



Synthesis Report

ROBUST Deliverable 3.3

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Contents

Contents.....	2
List of figures	4
List of tables.....	5
List of abbreviations	6
Executive summary	7
1. Introduction.....	11
1.1 <i>Introducing WP3 and the synthesis report.....</i>	11
1.2 <i>ROBUST's transdisciplinary way of working: living labs and communities of practice.....</i>	12
1.3 <i>Synthesis methodology and analysis</i>	15
1.4 <i>A changing research context: the COVID-19 pandemic</i>	16
1.5 <i>Reporting structure</i>	16
2. Living lab synthesis.....	17
2.1 <i>Living lab contexts and objectives.....</i>	17
2.2 <i>Implementing ROBUST's living lab methodology.....</i>	22
2.3 <i>The impact of COVID-19 on ROBUST's living lab work.....</i>	25
2.4 <i>Living lab experiments: introduction and innovation synthesis.....</i>	26
2.5 <i>Key messages from the living lab work.....</i>	30
2.5.1 <i>Rural-urban linkages</i>	30
2.5.2 <i>Smart development.....</i>	33
2.5.3 <i>Networked governance</i>	34
2.5.4 <i>Multi-stakeholder connections and cross-sectoral linkages</i>	35
3. Community of Practice synthesis.....	37
3.1 <i>Introduction.....</i>	37
3.2 <i>CoP innovation agenda and learning processes: joint enterprise</i>	38
3.2.1 <i>Business Models and Labour Markets</i>	38
3.2.2 <i>Cultural Connections</i>	39
3.2.3 <i>Ecosystem Services.....</i>	39
3.2.4 <i>Public Infrastructure and Social Services.....</i>	40
3.2.5 <i>Sustainable Food Systems</i>	41
3.3 <i>Shared repertoire of learning resources to strengthen rural-urban linkages</i>	41
3.4 <i>Key messages from the CoP work</i>	44

3.4.1	<i>Rural-urban linkages</i>	44
3.4.2	<i>Growth and smart development</i>	47
3.4.3	<i>Networked governance</i>	47
3.4.4	<i>Cross-sectoral connections</i>	48
4.	Rural-urban linkages as five dimensions of foundational economy	50
4.1	<i>The foundational economy: a new framework for rural-urban well-being</i>	50
4.2	<i>Rural-urban linkages as five dimensions of a foundational economy</i>	52
4.3	<i>Services dimension</i>	54
4.4	<i>Proximity dimension</i>	55
4.5	<i>Circularity dimension</i>	56
4.6	<i>Ecosystems dimension</i>	56
4.7	<i>Culture dimension</i>	57
5.	Monitoring and evaluation of joint learning processes	58
5.1	<i>Overview of Task 3.4: aim, monitoring and evaluation framework, data collection</i>	58
5.2	<i>Monitoring and evaluation findings</i>	60
6.	Conclusions	72
6.1	<i>Key messages</i>	72
6.2	<i>The living lab process and implications for future multi-actor projects</i>	73
6.3	<i>Closing remark</i>	76
7.	References	77
8.	Appendices	79
	<i>Appendix 8.1: Living labs in the ROBUST project – overview of the general approach</i>	79
	<i>Appendix 8.2: Living lab profiles</i>	82
	<i>Appendix 8.3: Research and Innovation Agenda, Mid Wales Living Lab (example)</i>	93
	<i>Appendix 8.4: Research and Innovation Agenda, Ecosystem Services (example)</i>	96

List of figures

Figure 1: ROBUST's living lab network	13
Figure 2: Aligning living lab outputs to CoPs (initial clustering of themes).....	46
Figure 3: Dimensions of the Foundational Economy, with services as the anchor point.....	53
Figure 4: Monitoring and Evaluation of joint learning processes in Living Labs.....	59
Figure 5: Living labs functioning as a team.....	65
Figure 6: Living labs achieving enhanced co-operation	66
Figure 7: Achievement of improved governance arrangements/planning instruments.....	66
Figure 8: Cost-efficiency of the joint work and path taken	67
Figure 9: Overall benefit from the participation in ROBUST	68

List of tables

Table 1: ROBUST's research structure - living lab and CoP networking	14
Table 2: Living labs arranged by Communities of Practice	15
Table 3: Living lab area and demographic characteristics	17
Table 4: Living lab context and rural-urban characteristics.....	19
Table 5: Living lab mottos and national and regional policy links.....	21
Table 6: Methods and activities per living lab stage (all labs).....	23
Table 7: Living lab experiments, innovation projects, outputs and outcomes	28
Table 8: Living lab innovations and rural-urban linkages	31
Table 9: CoP membership	37
Table 10: Joint enterprise and shared repertoire per CoP.....	42
Table 11: CoP resources and rural-urban linkages.....	45
Table 12: Key CoP messages in relation to ROBUST's research themes	49
Table 13: Rural-urban linkage clusters presented at the Graz virtual meeting	52
Table 14: Five dimensions of a Foundational Economy	54
Table 15: Overview of the four dimensions of the M&E framework with key criteria and indications	58

List of abbreviations

Acronym	Abbreviates
CoP	Community of Practice
<ul style="list-style-type: none"> • BMLM • CC • ESS • PI&SS • SFS 	<ul style="list-style-type: none"> • Business Models and Labour Markets • Cultural Connections • Ecosystems Services • Public Infrastructure and Social Services • Sustainable Food Systems
EC	European Commission
FE	Foundational Economy
LL	Living lab
OECD	Organisation for Economic Co-operation and Development
RIA	Research and Innovation Agenda
TD	Trans-disciplinary
WLGA	Welsh Local Government Association
WP (followed by number)	Work Package

Executive summary

This report presents a descriptive overview and structured analysis of the work carried out within 11 place-based living labs and five thematic Communities of Practice (CoPs) within the ROBUST project. ROBUST ran from June 2017 until November 2021 (including a six-month extension caused by the Covid-19 pandemic). In particular, this synthesis report evidences, through the innovations achieved in the 11 living labs and associated CoP research outputs, that **it is necessary to rethink the way economic development achieves well-being, particularly with a view to strengthening rural-urban linkages**. Analysis sets out five foundational dimensions of such a well-being approach to socio-economic and spatial development.

The overall aim of ROBUST was to optimise the ways in which rural-urban functional relationships are governed. Such functions include, for example, commuting, food production and consumption, ecological services such as biodiversity and water management, cultural heritage and landscape tourism and the provision of essential public infrastructure and social services.

The methodology for optimising rural-urban relations involved **the co-development of living labs** (Section 2). Living labs are increasingly used as participatory tools in social innovation. In ROBUST, the 11 labs were designed as arenas of experimental prototyping, particularly to identify and refine innovative governance tools or mechanisms. The labs were led by local teams of collaborating practitioners (local municipal authorities, regional planning agencies or civil society networks) and researchers (universities, research institutes or consultancy firms) in 11 European regions. Innovations were applied to 'real-life' and changing local policy contexts and relied on a range of multi-stakeholder participatory methods to plan and operationalise them. In linking the local experiments, living lab team members formed **Communities of Practice** (CoPs), arranged in relation to ROBUST's five themes of Business Models and Labour Markets, Cultural Connections, Ecosystems Services, Public Infrastructure and Social Services and Sustainable Food Systems (Section 3). The purpose of the CoPs was to harvest ideas, share experiences and develop common research agendas and a shared repertoire of resources. These were identified and jointly developed by CoP members who drew experience from the experiments unfolding in their living lab contexts. In this respect, the living labs generated experiences and empirical data that informed the development of research questions and approaches/tools to address shared research needs according to the five themes.

The operation of the living labs was structured and systematic and informed by guidance developed in the project. All **labs followed four distinct stages**, namely: (i) envisioning; (ii) experimenting; (iii) experiencing; and, (iv) evaluation. An overall **monitoring and evaluation** of combined living labs experience was carried out throughout the course of ROBUST (discussed in Section 5). The envisioning phase was characterised by the development of a **Research and Innovation Agenda** for each living lab, setting out research objectives and innovations planned. The experimenting phase involved field research and engagements with local stakeholder to elaborate ideas and 'test' the experiments. In the experiencing phase, experiments were refined, adapted and deepened before, finally, being evaluated and reflected upon to support the operation of future living labs.

The diversity of the living labs is notable, both in terms of the geography and socio-economic contexts of each (capital city regions, polycentric provinces, remote rural areas), the experimental innovations achieved, and the range of innovations. The **innovations conformed largely to five types**. The first group were strategic in focus, and initiated, extended or implemented local/regional policies. A second grouping produced new data and knowledge. A third group created strategic visioning and futuring scenarios. A fourth group tested and deliberated novel policy ideas. A fifth grouping co-produced good practice examples of rural-urban interdependence.

Examples of living lab innovations include municipal budgetary collaboration to support regional mobility (Metropolitan Area of Styria), enhancing opportunities for local food marketing and adopting new IT innovations in public food procurement (Lucca, Ljubljana Urban Region and Gloucestershire), the development of cultural strategies and rural visions (Tukums and Mid-Wales), linking development to regional economic capacity and functions (Lisbon and Frankfurt/Rhein-Main), establishing multi-stakeholder networks to integrate rural and urban policies linked to multi-locality living and working (Helsinki), assessing the prospects and impacts of novel attempts to integrate agri-environmental, spatial planning and circular farming-related policy objectives on regional agri-food systems (Ede) and rebalancing regional growth objectives to be more inclusive for remote, rural and non-coastal communities (Valencia).

The analysis of living lab innovations was structured around three guiding concepts developed in earlier stages of the project, namely: new localities (created by rural-urban links), smart growth and networked governance. **Innovations which enhance rural-urban links** cover a mix of relations, summarised as: proximity economy (e.g. local food); circular economy (especially for agri-food); service accessibility and quality (especially in remote and peri-urban areas); population mobility flows; natural resource management, especially where eco-spatial concepts such as river catchments crossed administrative boundaries; territorial governance which links rural and urban places, both proximate and distal; and heritage tourism linked to the valorisation of rural culture, gastronomy, landscape, language, etc. Smart growth objectives link territories to their optimal social and ecological capacities. Networked governance highlights the need for cross-sectoral and cross-boundary structures to ensure inclusive decision-making. This applies especially when rural-urban interdependencies rely on political collaboration, partnerships with business or requires additional research input to inform decision-making.

The CoPs complement the horizontal-type of learning revealed in the living labs. While the CoPs draw on the experiences and learning from the LLs, they also seek to develop a common, vertical, research agenda for each theme as a whole, examining how each functional theme affects, and has the potential to enhance, rural-urban synergies, smart growth and networked governance.

Key outputs (see section 3.3) from the CoPs include:

- Extensive **case studies of synergistic urban-rural business models** (BMLM CoP).
- **Case study descriptions, scientific papers and technical reports** covering topics such as mobility (esp. via public transport), digitisation and e-services, basic infrastructure for social services and cultural networking, multi-locality, rural service hubs and rural-urban food infrastructure (PI&SS CoP).
- **Research briefings** on multi-level mapping, payments for ecosystems services, circular farming, mapping and bundling of ecosystems services and community partnerships which enhance ecosystems services.
- A series of **webinars and reports** on local food branding, municipal food strategies, public food procurement, food and territorial cohesion and agri-food sustainability indicators.
- **Research** on how cultural festivals serve as rural-urban connectors, how to support digital co-ordination of cultural life and sustainable and equitable valorisation of cultural resources.

The key message and finding from the ROBUST project is an overwhelming desire and recognition of the need to build a new approach to regional economy and rural development, which we term **‘rural-urban economies of well-being’**. This resonates with wider societal and economic debates (and those in sociological and geographical scholarship), which are critical of neo-liberal, market-centric paradigms. In our analysis, work from foundational economy in particular helps to reframe and revalue parts of the economy previously undervalued, including basic infrastructure, public services and ecosystem services, particularly in terms of how they can work in a region to strengthen

rural and urban connections. Foundational economy is a place-based policy that supports foundational infrastructures and services. Conventional approaches to economy tend to render these components invisible and overlooked in terms of their contribution to development. In this new framework, they are essential assets for communities.

By aligning living lab innovations with the CoP repertoires, the analysis turned then to identify different strategies to strengthen rural-urban links. By comparing and synthesising the data, innovations and envisioning outputs from the living lab and CoP level, it was possible to identify **five dimensions of well-being**, which strengthen rural-urban relations and foster a more integrated approach to economic development (Section 4). The five dimensions of well-being are:

- **Services**, which focus on availability, access to and quality of (social) services (primarily linked to the Public Infrastructures and Social Services CoP, but also Business Models and Food Systems).
- **Proximity**, Focuses on reducing the social and / or spatial distance between providers/producers of services / goods and the customers / consumers of these services / goods (links to several CoPs)
- **Circularity**, which focuses on closing loops / cycles and enhancing the circular economy (links to several CoPs).
- **Ecosystems**, which focuses on topics such as biodiversity, soil, water, landscape, climate change (is primarily related to the Ecosystem Services CoP).
- **Culture**, which focuses on the role of culture and heritage in strengthening rural-urban relations.

The different dimensions are all important, but **services are the basic essential foundation**, given the intention to put well-being and welfare at the heart of this transition pathway. This is why rural-urban linkages are important, as this can ensure basic services are accessible in rural places (and 'liveable' places) in exchange for contributing to the foundation of urban areas through other dimensions (ecosystems, circularity, etc.). The other four elements work as pairs, with **proximity about reducing socio-spatial disparities and strengthening socio-cultural relations**, which reflects the role of culture and for ROBUST heritage in particular. **Ecosystems and circularity are different spatial and temporal resource use characteristics and relations to help territories reach climate objectives**, safeguarding rural assets (land, biodiversity, renewable energy projects, bio and circular economy models), as part of a larger transition to climate neutral economies. This well-being approach appeals to rural and regional policy stakeholders at the European level (Green Deal, Farm to Fork, Long-Term Vision for Rural Areas) and aligns with the OECD's new framework of rural well-being and the geography of opportunities (OECD, 2020), as well as echoing debates in many national economies at the moment. OECD thinking emphasises geography through remoteness and territoriality. Here, in keeping with WP1, the emphasis is more about relations, including relations across distance. This resonates with **neo-endogenous rural development principles** and extends ideas on smart growth and networked governance.

A number of key messages emerge from the WP3 work in terms of **rural-urban relations**, namely:

- The importance of **multilocality living**, new forms of 'counterurbanisation' and teleworking
- The importance of **infrastructure and services**, especially for rural areas
- The appetite for new approaches to economy, particularly **economies of well-being**
- The importance of public procurement to lever change through **anchor institutions**

- The role of territorial, or **place-based strategies** (for food, culture, ecosystems), as a governance mechanism
- The role of **municipalities and regional governance** in rural-urban governance and innovation
- The role, influence and need to engage **spatial planners and spatial planning at different scales**
- The relationship between different **foundational dimensions in rural-urban relations**
- The relationship between **territorialisation and relations across distance** (i.e. rural urban synergies in a region and across regions)
- The role of a wide range of **governance arrangements, led by a multiplicity of actor constellations** that can stimulate rural-urban synergy potentials.

