



Bio-based strategies and roadmaps for enhanced rural and regional development in the EU



## Briefing paper: Knowledge exchange and capacity building for the bioeconomy in rural areas

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## EXECUTIVE SUMMARY

Knowledge exchange and capacity building are among the key tasks of BE-Rural, and focused on the five Open Innovation Platform (OIP) regions.

Concepts of **knowledge exchange** emphasise that learning is a complex, contested and potentially mutually beneficial process, which can involve contributions from a wide range of stakeholders with different types of knowledge and viewpoints, and which is stimulated by interpersonal interaction, long-term relationships and mutual trust. Rationales for promoting knowledge exchange include: a) stimulating innovation; b) supporting rural or regional development; and c) enhancing democracy.

**Capacity building** or development is seen as the process through which stakeholders reinforce their abilities to set and achieve their own development objectives. It can encompass measures to support the capacities and resources of individuals; the functioning of organisations; or the enhancement of the wider regulatory, institutional, socio-cultural and political environment. Capacity building can contribute to economic development and also to democratic processes.

BE-Rural draws on existing approaches to knowledge exchange and capacity building, notably:

- **National and regional bioeconomy strategy-building processes**, which sometimes involve knowledge exchange in the form of dialogue/consultation or active co-production of knowledge, as well as capacity building in terms of citizen participation in decision-making and also support for various activities that build capacity (e.g. investment in human resources, or changes to legal or policy frameworks and social norms).
- **The EU's Smart Specialisation Strategy approach**, which involves a strongly participative approach ('entrepreneurial discovery process') to the exchange of knowledge among regional stakeholders, and steps aimed at identifying and reaching agreement on regional strengths, and at focusing efforts to build capacities to achieve shared goals.
- **EU Rural Development Policy**, which aims to build capacities in rural areas and includes measures to facilitate knowledge exchange and cooperation, notably the LEADER Local Action Groups (LAGs) and Fisheries Local Action Groups (FLAGs), as well as the Community-led Local Development (CLLD) approach, and the European Innovation Partnership for Agricultural Productivity and Sustainability (EIP-AGRI).

There are good practice examples of knowledge exchange and capacity building in rural bioeconomy strategies in a number of European regions, including:

- **Baden-Württemberg's** Sustainable Bioeconomy Strategy (Germany);
- **Catalonia's** Biolab Ponent, a rural Open Innovation Living Lab (Spain);
- **Oulu region's** Bioeconomy LEADER Tour (Finland);
- **Scotland's** Industrial Biotechnology Strategy (United Kingdom); and
- **Tajo-Salor-Almonte's** (TAGUS) Smart LEADER approach (Spain).

Key themes or lessons from the case studies include:

- **Ensure local/regional ownership of the strategy** by combining community/social and economic dimensions;
- **Mobilise a wide range of local/regional stakeholders** to participate in knowledge exchange, and actively seek their views and engagement;
- **Build trust among participants** e.g. by taking time to build relationships, and by ensuring that the lead organisation is seen as an honest broker;
- **Build a structured programme of knowledge exchange** in order to support local/regional stakeholders to reach agreement to target efforts on specific thematic strengths;
- **Target efforts on building capacities to support these strengths** e.g. by accessing external funding to invest in human resources or business innovation projects;
- **Ensure that participation is worthwhile** e.g. by showing early-on that the process can lead to new projects (even small ones) or other tangible results;
- **Take steps to ensure continued momentum over the longer term** e.g. appoint an organisation to lead a defined plan of action, or hold an annual networking event.

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## Abbreviations

<b>CAP</b>	Common Agricultural Policy
<b>CB</b>	Capacity building
<b>CLLD</b>	Community-led Local Development
<b>EAFRD</b>	European Agricultural Fund for Rural Development
<b>EIP-AGRI</b>	European Innovation Partnership for Agricultural Productivity and Sustainability
<b>EMFF</b>	European Maritime and Fisheries Fund
<b>ENRD</b>	European Network for Rural Development
<b>ERDF</b>	European Regional Development Fund
<b>ESF</b>	European Social Fund
<b>EU</b>	European Union
<b>FLAG</b>	Fisheries Local Action Group
<b>JRC</b>	Joint Research Centre
<b>KE</b>	Knowledge exchange
<b>LAG</b>	Local Action Group
<b>LEADER</b>	<i>Liaison Entre Actions de Développement de l'Economie Rurale</i>
<b>NGOs</b>	Non-governmental Organisations
<b>OG</b>	Operational Group
<b>OIPs</b>	Open Innovation Platforms
<b>S3</b>	Smart Specialisation Strategy
<b>SWOT</b>	Strengths, Weaknesses, Opportunities, Threats

# 1 Introduction

Innovation theories and studies of rural/regional development share the idea that knowledge exchange and capacity building are important drivers of innovation and economic development. This paper provides a briefing for BE-Rural's Open Innovation Platforms (OIPs) on the definition of and rationales for knowledge exchange and capacity building, and their contribution to designing and implementing strategies in a quintuple helix context. The Quintuple Helix Approach is one of the key principles of BE-Rural's **conceptual framework**. It means combining knowledge and innovation generated by stakeholders from policy, business, academia and civil society, while taking into account the natural and managed ecosystems in which these are located. This briefing also includes case studies of good practice strategy building in the bioeconomy in other European regions, focusing in particular on the experiences of rural areas. Research was mainly desk-based, but also included written and phone exchanges with EU-level bodies and policy-makers in the case studies presented at the end of this document.

The structure of the paper is as follows:

Section 2 summarises key **theories relating to knowledge exchange and capacity building**, particularly in relation to the goals of stimulating innovation, supporting rural and regional development, and enhancing democracy.

Section 3 provides an overview of **existing approaches to knowledge exchange and capacity building**. It builds partly on the outputs of the Horizon 2020 project **BioSTEP** (2015-18), which promoted stakeholder engagement and public awareness for a participative governance of the European bioeconomy. Particularly three frameworks are of particular relevance to BE-Rural's focus on Open Innovation Platforms in the bioeconomy in rural areas, namely:

- Existing national and regional bioeconomy strategies across Europe;
- The EU's Smart Specialisation Strategies (S3); and
- EU rural development policy.

Section 4 examines a series of **case studies of regional bioeconomy strategies**, focusing in particular on themes relating to knowledge exchange and capacity building. The case studies are:

- **Baden-Württemberg's** Sustainable Bioeconomy Strategy (Germany);
- **Catalonia's** Biolab Ponent, a rural Open Innovation Living Lab (Spain);
- **Oulu region's** Bioeconomy LEADER Tour (Finland);
- **Scotland's** Industrial Biotechnology Strategy (United Kingdom);
- **Tajo-Salor-Almonte's** (TAGUS) Smart LEADER approach (Spain).

Section 5 draws themes together for BE-Rural and provides conclusions.

This briefing paper will also feed into BE-Rural Deliverable 4.2 "Best practice guide on strategy development", which will be prepared by project month 24 (March 2021).

## 2 Knowledge exchange and capacity building: definitions and rationales

This section introduces the terms knowledge exchange and capacity building, providing definitions and rationales for the two concepts.

