Briefing on Smart Villages and Renewable Energy Communities. https://enrd.ec.europa.eu/smart-and-competitive-rural-areas/smart-villages/smart-villages-portal/smart-villages-toolkit_en developed in collaboration with https://www.rescoop.eu/

Societal Outcome 3: Mobilising industry for a clean and circular economy

In rural Europe, the 'old' bioeconomy of farming and forestry embodies many of the core principles of the circular economy, especially organic and biodynamic farming systems and many traditional farming systems. They use few bought-in inputs and produce high value distinctive products. Their products often provide the basis for smart specialisation. The new forest-based bioeconomy of Finland and Sweden provides a more high-tech response, helping to transform an ageing and unprofitable paper industry into biorefineries producing a very wide range of materials that can replace fossil fuel alternatives. Working with municipalities and major industrial players, these large-scale biorefinery complexes are pioneering actors in a new age of smart specialisation producing bio-based materials. A more local response is also possible.

Pronatura Belgium

Pronatura is a social enterprise that provides work for those who find it difficult to enter the normal workplace. As well as being a job-creating social enterprise for disadvantaged people, it is also a pioneering entity that works with other innovators to use waste products to make a range of biomaterials. It operates mainly in Belgian towns and cities with circular economy principles at the heart of its operating model. Pronatura has received financial support from the province of Vlaams Brabant and two EU Interreg projects. They teamed up with an innovation lab (GLIMPS https://glimps.bio/) which connected them to several start-ups that produce biomaterials using circular economy principles. Pro-Natura's "waste" becomes the feedstock for:

- **Q'bo**, high quality & 100% plant-based material (https://72p.be/)
- **Touch of Nature** biomaterials for seamless floors, panel coating and furniture finish https://touchofnature.eu/
- **Mycelium** material for insulation and design furniture (mycelium is the dense root network of fungi, which functions as a natural glue between the fibers) http://www.fungalogic.nl/wordpress/

In Pronatura's rather special case, social policy outcomes are achieved alongside the implementation of circular economy practices.

Societal Outcome 4: Building and renovating in an energy and resource efficient way

Rural Europe is a repository of diverse buildings crafted from local materials. Bulky building materials were costly to transport, and so historically rural buildings largely mirrored the local geology and relied on local resources. As coal, oil and gas and electrical energy displaced renewable wood for heating, and demands for space heating rose, so the thermal properties of many of these buildings were revealed to be poor. Not everywhere was the same. Some traditional Nordic buildings had excellent thermal properties and renewable heating systems and in southern Europe some, mainly traditional buildings, were designed to be naturally cool.

In general, however, especially across large areas of North Western Europe, the thermal properties of buildings are poor and retrofitting them is a major challenge. The heating of buildings is a major consumer of fossil fuels and a major contributor to global warming. A third sector community level agency is on many occasions the enabling actor which delivers services on energy efficiency, even when the public sector is footing the bill.

Enerterre, France

Enerterre is a third sector body based in Normandy, France. This social enterprise provides both a training scheme for unemployed building workers and a scheme to provide restoration and enhanced energy efficiency in old buildings.

Often these building were occupied by those who lack the financial means to convert them into more energy-efficient living spaces.

The project uses local building materials wherever possible. Enerterre's renovation work has enabled the beneficiary households to save on average 65.5% of the costs of the renovation work, compared to the cost of the work if it had been carried out by commercial craftsmen. These cost savings were made possible thanks to volunteers, who provided more than 6 000 hours of work. The use of EAFRD funds created employment at the Enerterre association and supervisory work for the local craftsmen. Without the support from Enerterre, the households could not have afforded the renovation works. In addition, Enerterre generated a turnover of EUR 60 412 for local craftsmen.

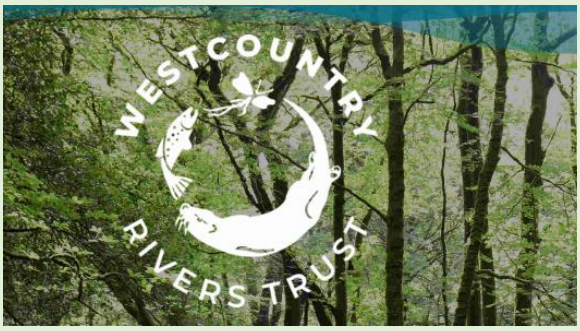
Societal Outcome 5: A zero pollution ambition for a toxic free environment

Rural Europe is not a pristine, pollution-free environment. Intensive agriculture has been associated with high levels of fertiliser application, eutrophication of waters, chemical pollution from pesticides and damage to biodiversity from pesticide residues (Falkenberg, 2016)[6]. The problems of nitrate and phosphate pollution require action at a farm-level, but outcomes are much enhanced by a catchment-scale approach. Although individual farmers are subject to increased regulatory control, it is widely recognised that the resolution of both legacy and ongoing problems requires a collective response and the development of novel advisory and governance regimes.