Living labs, which have been successfully applied in a multitude of urban settings to support policy and social innovations, helped strengthen rural-urban links in ROBUST's case study areas and provided inspiring material to reframe rural-urban linkages in relation to new thinking about well-being. Nevertheless, the complexity of issues and the time and resources required to initiate and operate multi-thematic, municipal living labs should not be under-estimated in **future transdisciplinary projects**. Key messages for future projects are the following:

- **The living lab concept is new to research and practice partners and more time is needed to understand how to plan and implement this form of joint working.** This concerns the time and resources that are required, as well as the roles of different lab members, including related leadership issues, working methods, communication etc.
- **The possibility to adapt work schedules, processes and output planning is essential.** Most teams had to adapt due to external factors, political sensitivities, etc.
- **Logistical issues need to be considered, especially for more remote rural areas,** given that collaboration and coproduction are essential for a successful lab and thus require the participation of a wide range of stakeholders.
- For most LLs, **the initial phases of gaining a mutual understanding and planning the joint work took much longer than anticipated** (agreeing on goals, focus areas, methods, etc.). This was particularly the case for the more focused innovation projects.
- **Communicating the goals, principles and functioning of LLs properly to stakeholders and politicians is important.** Some teams needed less time to set things up, but other teams spent considerable time figuring out the basis of their collaboration. This reiterates the time it takes to complete living lab work, especially more detailed experimental testing and deepening of ideas.
- In some LLs, **success was linked to a combination of policy linkage or the ability to make use of existing networks.**
- **Continuity, the need for a longer duration of multi-actor projects and the legacy of the jointly achieved outcomes is crucial.**
- **The format of the LLs as co-led and shared between practice and research partners substantially increased the capacity of the practice partner teams.** The opportunity to obtain a more encompassing perspective and reduce the adverse effects of thinking and acting in silos can be important outcomes.

In conclusion, the synthesis represented in this report provides a rich overview of the processes undertaken at living lab and CoP level, the main innovations and outcomes from the WP3 work and, combining the two datasets, **a vision for rural-urban linkages that reframes economic thinking more in line with well-being and foundational economy.**

1. Introduction

This report constitutes Deliverable 3.3 of ROBUST and synthesises the results of the place-based (living lab) and thematic (community of practice) case studies. The report also reflects on the participatory joint learning processes implemented for each living lab case study.

1.1 Introducing WP3 and the synthesis report

WP3 is the main empirical work-package for the ROBUST project. In Deliverable 3.1 (Methodological framework for case studies – Maye et al., 2018), the guidelines and procedures for living lab teams in each of 11 case study areas were set out in detail. The research and practice partner teams in each living lab then started developing and implementing a research and innovation agenda (step 1 in the living lab process), guided by the questions and needs of local practice partners. This work began in December 2018. Similarly, guidelines were set out in D3.1 for the thematic case studies and research-practice partner teams participating in a specific community of practice. A first step was again to agree a research and innovation agenda to define goals, data to be collected and shared activities to be undertaken. This thematic-level work began in February 2019. Living lab teams and thematic communities of practice (hereafter CoP) have therefore been working together for almost three years, initiating and curating in that time a range of activities, dialogues, initiatives, resources and interventions to address the **aim of WP3**, namely: ‘to explore and analyse rural-urban relations and synergies in five thematic fields, across 11 case study areas’.

To address this aim, WP3 had four **objectives**:

- To improve our understanding of both place-specific and thematic functional rural-urban linkages and their dynamics and determinants.
- To identify and assess the potentials and bottlenecks for enhancing mutually beneficial relations between rural, peri-urban and urban areas in 11 diverse territorial settings.
- To learn from sharing and comparing experiences from diverse rural-urban settings.
- To reflect on the multi-method and multi-actor joint learning process of ROBUST.

To answer the aim and objectives of WP3, the work was organised into **five tasks**, which started with the design of the case study methodology (**Task 3.1** – reported in D3.1), followed by the place-based analysis (living lab work – **Task 3.2**) and thematic case studies (CoP work – **Task 3.3**). ROBUST was one of the first Horizon 2020 multi-actor projects to align its work with transdisciplinary theory and in particular to implement the living lab approach. It was therefore important to monitor learning for future multi-actor project (objective four above). **Task 3.4** comprised monitoring and evaluation of the joint learning process, including the development and implementation of a monitoring and evaluation framework for the 11 living labs. Core elements of the evaluation framework were reported in D3.1, but it was subsequently substantively extended and deepened, which we explain below in Section 2.6. **Task 3.5** is the synthesis work – the main focus of this report.

The synthesis work draws together data and activities from Tasks 3.2, 3.3 and 3.4 and in turn addresses all four of the objectives above. In general, the synthesis summarises the living lab and CoP work and their key findings, particularly in terms of innovative governance arrangements and examples that have the potential to strengthen rural-urban relations. More specifically, this report provides an overview of the research process and approach adopted (methods-orientated); inspiring

examples and cases; and communicates common messages for rural-urban relations (framed around the idea of **foundations for rural-urban well-being**). The living lab and CoP material is rich and diverse. We reflect this diversity and give a sense of the resources created during the project. In this sense, the synthesis also provides the foundation and baseline for more detailed thematic analysis in subsequent ROBUST reports, namely: WP4 – cross-sectoral synergies; WP5 – governance; and WP6 – policy for rural-urban connectivity. Below we explain the logic and relationship between living labs and CoPs in ROBUST as a way of working, introduce the structure for the rest of the report and comment briefly on how the COVID-19 pandemic affected our research.

1.2 ROBUST's transdisciplinary way of working: living labs and communities of practice

The potential of transdisciplinary (TD) research for tackling sustainability challenges at different scales and in different contexts is increasingly recognised (Jahn et al., 2012; Lang et al., 2012; Scholz & Steiner, 2015a, 2015b; Wickson et al., 2006). Acknowledging these potential benefits, ROBUST was designed according to the principles of TD research, which include the joint definition of the challenges to be addressed and of the overall research plan (research and practice partners cooperate at the project design phase), as well as the joint implementation of the research. This method of working helps to achieve outcomes that satisfy actors from both science and practice, and that will contribute to a process of change. Moreover, in line with the TD literature, fostering co-learning and reflexivity and encouraging flexibility in the ongoing work were central to the ROBUST approach (at both the living lab and CoP level).

Living labs are one common way of working in a TD fashion. They bring actors from science, policy and practice together. ROBUST combined this approach with Communities of Practice (CoP), the latter as a mechanism to generate and broker co-learning across and between living labs. Deliverable 3.1 set out in detail the methodological approach developed to implement this living lab and CoP approach. We will not repeat that detail here, but provide a short summary of each element. This helps to structure the analysis of each in the results sections below. The relationship between the two approaches is also important to explain, both in terms of how we organised ROBUST's overarching transdisciplinary way of working and in turn the way we structure the synthesis to evidence, in Section 4, the overarching argument that underpins the report in terms of evidencing and supporting five key foundational dimensions for rural-urban well-being.

For ROBUST, living labs were defined, following (Voytenko et al., 2016), as an **arena** (geographically or institutionally bounded space) and as an **approach** for collaborative experimentation. Eleven living labs (also called 'place-based case studies') located in different European regions are centre stage in the ROBUST project (see Figure 1). Each living lab consists of a research and a practice partner team. Research partners are represented by universities, research institutes and consulting firms, while practice partners are represented by municipal or regional authorities overseeing regional development planning and policy. The 11 place-based labs, each jointly led by a research partner and a practice partner, brought together policymakers, researchers, businesses and citizens to co-develop, test and experiment with new ways to strengthen rural-urban linkages in their local region.

The emphasis on **experimentation** was important – in other words, labs were designed to be a 'safe space' to enable the creation of new approaches and solutions, reflexive learning, and visioning of future systems for rural-urban relations, particularly governance solutions and the policy

frameworks needed to underpin such experiments. The aim was to **jointly produce innovations** that strengthen rural-urban connections in a way that benefits all actors involved (active user involvement and multi-stakeholder participation and co-creation). To give this process structure and coherency across the labs **four stages of living lab working** were devised, as follows (for a fuller summary of the living lab stages see Appendix 8.1, plus D3.1 – Maye et al., 2018):

- Envisioning;
- Experimenting;
- Experiencing and analysing; and
- Evaluating, monitoring and reflecting.

Figure 1: ROBUST's living lab network



The living lab process was flexible – to reflect differing local needs in case study regions – with a toolkit of resources provided in Deliverable 3.1 that teams could use accordingly, depending on their agreed aim, purpose and the nature of their local experiments. The way living labs implemented their plan and applied different methods are evaluated in Section 2, including their innovation agendas, final outputs and outcomes.

The living labs were organised as specific, concrete and **context-focused**. They provided 11 local and regional contexts for the participatory development of innovative experimental solutions in place. The four stages were not applied in a strict sense (see Section 2); instead, they provided a useful orientation to organise LL work and planning. Monitoring and evaluation of the joint learning process started when the living labs were initiated. This means that the four stages are interrelated rather than linear, with feedback loops between stages, especially between experimenting and experiencing, which informs reflections on the vision and intended outcomes. In other words, there are different pathways to reach successful living lab outcomes (Steen and van Bueren, 2018), and for the ROBUST project and this synthesis report, they provide the entry point for the analysis.

The CoPs, on the other hand, are less about local context and more about identifying **common learning**, in terms of lessons and issues at a thematic (or functional) level to support rural-urban synergies. This constitutes an important relationship between the two levels by connecting inspiring

living lab innovations together to create common learning in relation to one of five functional themes (see Table 1, adapted from Woods et al., 2018: 9). The logic of this way of working is that the resources created at a CoP level are a first level of synthesis across the labs (defined by theme). As per the living lab process, each CoP worked according to three key CoP characteristics (see Wenger, 1998; 2000), namely:

- Mutual engagement (innovation agenda and communication strategy);
- Joint enterprise (common issues for the group to work on together); and
- Shared repertoire (common learning and joint resources co-produced by each CoP).

Deliverable 3.2 reports on the common learning and joint resources created by each of the five CoPs (one report for each). Section 3 summarises the resources and key messages for each CoP, which also inform the subsequent analysis of foundational economy dimensions for rural-urban well-being.

Table 1: ROBUST's research structure - living lab and CoP networking

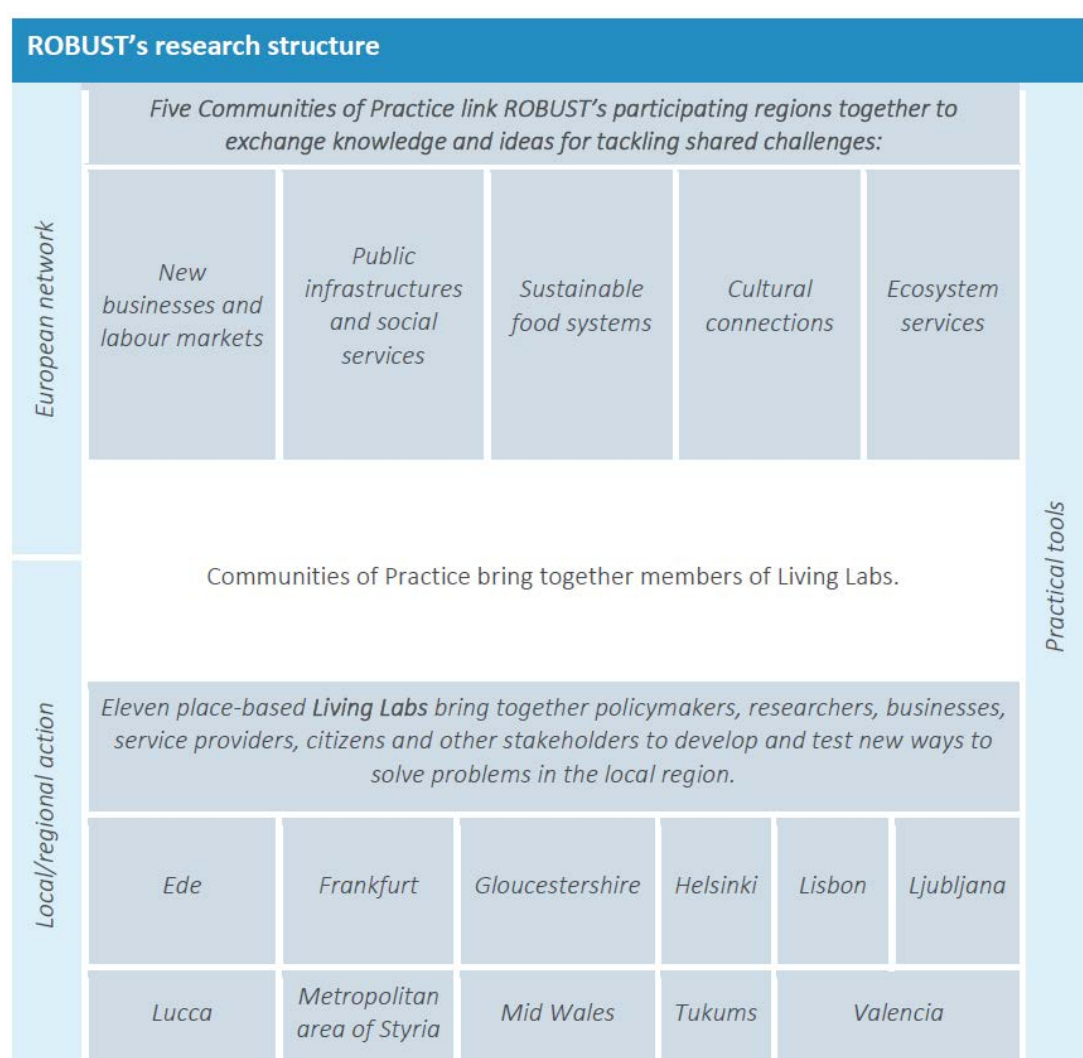


Table 2 provides a more detailed overview of the link between labs and CoPs, showing the three CoP themes selected by each living lab, which formed the five CoPs in ROBUST's European network.

Table 2: Living labs arranged by Communities of Practice

Living Lab	Community of Practice				
	New business models and labour markets	Public infrastructure and social services	Sustainable food systems	Cultural connections	Ecosystem services
Tukums					
Helsinki					
Ljubljana					
Ede					
Lisbon Metropolitan Area					
Gloucestershire					
FrankfurtRheinMain					
Lucca					
Mid Wales					
Styria Metropolitan Area					
Valencia					

1.3 Synthesis methodology and analysis

From a methodological perspective, the analysis is iterative and to some extent descriptive. The process of synthesising these data started several months ago with a clustering paper (internal discussion document), which organised the living lab experiments and CoP resources into five dimensions for rural-urban well-being. To inform this work, living lab partners and CoP co-ordinators submitted short reports summarising outputs and key messages from their work. The paper was initially presented and discussed at a project steering group meeting. It was further commented on by several members of the project via email exchanges and smaller meetings with living lab teams and the project steering group. Living lab and CoP draft reports were reviewed and commented on by at least two reviewers and once revised they were analysed by the WP3 co-ordinators to identify key messages in terms of the learning processes and content. Summary documents for the 11 living lab reports and five CoP reports were prepared and coded to develop tables and themes for the synthesis, as well as to validate and evidence the five dimensions and other main messages from the work. The development of the synthesis was also preceded by longer, iterative engagements between the WP3 leaders and the living lab and CoP teams, who regularly produced progress reports, requested clarifications or discussed adjustments to their goals over the course of the project. A first attempt at clustering living lab outcomes was based on the results of WP4 outputs in 2018, namely the regional workshops on cross-sectoral collaboration.