### 2.1 Knowledge exchange

#### 2.1.1 Definitions

The term “knowledge exchange” has developed in the fields of organisation theory and research/knowledge theory (for a review, see Jacobson, 2007). It relates to concepts such as “knowledge transfer” and “technology transfer”, but tends to emphasise a specific view of knowledge and learning:

- First, learning is seen as a **complex, interactive, contested and potentially mutually beneficial process**, rather than in terms of a linear transfer of knowledge from one actor to a second passive recipient (Phillipson et al., 2012).
- Second, learning is seen to depend on a **wide range of different types of knowledge**, different skills and different modes of learning – all of which are highly valued (Raymond et al., 2010). These include not only codified, scientific knowledge but also tacit knowledge relating to implementation, as well as emotional intelligence and management/motivation.
- Third, learning is therefore seen to be depend on **contributions from a wide range of different stakeholders**,<sup>1</sup> with different knowledge, viewpoints and capacities.
- Fourth, learning is seen as a social process which is stimulated by **interpersonal interaction** between individuals with different knowledge and skills, and depends on long-term relationships and trust (Abreu et al., 2008; Reed et al., 2015).

#### 2.1.2 Rationales for knowledge exchange

##### Rationale of stimulating innovation

This view of knowledge exchange and learning complements theories of innovation, such as “open innovation” (Chesbrough, 2003):

- Innovation is seen to depend on a **wide range of knowledge, skills and experiences**, rather than simply on brilliant scientific research.
- **No single organisation** – even a large multi-national corporation – can possess all these forms of knowledge and skill, and a collaborative approach, based on exchanging different types of knowledge, is seen as necessary for effective innovation.
- Significant **dimensions of innovation occur during the implementation** of new ideas, and often depend on tacit knowledge that requires interaction and exchange.

##### Rationale of supporting rural/regional development

Knowledge exchange is also emphasised in studies of rural and regional development:

- A key challenge for many rural areas is the **limited number of innovation-relevant stakeholders**, including businesses, research/education institutions, financial intermediaries and business support organisations. Diverse and effective linkages (both physical and social) with a wide range of potential innovation partners and

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<sup>1</sup> We draw on the following definition of a stakeholder: “Someone representing a collective interest. This interest can be embodied by an organisation or movement, but also by a group of people who share similar features, needs or interests. Being stakeholder is a role tied to a physical person.” (Lukesch, 2019)

knowledge-sources outside the area can be key to facilitating innovation in rural areas (Granovetter, 1973; Atterton, 2007).

- A further risk is that rural businesses and other stakeholders become **locked in to particular narrow patterns of cooperation and knowledge exchange**, which can reduce adaptability in the face of structural changes as new knowledge may not be accessed or assimilated (Grabher, 1993), and may mean that some local sources of knowledge and other capacities are not fully mobilised (Barca, 2009).

### Rationale of enhancing democracy

Knowledge exchange can also be seen as a form of stakeholder and citizen engagement, which in turn may have diverse rationales (Ribeiro and Miller, 2015; de Bakker et al., 2016), namely:

- **Achieving pragmatic goals**, such as creating new business opportunities; finding new partners, suppliers, customers or workers; gaining new access to financing; or shaping public policies and legislation;
- **Mobilising a range of viewpoints** to inform decisions, address blind spots, co-create shared visions/goals, resolve conflict, and mobilise support for sustainability targets;
- **Ensuring that people can voice their views and interests** in order to encourage broad-based debate, to allow a new consensus to emerge on fundamental objectives, and to facilitate democratic engagement.

## 2.2 Capacity building

### 2.2.1 Definitions

“Capacity building” or “capacity development” is a term often used in development and transition economics, and can be defined as **“the process through which individuals, organizations and societies obtain, strengthen and maintain the capabilities to set and achieve their own development objectives over time”** (UNDP, 2009, p.5). It derives from work in welfare economics that emphasises that every individual should have the opportunity and ability to exercise a range of “capabilities” in order to live well (Sen, 1997; Nussbaum, 2000; Nussbaum and Sen, 1993). It is therefore wider than concepts such as “institutional capacity” and “administrative capacity” which focus solely on the quality of governmental organisations, legislation and policy-making.

Capacity building **aims to strengthen local capabilities and to empower communities to design and implement their own development strategies**, drawing on local resources, emphasising a participative and inclusive approach, and tailored to local circumstances (UNDP, 2009; European Parliament, 2017; Babu/Sangupta, 2006). It can encompass measures to (Forss, 2001):

- Improve human resources, through education and training for **individuals**;
- Strengthen the functioning of specific **organisations**, through investment in management and strategic systems, structures, human capacities and physical equipment;
- Enhance the **broader environment**, including legislative, regulatory and institutional frameworks, as well as policies, value systems, social norms, and power relations.

### 2.2.2 Rationales for capacity building

#### Rationale of supporting economic development

Advocates of capacity building/development see this approach as fundamental to successful economic development and “the engine of human development” (UNDP, 2009, p.5).

In contrast, “top-down” policies are viewed as less effective, e.g. those based solely on the allocation of external funding, the provision of external expertise, the implementation of one-dimensional policies, or the imposition of methods and solutions that have worked elsewhere.

### **Rationale of enhancing democracy**

Capacity building is also inherently democracy-enhancing, as it includes a strong emphasis on stakeholder engagement, aimed at ensuring that:

- Action is rooted in **objectives shared by local communities** and in the resources of these communities;
- There is widespread local commitment to and **local ownership of the capacity development process**; and
- Action is **accountable to local communities** (UNDP, 2009).

### 3 Existing approaches to knowledge exchange (KE) and capacity building (CB)

This section presents existing approaches to KE and CB, particularly in relation to the bioeconomy and in the context of the EU-driven smart specialisation and rural development frameworks.

#### 3.1 KE and CB via national/regional bioeconomy strategies

Many European countries and regions have agreed national or regional bioeconomy strategies. The processes of designing and implementing these strategies involves various elements and degrees of KE and CB.

**Knowledge exchange** typically occurs between triple or quadruple helix stakeholders (i.e. representatives of policy, business, research/education and sometimes civil society) during the design and sometimes also during the implementation of bioeconomy strategies (Davies and Ribeiro, 2016). These can take the form of:

- **Dialogue and consultation**, via Bioeconomy Councils, Panels or Working Groups, or via ad hoc round table or online consultations; or
- **Stakeholders actively cooperating to co-produce knowledge**, sometimes led by a hybrid organisation such as an innovation centre or cluster body, or stimulated by public funding for collaborative projects involving diverse types of stakeholders, e.g. university researchers and businesses, or businesses and local councils or non-governmental organisations (NGOs).

**Capacity building** encompasses a wider range of activities and can involve the participation of individual citizens, as well as quadruple helix stakeholders, in national/regional bioeconomy strategies e.g. via:

- **Citizen participation in the design of bioeconomy strategies**, which may simply take the form of information provision, or may involve a more substantial consultation process. There are fewer examples of citizens having a significant impact in shaping local bioeconomy strategies (which could potentially lead to community empowerment and stronger local capacities), although active citizen participation is seen in relation to local sustainable energy strategies;
- Bioeconomy strategies may also include **support for a range of activities that build capacity**, whether investment in education and training; action to strengthen the functioning of specific organisations; or changes to the wider environment e.g. laws, policies, and social norms.