Tamar 2000 project, UK

The Tamar 2000 project was set up by the West Country Rivers Trust, a UK charity set up in 1995 to address diffuse pollution and declining water quality in rivers in South West England. It became a prototype for catchment-scale planning to reduce water pollution. The river Tamar suffered from problems of excessive siltation, nutrient enrichment, habitat degradation and water pollution. This impacted adversely on migratory salmonids and compromised water quality.

The new approach relied on a partnership approach, with project officers generating face-to-face visits and farm walks with farmers, drawing a management plan and addressing these problems at farm-scale, but recognising the catchment context. Around 300 farmers participated in the project and it was estimated that there were both economic gains to farmers and significant ecological gains to the catchment. Funding came from the European Union (LIFE, Interreg), the local council and private sources.



See Horsey, S., 2006. Case studies aimed at reducing diffuse water pollution from agriculture in England. Department for Environment Food and Rural Affairs, Water Quality) Division, London.

[6] Falkenberg, K. (2016) Sustainability Now: a European Vision for Sustainability EPSC Strategic note Issue 18

Societal Outcome 6: Preserving and restoring ecosystems and biodiversity

For three decades or more, agri-environmental policies have been directed towards protection and improvement of agricultural landscapes and biodiversity. In many areas, despite the existence of these policies, the problems of ecological damage remain and have sometimes worsened[7]. There is growing recognition that individual farm-level initiatives are insufficient to deal with habitat loss and that landscape-scale actions are required. The Dutch Government has actively promoted a new landscape-scale approach using environmental cooperatives managed by collectives of farmers. These are now an option within the RDP and there are currently 40 environmental coops in the Netherlands. Environmental coops have been rolled out in a number of other Member States such as Denmark.[8]

Karby Landscape Strategy Making Process, Denmark

The coastal village of Karby, in Jutland, is an example of the "integrated proactive and participatory approaches to landscape governance that are emerging all over Europe" (Primdahl et al. 2019). The salt marshes adjacent to Karby are a Natura 2000 habitat which obligates the relevant agency to produce a management plan. The village is now distinctly less agricultural in its occupational structure and many people have moved into the area attracted by the quality of its environment. Using the agri-environmental measures of the RDP, the farmers have signed a long-term management agreement over the saltmarshes. Walking trails have been created and arable fields have been converted back to grasslands. The key to the success of the Karby project has been the creation of an effective partnership between the primary landscape managers, the municipality and other public agencies and local residents in various community groups. In some cases, local residents adopt a citizen science approach for measuring biodiversity changes. They may not see their actions as Smart Village actions, but this is Smart Village thinking at its best.

Societal Outcome 7: From farm to fork- a fair, healthy and environmentally friendly food system

Europe supports hugely diverse food systems. Over time, the concentration of market power at the retail end of the food chain can be seen to have created power imbalances. Agricultural intensification has caused environmental damage (Falkenberg, 2016). Changing diets and lifestyles have produced an obesity epidemic yet there are still many who go hungry and use food banks.

The EU has been at the forefront of designating regionally specific foods and supporting and safeguarding protected designation of origin (PDO), Protected Geographical Indication (PGI) and Traditional Speciality Guaranteed (TSG).

These designations depend on the collaboration of producers coming together to assert the identity of their product. Over the last three decades, the European Union has funded many projects investigating short and sustainable food supply chains and exploring local initiatives. Not all food supply chains are built around a market model. Many food chain actors have ethical commitments to others along the chain and to the environment. Community Supported Agriculture is an example of such a food system where ethics, environment and healthy food come together.

[7] Evaluation of the impact of the CAP on habitats, landscapes, biodiversity (Final Report, November 2019). https://ec.europa.eu/info/sites/info/files/food-farming-fisheries/key_policies/documents/ext-eval-biodiversity-final-report_2020_en.pdf

[8] Primdahl, J., Pinto-Correia, T. and Pedroli, B. (2019) European Landscapes in Transition: Implications for Policy Integration and Landscape Governance. EuroChoices, 18(3), pp.18-23.