The synthesis report works at three levels: first, we describe processes and give an overview of experiments and resources created by the teams; second, we identify key messages looking within and across the living lab and CoP data in terms of rural-urban linkages, cross-sectoral relations, governance and growth; and third, we reflect on wider learning for future multi-actor projects, particularly in relation to the living lab methodology. A key argument is that we see evidence from the multiple sources for new forms of economy, which in different ways challenge conventional

economic thinking e.g. inward investment, GDP, productivity and market-orientated business models. We draw on foundational economy and well-being literature to develop these arguments, using examples from ROBUST.

1.4 A changing research context: the COVID-19 pandemic

Like all walks of life, the COVID-19 global health pandemic significantly disrupted the ROBUST project and in particular the WP3 programme of work, especially at a living lab level, which at the time were all in the process of initiating experiments and innovation projects. The details and impact of this disruption will be described and captured at the living lab and CoP levels in Sections 2 and 3 respectively, but in general terms we observe that the disruption required in some cases quite significant adaptation to methods and innovation plans, most notably a shift to online meetings and data collection methods. That said, the pandemic also galvanised and energised the importance and urgency of our ROBUST work and messages, highlighting in many cases the impacts of rural-urban inequalities and the need for new thinking and governance innovation.

1.5 Reporting structure

The rest of the report is structured as three levels of analysis, starting from the ground up, via our living lab data. Section 2 thus starts by introducing the 11 labs, their context and policy issues and initial aims and mottos. We also summarise how we implemented our living lab way of working in practice and the interesting differences in approach that emerged. This material helps to contextualise the innovations and shows the diversity within the cases. In the main living lab section, we focus on the actual experiments and outcomes (content) created by the labs, including a summary of key messages in relation to ROBUST's core themes (rural-urban linkages, etc.).

Section three focuses on the CoP reports – we summarise the five themes, the resources each created and key messages in terms of rural-urban linkages. These data represent the first level of synthesis in terms of moving from local living lab experiences to formalise common messages.

The fourth section uses the resources created at a lab and CoP level to synthesise the material according to five dimensions of foundational economy for rural-urban well-being. This section represents the key overarching messages from the WP3 work and this synthesis report, building on previous reports and visioning statements, particularly for rural regional development (most notably the OECD's (2020) rural wellbeing report and the forecast scenarios set out as part of the EC's Long Term Vision for Rural Areas of June 2021).

Section five covers key learning points from the living labs, gleaned through a systematic monitoring and evaluation process. This was an integral aspect of the living lab methodology and constituted a separate work-package deliverable (D3.4). The evaluation is rich, both as an assessment of the project limitations and successes and in terms of wider messages for future projects of this type.

The report ends by summarising key messages to strengthen rural-urban linkages, the main aim of ROBUST, and suggestions for multi-actor projects and living lab design going forward.

2. Living lab synthesis

In this section of the report, we introduce the 11 LLs, their aims and objectives, research methods and local innovations to strengthen rural-urban relations.

2.1 *Living lab contexts and objectives*

The LLs are rich in detail, generated from a range of local contexts and situations. Trying to capture the richness and links between these 11 locations is a challenge that this sub-section is designed to navigate, both to introduce the case studies and to alert readers to elements of specificity. Appendix 8.2 of the report provides a **living lab profile and case-by-case description of each** in terms of their socio-economic development. Table 3, taken from Knickel et al. (2021: 8), provides an overview of the characterisation of the 11 living lab regions in terms of area, population density and population change. Table 4 provides a summary of local context per case, based partly on the lab profiles (Appendix 8.2), and includes key governance arrangements, social, geographical or other local factors and rural-urban regional characteristics (remote rural, city region, etc.).

Table 3: Living lab area and demographic characteristics

Region	Area sqkm	Population	
		Density inh./sqkm	Change * %
Ede Municipality, Netherlands	318	364	+0.9%
Frankfurt/Rhein-Main, Germany	2458	960	+1.2%
Gloucestershire, United Kingdom	3150	239	+0.9%
Helsinki-Uusimaa Region, Finland	9568	176	+1.0%
Lisbon Metropolitan Area, Portugal	3015	944	+1.3%
Ljubljana Region, Slovenia	2334	237	+0.8%
Lucca Province, Italy	1773	220	−0.1%
Mid-Wales, United Kingdom	17,034	60	−0.2%
Metropolitan Area Styria, Austria	1890	261	+1.1%
Tukums Municipality, Latvia	1195	23	−1.2%
Province of Valencia, Spain	10,812	228	+1.0%

Source: Authors compilation based on information provided on the project website: <http://rural-urban.eu/> (accessed: 26 April 2021). * last 5 years in % p.a. (i.e., approximately 2015–2020).

From the data presented in Tables 3 and 4 and Appendix 8.2, the following points are notable in terms of local regional context. First, **the living labs are diverse in their geography, socio-economic characteristics and rural-urban dynamics**. In Table 3, for instance, two regions have a low population density and significant depopulation (Tukums and Mid-Wales); in contrast, Frankfurt/Rhein-Main and Lisbon have a very high population density and significant increases in population; the other living lab regions are more comparable in terms of population density and change. Other points of note, in terms of contextual factors and rurality, are as follows (Table 4):

- **Helsinki, Lisbon and Ljubljana** are national capitals with extensive rural hinterlands. Regional territorial concerns (such as labour mobility or the environmental impact of urbanisation) sit alongside their roles as seats of national government, nodes of international trade and European centres of culture.

- The agglomeration of population, labour, services and enterprise in the cities of **Valencia, Graz and Frankfurt** dominate their regional economies, while Frankfurt is one of the world's most important financial centres. Town and rural interdependences emerge via discussions about municipal collaboration, sustainable public transport or spatial planning.
- **Lucca, Ede and Gloucestershire** bear comparison in terms of their scale and provincial self-identity, underpinned by agricultural landscape designations and the importance of the food economy. The regions are globally connected: in Lucca through their World Heritage designation (and tourist interest in the city's architectural heritage and Tuscan gastronomy), through a high-tech food industry innovation centre (Food Valley) in Ede, and in cyber-security innovation in Gloucestershire, where the UK government's communications headquarters is located.
- **Mid Wales** has a strong rural identity linked to the Welsh language, which is widely spoken within the family-centred farming community. Upland livestock farming is set within relatively inaccessible landscapes making the goods and services of proximate cities seem distant, but which also support international countryside tourism and leisure industries. The celebration of rural customs, arts and cultures is a key motivation in **Tukums**, a rural area benefitting from a well-developed network of cultural houses, distinctive architectural and food heritage. However, unlike Mid-Wales, Tukums lies close to the Latvian capital Riga, from which it draws visitors.

In an earlier analysis of living lab contextual factors, **three living lab clusters** were proposed (Kobzeva and Knickel, 2018: p. 4), emphasising that cross-sectoral activities linking rural, peri-urban and urban areas are complex. The living lab reports and analysis presented here supports these clusters, with some minor amendments. The three contextual clusters are as follows:

- **Managing rapid growth (Frankfurt/Rhein-Main, Helsinki, Valencia):** this theme is notable for three of the large metropolitan living lab regions in ROBUST. In Frankfurt/Rhein-Main growth is linked to demand for space and motivates the need to develop strategies that reduce expansion of built-up areas. Rapid growth is also a challenge in Finland, but is about finding governance arrangements that support residents who have multiple residences and cross-border links between Helsinki and Tallinn. The Valencia case is about the influence that rapid growth of the Valencia has on medium and small cities and rural areas in the city region.
- **Social and economic development (Ljubljana Urban Region, Styria, Tukums, Mid Wales):** this is the key motivator in the Ljubljana Urban Region, particularly with a view to shortening food chains to improve economic opportunities for regional farmers and reduce environmental impacts of distribution. In the Metropolitan Area of Styria, the need to improve public infrastructure provision in the region via inter-municipal approaches frames the work of the lab. Effective infrastructure is also strategically important in the Tukums lab, whereas in Mid Wales polycentric growth of smaller rural towns is a key factor for balanced development in the region.
- **Renewing proximity relations (Lisbon, Lucca, Ede, Gloucestershire):** Lisbon is equally sensitised to growth challenges but the critical driver is creating stronger relations between urban, suburban, peri-urban and rural areas for multiple uses. In Lucca, proximity through landscape and territory, and the synergy between food policy and land use planning, are critical factors. Cross-sectoral relations are the driver in Ede, envisioned via food policy development. In Gloucestershire, stronger linkages between urban areas and rural areas need to manage expected growth and future climate (flooding) risks alongside supporting local food economies and protecting the county's heritage and physical environment.

Table 4: Living lab context and rural-urban characteristics

Living lab	Local context	Rural-urban characteristics
Ede	Intensive agri- and agri-tech growth centre orientated to global markets via a cross-sectoral Food Valley initiative. Protected rural landscapes. Costly homes and land.	Predominantly rural. Largely agri-rural landscape with polycentric urban centres, which are home to two-thirds of the 115,000 population.
Frankfurt / RheinMain	Half of all regional jobs are in Frankfurt city, which is growing quickly, due to its global and national economic importance.	Mixed urban and rural with a large city. Despite the presence of Frankfurt city, the region is polycentric and contains large areas of high quality rural open (outer) space.
Glos.	Two-tier municipal system, with most local planning decisions delegated to 2 nd -tier districts. Infrastructural planning, e.g. waste, minerals and transport is overseen by (1 st tier) Gloucestershire County Council	Predominantly rural. Affluent rural county with two adjacent main urban centres. Well-served with transport infrastructure and over 50% of landscape is environmentally designated.
Helsinki	Rural-urban working patterns, seasonal summer urban-to-rural exodus, and urban-to-urban commuting/enterprise investment (Helsinki-Tallinn).	National capital metro-region. The area's population is split roughly 70:30 between Helsinki city and the region of Uusimaa.
Lisbon	The region of 18 municipalities experiences peri-urban pressures and an unbalanced territorial development pattern, which exerts pressure on high-value natural capital.	National capital metro-region. Home to 25% of the national population. Urbanisation pressure linked to rural depopulation and migration.
Ljubljana Urban Region	25 municipalities make up the region, including those in peripheral rural regions. High consumer preference for local food and regional landscape protection.	National capital metro-region. Home to 26% of the Slovene population. Suburbanisation linked to rapid development in the 1990s. Important European transport intersection. Extensive Natura 2000 designations close to suburban areas.
Lucca	Second-tier authority of 38 municipalities, including the UNESCO World Heritage city of Lucca. The area is characterised by a distinctive villa-based cultural landscapes.	Predominantly rural. Lucca province is a varied area of rural landscapes, including coast, mountains and plains.
Mid-Wales	No large-scale urban settlements within the 9 municipalities. The importance of smaller, market towns as employment and service centres is emphasised.	Exclusively rural. Faces challenges as a predominantly rural region, including remoteness, limited infrastructure, access to markets and services, and post-Brexit changes.
Styria	The metropolitan region of Styria includes 51 municipalities, including Graz, Austria's second city. The region is orientated towards post-industrial hi-tech growth.	A polycentric city-region, dominated by Graz. Urban net migration leading to suburbanisation and car-commuter traffic challenges. Public service demands of a growing, affluent population.
Tukums	Tukums municipality, which is home to a little under 30,000, was created in 2009 and will be merged with adjacent councils in 2021.	Predominantly rural. Tukums is largely rural/semi-rural, including some remote and underserved areas, which are experiencing depopulation.
Valencia	The region is divided into three distinct industrial/economic regions, namely the coast, the inland plains and the peri-urban area.	Mixed urban and rural with large city. Economic development is uneven and directed towards the coast, causing concerns about rural poverty, depopulation and urban quality of life.

There are other ways one could organise and cluster the living lab reports in terms of contextual factors and rural-urban dynamics. However, for the purposes of this report, the key argument is to **recognise diversity between the cases**. This is important to contextualise the local experiments and their motivations, particularly when discussing upscaling and diffusion of local level innovations to strengthen rural-urban relations (see Section 4).

We turn now to look more specifically at **the underlying aims and motivations** of each lab. In the first phase of living lab work, each research and practice partner developed an overarching (internally agreed) motto (i.e. a brief 'mission statement'). This was part of labs designing their research and innovation agenda, which set out the agreed objectives, modes of experimentation and criteria against which progress towards the objectives could be monitored. Table 5 summarises the motto for each lab and shows links with local, regional or national policy agendas.

The following points emerge from Table 5. First, in terms of the motto descriptions, we see that some labs adopted from the outset a **strategic policy development approach** (Mid-Wales, Lisbon, Ede); in other words, these living labs set out to develop or implement policies. Other labs by contrast were orientated more towards achieving a **change or set of changes in local practice** (Gloucestershire is one example of this approach, with developments in the lab linked to emerging national food and industrial policy agendas). Other labs developed a research agenda to **address local rural-urban challenges** (e.g. Frankfurt's growth and spatial planning issues). Secondly, and relatedly, living lab work in some cases is helping **to implement policy agendas** (e.g. Lucca's food and territorial planning work) and in other labs the work is seeking **to fill policy gaps** (e.g. Mid Wales' rural visioning work and Ljubljana Urban Region's efforts to link local food production and public health through public procurement in schools). Thirdly, **the mottos developed within each LL are dynamic**; they reflect, in other words, LL's objectives at the start of the process and, as we will see below, in some cases mottos were adapted to respond to shifting regional or national policy priorities (COVID-19 played a part in this too, but this is a separate point).

Table 5: Living lab mottos and national and regional policy links

Living lab	Motto	Policy links
Ede	Further developing and integrating Ede's municipal food, environmental and spatial planning policies, by formulating goals and distinguishing key indicators for monitoring its agri-food system and natural capital.	The lab is an attempt to integrate municipal policy-making, esp. with the National Environmental & Planning Act, including circular farming.
Frankfurt / RheinMain	Transitioning from quantitative growth and expansion, to qualitative growth and quality of life: the role of regional land use planning.	Revision of the regional plan informed by the LL. Previous plans delineated inner (developed) and outer (not yet developed) land.
Glos.	To assess the potential and feasibility of circular economy and natural capital growth models in the county and their potential for synergies and improved urban-rural linkages.	Lab inspired by national policy developments, notably the Industrial Strategy (circularity) and the new Environment Bill (natural capital).
Helsinki	Developing resilient urban-rural solutions that enable knowledge networks and multiple locations for life, work and entrepreneurship across the border of Finland (Helsinki) and Estonia (Tallinn).	While rural, urban and regional policies are advanced, they are not connected. The LL was an attempt to build a 'meta-network' to connect these scales.
Lisbon	Territorial cohesion from within: bridging metropolitan communities and economies for improved urban-rural synergies.	Links with the National Program for Spatial Planning Policy (territorial management) and the Regional Strategy 'Lisbon 2030' (integrated governance).
Ljubljana Urban Region	Functional collaborative partnership/platform to co-design and operate short food supply chains in the Ljubljana Urban Region.	Developed tools to link producers and procurement officials to support municipal public health policies. Highlighted rural-urban synergy opportunities as part of the development of the regional development strategy.
Lucca	Developing a local food policy and a territorial plan to reduce urban sprawl, steer synergies between the city and the countryside, and valorise cultural heritage, landscape and territory.	Two levels: first, food policy momentum regionally and nationally; and second, local territorial planning (various land use and territorial plans).
Mid-Wales	Polycentric growth without an urban hierarchy.	National policies have focused on agricultural diversification and investment in city-regions. Local government priorities to focus on strategies for rural growth.
Styria	Shaping vibrant rural-urban-cooperation to foster better quality of life through the enhanced provision of regional collaboration.	The law promoting inter-municipal collaboration is the key policy link. Decision-makers are pooling existing resources in the different sub-regions.
Tukums	Developing a cultural strategy for the municipality by identifying key development objectives and priorities.	Backdrop of nationwide local government reform. Uncertainty about how the strategy will be extended to take in the enlarged municipality after July 2021.
Valencia	Contributing to implement rural-urban territorial processes in the domains of business, labour markets, public infrastructure and sustainable food systems.	Can a shift from a sector-based short-term growth focus to a territory-based longer-term view help the region better manage challenges in the future?