The **BioSTEP** project drew on existing studies and original research to identify **7 principles** that support **effective stakeholder and citizen participation** in bioeconomy strategies (Davies and Ribeiro, 2016):

- 1) **Design and prepare engagement activities carefully**, including the timing, methods, context, and the representativeness and needs/wishes of participants.
- 2) **Ensure transparency, integrity and respect for all perspectives**, via open communication on design, implementation and results, and respecting all views.
- 3) **Ensure that engagement makes a difference** i.e. that participants' views genuinely shape decision-making processes and activities.
- 4) **Review and evaluate engagement to improve practice.**
- 5) **Tailor engagement to the national/regional bioeconomy** stakeholders, sectors and activities in the region, including whether bioeconomy activities are early stage or well-established and assessing how engagement could support further development.
- 6) **Listen and engage people on what matters to them**, i.e. on specific issues which are of interest to stakeholders and citizens, rather than simply trying to communicate a message.
- 7) **Learn from other sectors, regions and countries**, as there may be scope to learn from engagement practices undertaken outside the bioeconomy, e.g. in urban/spatial planning.

## 3.2 KE and CB via Smart Specialisation Strategies (S3)

### 3.2.1 Policy and conceptual framework

The EU's Smart Specialisation Strategy (S3) approach<sup>2</sup> is part of EU Cohesion policy (and is also used in some non-EU countries). It supports the design and implementation of regional/national innovation strategies, and includes steps to:

- build or **expand KE networks** among regional stakeholders;
- **identify regional strengths**, as well as weak or missing capacities; and
- **reach consensus** among regional stakeholders to focus capacities on shared goals.

Every Member State or (NUTS 1 or 2) region in the EU is required to agree an S3 as a condition for receiving EU Cohesion policy funding. According to the European Commission: "Smart specialisation is a place-based approach, meaning that it builds on the assets and resources available to regions and Member States and on their specific socio-economic challenges in order to identify unique opportunities for development and growth." Smart Specialisation is seen as:

- **Smart:** It aims to identify the region's specific strengths and assets;
- **Specialised:** It aims to target research & innovation investment on these strengths;
- **Strategic:** It aims to support stakeholders to define a shared vision for innovation.

The S3 approach is based on research that suggests that:

- **Innovation depends on cooperation** between people;
- Many **regions have underused capacities**, energies and resources – e.g. because of lock-in to narrow patterns of activity and cooperation;
- **Social capital and trust matter** for innovation and economic development;
- Building wider **networks can mobilise existing capacities**, energies and resources, and enable stakeholders to target capacities on shared goals.

S3 processes typically involve a **quadruple helix approach to stakeholders**, including:

- Policy-makers and various public sector organisations;
- Business associations, chambers, and possibly individual businesses;
- Research and education institutions, including universities and colleges; and
- Civil society organisations and NGOs.

### 3.2.2 S3 in practice

The S3 approach aims to provide a structure to support stakeholders to explore possibilities for cooperation and KE. It takes a systematic approach to strategy development i.e.

- An **analysis of the regional situation**, notably strengths and assets;
- An '**entrepreneurial discovery process**' or meetings where quadruple helix stakeholders (representing policy-making, business, research/education, and civil society) come together to build working relationships, share ideas/knowledge, and agree on a common vision and priorities which are rooted in the region's strengths (or 'specialisation');
- Stakeholder **agreement on a formal strategy** and implementation roadmaps.

An equally important aim is to bring together diverse organisations and individuals to develop relationships, trust and community, and to share and co-create knowledge. In the long term, this may have stronger effects than the formal strategy.

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<sup>2</sup> Please note that the information on S3 and rural development in these sections is based on the EU's frameworks for the 2014-20 funding period. At the time of writing, negotiations for the next period were ongoing and the 2021-27 frameworks are likely to be different.

### 3.2.3 S3 in the EU context

National/regional S3 are being revised in 2019 in preparation for the forthcoming **2021-27 funding period** of EU Cohesion policy. There is therefore **scope for the BE-Rural activities to be linked to wider national/regional S3 for 2021-27**.

The European Commission offers extensive support for S3 processes in its Member States. The **European Commission's Joint Research Centre (JRC) runs the S3 Platform**; over 180 regions have registered with the JRC, including from countries outside the EU. The JRC provides:

- Support for regions with less experience of developing S3 strategies;
- Guidance and information;
- Assistance in setting up EU-wide thematic stakeholder networks involving regions with particular thematic specialisations, such as **Bioenergy**.

#### **Box: EU Cohesion policy and regional bioeconomy strategies**

Although BE-Rural is more closely related to rural development policy, it is also the case that regional development policies at national, regional and EU-levels can include support for activities related to the bioeconomy. In the EU, regional policies are typically co-financed by **EU Cohesion policy**, which helps to fund the EU's **Circular Economy Package** by **contributing to a strengthening bioeconomy**.

A new period of Cohesion policy programmes for 2021-27 are currently being prepared. The EU budget for 2021-27 is likely to include an increased focus on themes relating to climate change. The European Commission has proposed **five Policy Objectives** for Cohesion policy in 2021-27:

- 1) a **smarter Europe** by promoting innovative and smart economic transformation;
- 2) a **greener, low-carbon Europe** by promoting clean and fair energy transition, green and blue investment, the circular economy, climate adaptation and risk prevention and management;
- 3) a **more connected Europe** by enhancing mobility and regional ICT connectivity;
- 4) a **more social Europe** implementing the European Pillar of Social Rights; and
- 5) a **Europe closer to citizens** by fostering the sustainable and integrated development of urban, rural and coastal areas and local initiatives.

Themes relevant to the bioeconomy will be addressed mainly **under Policy Objective 2 (circular economy)**, as well as under **Policy Objective 1 (smarter Europe)** and **Policy Objective 5 (a Europe closer to citizens)**.

For each Member State, the European Commission has recommended particular areas of intervention in 2021-27 (see **country reports**, Annex D). Although "the bioeconomy" is not directly mentioned, the circular economy is recommended as a key area of intervention in many countries, including the four OIP countries that are EU Member States. For instance, Cohesion Policy funding should be used:

- To **develop alternatives to raw materials and the use of recycled materials as raw materials** (relevant for all OIPs, but Bulgaria and Latvia are specifically mentioned);
- To invest in **capacity-building for all stakeholders** involved in the transition to circular economy (relevant for all OIPs, but Romania is specifically mentioned); and
- To **improve the knowledge base on the circular economy** (relevant for all OIPs, but Bulgaria is specifically mentioned).

### 3.2.4 Challenges and lessons for S3

The S3 approach is often easier to implement in regions where there are already good working relationships between stakeholders. It is more challenging elsewhere – yet it has the potential to be particularly helpful where relationships and KE are currently more limited.

There are several challenges to developing effective S3, e.g. (Polverari, 2016):

- It depends on the willingness and **capacities of a range of stakeholders to cooperate with each other** and engage in KE;
- Stakeholders may have very different views and interests, and may find it difficult to **agree on a limited number of realistic areas of specialisation**;
- It takes **time to develop and agree a strategy** through discussion and cooperation, and the outcomes are uncertain.