Hawaruhof Community Supported Agriculture, Austria

Hawaruhof is a small biodynamic farm in Austria producing vegetables biodynamically for around thirty households. The farm grows around 40 types and about 100 varieties of fruit and vegetable. Hawaruhof follows the producer-led Community Supported Agriculture (CSA) approach. In their model the production risk is shared between the consumers and the farmers who operate in a partnership. The production system is environmentally friendly and the close relationship between producers and consumers is enhanced by food and fermentation workshops being held on the farm. Farmer to farmer learning is encouraged by the workshops run by the farmers. This small example shows how a distinctive food supply model can carve out a niche which satisfies the Green Deal aspirations. The building of strong collaborative links along this local supply chain shows how smart specialisation can drive more sustainable outcomes.

© HAWARUHOF (https://www.facebook.com/hawaruhof/)

Source: Social Innovation in Marginalised Rural Areas (SIMRA), H2002 project. http://www.simra-h2020.eu/index.php/simra-case-studies/hawaruhof-austria/

Societal Outcome 8: Accelerating the shift to sustainable and smart mobility

Public transport systems in remote rural areas have been one of the major casualties of the forces of austerity and declining public subsidy, privatisation and the increase in private mobility. Across Europe, public transport services are in serious decline in rural areas. The principal losers are those without access to a private car, typically the young adults, the very old and the poor. Coupled with the closure of many basic rural services, the degree of transport deprivation has increased substantially for certain subgroups in the population.

The decline has been met with a range of responses which include attempts by the public sector to develop demand-responsive and flexible public transport options. The third sector has emerged as a major actor in providing community (mini-)buses, where the bus is usually owned by a community association and run by volunteers.

New information technologies have offered possibilities such as dial-a-bus services, but these can still struggle to give the access enhancement sought by those who are most mobility-deprived. These smart service models are being rolled out in Smart Villages throughout Europe[9].

[9] ENRD Briefing on Smart Villages and Rural mobility. Smart Villages and Rural Mobility, ENRD Briefing. https://enrd.ec.europa.eu/publications/smart-villages-rural-mobility_en

Rezo Pouce, France

France has been one of the countries at the forefront of designing new IT-based systems for improving the mobility of some of the most mobility deprived groups. The app Rezo Pouce is the result of a partnership between a private company, the Transdev Group, a municipality and the Macif Foundation which supports social innovation. Rezo Pouce is essentially an IT-based hitch-hiking system which matches lifts to those seeking to travel. Although run as a social enterprise, it is dependent on municipal support as the local authorities take on the management of the Rezo Pouce infrastructure. The mobility of access-deprived young adults without a driving licence is much enhanced. Many initiatives have been supported by LEADER. 1 400 local authorities are now signed up to Rezo Pouce showing just how big was the gap that needed to be filled.

Source: EAFRD Projects Brochure 'Digital and Social Innovation in Rural Services'.
https://enrd.ec.europa.eu/publications/eafrd-projects-brochure-digital-and-social-innovation-rural-services_en

Societal Outcome 9: Mobilising research and fostering innovation

Over the last two decades, there has been a marked shift in how rural research is conducted. There has been a partial move away from the idea of research as a product of scientists which is then moved down a pipeline by transfer of technology to practitioners. Instead, more collaborative research processes are being encouraged, where participatory learning and action research are interwoven and research is co-constructed by researchers and the practice community. Many of these ideas were practiced in developing countries but Australasia was the setting for several great examples.

Landcare projects were designed by groups of farmers collaborating in response to a particular crisis or set of crises within a particular community, who worked with researchers to address major environmental crises such as salinification or soil erosion. Landcare's distinctiveness has been the way in which groups in particular geographical communities focussed the research effort on their problems. This is environmentally-smart thinking.

The Agricultural European Innovation Partnership or EIP AGRI has moved in a similar direction with its multi-actor interactive innovation approach. Over 1 500 Operational Groups have been set up, bringing together farmers with researchers and other food

chain actors to cooperate and find innovatory solutions to specific agricultural problems.[10] At the same time, policies are being put in place to strengthen the "ecosystem" of actors involved in what has become known as Agricultural Knowledge and Information Systems (farmers, food chain actors, farm advisors, technology suppliers, research centres, universities, etc). However, so far this approach has been limited to the farming and food sector.