2.2 *Implementing ROBUST's living lab methodology*

Here we describe the process of experimentation; i.e., how each lab followed and, in some cases, adapted the four living lab stages developed for the ROBUST project: envisioning, experimenting, experiencing and evaluating. We focus on **the methods and activities initiated** at the different stages for each lab (methodology). Analysis of the innovations is detailed in sub-section 2.4. Table 6 summarises the activities carried out by each lab. It describes methods labs implemented and key changes relative to the activities planned in the original Research and Innovation Agenda.

Various points emerge from Table 6 and the living lab reports regarding the living lab methodology. The first relates to **the development of a Research and Innovation Agenda (RIA)**, which was specified as a key task for Phase 1 (envisioning), with a template provided in the WP3 guidance (see Appendix 8.3 for a completed RIA example for Mid Wales). The research-practice partner teams in each lab developed and implemented their own research and innovation agenda, focusing on their three chosen priority themes. This was not the sole activity of Phase 1 work, but more the culmination of this phase of work, following in nearly all cases several rounds of engagement with local stakeholders to identify rural-urban priority issues. Labs completed this activity and feedback in the reports indicates that it was a very useful exercise to help the teams agree goals and to engage a range of participants at an early stage in the research process (user engagement). The mottos in Table 5 are taken from the RIAs. Some labs (e.g. Ede, Lucca) revised the RIA multiple times.

The second point relates to **the depth and breadth of social research methods utilised by the labs across the four stages**, including participatory methods to organise and guide exercises in workshops and focus group settings, various data collection methods, particularly for the experimenting and experiencing stages (qualitative methods, social surveys, GIS and other datasets, scenarios, etc.). During the pandemic teams shifted to online research tools. No singular approach is evident – the work was flexible and adapted to local objectives and specific innovation priorities.

The third point relates to **the living lab stages as discrete phases of work**. Table 6 summarises the progression through the four stages per lab. All labs undertook activities for each stage, but some labs merged or integrated stages, rather than following each stage separately. In particular, we see a **blurring between the experimenting and experiencing stages** (e.g. Lucca, Tukums). Some labs did not get much beyond envisioning and experimentation; only towards the end of their work were they engaging in in-depth analysis of innovation projects. This reflects the time it takes to initiate experimentation, particularly if researchers and practice partners were new to the living lab way of working, which meant taking extra time to work out what to do and agree how to do it. The impacts of COVID can also not be overstated, restricting opportunities for practical experimental work.

The fourth point is that **labs amended and adapted initial plans**. In Ljubljana Urban Region, for example, plans to localise food procurement were met with scepticism from farmers and were revised accordingly. Some labs integrated the different stages of the living lab process in complementary ways, resulting in the expansion of outputs and participatory engagements (Lisbon provides a good example of this). Adaptations were pragmatic and linked to difficulties engaging intended local partners or finding traction around initial research themes. In Gloucestershire, for instance, an intention to consider the minimisation of food waste in public food was adapted in favour of a more realisable goal of supporting new public procurement IT developments within the school food contract.

Table 6: Methods and activities per living lab stage (all labs)

LL	1. Envisioning	2. Experimenting	3. Experiencing	4. Evaluation
Ede	Development of expectations via meetings & matching exercise with LL team. Consensus on menu card approach sought via further meetings & interviews .	Group meetings with stakeholders to assess views on indicator development. Multi-stakeholder workshop to identify circular farming 'topics'. Document analysis .	Circular farming & the National Environment and Planning Act goals not discussed (too sensitive). Participation in national learning networks .	The lab did not meet the success criteria in the RIA. Regular in-team meetings to monitor and review progress.
Frankfurt/ Rhein- Main	RIA and motto drafted and discussed with stakeholders (group meetings); consensus not reached - RIA and motto revised. Systematic evidence reviews .	Testing ways to obtain evidence regarding inner and outer space. Concept mapping (geodata for GIS analysis and approaches to land use mapping and rating).	Data projects : e.g. night satellite imaging; socio-economic analysis; & climate impacts of reduced rural-to-urban commuting. Stakeholder survey.	Partially met the success criteria in the RIA. No explicit evaluation tasks, but regular in-team meetings and stakeholder feedback on outputs.
Glos.	Workshop on rural-urban relations (to test concepts and identify opportunities for innovation). Desk-review of functional themes and governance tools. In-team meetings to draft, revise & agree RIA.	Stakeholder interviews (15) to test circular economy and natural capital ideas/concepts. Stakeholder mapping and appreciative inquiry workshop (food and drink conf.) to extend visioning exercises.	Innovation projects : procurement (4 WS, 7 interviews, 3 producer FGs & online WS); flooding (5 interviews; meetings; competency group; 2 WS); circular economy (2 WS, desk reviews).	Partially met success criteria in RIA. Regular in-team meetings to review progress (surveys); final review meeting between research and practice partner and invited evaluator.
Helsinki	Interviews , two stakeholder workshops and in-team meetings to agree motto and vision for the lab (meta network of rural and urban policy stakeholders). Desk analysis of reports / past studies.	Thought experiments & analysis to test multi-locality: "What if" scenarios; network analysis; workshop I (urban & rural actors); GIS analysis; short video; stakeholder seminar; workshop II (Estonia perspective).	Further analysis of multi-locality: stakeholder WS (governance models, vision); text mining of documents; quantitative analysis of register & survey data; data dissemination.	Partially met the success criteria outlined in RIA; meta-platform was not achievable. Evaluation questionnaires (for 4 WS). Regular in-team meetings to review progress relative to RIA.
Lisbon	Visioning exercise on 'territorial cohesion from within'. Further vision building participatory processes involving a range of stakeholders to jointly construct the lab's vision and overarching motto.	One experimentation phase. Themes identified via a workshop (27 participants; world café technique & 'mapping of interests' exercises). Workshop led to a principal focus on the Territorial Economy of Proximity. 'Synthesis matrix' developed. Two stakeholder working groups set up (sustainable school catering/food and ecosystem services respectively, with innovation projects within each WG; 6 projects in total).		Met the success criteria outlined in RIA. Synthesis matrix to structure M&E (methods per stage & alignment with RIA).
Ljubljana Urban Region	Six rapid appraisals on sustainable food and short food chains, public transport and green infrastructure; procurement identified as the key topic to support	Mapping of local food sourcing ; pilot to assess the capacity of farmers' markets and food fairs; inventory of short chain business models. Research into businesses'	Two market place events held connecting catering suppliers from Kindergartens with local producers.	Partially met success criteria in RIA. The LL concept was unfamiliar and farmers were sceptical. In-team monitoring .

	short food supply chains; in-team and stakeholder meetings to agree RIA.	adaptations to COVID-19. Public transport and traditional food culture research.	Analysis of short food chain and public procurement business models.	
Lucca	Started with a bilateral meeting with civil servants from Lucca and Capannori; several iterations and in-team meetings to agree RIA focus, objectives and plan.	Support for elaboration of the Intermunicipal Food Policy Bylaw; work on guidelines for land use planners; examples drafted; appraisal of local food branding.	Focus on peri-urban vacant/abandoned land; mapping farmland in peri-urban areas; stakeholder consultation ; testing governance models for peri-urban land.	Met the revised RIA criteria (after multiple iterations). Regular in-team M&E meetings . Final self-evaluation . Final review meeting between research and practice partner and invited evaluator.
Mid Wales	Discussions & meetings with WLGA Rural Forum members to agree focus / success criteria. Group interviews with officers and members in local rural authorities. Two workshops with wider stakeholders.	Thought experiments using 13 scenarios, with online survey & workshop ; & 'experimentation by proxy' via case studies of existing innovative projects (interviews, meetings, online research).	Co-production of Rural Vision via online workshop & follow-up online meetings ; event to launch vision (75 participants). Ethnographies with WLGA / local authorities not done due to COVID.	Met the success criteria in the RIA. In-team evaluation to review process and next steps. Feedback on outputs also from selected external stakeholders .
Styria	Focus group with stakeholders to examine perceptions and expected changes in the region. Provided inputs for the formulation of the RIA.	Three governance arrangements and four snapshots elaborated (as a rapid appraisal and screening of existing pilot projects).	Regional workshop and multi-stakeholder workshop . Survey of mayors in the 52 municipalities. Case studies of practical examples.	Met RIA success criteria. LL team in regular contact (internal monitoring) & feedback from survey of mayors & stakeholder events.
Tukums	Meetings and brainstorms between the practice and research partners to agree RIA focus & motto (draft). RIA further developed via focus groups & discussions with members of municipal government.	Experimenting and experiencing phases integrated as one, with empirical and collaborative work to inform the cultural strategy. Cultural strategy is an official planning document, so required the creation of an action plan. Work included documentary assessment , public opinion survey , workshops with researchers and stakeholders, interviews , working group meetings and stakeholder mapping .		RIA success criteria partially met. M&E managed by the research team , including collating stakeholder feedback from LL events. Final review meeting between research and practice partner and invited evaluator.
Valencia	Focus group with stakeholders for each of the three LL CoP themes (strategic overview provided for each), plus rapid appraisals . These data were used as the basis to develop and agree a joint RIA.	Various co-production activities , including a workshop on cross-sectoral relationships; an online survey on internet access in rural areas of Valencia; and virtual workshops and virtual meetings with a cross-section of stakeholders per theme.	The experiencing phase focused mostly on analysing data collected in the experimental phase (this strategy was partly in response to the pandemic).	RIA criteria partially met. Evaluation was not formally structured, but regular in-team meetings monitored progress . LL members' feedback was recorded at regular intervals and a final evaluation event was organised.

2.3 *The impact of COVID-19 on ROBUST's living lab work*

As noted in the introduction, all 11 labs had to make adaptations due to COVID-19. Here we review in more detail how living lab work was impacted and how they responded. In most cases, the pandemic and its consequent lock-downs, affected and delayed active field work, at least for a while, until on-line communication was routinised. Living lab reports noted too that COVID-19 provided a sharpened focus for rural-urban dynamics. For example, people stayed at home and travelled less (and this became the subject of studies in Frankfurt and Valencia). The mobility of food supply chains was interrupted and local food initiatives expanded their capacity, offering new business opportunities in Ljubljana Urban Region. Many people started to think about leaving their urban lifestyles in favour of the countryside and public discussions reflected on the relative merits of living in urban and rural places (Mid-Wales, Helsinki).

To give a place-based sense of the impact of COVID-19 on our living lab working, below we provide short **case study reflections** from six labs. Collectively they show how labs implemented innovation projects to address issues highlighted by the pandemic, adapted work plans and made re-alignments with policy.

- **Frankfurt/Rhein-Main** initiated a dedicated study on teleworkability, Covid-19 and climate protection. The study was carried out at (rural and city) district levels in southern Germany, not just the LL area, reflecting the extended importance of the region as a magnet for workers. Policy relevant conclusions from the study were presented to stakeholders from civil society organisations who commented on the findings and their implications for teleworking.
- In **Gloucestershire**, the pandemic delayed (by 18 months approx.) the launch of the South West Food Hub (a new regional food logistics centre dedicated to the public sector). This impacted final outcomes from the work in terms of agreeing changes to the school food contract. Nevertheless, the UK government is considering post-COVID rural recovery measures and public procurement offers a largely untapped market for producers. The work has therefore attracted renewed urgency, with interest from the England National Food Strategy, for example.
- Covid-19 brought an interesting change to the movement of people in **Helsinki**, with increased interest in teleworking and staying in isolated summer cottages (so-called 'corona refugee[s]'). This brought the lab's focus on multi-locality living into the public and policy sphere in Finland. The pandemic also created disruptions to the LL work programme, especially face-to-face planned meetings for the experiments, which despite online interactions did not generate the same depth of interactive dialogue as pre-lock-down dialogues.
- In **Ljubljana Urban Region**, COVID-19 restrictions affected food markets, for example, where schools, cafes and restaurants were closed. The LL shifted the emphasis of its work, to track how short food chain organisations and businesses adapted their operations in the light of the loss of these markets and rapid increases in demand for home deliveries. While such adaptations revealed flexible and adaptive business models, LL research noted a return to conventional purchasing habits by many consumers as restrictions eased, indicating that loyalty to food companies marketing local food values was not necessarily sustained.
- In **Mid Wales** initial proposals to support the development of a Rural Vision with targeted and grounded innovation projects on local food planning, foundational economy principles and cultural heritage were disrupted. Events, workshops and face-to-face meetings were postponed and switched to online meetings. Once participants adapted to online events the diversity of participants widened. Two COVID-19 specific scenarios were developed. The pandemic thus

presented significant methodological challenges but also had positive outcomes in terms of drawing attention to issues of rural-urban connections and the importance of the Rural Vision.

- In **Valencia** the pandemic also forced changes in planned living lab research activities. Face-to-face interviews and workshops could not be implemented and social network analysis was not possible. However, as per other lab experiences, the pandemic led to important changes in the research agenda and preferences, particularly to reflect public discussions about teleworking. In this regard, a new line of work was created to investigate internet access in rural areas and more attention was given to mobility and transport projects in the region.

2.4. *Living lab experiments: introduction and innovation synthesis*

In this section, we introduce the experiments and specific innovation projects initiated by each lab, including final outputs and outcomes. The driver of innovation was to strengthen rural-urban connections. In Table 7 we include the CoP themes that were selected by each LL, to give a sense of the rationale and focus of the innovations prioritised and developed as particular rural-urban functional links, namely: new business models and labour markets (BMLM), cultural connections (culture), ecosystems services (ESS), sustainable food systems (food) and public infrastructure/social services (PI&SS). The final innovations per lab are not delineated by CoP theme. It was not always possible to fulfil innovations across the three functional themes. We report here on final outcomes.

Table 7 is necessarily quite detailed and describes the different ways living labs approached their transdisciplinary work. The following points summarise the living lab work in terms of living lab approaches, the different types of experiment/innovation project we observe and, crucially, how different outputs can be organised to strengthen rural-urban relations.