Experiences so far have shown that **S3 can be particularly challenging in rural or peripheral regions**. **S3 in sparsely populated areas** is challenging because of (Teräs et al., 2015):

- The **limited numbers of stakeholders**;
- The **long distances between stakeholders**, which may constrain communication and cooperation and/or add to the costs and time of KE;
- The **lack of critical mass** and agglomeration economies in terms of human, knowledge and business capital.

### 3.2.5 Success factors for S3

In order to be effective, the S3 process needs to (Michie et al., 2019):

- Provide a **structure that supports stakeholders** to explore possibilities for KE and cooperation;
- Prioritise **building connections among stakeholders**, as well as strategy-building;
- Enable stakeholders to **voice different viewpoints** about present-day realities in the region, and about future directions and goals;
- Ensure the participation of a range of different stakeholders, including those:
  - With the **capacities to drive strategy-building** and implement roadmaps;
  - **Outside dominant interest groups**, who can contribute new ideas;
  - **Able to build bridges** across sectoral boundaries;
  - With strong **connections outside the region**.

In sparsely populated or rural areas, S3 needs in particular to:

- Take a **wide-lens approach to analysing the region's strengths** and possible ideas for specialisation (given that it may be difficult to compete with more densely populated areas in conventional fields);
- Use **diverse ways of promoting KE** and cooperation (given that stakeholders are likely to be located at some distance from each other);
- Maximise opportunities to **build connections with external stakeholders** and knowledge-sources outside the region;
- Consider **opportunities to expand or build new capacities** in order to increase critical mass.

### 3.3 KE and CB via EU rural development policy

#### 3.3.1 Broad aims and instruments of EU rural development policy

The [EU's rural development policy](#) is the second pillar of the common agricultural policy (CAP) and includes support for KE and CB. It is designed to assist rural areas of the EU and meet a wide range of economic, environmental and societal challenges. It has 3 overarching objectives: a) improving the competitiveness of agriculture; b) achieving sustainable management of natural resources and climate action; and c) balanced territorial development of rural areas. These translate into 6 EU priorities for rural development policy:

- Fostering **knowledge transfer** in agriculture, forestry and rural areas;
- Enhancing the **competitiveness of all types of agriculture** and enhancing farm viability;
- Promoting **food chain organisation and risk management** in agriculture;
- Restoring, preserving and **enhancing ecosystems** dependent on agriculture and forestry;
- Promoting resource efficiency and **supporting the shift toward a low-carbon and climate-resilient economy** in the agriculture, food and forestry sectors;
- Promoting **social inclusion**, poverty reduction and **economic development** in rural areas.

#### 3.3.2 Support for the rural bioeconomy

The main funding source of EU rural development policy is the **European Agricultural Fund for Rural Development (EAFRD)**. It also funds bioeconomy projects, e.g. using [tomato by-products](#) in the Netherlands and [biogas facilities](#) in Sweden.

In order to support rural actors, the European Commission has set up the **European Network for Rural Development (ENRD)**, which has the “greening” of the rural economy as one of its focus themes. The ENRD Contact Point serves as a hub for exchange of information on rural development policy, EU-funded Rural Development Programmes (RDPs) programmes and projects. It is generating and sharing knowledge, as well as facilitating KE and cooperation across rural Europe. The ENRD has set up a [Thematic Group](#) on bioeconomy which concluded its work in July 2019 with the seminar “[Bioeconomy: Seizing the opportunity for rural Europe](#)” and the publication [Mainstreaming the Bioeconomy](#). As part of this, the Contact Point presented a **series of useful briefing documents** in June 2019, including a variety of projects examples. There are guidance documents on [policy and tools](#) for the rural bioeconomy and on [awareness raising](#) and communication. Also, there are recommendations focussing on how to make use of EAFRD funding through RDPs [Recommendations on the use of RDPs](#) and a [projects brochure](#) presenting 12 EAFRD-funded bioeconomy projects from 10 countries.

The ENRD also runs a [Rural Bioeconomy Portal](#), presenting projects dealing with different aspects of the bioeconomy and delivering benefits to rural areas. These examples are funded by different EU funding streams, such as EAFRD (incl. LEADER, see section 3.3.3), EMFF, Interreg and Horizon 2020. The growing list of project examples is supposed to offer inspiration to develop new projects and may open opportunities for collaboration and exchanges of good practice among practitioners and institutions.

#### 3.3.3 LEADER/CLLD

[LEADER](#) (*Liaison Entre Actions de Développement de l'Economie Rurale*) is a local development method to **engage local stakeholders in the design and delivery of strategies**, decision-making and resource allocation for the development of their rural areas. LEADER is implemented under national or regional Rural Development Programmes (RDPs) of each EU Member State, co-financed from the EAFRD, which is part of the CAP.

LEADER is a compulsory element of all RDPs, with a minimum of 5% of RDP funding being implemented by **Local Action Groups** (LAGs) on the basis of bottom-up development strategies. In the 2014-20 programme period, there are c. 2600 LAGs across the EU, which bring together public, private and civil-society stakeholders in a particular area.

A new element in the 2014-20 period was the extension of the LEADER method under the term **Community-led Local Development (CLLD)**. CLLD can include resources from any combination of four EU Funds: the EAFRD, the European Maritime and Fisheries Fund (EMFF), the European Regional Development Fund (ERDF); and the European Social Fund (ESF). The seven key principles of LEADER/CLLD are outlined below:

- **Area-based:** taking place in a small, homogeneous socially cohesive territory
- **Bottom-up:** local actors design the strategy and choose the actions
- **Public-private partnership:** LAGs are balanced groups involving public and private-sector actors, able to mobilise all available skills and resources
- **Innovation:** giving LAGs the flexibility to introduce new ideas and methods
- **Integration:** between economic, social, cultural and environmental actions, as distinct from a sectoral approach
- **Networking:** allowing learning among people, organisations and institutions at local, regional, national and European levels
- **Co-operation:** among LEADER groups, for instance to share experiences, allow complementarity or to achieve critical mass

The European Commission has produced LEADER/CLLD [guidance for the Member State or programme management level](#) as well as [guidance for local actors and LAGs](#). The ENRD has also published [guidance on how to create Local Development Strategies](#).

Where LAGs are funded by the EMFF, these are generally referred to as **FLAGs (Fisheries Local Action Groups)**. FLAGs can make use of their own networking support, [FARNET](#) (Fisheries Areas Network). LEADER/CLLD LAGs do not only cover the majority of rural areas in the EU, but also beyond, such as in [Moldova](#) or [Serbia](#).

All OIP regions of BE-Rural are at least partly covered by one or more LAG or FLAG.

### 3.3.4 EIP-AGRI Operational Groups

**European Innovation Partnership for Agricultural Productivity and Sustainability (EIP-AGRI)** was launched in 2012. The 2010 European Commission Communication 'Innovation Union' states that the EIPs should encourage collaborative efforts in order to achieve synergies and EU value added. **EIP-AGRI encourages interactive innovation** using complementary types of knowledge. It supports co-creation and diffusion of solutions that are ready to be implemented in practice.