Smart Villages require fast and appropriate access to knowledge in a very wide range of fields – not only those that have been discussed earlier, such as renewable energy and sustainable mobility, but also on sustainable models of service provision in rural areas, digital transformation and many others. To deal with these broader rural challenges, several Member States are exploring the possibility of creating teams of "innovation brokers" in these fields and of incorporating LEADER groups into a wider rural innovation ecosystem or "ARKIS" (Agricultural and Rural Knowledge and Innovation Systems).

Two cross cutting principles

1. Leave no-one behind

The objective of the Green Deal to leave no-one behind might be considered necessary because of the loss of concentrations of employment in coalfield or hydrocarbon communities, but many natural resource-dependent communities face problems of loss of jobs, including the fishing, farming and forest-dependent communities. The major investment in the forest-based bioeconomy in Nordic countries is in part an attempt to revitalise the forest supply chain in the paper industry, a sector that has haemorrhaged jobs in recent decades. The population of many remoter rural areas can often feel left behind. An inclusive collaborative approach to village revitalisation is at the heart of the Smart Villages movement. This means accepting that the innovations undertaken by Smart Villages are always in relation to the local context and needs and that communities with less social capital require more support and capacity building.

Artieda, Aragon, Spain

Artieda is a small mountain village in Aragon (Spain). Faced with growing problems of depopulation similarly to much of the rural interior of Spain and the additional challenge that an expanded reservoir might take some of the best farmland in the community, the population of Artieda refused to give in. They have worked hard to strengthen their community and breathe new life into it. They engaged with the different subgroups of the population to ascertain their needs, including the elderly and the young. A combination of citizen action, collective endeavour and entrepreneurial talent, Artieda has created a strongly bonded partnership of actors wholly committed to enhancing the liveability of Artieda.

© Artieda.es

More information: http://www.simra-h2020.eu/index.php/2020/01/27/rural-development-is-analised-in-zaragoza/

2. Financing the transition

The European Green Deal rightly places emphasis on the need to finance the transition and develop appropriate financial instruments. Already where

[10] https://ec.europa.eu/eip/agriculture/en/find-connect/projects

the appropriate policy infrastructure is in place, we can see Green Deal outcomes being delivered by new and existing financial instruments (e.g. EAFRD). The highly regarded Community and Renewable Energy Scheme (CARES) in Scotland offered grants for pre-feasibility studies in community renewable energy projects which were translated into a loan only if the project obtained the necessary planning consent to go ahead. By de-risking the bundle of feasibility studies required to get a renewable energy project to the construction stage, the CARES system acted as a powerful support mechanism for third sector groups.

Huntly and District Development Trust, Scotland, UK

Huntly is a small but smart town in West Aberdeenshire. A three-year municipal regeneration project morphed into a third sector project and the development trust actively sought funds to guarantee their survival as a community development agency. In an area where there have been both many large-scale and small-scale wind energy developments, the trust decided to pursue renewable energy as a means of financing local development projects. To bring the projects to fruition, the trust used a mix of CARES funding and private finance to guarantee them an income stream for the next 20 years. This project not only helps meet renewable energy targets but also nurtures sustainable development which is at the core of the trust's activities.

More information: https://scottishcommunityalliance.org.uk/org/huntly-district-development-trust/

Conclusions

Every element of the European Green Deal can already find expression in village-level actions where social innovation is driving forward Green Deal objectives. These are communities where innovativeness is part of the DNA of the place, where citizens collaborate to drive forward sustainable development outcomes. In these smart communities, there is a sense of strong collaborative effort in moving these places forward, meeting place-based challenges and grand societal challenges alongside each other and allowing synergistic gain. Nearly always 'smartness' manifests itself as collaboration between civil society, the state and the business community.

The examples, illustrated in the text and in the boxes, show the diverse nature of initiatives and institutional forms which are trailblazing the pathway towards the Green Deal outcomes in rural Europe. A just transition is called for in the Green Deal and this is explicit in the transformational changes we see among Smart Villages, for example, in ecovillages and in collaborative environmental partnerships addressing water quality and biodiversity, in local food sector developments and in renewable energy communities. Smart Villages focus on inclusive development. They seek to leave no one behind. They draw on collaborative arrangements with researchers to co-design more sustainable futures. The examples we have explored are beacons that throw light on how to address Green Deal challenges and from which the rest of Europe can learn. Collaborative action at village or small town level can be seen as a highly suitable entry point for the injection of Green Deal principles.