In terms of the **overall approach**, we observe a difference between labs who favoured an overarching experiment and strategic vision compared to labs that favoured multiple experiments at different thematic levels to influence targeted strategic priorities. Mid Wales and Lisbon are good examples of the **overarching approach**. Mid Wales organised the work to pave the way for a new rural plan via a series of future scenarios in eight priority areas, producing as an outcome of the work a draft structure for the rural plan. Lisbon's work was aligned to the city-regional economic system plan and the combined outcome of three planned experiments is the Proximity Territorial Economy, which outlines business models that support sustainable food in line with regional ecological capacity. Other labs exemplify this approach too (e.g. Lucca, Tukums, Helsinki). Gloucestershire is the clearest example of the **multiple approach**, with specific governance experiments (procurement, natural flood management and circular economy) aligned to relevant local and national priorities.

All labs have concepts or areas of interest that unify their work (see Table 7). We see a **prioritisation of experiments over time**. In the RIA, labs were encouraged to identify three experiments to work on, linked to the three CoP themed functions for their lab. What we see in Table 7 is that it was often more common for one or two innovations to have been achieved. This was partly because of COVID disruptions, but also because of difficulties in securing stakeholder buy-in (e.g. Ljubljana Urban Region, Frankfurt) and/or because experimental innovation is complex, unfamiliar and time-consuming. It also reflects the influence of politics (e.g. Ede) or planning/law (e.g. Frankfurt).

In terms of the **types of experiment/innovation project, and the related outputs and outcomes**, we observe the following patterns (based on Table 7 and the living lab reports).

- **New data and knowledge generation:** living labs were a mechanism for generating new data and building an evidence base. The Frankfurt and Valencia labs were particularly orientated to this type of work but nearly all generated new data and crucially debated the findings and implications with stakeholders as rural-urban topics (e.g. data from the Helsinki lab reveals how multilocality living is different in urban and rural areas). Analysis and rural-urban topics included teleworking data – Frankfurt and Valencia, land bank and shared assets data – Lucca and Lisbon, and data on labour mobility, foreign direct investment and multiple locational occupancy – Helsinki. The outcome was not solely new data. The team in Mid Wales, for example, prepared a local food report as a knowledge input to inform the Monmouthshire County Council’s food policy work. Outputs: innovative data collection methods applied to generate new understandings of territories.
- **Strategic visioning and futuring:** this work aligns well with labs that adopted a strategic approach to their region, but the critical point is that several labs co-produced strategies and visions as systemic statements about future rural-urban relations. Examples include Tukums’ cultural strategy, the rural vision in Mid Wales, and Lisbon’s integrated city-region strategy (territorial plan). Outputs: vision statements, scenarios, manifestos, evidence reports (supporting data to underpin the visions, statements, etc.).
- **Testing and deliberating novel policy implementation:** lab work was orientated towards creating a space for dialogue and discussion about new policy ideas. Examples include land and spatial planning changes – Frankfurt, territorial food policy, Lucca, circular farming – Ede, public procurement innovation – Gloucestershire, Ljubljana Urban Region, catchment-based management – Gloucestershire, and municipal co-operation to develop shared public services and budget setting – Styria. Outputs: dialogues, evaluation reports on innovations, recommendations, draft wording for changes to policies, laws or regulations, new policy networks.
- **Co-producing good practice examples:** most labs had specific innovation projects that they worked on (as part of an overarching vision or as separate projects). Several labs co-produced good practice examples: multi-modal transport and municipal budget setting examples and best practice reports - Styria; circular business inventories - Ede; and how to expand regional food procurement – Ljubljana Urban Region; and rural taxi services and automated teller machines (ATMs) in rural areas - Valencia. Outputs: new practices that enhance regional operations (examples).
- **Co-developing concrete practical tools:** e.g. food labels, Tukums; database and regional visitor guides, Styria; food policy dashboard, indicators and menu-card system, Ede. Outputs: practical tools for policy implementation.

The innovations, outputs and outcomes are diverse in form and range. One common thread is the way that **labs provided a space for dialogue and discussion**. We conclude our introduction to the living lab innovations in Section 2.5, summarising key messages for rural-urban relations, smart growth, governance and cross-stakeholder and sectoral linkages, supported with examples for each.

Table 7: Living lab experiments, innovation projects, outputs and outcomes

LL & CoP themes	Experiment/s	Description (as mechanisms of rural-urban innovation)	Outputs and outcomes
Ede [Food, ESS, BMLM]	Agricultural land use was the unifying focus. Specifically, indicator development for urban food policy making and circular farming .	The lab was designed to bring together urban and rural food stakeholders to develop indicators for a food policy dashboard. Changes to the Dutch Environmental Planning Act brought sharp focus on rural-urban aspects of a ‘ menu card approach ’ to ESS enhancement. Consensus on indicator development was difficult, so the focus shifted to the process of indicator development . Ten circular farming topics were identified for an inventory.	Description of urban policy indicator processes & inventory of circular farming topics . Discussing future goals linked to the EPA was difficult (too sensitive), so the lab realigned with Dutch circular farming initiatives (non-local networks) to ensure outputs generated policy impacts.
Frankfurt/R-M [ESS, PI&SS, BMLM]	Land use planning was the unifying focus. Outer and inner space concepts to influence regional land use planning in the region.	The lab was designed to inform regional land use planning in the region so that outer (rural) space was not a ‘land-take’ reservoir for development but regarded more holistically (regional well-being). Participatory innovation was not possible. The lab was used to build the evidence base through specific data projects (commuter flows, matching supply and demand of ESS, reducing rural-urban commuting for climate change, COVID & commuting – Table 5).	Multiple datasets and study reports (spatial clustering analysis, statistics, etc.). The results were disseminated and discussed with regional stakeholders, including regional politicians, municipal officers, NGOs and academics.
Glos. [Food, ESS, BMLM]	Circularity and natural capital innovations to strengthen rural-urban relations was the unifying focus; identifying and implementing practical governance experiments was critical.	The lab was designed to examine circular economy principles. This was eventually broadened and three specific innovation projects were implemented to: 1. examine the potential for the county’s school food contract to be part of a dynamic food procurement platform ; 2. develop a competency group to plan the strategic integration of nature-based solutions in regional flood risk management ; and 3. examine circular business models .	Evidence reports and practical governance outcomes : set up a new flooding sub-group; agreed text for the invitation to tender for the school food contract (with dynamic food procurement as an option); informal commitment by the County Council to promote CE in the climate change strategy.
Helsinki [BMLM, ESS, PI & SS]	Multi-locality living was the unifying focus of the work; specifically, identifying novel solutions to enable multiple locations for life and work.	The lab envisioned an over-arching experiment to develop a meta-network platform (for integrated rural-urban governance). Underpinned by studies to examine: (i) Finnish companies’ FDI in Estonia; (ii) job switching between knowledge intensive enterprises in Uusimaa; (iii) analysis of multi-locality seasonal residency; iv) review of rural policy and its implementation, including links between rural and urban networks; & v) REKO-ring business study.	The meta-network platform did not work. It was too ambitious, but the lab created a number of major data outputs and findings on multi-locality, with excellent stakeholder collaboration and impact at regional and national level, including cross-border relations with Estonia.
Lisbon [BMLM, ESS, PI & SS]	Ecosystems and territorial proximate economy were the unifying focus (developing a shared vision). Strategically working towards the integration of ESS in territorial planning instruments , in particular the territorial plan.	The lab work was complex and systematic. Six innovation projects (organised via two working groups (food and ESS)) inform the vision: 1. mapping, valuing & integrating ESS into the territorial planning system; 2. Criteria for the delineation of Green Infrastructure; 3. Sustainable proximate supply to school canteens; 4. Study plan for sustainable food in the curriculum; 5. Creation of an agro-parks network; and 6. Business models to enhance ESS.	The lab is strategic in its visioning approach. Six research reports (one per innovation project) as data inputs for the vision / territorial plan. The lab work was integrated with multi-level policy agendas (EU, national and regional levels), notably the Portuguese National Programme for Spatial Planning Policy and Lisbon’s 2030 strategy.

Ljubljana Urban Region [BMLM, Food, PI & SS]	Regional food supply chains were the unifying focus. Emphasis on public procurement , school meals and short food chains and public infrastructure for local food access.	The lab was designed as a partnership and platform model to co-design and operate short food chains in the region . The work was organised via projects that mapped direct sales initiatives; examined SFSC organisations; showcased & examined procurement in schools (connecting catering & local producers); & improved understanding of farmers' markets (as local food public infrastructures).	Data and analysis reports regarding local sourcing and practical output (e.g. a list of SFSC food procurement good practice exemplars, adaptation to COVID). The local food marketplace and analysis of public procurement also informed Ljubljana's food strategy .
Lucca [Culture, ESS, Food]	Food policy and land use planning are the focus. Inter-municipal food policy and territorial planning combined via a vision for the Plain of Lucca (food plan for the province).	The lab worked on the establishment of a governance model for the participatory and formalised development of an Inter-municipal Food Policy for the Plain of Lucca , which comprises five municipalities around Lucca city. As well as co-developing this food policy model, the lab explored solutions to maintain multi-functional cultivated land . The work was ambitious & challenging.	Report and outline of a food policy model . It is the first example in Italy of an institutional territorial strategy as a joint management model to share functions on food policies. Also informed the provincial plan (Provincial Territorial Coordination Plan).
Mid-Wales [Culture, Food, PI&SS]	Polycentric growth and strategic visioning for rural Wales was the focus. The drafting of a ' rural deal ' as counter to regional growth deals.	This lab was designed to offer a way to combine rural areas to provide more rural-specific policies in places where you have an absence of primary urban centres. The mechanism is a co-produced rural vision for Wales . The <i>Rural Vision</i> development process was experimental in seeking to build consensus. Local food planning in Monmouthshire was a specific innovation project.	This lab generated multiple outputs and outcomes, namely: Rural Vision, Evidence Report and WLGA Rural Manifesto , & 'How Local is Local? Report. Impressive policy reach, including Mid Wales local authorities and regional and rural policy in Wales.
Styria [BMLM, Culture, PI&SS]	Regional development and quality of life was the focus. In particular, the lab was used to discuss a regional budget to facilitate inter-municipal co-operation in the region.	Intercommunal budgeting was the focus, using three pilot projects as material for discussion and dialogue. These are: (i) the law on planning and development (intercommunal budget); (ii) GUSTmobil (an on-demand rural mobility service – shared hailed taxi) and (iii) REGIOtim (a rural extension of urban pilots in the Graz/Voitsberg public transport network – multimodal nodes)	The lab generated 10 case studies/best practice reports (as r-u shared economy models), an online database/regional visitor guide (intercommunal r-u cultural networking and tourism promotion) and two scientific papers reporting on a survey of 38 of 52 mayors re. intercommunal budgeting.
Tukums [Culture, Food, PI&SS]	The preparation of a cultural strategy for the municipality was the unifying focus. Culture regarded as a way to enhance quality of life and mitigate negative impacts of out-migration .	The lab established five working groups to enable the cultural industries sector to connect (museums, tourism and churches; libraries and culture houses; amateur art; schools; independent artists and publicists). Projects also to improve use of Tukums market (food) and access to regional cultural events (practical).	The lab created a cultural strategy document , & supporting data / stakeholder feedback, plus reports on Tukums market and public infrastructure. Boundary changes make the final impact of the work uncertain.
Valencia [BMLM, Food, PI&SS]	Territorial or territory-based strategic planning is the unifying focus for this lab to counter currently unbalanced territorial economic development in the region. A key argument is the central role of public actors , especially regional government, in innovation projects.	The lab has undertaken a range of innovation projects and data collection exercises (i.e. data generation function). The lab is a research-led stakeholder engagement process, with projects examining the emergence of employment initiatives linked to Territorial Employment Pacts , territorial participation in the development of governance structures / plans for local food procurement and improving internet access in small rural settlements (teleworking / digital service provision).	Multiple outcomes, including recommendations on extension of TEPs into peripheral areas, a study report on school food procurement models and sustainability good practice, and recommendations and report on digital service provision, plus also rural transport, cultural resource services, and the rural ATM network.

2.5 Key messages from the living lab work

In the preceding sections, we reflected on the 11 LL contexts, the methods chosen by each team for different LL stages, leading finally to a wide range of LL experiments and innovations. In this section, key messages are summarised from the LL work, drawn from the experiments and learning reflections. ROBUST is concerned with the improvement of the governance of rural-urban functional links and the optimisation of rural-urban synergies, especially where such synergies create opportunities for jobs and economic growth in rural areas. Concepts for structuring the analysis of rural-urban synergies were outlined in Deliverable 1.1, *The Conceptualisation of Rural-Urban Relations and Synergies* (Woods and Heley, 2017). Three concepts were elaborated, namely:

- **New Localities** – namely, how rural-urban links (both proximate and distal) create administrative, political, functional, social or environmental places. An example of this is to think not about municipal boundaries and instead about river catchments (soft spaces).
- **Smart Development** – prioritising what a specific local or place-based economy can do best with existing resources and connections.
- **Networked Governance** – good rural-urban governance enables participation (WP5). Networked governance involves partnerships between public, private, non-profit and research sectors to facilitate joint decision-making and shared values/outcomes.

2.5.1 Rural-urban linkages

We start by organising the living lab innovations into thematic clusters that potentially strengthen rural-urban relations (Table 8). They are a first attempt to organise the innovations and emerged inductively as an outcome of the experimental work and rural-urban issues that the labs opted to explore and prioritise. In particular, rural-urban links are a foundation for understanding place-based interdependence (see ‘New Localities’ in the preceding paragraph). Table 8 includes examples from the living labs per theme and the outputs they co-created. In many cases, outputs are new data and knowledge generation, but we also have proposals to develop new policy approaches and new tools to improve rural-urban relations.

Innovations developed to strengthen rural-urban relations are as follows:

- **proximity economy** - spatial/social - e.g. local food;
- **circular economy** - especially for agri-food;
- **service accessibility and quality** - this features strongly in remote rural case studies but is linked to contexts and includes peri-urban areas that face service problems due to low quality public transport or social groups affected by low access to services;
- **population mobility flows** - partly connected to services but indicates a specific set of innovations that consider rural-urban commuter flows;
- **natural resource management** – multiple ideas here, including tools to map, new forms of business model and partnership arrangements at different scales (catchment, etc.)
- **territorial governance** - this is a complex category because institutional development is influenced by scale and regional and national contexts, as well as organisational differences,

funding and so on, but several innovations have an explicit rural-urban territorial aspect via territory-based strategic planning; and finally

- **heritage tourism** - this theme also has a territorial aspect but is about valorisation of culture, gastronomy, landscape, language, etc.

We have clear messages emerging, in terms of critical rural-urban linkage issues, notably the still untapped potential of **public procurement** (especially for food); the debate about **multilocality living**; **teleworking** and rural-urban broadband provisioning; **green infrastructure** and ecosystem services; **territory-based strategic planning**; **polycentric growth**; and **territorialisation** as a strategy for place-making, heritage valorisation and rural-urban connectivity. The innovations in Table 8 to strengthen rural-urban links are further developed in Section 4, in combination with CoP resources.