EIP-AGRI is based on a number of different **platforms that bring innovation actors together**. The key framework that brings regional stakeholder from a specific thematic area together is an [Operational Group \(OG\)](#), which formally are projects funded under an EAFRD programme. OGs consist of a diverse group of partners (farmers, researchers, agri-business etc.) with a common interest in a specific, practical innovation project. Participants in OGs include researchers, advisors, entrepreneurs, farmers, NGOs and others, with a research institute most commonly (40% of all OGs) taking on the role of lead partner. In total, 3,200 OGs are planned for 2014-20, funded by 95 EAFRD RDPs in 27 countries (Luxembourg is not planning any OGs). By summer 2019, over 1,000 OGs had been reported. OGs cover a broad range of agricultural themes, including in the area of the bioeconomy. In August 2019, there were 17 OGs explicitly dealing with the bioeconomy. There is a searchable [database](#), although not all OGs have been entered into it.

The European Commission has created a **Service Point to support the work of EIP-AGRI OGs**. It offers advice on [how to launch and manage OGs](#) and it organises temporary [focus groups](#) on selected themes as well as workshops such as one on [farm diversification in the bioeconomy](#) in February 2019.

## 4 Case studies of good practice KE and CB in rural bioeconomy strategies in Europe

There are already examples of good practice of KE and CB in rural bioeconomy strategies in a number of European countries. This section provides information on five such case studies:

- **Baden-Württemberg's** Sustainable Bioeconomy Strategy (Germany);
- **Catalonia's** Biolab Ponent, a rural Open Innovation Living Lab (Spain);
- **Oulu region's** Bioeconomy LEADER Tour (Finland);
- **Scotland's** Industrial Biotechnology Strategy (United Kingdom);
- **Tajo-Salor-Almonte's** (TAGUS) Smart LEADER approach (Spain).

The case studies have been selected on the basis of advice from BE-Rural consortia members as well as from the JRC's S3 Platform and the ENRD. The selection was made to ensure relevance to OIPs and variation in a number of dimensions:

- **Geographical scale:** Covering large administrative regions (Baden-Württemberg and Scotland), medium-sized areas (Oulu) or relatively small functional areas (Tajo-Salor-Almonte, Terres de Ponent);
- **Leadership:** Led by government (Baden-Württemberg), a partnership of business and government (Scotland), associations (Oulu), a LEADER Local Action Group (Tajo-Salor-Almonte) or local committee of stakeholders (Terres de Ponent);
- **Thematic focus:** Focusing primarily on business innovation and economic development (Scotland), including economic, social and environmental aspects (Baden-Württemberg), or taking a wide-ranging, community-based perspective (Oulu, Tajo-Salor-Almonte, Terres de Ponent);
- **Participants:** Mainly involving triple helix stakeholders (Scotland), taking a quadruple or quintuple helix stakeholder approach (Baden-Württemberg, Terres de Ponent) or also involving individual citizens (Oulu, Tajo-Salor-Almonte);
- **Technological sophistication:** Targeting sophisticated technological innovation (Baden-Württemberg, Scotland) or a wider range of economic and community activities (Oulu, Tajo-Salor-Almonte, Terres de Ponent).

Information for each case study comes from desk research and, as far as possible, written and/or phone interviews with policy-makers in the region. Any lessons learned mentioned have been identified by the policy-makers involved in the KE and CB processes.

## 4.1 Baden-Württemberg's Sustainable Bioeconomy Strategy (Germany)

The development of the [Baden-Württemberg "Sustainable Bioeconomy" strategy](#) published in June 2019, was based on a participation process managed by BIOPRO Baden-Württemberg. BIOPRO is an agency created that is owned by the Land (federal state) of Baden-Württemberg (population: 11 million) and was set up in 2003 to focus on the bioeconomy, biotechnology, pharmaceutical industry and medical technology.

The strategy development was centred on **two parallel participatory processes**, which have been documented and are [available for download](#). The participation processes involved a wide range of **quadruple helix stakeholders** from primary production, trade, the manufacturing industry, academia, social partners and NGOs. The core element of the strategy platform consisted of **eight thematic working groups in two thematic strands**. In these, **over 100 stakeholders** worked together between October 2017 and October 2018. This participatory strategy process gave all relevant stakeholders in Baden-Württemberg the **opportunity to make a contribution to the development of the strategy**. The process was divided into two parallel strands, focusing on a) [rural areas](#) and b) [urban and industrial areas](#). Both parts looked **not only at technological, but also at socioeconomic and ecological aspects**. A board made up of representatives of the working groups and of the lead Land ministries ensured networking and interaction between the two strands.

Figure 1: Baden-Württemberg (Germany)



Source: Wikipedia

The part on **bioeconomy in rural areas** was led by the Ministry of Rural Affairs and Consumer Protection. It looked at the **provision of biomass through agriculture and forestry and its processing into high-quality products**, both traditional and innovative ones. For instance, one of the priorities was on coupled uses and cascade uses of by-products and residues. BIOPRO invited c. **200 individuals representing c. 100 organisations**, covering producers (agriculture and forestry) and businesses processing biomass, as well representatives of trade, public bodies, research and education bodies and environmental NGOs. Looking at **quadruple helix representation**, businesses/farmers made up 38%, civil society 26%, research and education 24%, and public bodies 12%. Stakeholders were then divided into **4 working groups** which met 2 or 3 times (9 times in total) for half-day meetings between March and September 2018 on the following themes:

- biomass production,
- biomass processing,
- framework conditions and
- knowledge transfer and social dialogue.

The part on **bioeconomy in urban and industrial areas** was led by the Ministry of Environment, Climate and Energy. It focused on the use of bio waste, effluents and CO<sub>2</sub>, as well as on potential uses of biological processes, practices and principles. Similar to the process for rural areas, BIOPRO invited c. 350 individuals from c. 220 organisations. 57% were businesses, 25% research and education bodies, 15% civil society and 3% public bodies. These were again divided into 4 working groups which met 5 times each (20 times in total) between November 2017 and October 2018 to discuss:

- bio-based methods, processes and systems,
- technology development and innovation,
- indicators and criteria for assessing the bioeconomy, and
- networking and communication.

The working groups developed **practical recommendations in the form of 37 measures**. These are grouped into 6 areas of action:

- support framework for the bioeconomy,
- bioeconomy in rural areas,
- bioeconomy in industrial and urban areas,
- networking between territories, actors and clusters,
- qualification and development of skilled workers and
- information and dialogue on a sustainable bioeconomy.

The working groups also identified topics that should be investigated by further studies.

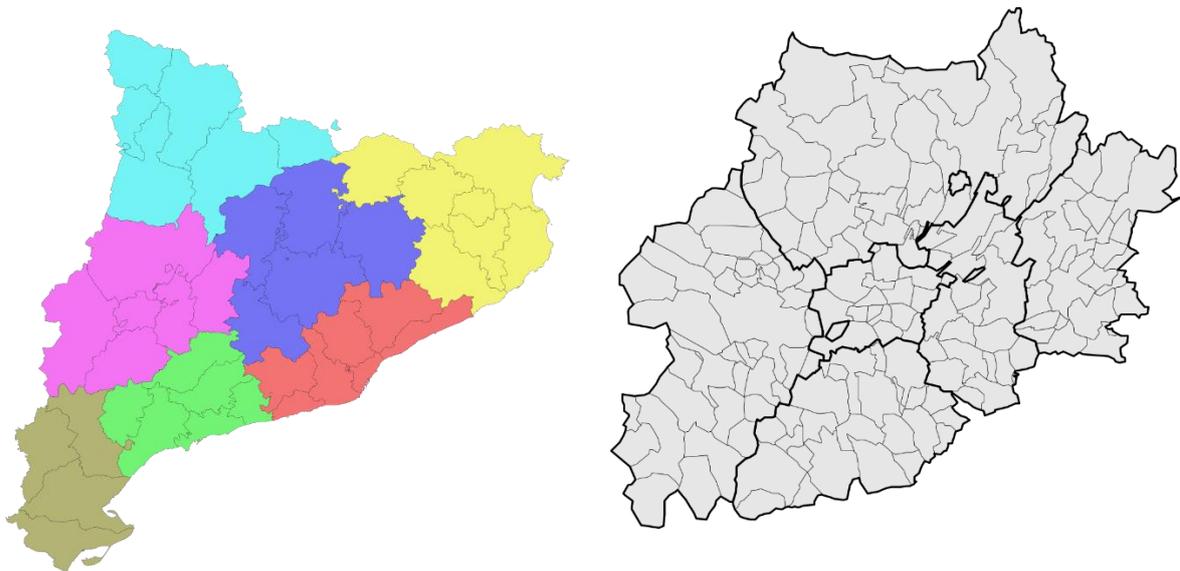
The facilitator of the strategy-building process drew out a number of lessons:

- First, it is **advisable to limit the number of meetings to ensure good participation**. Spreading, for instance, 3 meetings across 7 months allows sufficient time between them to analyse their outcomes and prepare for the next ones.
- Second, **bringing together different groups at a later stage, after they met separately to start with**, can be a helpful approach. In one case, the stakeholders suggested organising their third meeting as a joint one between two originally separate working groups, which proved to be beneficial.
- Third, **the facilitator of the stakeholder engagement activities must endeavour to remain neutral and to be perceived as an honest broker by all stakeholders** throughout the process. There is a risk that the facilitator may be seen to be biased if it is located clearly in one of the dimensions of the triple or quadruple helix, e.g. if the process is initiated and/or managed by a public sector body, a business organisation or a research institute.

## 4.2 Biolab Ponent, a rural Open Innovation Living Lab in Catalonia (Spain)

Biolab Ponent started in 2017 with the aim of contributing to the **transition towards a circular bioeconomy** in “**Terres de Ponent**”, a rural region in Catalonia. Set up as a **Rural Open Innovation Living Lab**, the initiative is promoted by a committee composed of farmers, local and regional authorities, experts and research representatives. It aimed at innovation and **the co-creation, co-development and testing of local-based bio business models**, creating a model of sustainable development for rural areas. The initiative is a **pilot bottom-up approach based on awareness raising and open innovation**. The process was funded by the Catalonia ERDF and EAFRD programmes 2014-20.

**Figure 2: Terres de Ponent (pink) in Catalonia, Spain**



Source: Wikipedia

The project's **rationale** is that the deployment of a circular bioeconomy model requires a **systemic transition** approach, which implies being able to develop **social, technological and organisational innovation** to transform the current production and consumption regime. Systemic transition is not possible without the involvement of rural communities. Awareness raising and open innovation in a **quintuple helix approach** are crucial to reach the expected transformative impact.

Biolab ran a series of events, including three innovation labs:

- **Local authorities' engagement workshop**, to raise awareness of the societal challenges.
- **Innovation lab 'Awareness and Vision Formulation'**, lasting eight hours, with participants in quadruple helix configuration.
- **Innovation lab 'Generating Ideas'**, to identify new or improved bio-based value chains.
- **Innovation lab 'Generating Business Models'**, to define sustainable and circular bio-business models.

According to Biolab's project manager, the key lessons are:

- **Make engagement worthwhile.** It is important to make the stakeholders' investment of time and effort attractive. For instance, SMEs must see opportunities that their participation might lead to future business opportunities.
- **Establish a facilitator who is seen as neutral.** Public bodies should not be leading the process, but should be involved just as any other stakeholder.

- **Make researchers engage with the wider society.** Universities and research bodies need to be persuaded to go out of their comfort zone and to interact with actors from other parts of the triple/quadruple helix.
- **Be aware of political timetables.** It can be particularly challenging to involve public actors, such as mayors, which are guided by their terms of office and therefore want to see results within this timeframe. Yet, innovation processes can take long and risk of not fitting with political time horizons.
- **Build up trust amongst stakeholders.** One could note that the process went smoother and was more constructive after the first sessions, once the actors got to know each other.
- **Deliver quick, visible results.** Stakeholders want to see quick, concrete outputs. Therefore, Biolab implemented a number of small projects very early on, so that stakeholders were able to see that their involvement creates tangible results.

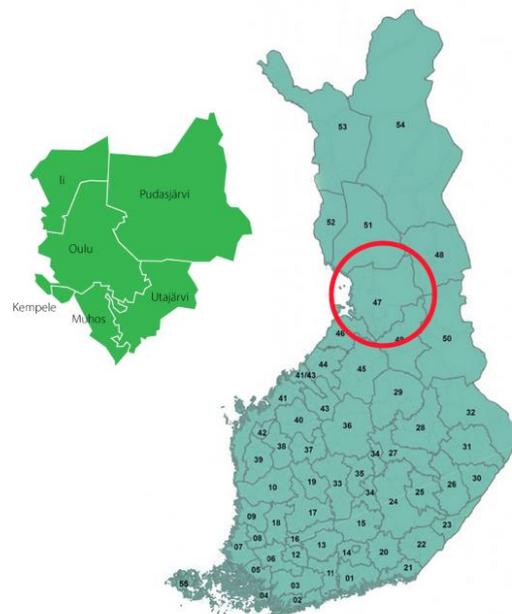
### 4.3 Oulu region's Bioeconomy LEADER Tour (Finland)

The Bioeconomy LEADER Tour was a 3-year (2016-19) project in the **Oulu LEADER rural region** of Finland (i.e. areas of Ii, Kempele, Muhos, Pudasjärvi, Utajärvi and Oulu, excluding the city of Oulu). This region is part of Northern Ostrobothnia, stretching inland from the Gulf of Bothnia). The city of Oulu itself has a **strong innovation profile**, with a university, science and technology parks, and many innovative enterprises e.g. in sectors such as ICT, mining and metallurgy, wood, and healthcare.

The Bioeconomy LEADER Tour project supported a range of **KE activities** aimed at increasing understanding what the bioeconomy could mean for this region, and generating **new collaborative opportunities in the bioeconomy** for businesses, villages and other local stakeholders. The **project** received total funding of €180,000 from a combination of EU, national and municipal sources. The project leaders were ProAgria and the Rural Women's Advisory Organisation – both of which are national associations with regional offices and provide advisory services to rural businesses and other rural stakeholders.

The project was linked to the **Finnish Bioeconomy Strategy**, as well as with the Oulu LEADER Local Development Strategy, the Northern Ostrobothnia Bioeconomy Strategy 2015-20, and the Finnish Rural Development Programme (sub-measure 4.2.1. Innovations boosting bioeconomy). The project's interactive and collaborative approach should be understood in the context of the **strong emphasis on stakeholder participation in bioeconomy and wider policy strategies in Finland**, involving formal institutions representing different societal groups (e.g. businesses, trade unions, civil society organisations, research/education bodies, and public sector entities), as well as individual citizens.