Table 8: Living lab innovations and rural-urban linkages

Rural-urban linkage	Living lab outputs*
Proximity economy	Indicator development (menu card dashboard), Ede ⁵ ; Dynamic procurement, Glos ³ ; REKO-ring direct sales of local food, Helsinki ⁴ ; SFSC good practice examples in procurement, Ljubljana Urban Region, Valencia, Lisbon ⁴ ; Sustainable food in the curriculum, Lisbon ⁵ ; direct sales mapping, Ljubljana Urban Region ¹ ; place branding and local food marketing, Tukums and Mid Wales ⁴ ; local and regional food planning, Mid Wales and Lucca ^{2,3}
Circular economy	Circular farming, Ede ⁵ ; circular business models, Glos ⁴
Service accessibility and quality	Intercommunal budgeting, Styria ³ ; multi-modal services & shared economy models, Styria ³ ; Public and civic infrastructure, Tukums ¹ ; teleworking and digital service provision, Valencia ¹ ; rural transport and ATM networks, Valencia ¹
Population flows / mobility	Commuter flows, Frankfurt ¹ ; Multilocality and seasonal residency ^{1,2,4} , Valencia and Mid Wales ¹
Natural resource management	Regional flood risk management (river catchments), Glos ³ ; green infrastructure criteria, Lisbon ⁵ ; Mapping ecosystem services, Lisbon ¹ ; AgroParks network, Lisbon ³ ; ecosystem business models, Lisbon ⁴
Territorial governance	Intermunicipal food policy and draft territorial coordination plan, Lucca ^{2,3} ; regional land use planning (inner and outer space), Frankfurt ¹ ; territorial proximate economy, Lisbon ² ; rural vision, Mid Wales ² ; territorial employment pacts, Valencia ¹
Heritage tourism	Regional visitor guide, Styria ⁵ ; Welsh language and cultural connections, Mid Wales ⁴ ; cultural strategy, Tukums ²

*Innovation themes / codes: 1. New data and knowledge generation; 2. Strategic visioning; 3. Novel policy development; 4. Good practice examples; 5. Practical tools

Innovations to strengthen **proximate urban-rural link** emerged in several LLs, including Gloucestershire, Ljubljana Urban Region and Lisbon, where efforts have been made to ensure that the market potential of urban centres is optimally distributed to or realised by local producers through short food supply chains. For example, through efforts to increase levels of local supply in public procurement, or to find new ways to market regional food in the city. Ede complicates this picture: its food policy emphasises the need to strengthen and further develop spatial proximity relations for food, while its agricultural sector is largely (although not exclusively) export-oriented. Support for this orientation comes from a municipal and enterprise collaboration called the *Food*

Valley initiative. Strengthening proximate urban-rural relations therefore seems to indicate a discrepancy between urban requirements and rural possibilities and interests. These factors position Ede as a leader in intensive livestock and agro-tech innovation, albeit at some cost to the local environment, and revealing a high level of dependence on imported protein feedstock from non-European rural areas.

The LLs also confirm the **interdependence (and in some cases fluidity) of rural and urban spaces**. For example, efforts to stimulate rural land use in order to reduce downstream (urban and rural) risks from flooding; shorten regional food supply chains to be more inclusive of a range of different producers; and re-focus development pathways from zoned economic land use towards regionally integrated visions for better ecosystems, well-being, rural jobs and public services. The LL case studies provide examples of strategic rural-urban interdependence in different ways, exemplified by Frankfurt/Rhein-Main and Lisbon.

Rural-Urban Case study #1 – Frankfurt/Rhein-Main

Previous incarnations of the regional development plan had framed land as either developed or not yet (and still to be) developed, highlighting the global economic importance and expansion of the region as a world financial hub, centred on the city of Frankfurt. The LL took advantage of timing and for the plan revision process re-framed regional land as **inner and outer space**, emphasising that **land is a finite ecological resource, and should be treated as such**, not just a land-bank waiting to serve urban expansion. The pandemic presented an opportunity to study changes in rural-urban commuter flows, revealing a sharp drop in associated GHG emissions, road traffic accidents and congestion. Subsequently, better teleworking opportunities can be integrated into regional spatial and ecosystems policies. Informing land take (i.e. urbanisation) decisions and reducing these to a necessary minimum, via the **ecosystem service approach** is proposed **as a core part of the decision process to develop land use planning reform**.

Rural-Urban Case study #2 – Lisbon

Lisbon, Portugal's capital, accounts for a third of national exports and a quarter of the population. The LL aimed to develop a **territorial economy of proximity** Important functional links between rural and urban emerge, notably direct supply of food in rural areas to the nearest urban areas, territorial continuity and connectivity of green infrastructure and rural space as a link between urban population and nature. The latter includes the attractiveness and special designation of the regional biosphere as a tourist attraction. High levels of policy integration of the LL and the desire to delegate LL leadership, led to themed experiments organised into two Working Groups.

Working Group #1 supported **local procurement and the introduction of practices for sustainable food in the curriculum and with school families**. Working Group #2, in particular, highlighted how **healthy ecosystems link urban, peri-urban and rural territories** and emphasised that ecological conservation is vital in the form of Metropolitan Green Infrastructure. As such, the Working Group recommended the creation of a network of regional agoparks, supported by a program of commercialization and restoration to safeguard Metropolitan Green Infrastructure through sustainable food enterprises, which value regional ecosystems.

2.5.2 Smart development

In several labs, we observe **attempts to challenge conventional economic growth models, particularly with a view to improving rural-urban well-being** (see Tables 7 and 8; see also Section 4 for further elaboration). Smart development is one way to frame growth in rural and urban areas. It resonates with principles of neo-endogenous rural development, in terms of trying to make the best use of existing cultural and environmental resources, rather than focusing on what an area did in the past, or should do according top-down growth plans. Several LLs reveal smart development opportunities, including:

- Balancing the needs of locals with the possibilities linked to rural tourism in marginal communities.
- Using new metrics – such as Sustainable Development Goals – to help plan development agendas.
- In two LLs – Lucca and Lisbon – regional smart development is linked to a network of peri-urban agro-parks, which combine food sector growth opportunities in urban centres with sustainable environmental husbandry, protecting the distinctive landscapes and biodiversity.

Two cases, Mid-Wales and Valencia respectively, reveal how the LL was able to lead a process of **counter-balancing sectoral growth agendas**, which seemed to offer little hope for change in peripheral rural areas. Instead, the LLs conducted wide-reaching consultations and research into the possibilities of integrating rural cultural and economic life into a wider territorial growth agenda.

Smart development case study # 1 – Mid Wales

The concept of growth is central to the Mid-Wales case, and reflected in the terminology of growth deals and the concern of stakeholders to grow jobs and increase productivity as a way to address this rural area's 'lagging' status, where all the settlements have fewer than 20,000 inhabitants. However, the growth agenda for Wales highlights challenges in post-industrial south Wales and the northern and coastal areas of the country. The LL therefore developed a ***Vision for Rural Wales***, using natural and cultural resources within the region, supporting small businesses and entrepreneurship, updating local workforce skills (including opportunities for a 'green recovery' post-COVID in terms of sustainable energy generation and agriculture), retaining income generated locally. In particular, the **local embeddedness of the region's economy is a strength**, with opportunities for valorisation of endogenous resources; **relatedness and achieving the right balance between economic diversification and smart specialisation adopted as a strategy**. Poor transport connectivity remains a weakness of the region, with calls to improve investment in digital and transport infrastructure and the application of smart technologies, some scepticism to drive large-scale change is notable.

Smart development case study #2 – Valencia

Over time, unbalanced population growth and development in coastal areas has resulted in complex territorial, social and economic tensions. Decision-makers face a choice of shifting from sector-based (mainly tourism and intensive horticulture) short-term growth, to a **territory-based, more comprehensive longer-term view** could help the region better manage challenges in the future. This would require **fostering smart growth to improve rural–urban relations and overcoming the negative impacts of low-cost tourism**. The LL serves as a research-led stakeholder engagement process that generated data-informed recommendations in support of existing regional policies to promote rural-urban economic and labour-market integration through **Territorial Employment Pacts** (which bring together trades unions, local government and employers to address employment and economic development). Improvements in sustainable school meals programmes, including local sourcing in Valencia City could be extended to the whole region. Finally, the LL called for improvements to public-private efforts to improve internet access in small, rural settlements.

2.5.3 Networked governance

In the LLs, a number of effective governance networks have either come into existence or used the capacity offered by the project to provide a focal point for networked governance. An important finding is that **living labs can help existing networks expand, adapt or refocus their objectives and membership in relation to rural-urban synergies**. Overall, it was evident that influencing existing networks was most achievable and effective. Examples include:

- The development of a regional sub-group in England (sub-ordinated to the Regional Flood and Coastal Committee) to identify nature-based flood risk interventions;
- A new working group for multi-locational living in Helsinki-Uusimaa;
- The existence of peer-networks (fragile, and in need of support) in Tukums which co-operate in the development of cultural events and the celebration of rural food and culture; and
- The associations of municipalities in Frankfurt Rhein Main and the working groups described above for Lisbon.

The case studies below provide further examples of existing networked governance arrangements.

Networked Governance case study #1 – Metropolitan Area Styria (MAS)

Centred around the growing city of Graz, the MAS has been piloting **inter-municipal collaboration** on a range of public service and growth-related innovations, especially inter-communal transport. A survey of mayors in the 52 municipalities of MAS was particularly valuable to understand local challenges and change over time. This helped to contextualise inter-communal co-operation and raised opportunities for shared economy projects, including on-demand rural taxis, electric car loans schemes and improved links to public transport hubs. The practice partner, the Regional Development Agency, informed the development of examples of shared economy and new business models, short reports and an online database, plus a regional travel guide. The Agency also acts as a service-orientated, intermediary organisation, moderating and promoting regional development processes, and connecting the governance arrangements of the MAS. Such enabling actors, which are politically independent, are crucial to act as supportive drivers and mediators of complex and networked governance arrangements. The LL also emphasised **the need for new cross-sectoral interlinkages to be established between labour markets and social services**, illustrated by the development of shared /social economy business model case studies.

Networked governance case study #2 – Lucca

Five municipalities in the Plain of Lucca had been collaborating on the development of an **Intermunicipal food policy** (IFP). Given the existing foundations and allied initiatives, the area enjoyed a well-developed network of institutional, research and grassroots organisations that were already engaged in long-standing discussions about the benefits of and multi-functional possibilities linked to local food (including in the lucrative tourism market), but also including spatial and environmental dimensions linked to soil sealing and urban sprawl. The LL devised a new governance model, bringing together the *gestione associate* (joint municipal management structure) and the food policy office, and connected other networks to the model, in order to ensure participatory and thematic objectives were met. Specifically, additional networks included the Agora (a public forum concerned with the themes of the IFP), the Food Council (13 councillors from the 5 municipalities, of which 5 chair thematic groups), the chairs of the Agora and the Food Council, and the assembly of mayors of the five municipalities. Challenges included engaging the private sector in highly bureaucratic processes. Nevertheless, the model represents ‘the first exemplar of **institutional, territorial strategy implementation** in the Plain of Lucca and the IFP governance model is the first case in Italy of the joint management model for sharing functions on food policies’.

2.5.4 Multi-stakeholder connections and cross-sectoral linkages

By their nature, LLs require the inclusion of multiple stakeholders, resources and capacities in order to succeed, exemplified by the quadruple helix model (see Appendix 8.1). **Positive multi-stakeholder connections (often across-sectors) are essential for developing innovations across administrative boundaries and arenas of expertise.** Examples of this from the ROBUST LLs include:

- The establishment of two stakeholder working groups in the Lisbon lab to improve school meals and introduce food-based education into the curriculum and to protect the regional environment by integrating economic growth with environmental capital and capacity both involve and indeed require inter-municipal and cross-sectoral arrangements.
- Working with private sector allies in the motor industry, waste management and hospitality sectors to initiate rural transport and tourism opportunities in the Metropolitan Area of Styria.
- In Lucca, alliances across sectors (e.g. school education and food production/catering) help to identify problems, understanding and steer initiatives and projects, partnerships and initiatives linking farming with tourism (ecotourism) have beneficial cross-sectoral connections. Cultural events and food festivals are also a tool for mobilising society and strengthening connections between farmers, consumers, restaurants and citizens.
- In Mid Wales cross-sectoral coordination and innovation is noted, too, through, for example, the Monmouthshire Food Project, which links agriculture, public procurement, business development, skills training, land use and planning.
- Researching rural employment opportunities through multi-stakeholder Leader networks in Valencia.
- Public-private ‘food-market’ exchanges between producers and food buyers in Ljubljana Urban Region; the Ljubljana Food Marketplace combines rural development, public procurement, health and tourism (cross-sectoral).

- Identification by several LLs of synergistic rural business models, often characterized by different expressions of sectoral boundary-crossing.

Gloucestershire's work on dynamic food procurement and the work in Helsinki to assess multi-locational living and related governance arrangements both rely on cross-sectoral connections (technology innovation and sustainable food procurement rules, for example) and are elaborated further in the case study boxes below. However, we also observe that **cross-sectoral linkages are not always easy**. In Ede, for example, narrowly defined agricultural interests persist and are increasingly at odds with regional sustainability and climate change challenges. The fragmentation of policy-making and delivery between different economic and policy sectors and institutions was a significant obstacle to effective rural development in the Mid Wales lab, hence the attempt to develop a holistic Rural Vision that integrated and cross-cut sectoral silos. The importance of partnership working between the public, private and third sectors was therefore critical and the need for network governance and cross-sectoral collaboration was anticipated by stakeholders to increase in the future because of post-pandemic pressures on public finances. In Lucca, cross-sectoral connections were also important, but to work required significant effort to move from the status of initiative to a consolidated change of practices (inertia linked to administrative processes and costs).

Multi-stakeholder connections case study #1 – Gloucestershire

In Gloucestershire, the county council is responsible for feeding over 18,500 pupils during every school day, without fail and on a tight budget. This service is commercially contracted to a private company. During the LL process, the national government's procurement agency, Crown Commercial Services, decided to initiate a pilot/test 'food hub' in an attempt to co-ordinate all public sector food procurement at a regional scale using a new IT logistical innovation called **Dynamic Purchasing System** (DPS), developed in the private sector. In brief, the DPS consolidates all regional public food demand and matches it with food supplies from pre-qualified producers on the basis of daily availability. This means that smaller and seasonal producers can dip in and out of the procurement system without being tied to commodity-scale contracts, fixed pricing or face onerous administrative and logistics procedures, which will be handled by the non-profit food hub. The LL may have been instrumental in locating the food hub pilot in the south west region. In any case, the experiment is a good example of private, public, civil society and research communities working in co-dependent and mutually supportive ways to achieve practical benefit for rural jobs.

Multi-stakeholder connections case study #2 – Helsinki

The Finnish capital, Helsinki, exhibits a range of interesting multi-locational and urban-rural characteristics, including a culture of rural summer houses among its urban population, substantial Finnish enterprise investment in neighbouring Estonia as well as in logistically convenient peri-urban areas, and commuting by Estonians working in Helsinki. Arranging such **multi-locational life** is a cross-sectoral challenge. The use of an access to public infrastructure and social services are key focus points for Finland's Rural Policy Council and its counterpart, the Urban Policy Committee. These networks generally do not closely overlap. The work of the LL coincided with the high profile of multi-locational as a national discussion topic, partly as a result of COVID. A new **Working Group for Multi-Local Living** was set up and will function for two years and is something that could be replicated in other regions / places. The lab work raised awareness of the potentially biased influence of the use of statistics as a planning tool, particularly the use of statistics as static population measures to direct regional development funds.