Figure 3: Oulu LEADER region in Finland



Source: Oulun Seutu LEADER

Overall, the project ran **117 interactive information events on the local bioeconomy**, with a total of 2,124 participants. It also undertook **needs surveys** with local actors and villages interested in new cooperation models, and implemented a wide-ranging **communication campaign** through traditional and social media.

There was a strong focus on supporting local businesses and stakeholders to make **sustainable use of local resources**; adding high value to local raw material; and with local and circular supply chains, drawing on local renewable energy and local collaboration models. **Key activities** included:

- **Energy and vitality from small biogas plants:** 6 local events and study tours in the area led to the construction of 2 new farm-level biorefineries for biogas and bio-based products, with a further 3 plans being planned and other farms showing interest.
- **A “Kickstart for business” tour:** 7 local events offered local enterprises the opportunity to discuss potential for bioeconomy products, services and financing with business advisors and one another, as well as individual follow-up meetings.

- **Village-level possibilities in the bioeconomy:** 9 events discussed ideas for the local circular economy, and provided the basis for cooperation between local businesses, associations and citizens.
- **Specialist locally-tailored briefings** were also provided to local stakeholders e.g. on business opportunities in organic horticulture; establishing certified organic collection of local natural harvest plants (berries, mushrooms, herbs etc.); nature attractions for local nature tourism; and business co-operation in food sector.

By the end of the project in 2019, the following outputs had been achieved:

- 55 small rural enterprises had started to develop bioeconomy-related activities;
- 19 enterprises had received advice on investments or financing;
- 17 enterprises had started planning investments, and 10 had already applied for funding; and
- 5 new enterprises had been established, and 5 more were being launched.

According to the project manager, lessons include the need to:

- **Ensure sufficient time, repetition and multiple channels** in order to communicate specific messages effectively;
- **Network with other relevant projects**, in order to ensure cross-fertilisation of ideas and KE;
- **Design complementary projects**, so that e.g. KE among businesses is followed by advice tailored to individual businesses.

#### 4.4 Scotland's Industrial Biotechnology Strategy (United Kingdom)

Scotland has a population of 5.3 million people, most of whom are concentrated in main cities of Glasgow, Edinburgh, Aberdeen, Dundee and Inverness, while large areas in the Highlands & Islands and South are sparsely populated. KE and CB in bioeconomy strategies have taken place in the field of industrial bioeconomy, as well as in related fields, notably renewable energies, and life sciences. There has been **particularly strong interaction between triple helix stakeholders, including:**

- **Business representatives** from large and small firms across a range of sectors e.g. food, pharma, materials, chemicals and biochemical, molecular biology, and bioprocess engineering;
- **Universities and research centres** with expertise in a range of related disciplines;
- **Government bodies**, including Scottish Enterprise, Highlands and Islands Enterprise, and Skills Development Scotland, as well as sectoral bodies such as Zero Waste Scotland and the Forestry Commission.

The initial idea for a Scottish **National Plan for Industrial Biotechnology** emerged in 2013 from an industry association, Chemical Sciences Scotland, which, in cooperation with Scottish Enterprise (an economic development agency funded by Scottish Government) set up a working group – the **Scottish Industrial Biotechnology Development Group (SIBDG)** – with representatives from businesses, universities, and public bodies. SIBDG agreed a Plan to support transition from an oil-based economy to a bio-based economy, with a view to expanding employment and output, and focused on four themes:

- **Industry engagement:** helping to increase awareness and use of industrial biotechnology;
- **Biorefinery:** assessing potential for a biorefinery or biochemical facility as the cornerstone for sustainable manufacturing in Scotland;
- **Skills:** helping to address any skills barriers;
- **Innovation Centres:** developing biotech innovation centres and positioning Scotland as a leading hub for innovation in industrial biotechnology.

SIBDG applied for Scottish Government funding to set up the **Industrial Biotechnology Innovation centre (IBioIC)**, which was launched in 2014 with £10 million, and in its first five years leveraged in over £50 million. In 2019, it is supporting 130 companies and 50 research projects, and is working with 18 Scottish universities and research institutes. Key activities include:

- **Supporting businesses to transition into industrial biotechnology** by assessing benefits and opportunities, overcoming any barriers, and facilitating collaboration with other businesses and universities/researchers;
- **Providing open access equipment centres**, notably a Rapid Bioprocess Prototyping Centre at the University of Strathclyde, and a Flexible Downstream Bioprocessing Centre at Heriot-Watt University;
- **Supporting its members to build project consortia and win research and innovation funding** from UK and EU funding sources;
- **Facilitating KE and cooperation** between its members and specialists with the wide range of knowledge and expertise included in industrial biotechnology;
- **Building a skilled workforce in industrial biotechnology**, via the upskilling of existing workers, and the creation of bespoke training programmes at PhD, MSc and

Figure 4: Scotland



Source: Wikipedia

HND level, which currently support over 100 students, with a further 100 already having graduated;

- **Organising networking and partner-finding events**, including thematic workshops, and a major annual conference, which includes an exhibition, specialist fringe events, one-to-one partnering meetings.

The Scottish Government has a **strong commitment to addressing climate change**, and also to economic and community development in rural and sparsely populated areas. Scottish Government legislation has, for example, facilitated the buy-out of land by local communities based on citizen participation, which is often linked to the creation of **community-owned business activities**, particularly renewable energy generation. Scottish Government is also funding **smaller-scale bioeconomy projects, particularly in rural areas**. The **Local Energy Challenge Fund (LECF)** has funded large-scale low carbon demonstrator projects which linked energy generation and energy use within local areas, and aimed to create local value and benefit. The LECF has now been replaced by the **Low Carbon Infrastructure Transition Programme**.

One project funded by LECF is **Algal Solutions for Local Energy Economy (ASLEE)**, which brings together a range of stakeholders in a rural area on the west coast of Scotland, to assess the economic and technical feasibility of using locally-generated renewable energy to reduce the costs of **bio-manufacturing high value microalgae**. The key project partners have diverse and complementary knowledge, and include:

- **Xanthella Ltd**, a local SME and project-lead, which designs and manufactures equipment for algal biomanufacturing and research, and is located on the European Marine Science Park, near the **Scottish Association for Marine Science (SAMS)**, a leading research and education centre in marine science.
- **Argyll, Lomond and the Islands Energy Ltd**, which is a local non-profit energy agency, and aims to promote sustainable energy use and renewable energy generation, with a view to reducing fuel poverty and carbon emissions.
- **Woodlands Renewables Ltd** on the Ardnamurchan Estate, which provides a location for the energy production, building on its existing wind, hydro, biomass and wave generators.
- **Wood Group**, which is a consultancy business that specialises in developing innovative solutions to combine renewable energy with other investment opportunities in remote communities, and provides the project with technical expertise.
- **University of Stirling's Marine Environmental Research Laboratory**, which specialises in aquaculture research, and undertakes nutritional analysis of algae in relation to fluctuations in light regime in order to optimise the nutritional quality of algal products.
- **VCharge UK Ltd**, which provides services to electric grid operators, with a view to reducing energy costs and ensuring delivery of energy services.
- **FAI Aquaculture / Ardtoe Marine Research Facility**, which undertakes applied R&D in marine aquaculture, and in the project tests and compares the productivity and nutritional quality of a range of algal species.
- **University of the West Scotland**, which provides the project with business strategy, financial, economic and market analysis expertise and also technical expertise in electrical and engineering technologies.