3. Community of Practice synthesis

3.1 Introduction

As discussed in Section 2, the Living Labs form the empirical foundation of ROBUST, comprising local case studies of experimentation with the aim of achieving rural-urban functional synergies. An important characteristic of the LLs is that they are locally embedded, which means that they were substantially guided by the needs of the practice partners.

The five Communities of Practice (CoPs) in ROBUST effectively represent thematic case studies, cutting across all 11 LLs. As such, they offer a vertical style of learning, compared to the horizontal insights gleaned from LLs. While the CoPs draw on the experiences and learning from the LLs, they also seek to develop a common research agenda for each theme as a whole, examining how each functional theme affects, and has the potential to enhance, rural-urban synergies.

ROBUST's CoP work was organised into five themes (see Section 2 for details): Business Models and Labour Markets, Cultural Connections, Ecosystems Services, Public Infrastructure and Social Services, and Sustainable Food Systems. At the start of the project, each lab prioritised three of the five themes, and therefore each LL became a member of three CoPs. Table 9 summarises the membership and leadership of each. Each CoP was led by research partner from the project.

Table 9: CoP membership

CoP theme	LL membership*	CoP Leader
Business Models and Labour Markets (BMLM)	Ede, Frankfurt/Rhein-Main (FRM), Gloucestershire, Helsinki, Lisbon, Ljubljana Urban Region, Styria Metro Area, Valencia (8 LLs in total)	PRAC, Frankfurt
Cultural Connections (CC)	Lucca, Mid Wales, Styria, Tukums (4 LLs)	Baltic Studies Centre
Ecosystems Services (ESS)	Ede, FRM, Gloucestershire, Helsinki, Lisbon, Lucca (6 LLs)	Institute of Science and Technology Lisbon
Public Infrastructure and Social Services (PI&SS)	FRM, Helsinki, Ljubljana Urban Region, Mid Wales, Styria, Tukums, Valencia (7 LLs)	Federal Institute of Agricultural Economics, Rural and Mountain Research, Vienna
Sustainable Food Systems (SFS)	Ede, Gloucestershire, Lisbon, Ljubljana, Lucca, Mid Wales, Tukums, Valencia (7 LLs)	Oikos, Ljubljana

* Membership includes research and practice partners per case

The CoPs generated shared learning and research-led resources, which draw from the local LL contexts, leading to a first, higher-level synthesis of the project findings, in terms of how each theme

supports or affects the achievement of rural-urban synergies. The purpose and work undertaken by each CoP is captured in the collective development of three core activities, namely:

- (i) **Developing an agreed work programme** (i.e., joint enterprise), which is recorded in the five respective CoP Research and Innovation Agendas;
- (ii) **Discussing and elaborating common learning resources** (i.e., shared repertoire), following communication and joint collaborative work within the CoP; and
- (iii) **Harvesting key messages and shared learning per theme** (i.e. collective knowledge for communication) that informs ROBUST's objectives (i.e., rural-urban linkages, growth and smart development, (networked) governance and cross-sectoral connections).

The five individual CoP reports have been compiled into a unified CoP report (D3.2). In common with the LLs, each CoP had a slightly different approach to developing its work, depending on the preferences of its membership and the collectively agreed work programme. Each CoP was able (like the LLs) to draw on the range of methods provided in the WP3 methodological toolkit (D3.1).

The rest of the CoP synthesis is organised into three parts, which follows the logic of how the work was organised. We start by describing what each CoP did in terms of their joint enterprise, summarising their agreed research and innovation agenda, methods and ways of co-working. Section 3.3 summarises what each CoP produced in terms of learning resources/outputs (shared repertoire). Section 3.4 concludes the CoP synthesis by communicating key messages agreed per CoP in accordance with ROBUST's main themes (rural-urban linkages, etc.).

3.2 *CoP innovation agenda and learning processes: joint enterprise*

This section first summarises processes used to plan CoP activities. Each CoP agreed a standardised Research and Innovation Agenda (see Appendix 8.4 for an example from ESS). The purpose of the RIA was to provide an overview of each member's local LL perspectives in relation to the CoP theme, a proposed process for communicating between members and agreeing collaboration towards the articulation of a joint enterprise, and proposals for a shared repertoire of research outputs. While the RIAs for the LLs were developed in the first (envisioning) stage of the LL process, the articulation of a joint CoP enterprise was a longer process, usually solidifying around halfway through the project's duration. This was linked to the importance of reflecting on the progress of the LL experiments as a way to inform the research needs arising from the CoPs.

3.2.1 *Business Models and Labour Markets*

This CoP set out to examine business prospects, labour market dynamics and job opportunities that stimulate, or rely on, rural-urban interdependencies. The CoP also highlighted counter-urbanisation particularities linked to COVID, leading to new interest in rural entrepreneurship and supporting a critical reassessment of local economies. Communication between the eight members of this CoP included a LinkedIn group for networking outside partnership meetings. The development and shared review at partnership meetings of the WP2 rapid appraisals (of rural-urban governance arrangements, instruments and tools in the LLs) generated a range of joint themes that were refined and further condensed in October 2019. Common CoP themes were as follows (see Table 10):

- (i) Territorial development strategies – including socio-economic and labour market development, digitisation, partnership and co-operation networks, and participatory approaches to enterprise and labour.

- (ii) Multi-level governance – including land use planning and participation in the local economy, and Common Agricultural Policy reorientation.
- (iii) New Business Models – including territorial, smart and social models, circular economy, digitisation and its impact on new business models and new forms of cross-sectoral working.

A set of seven specific research questions was developed in association with these three themes, as well as a conceptual model of multi-spatial understandings of rural-urban synergies, covering absolute, relative and relational space. This framework allowed CoP members to be flexible about the spatial scope of their individual focus when applying it to their LL experiences. CoP members also agreed upon **the importance of the ‘fourth sector’** within synergistic business models, which represents ‘for-benefit’ organisations which combine market-based approaches with the social and environmental aims of the public/non-profit sectors (and thereby complements the traditional three sectors of market, state and civil society).

The CoP then dedicated itself to **the characterisation of synergistic business models**. This was achieved, firstly, by typifying business models which stimulate rural-urban links and, secondly, by identifying 20 such models from the LLs (for example circular farming in Ede). Several different methods of communication and joint planning were applied by the CoP, including world café, joint visioning, story-telling and cross-organisational knowledge sharing.

3.2.2 *Cultural Connections*

This was a relatively small CoP (four LL members), of which only Tukums had selected the theme as a first choice. Initially, CoP members brought together a range of cultural emphases, including: the importance of historical identity and the celebration of rural events (Tukums); the importance of local cuisine for rural identity (Lucca); the significance of the Welsh language and the dominance of agricultural landscapes as a rural cultural backdrop (Mid Wales); and the co-situation of rural and urban cultures in an urbanising city region (Styria).

Later revisions of the RIA (May 2019) re-focused CoP work towards **a focus on cultural tools** and the development of outputs (Table 10). These included inter-municipal co-operation (linked to Styria’s tourism guide) and opportunities for valorising cultural resources in an equitable way. Methods used by the CoP team to cover these activities included stakeholder mapping, participant observation and interviews. The use of additional methods was limited by low CoP membership. An important observation is that culture overlaps and permeates aspects of the rural-urban focus of other CoPs. Consequently, some planned outputs were shifted to other CoPs, as follows:

- A thematic briefing on cultural valorisation of local products informed a Sustainable Food CoP webinar on local branding.
- A thematic briefing on the governance of cultural connections was altered to become a case study for Tukums’ cultural strategy.
- Short reports on cultural infrastructure and the governance of culture were redirected to the PI&SS CoP.

3.2.3 *Ecosystem Services*

The ESS CoP aim was to **identify, map and integrate functional ESS relationships** in four arenas, namely: spatial and sectoral planning; contributions to a redefinition of rural-urban relations (for example shifting from zoned to integrated relations); associating ESS use and delivery to planning

instruments and governance models at multiple scales; and exploring how ESS enhance rural-urban synergies. To pursue these aims, the following five steps were agreed as a collaborative work plan:

- (i) Agreement of shared interests
- (ii) Development of a conceptual research framework to examine rural-urban links
- (iii) Composition of a RIA with related questions
- (iv) Conversion of the agenda into a shared repertoire
- (v) Distillation of the repertoire into two levels of research outputs in standard templates (research briefs and practice briefs)

In the first step, initial shared interests were gradually reduced from eight topics to five, because an important overlap was recognised between the ESS and other CoPs. For example, food provisioning is an ESS, cultural services are an ESS category, ESS enable new BMs, and green and blue infrastructures constitute public ecological infrastructure and services.

The conceptual model, following several iterations, was organised around rural-urban synergies flowing from the relationship between suppliers and users of ESS. This allowed members to convert the framework into a clustering of shared interests by following a four-stage process of identifying a policy issue within member LLs, linking this to ESS, organising the ESS within rural-urban settings (spatial relationships and tools) and agreeing how to address ESS benefits and vulnerabilities.

A matching exercise helped to link LL members' interested to ESS themes, resulting in a **Repertoire of Tools for Matching**, which are six short reports developed by CoP members linked to agreed research topics. The refinement of these led to an agreed RIA and **five core topics for research** (see Table 10). Collaborative methods used by the CoP during its work included a world café to deepen discussions around the tools in the shared repertoire, stakeholder mapping, systematic evidence reviews and concept mapping. A review of outcomes at the end of the learning cycle was organised to enable CoP members to reflect on their experiences and the final outputs.

3.2.4 Public Infrastructure and Social Services

The PI&SS CoP membership was diverse, ranging from large cities (e.g. Helsinki) to sparse rural areas (e.g. Mid Wales). This initially created some challenges in terms of joint thematic collaborations, especially around the questions of how to create a common basis for working together, what thematic comparisons are possible among the seven member LLs, and what exchanges of knowledge and experience can take place between them. This diversity informed the CoP's approach in illuminating and examining LL-specific PI&SS contexts. After initial discussions about shared CoP interests, and the presentation of posters by CoP members at a ROBUST partnership meeting using a world café format, five shared topics were identified and discussed using good practice examples drawn from the LLs involved in the CoP. A shared repertoire was organised around **six themes**:

- mobility (esp. via public transport)
- digitisation and e-services
- basic infrastructure for social services and cultural networking
- multi-locality
- service hubs
- food infrastructure

The shared repertoire resulted in the creation of case studies, reports, media releases and scientific papers based on the six CoP themes (see Table 10). They highlighted, for example, how rural village halls could operate as social service hubs, or how multi-locality is poorly captured in planning tools.

3.2.5 Sustainable Food Systems

The Sustainable Food Systems CoP initially discussed the changing role of agriculture and the reduction of its economic importance in the countryside, leading members to reflect on the complex nature of food production and consumption systems, and the role of cities. Cities and towns represent important consumption centres, while urban authorities exert a significant influence on regional and national food policy governance. In common with other CoPs, the Helsinki partnership meeting in May 2019 led to the consolidation of a range of earlier discussions designed to raise and compare topics of shared interest among the CoP membership. The **five topics** were as follows:

- municipal food strategies
- sustainability indicators
- branding
- public procurement
- territorial cohesion

Collective interest in these areas was articulated in a range of formats, including webinars, thematic snapshots and longer research briefings, and toolkits, and scientific articles published by CoP members.

3.3 Shared repertoire of learning resources to strengthen rural-urban linkages

Having set out the learning cycle and means of discussing, elaborating and refining research arenas per CoP, this next section summarises the resulting shared repertoire of resources created per CoP, all of which offer in different formats solutions to strengthen rural-urban linkages. In other words, we describe how CoP deliberations as agreed working frameworks (joint enterprise) were converted into CoP resources (shared repertoire) (see Table 10). The resources represent detailed and varied datasets, which inform understandings of rural-urban interdependencies. The joint enterprise is informed by experiences from the LLs. Patterns of activity emerge from the CoPs. For example:

- In the PI&SS and BMLM CoPs, extensive **lists of case studies were compiled**. In the case of PI&SS, these illuminate foundational types of social services, which members regarded as essential for the functioning of other CoP themes and in supporting rural-urban synergy. The BMLM CoP conceived a new type of synergistic business model and compiled examples to explain how these new models work in practice.
- Practical objectives led to the development of a **research ‘toolbox’** for the CoP members which were used to assess developments in relation to the CoPs key findings, while in Food, a practical ‘How to’ guide was compiled for practitioners who wish to increase local sourcing in public catering.
- The ESS CoP was more conceptually guided and produced **scientific research outputs (journal articles, book manuscript)** which review the literature and current practice in relation to a range of priority areas.

Table 10: Joint enterprise and shared repertoire per CoP

CoP	Joint Enterprise (research focus re. rural-urban synergies)	Shared repertoire of common learning resources (final outputs)
Business Models and Labour Markets (BMLM)	<ul style="list-style-type: none"> • Territorial development strategies • Multi-level governance • New (synergistic) business models 	<ul style="list-style-type: none"> • 20 profiles of synergistic business models, describing how these stimulate rural-urban links and stimulate rural-urban synergies
Cultural Connections (CC)	<ul style="list-style-type: none"> • Cultural festivals as rural-urban connector • Digital co-ordination of cultural life • Culture as a marker of regional and local heritage • Sustainable and equitable valorisation of cultural resources 	<ul style="list-style-type: none"> • Paper on urban-rural discourse in cultural heritage (AISU Conference, Sept 2019) • Report: 'Strengthening rural-urban cultural connections' (ROBUST website) • Webinar on rural culture (April 2020) • 'Toolbox' of 18 questions to help CoP members to assess the current state and future opportunities in relation to (i) co-ordination of events, (ii) enhancing rural identities, and (iii) valorising rural culture sustainably.
Ecosystems Services (ESS)	<ul style="list-style-type: none"> • Community partnerships • Multi-scale planning • Mapping and bundling ESS • Payments for ESS • Circular farming 	<ul style="list-style-type: none"> • 5 short practice briefs on the Core Theme topics • 5 longer research briefs on the Core Theme topics • A textbook in preparation for Springer Nature on ESS and rural-urban synergies. • Conference session by CoP members at the ESP conference in Hanover, 2019. • Academic manuscript on land sharing/sparing.
Public Infrastructure and Social Services (PI&SS)	<ul style="list-style-type: none"> • Mobility via public transport • Digitalisation, broadband coverage and e-services • Basic infrastructure, social services and cultural networking • Multi-locality • Service hubs • Food infrastructure 	<ul style="list-style-type: none"> • 26 good practice case studies of mutual learning from across the CoP membership.
Sustainable Food Systems (SFS)	<ul style="list-style-type: none"> • Municipal food strategies • Sustainability Indicators • Local branding • Territorial cohesion • Public procurement 	<ul style="list-style-type: none"> • Thematic briefing, webinar and good practice guide on municipal food strategies. • Two briefings/food strategy examples (Tukums and Gloucestershire). • Snapshot and webinar on local food branding. • Snapshot on food and territorial cohesion in Tukums. • A thematic briefing on public procurement. • Lisbon food strategy report.