## 4.5 Tajo-Salor-Almonte's (TAGUS) Smart LEADER approach (Spain)

Tajo-Salor-Almonte is a small region in the Spanish Extremadura. With a population of 28,000 people, only 12 people per square kilometre, it is **very sparsely-populated, but has rich natural and patrimonial assets**. Dominated by the primary sector, the region's industrial and service sectors are fragmented and it has a high unemployment rate. Tajo-Salor-Almonte is not focusing specifically on the bioeconomy, but it is an unusual example of stakeholder and citizen engagement at the local level in a rural area, where the actors make use of **synergies between S3 and LEADER frameworks**, creating a 'Smart LEADER' approach.

Figure 5: Tajo-Salor-Almonte LEADER region in Extremadura, Spain



Source: LAG TAGUS

In the area, local actors recognised that **rural innovation does not emerge spontaneously, but that instead it has to be catalysed from within**. LEADER, through its Local Action Groups (LAGs) can play a critical role for this to happen (for LEADER see Section 3.3.3). In Tajo-Salor-Almonte, the LAG **TAGUS** recognised the need to engage with actors other than the typically agriculturally stakeholders. It actively approached the S3 Platform for advice on how to make use of the smart specialisation concept. In 2014, **TAGUS then carried out their own sub-regional entrepreneurial discovery process (EDP) as part of developing their LEADER local development strategy (LDS)**.

This strategy-building process involved **over 200 people, from public bodies as well as from civil society**. Different stakeholder groups were targeted in separate workshops for public administration bodies and for entrepreneurs and business owners, as well as through open sessions for citizens and civil society associations.

TAGUS carried out a **SWOT analysis for 12 selected potentials of the area**, covering, for instance: territorial cohesion, social and cultural aspects, education, employment, agricultural and food sectors, the green economy and touristic heritage. This resulted in the **decision to focus on a traditional food product**. The territory identified its local comparative advantage in the exclusively **local cheese "La torta del Casar"**.

The process was also **linked to the regional smart specialisation strategy of the Extremadura**, aiming to align the local and regional frameworks. It involved an extended

governance model with various **knowledge stakeholders in the local area of Tajo-Salor-Almonte, but also beyond**, such as a technological park, an agri-food technology centre and the University of Extremadura. The EDP resulted in a **jointly elaborated innovation action plan that became a component of the LEADER LDS**. In order to implement its action plan, the LAG **looked for external funding sources** and made initial steps towards an evaluation and monitoring plan. Within weeks after starting the process, TAGUS started first actual projects:

- **Holistic shepherding**: it aims to optimise sheep feeding using satellite-based tools to monitor the nutritional value of pastures. It is EAFRD-funded via an Operational Group under EIP-AGRI (see Section 3.3.4) and is connected to Horizon 2020 projects.
- **Shepherding school**: Cooprado Cooperative runs a regular shepherding school to train new professionals to ensure the continuity of sheep farming in the area. This allowed to increase supply of shepherds during peak season. About 50% of the students trained are currently working in this sector.

The rural EDP **allowed local actors, including farmers and knowledge institutions, to address the weaknesses of their production system**, e.g. the lack of capacity to respond to market demand during peak seasons. TAGUS resorted to their **network of actors and beneficiaries** that was built up as part of their LEADER activities so as to achieve the maximum possible degree of participation from businesses as well as citizens. The LAG-specific **triple-helix partnership model was seen as helpful to guarantee good involvement from companies and civil society**. TAGUS also signed some agreements or **memoranda of understanding with academics and research centres** that already had some prior or present activity related to the specialisation focus (Torta del Casar).

One of the strengths of the EDP was its **strong civil society involvement**. TAGUS tried to **adapt the EDP procedures to the different types of stakeholders**:

- **For firms**, the focus was on identifying entrepreneurial projects or initiatives targeted at reducing the weaknesses and leveraging the strengths of the specialisation product.
- **When talking to citizens**, TAGUS focused on wider social issues such as rural depopulation, creating new entrepreneurial opportunities, diversification of traditional economic activities, etc.

According to the LAG, local actors and policy-makers recognised the usefulness of such a process. Yet, **it remains challenging for the different public bodies involved to coordinate their initiatives** and policies, both at local and regional levels.

## 5 Conclusions

WP4 of BE-Rural aims to support KE and CB activities in the five OIP regions with a view to providing the basis for a regional consensus and ownership of the regions' bioeconomy strategies.

The case studies outlined in Section 4 provide an overview of a range of different approaches to the kinds of processes which the OIP will implement in the regions, and each case study is characterised by different strengths:

- **Baden-Württemberg** has conducted wide-ranging KE processes via multiple working groups with quadruple helix stakeholders, in order to develop a broad-based formal bioeconomy strategy, with a dual focus on rural and urban areas.
- **Catalonia Biolab Ponent**, a rural Open Innovation Living Lab, has taken a quintuple helix approach to awareness raising and supporting the co-creation and testing of locally-based bio business models, led by and involving a partnership of farmers, public authorities, and researchers.
- **Oulu region** has supported a range of bioeconomy-related KE activities among quadruple helix stakeholders, focused on supporting local businesses and exploring and addressing the needs of local communities and citizens.
- **Scotland** has built on business, research and innovation strengths in the bioeconomy, along with strategic government funding, to support goal-oriented KE and cooperation, especially among triple helix stakeholders, particularly via the Industrial Biotechnology Innovation Centre, in order to expand business and university investment, as well as organisational capacities and human resources.
- **Tajo-Salor-Almonte** has combined S3 and LEADER to create a 'Smart LEADER' approach at the local level in a sparsely populated agricultural economy, based on extensive KE and CB with stakeholder groups (particularly businesses and the public administration) and with individual citizens and citizen society organisations, as well as with research/innovation and education institutions both inside and outside the region.

Key themes or **lessons from the case studies** include:

- **Ensure local/regional ownership of the strategy** by combining community/social and economic dimensions;
- **Mobilise a wide range of local/regional stakeholders** (preferably quadruple helix) to participate in KE, and actively seek their views and engagement;
- **Build trust among participants** e.g. by taking time to build relationships, and by ensuring that the lead organisation is seen as an honest broker and without a clear vested interest in a particular outcome;
- **Build a structured programme of KE** and engagement in order to support local/regional stakeholders to reach agreement to focus their efforts on specific thematic strengths;
- **Target efforts on building capacities to support these strengths** e.g. by accessing external funding to invest in human resources or business innovation projects;
- **Ensure that participation is worthwhile** e.g. by showing early-on that the process can lead to new projects (even small ones) or other tangible results;
- **Take steps to ensure continued momentum over the longer term** e.g. appoint or set up an organisation or committee to lead a defined plan of action, or hold an annual networking event.

An accompanying document to this paper provides detailed guidance on the KE and CB activities to be undertaken with quadruple helix stakeholders in the OIP regions under BE-Rural Task 4.3 and Task 4.4.

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