Such patterns illustrate the diversity of approaches on developing a joint enterprise and shared repertoire to strengthen rural-urban linkages. As shown in Table 10, **two CoPs developed extensive portfolios of rural-urban case studies**. In the case of BMLM, the CoP developed the **rural-urban synergistic business models** concept and compiled 20 examples / business profiles (as well as new business models profiles include rural, territorial, rediscovered and redefined examples). Similarly, the PI&SS CoP compiled 26 examples, which underline **rural-urban social service initiatives**.

The ESS and Sustainable Food System CoPs developed a range of research outputs. In the ESS case, five thematic priorities were agreed and **short ‘practice briefs’** aimed at non-academic audiences and **longer ‘research briefs’** were written by team members. In the Sustainable Food CoP, short briefings were complemented by a longer research paper on **municipal food strategies** as drivers of rural-urban synergies in food systems, as well as by three themed interactive webinars and a practical ‘How to Guide’ for **sustainable procurement practices**. While the importance of urban actors in helping to develop sustainable food systems in extended and proximate territories has been noted, snapshots on **branding and territorial cohesion** emphasise the importance of food to rural economy and culture. In particular, the reliance of local food chains on SMEs, including processors, retailer and gastronomic enterprises, underlines the demand for local labour.

The Cultural Connections CoP developed **practical tools** to complement research-based outputs, for example in developing a list of 18 critical questions that allowed member LLs to assess current and future opportunities in relation to the CoP’s three main themes of event co-ordination, enhancing rural identities and valorising rural culture in a sustainable way. The latter provided a vital focus in the effort to **balance the importance of rural identity and cultural meaning** (enhanced and politicised through cultural practices such as the use of the Welsh language), or the celebration of traditional foods, with growth opportunities linked to tourism markets, outdoor recreation and cultural festivals.

A shared emphasis of the BMLM and ESS repertoires is the importance of **territorial land use**, and how this is governed to stimulate better rural-urban links through the stimulation of new entrepreneurial possibilities. For example, **circular farming** is a way to reduce the environmental impact of agriculture and opens opportunities for new enterprise models. Those listed in the case studies include **direct marketing models** such as **REKO-rings and social enterprises food businesses**, which reinvest profits into local social projects. Similarly, the blurring of public-private boundaries is evident in the research on **Payments for Ecosystems (PES) schemes**, especially where commercial or civil society actors apply land use change through the instrument of tenancy contracts. Given the diffusion of land holdings in Europe, land managers and rural enterprises need to be involved in consultations to initiate PES schemes with blended outcomes from the very outset, including implementation and evaluation.

3.4 Key messages from the CoP work

In this section, the common resources created per CoP are converted into key messages linked to ROBUST's four main objectives: rural-urban linkages, smart growth, networked governance and cross-sectoral connections. We summarise key messages that emerge per theme based on the CoP reports (D3.2). Overall, **the CoP resources indicate that rural-urban synergies can best be secured by a shift from economic growth for its own sake towards economic outcomes which at their core enhance sustainability and well-being.** The CoP resources provide important insights into how these objectives can be enabled (see also Section 4).

3.4.1 Rural-urban linkages

Table 11 summarises the **CoP resources as types of outputs** created (using the same list as for the living lab outputs in Table 7) and links them to the rural-urban linkages identified in the living lab analysis. Table 12 then provides a more comprehensive summary of key messages per CoP.

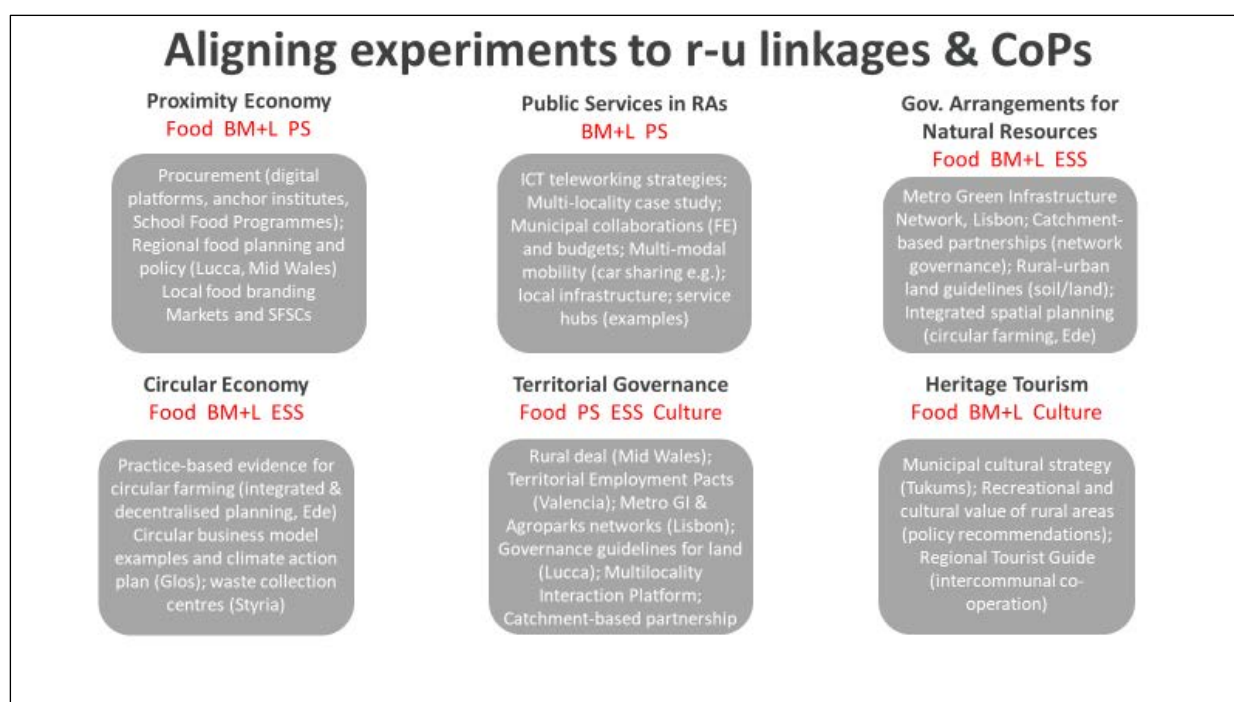
In terms of the learning resources, by far the most common output is the identification and creation of **good practice examples** per theme (Table 11). We can see too that the resources created per theme are designed to strengthen rural-urban linkages in different ways. The Business Models theme covers all rural-urban linkages to some extent, but proximity and circularity are the primary relations. In the other CoPs, the primary rural-urban linkage is more obvious and reflects the content of the CoP. There is a close relationship between the learning resources and types of rural-urban linkage prioritised in Table 11 and the innovations at the living lab level. Figure 8 shows this relationship and the alignment between the living lab experiments, CoP resources and rural-urban linkages. In Figure 8 population flows and mobility is subsumed under the public services theme.

Table 11: CoP resources and rural-urban linkages

CoP	Learning resources & innovation*	Rural-urban linkages	How resources inform r-u synergies
Business Models and Labour Markets (BMLM)	<ul style="list-style-type: none"> • Territorial development strategies^{2, 4} • Multi-level governance³ • New (synergistic) business models⁴ 	Proximity & circular economy Service accessibility & quality Territorial governance Heritage tourism	Territorial strategies avoid sectoral development agglomerations based solely on locational or logistical clusters. Instead, they emphasise territorial growth opportunities, functional connections and interdependencies. Multi-level governance requires integration of local, city, regional and national policy goals. Synergistic business model case studies reveal rural and social well-being flowing from different forms of enterprise.
Cultural Connections (CC)	<ul style="list-style-type: none"> • Cultural festivals as rural-urban connector⁴ • Digital co-ordination of cultural life⁵ • Culture as a marker of regional and local heritage^{1,4} • Valorisation of cultural resources⁵ 	Heritage tourism Proximity economy	Thriving rural culture, linked to dynamic local particularity, can ensure that culture is informed by the best of the past but is responsive to change. Urban migration can help to add new layers (patina) to rural cultural celebration, value and experiences. Digitisation can improve the accessibility of rural collections, enabling integration with regional, national and international collections.
Ecosystems Services (ESS)	<ul style="list-style-type: none"> • Community partnerships³ • Multi-scale planning³ • Mapping and bundling ESS¹ • Payments for ESS⁴ • Circular farming⁴ 	Natural resource management Territorial governance Circular economy	Community partnerships are the basis of multi-level planning, ensuring that citizens inform proposals for territorially connected ESS infrastructure e.g. habitat corridors. Integrating private and public landholders at the design and initiation of new PES will enhance operational success and maintenance. Circular farming directly connects consumers and producers in high-performing functional circuits.
Public Infrastructure and Social Services (PI&SS)	<ul style="list-style-type: none"> • Mobility via public transport⁴ • Digitalisation, broadband coverage and e-services⁴ • Basic infrastructure, social services & cultural networking⁴ • Multi-locality⁴ • Service hubs⁴ • Food infrastructure⁴ 	Service accessibility & quality Population flows / mobility Proximity economy Territorial governance	Municipal collaboration within regions can enhance the integration, efficiency and distribution of essential services such as rural broadband, public transport and cultural services. Service hubs co-locate several social services in one space (such as village halls, libraries or medical centres) and enhance the efficiency of and connection between each service. Their operation in peripheral rural areas represents an effective public infrastructure business model that can efficiently draw upon or make accessible urban-based services in the countryside.
Sustainable Food Systems (SFS)	<ul style="list-style-type: none"> • Municipal food strategies^{3,4} • Sustainability Indicators⁵ • Local branding^{4,5} • Territorial cohesion³ • Public procurement⁴ 	Proximity economy Territorial governance Circular economy Heritage tourism	Municipal strategies capture consumer, social justice and dietary considerations and seek to strengthen the sustainability of regional supply chains. Multi-dimensional sustainability indicators, such as carbon impact, waste efficiency or affordability, can help food purchasers make balanced choices. Local branding is a way to enhance the profitability of local foods while guaranteeing qualities of authenticity. Public procurement (via 'anchor institutes') represents a lever for regional agri-food growth.

* Innovation type: 1. New data and knowledge generation; 2. Strategic visioning; 3. Novel policy development; 4. Good practice examples; 5. Practical tools.

Figure 2: Aligning living lab outputs to CoPs (initial clustering of themes)



Overall, these attempts to cluster the innovations and resources reveal the different strategies emerging in the data to strengthen rural-urban linkages (Table 11 and Figure 2). LLs within the Food, BMLM and PI&SS CoPs identify experiments which seek to stimulate the **proximity economy** via rural and urban links. In the food CoP, for example, local food chain contributions to sustainable rural-urban relations are fostered by **public procurement** and **producer and consumer collective action** enabled through innovative practices and new business models. Strengthening **public services** in rural areas are associated with ideas emerging in PI&SS and BMLM CoPs around how to improve access to services, both physically (e.g. through mobility or the expanded use of existing resources) and virtually (through better rural IT provision for urban-located services). Public services are foundational and essential for other sectors. Multi-modal mobility, service hubs, multi-local living and new working models provide opportunities and are examples of innovative services and governance mechanisms to foster rural-urban synergies. Government arrangements for **natural resources** is a cluster where territorial connectedness and better approaches to planning are important for members of the Food, ESS and BMLM CoPs. The **circular economy** is of interest to ESS, food and BMLM CoPs as a novel strategy to close resource use loops, including rural-urban connections and interdependencies. **Territorial governance** unites four of the five CoPs by linking, for example, rural cultural identity to landscapes, by suggesting nature-based land and water management methods, and advocating strategic rural alternatives to conventional economic growth plans. **Heritage tourism** embraces food, BMLM and cultural themes, through the development of regional cultural strategies, tourism guides and the valorisation of cultural resources.

Other key messages from the CoP reports regarding rural-urban linkages are (see Table 12):

- **The central goal of enhancing and enabling rural-urban functional synergies requires a shift in thinking away from narrow sectoral and growth-prioritising ways of planning territorial development.** The characterisation of synergistic business models reveals that social outcomes are important dimensions of economic and entrepreneurial activity (social business models). The emergence of a less place-based labour force is an important framing of rural-urban

transformation, driven through IT developments (accelerated by COVID), cultural practices or the dynamism of enterprise investment and skills demand.

- **Urbanisation and growth pressures indicate an urgent need to enhance spatial interdependency and mobility , driving a convergence between rural and urban ways of life.** This emerges in positive ways (e.g. shared experiences and enjoyment of rural places and investment in rural transport connectivity) and negative ways (e.g. loss of rural cultural identity, or the over-exploitation of rural assets, heritage collections and landscapes, which stifle cultural dynamism and change).
- **Shared environmental assets and the need to manage environmental resources across spatial and administrative boundaries** is also very evident from the CoP research and is increasingly reinforced by human-led climate change. New spatial arrangements such as river catchments, geological substrates affecting soils, carbon capture possibilities and habitat management remain essential in rural-urban blue and green infrastructure networks, which can be linked variously to enterprise innovations, reformed public subsidy and much better, longer-term environmental monitoring and data analysis.

3.4.2 Growth and smart development

Smart growth is based on what regions can do best (cf. section 4 below). However, **the focus on sectoral growth or renewal has tended to try and revive (or reframe) past industrial specialisations.** IT advancements substantially open up rural areas for enterprise innovation, public services, visitor intelligence and environmental monitoring but rural provision remains uneven, especially in remote areas, which need most support. Cultural connections can stimulate smart development in several ways e.g. by pulling cultural resources and stakeholders together; and using rural assets in smart development projects. **The circular economy has potential for growth but much more needs to be done to support businesses in understanding, planning and innovating in this arena.** Rural spaces remain places of ESS supply, while cities are perceived as ESS consumers. This is a unidirectional and simplistic way of thinking about ESS, which overlooks symbiotic growth opportunities in, for example, environmental processing and management, the leisure economy and highlights the weakness of tools for specifying planning conditions. Market and public incentives are needed to enhance green enterprise innovation. The role of **peri-urban agriculture**, which is close to urban markets and their export channels, has emerged as a potential for SME-based innovation that can underpin green infrastructure, help manage urban sprawl and enhance urban ecosystems. In other contexts peri-urban agriculture also interlink and align different rural markets.

3.4.3 Networked governance

Rural-urban interdependence comes into focus through all CoPs, especially via the ESS lens. ESS present a challenge to cross-boundary environmental management and governance and requires integration into different scales of spatial planning (local, municipal, regional) to capture cross-border reach (catchments, landscapes, shared public benefits). The analysis points to new forms of governance that involve and engage multiple urban and rural actors and stimulate collective action.

In other cases, the leadership of rural-urban governance has been championed by urban networks (in the case of urban food policy councils or networks of sustainable city food systems, for example); in other cases, LEADER Local Action Groups and rural policy/growth networks have taken the lead. In

any case, **the role of public bodies remains vital in leveraging innovation and rural-urban integration and a number of the CoPs (SFS, PI&SS) indicate that municipal collaboration is important.**

In some localities, politically independent regional development agencies facilitate, structure, or join governance networks to promote rural-urban links, using tools such as inter-municipal budgets, the co-ordination and promotion of events and services, or contracts (such as land tenure or service contracts). The key point here is that **public bodies have long-term and locally-embedded interests, and in some cases assets or funding, to help develop functioning governance networks** to secure rural-urban integration, based on shared values around well-being.

3.4.4 Cross-sectoral connections

CoP findings have helped to **complicate the scope and scale of rural-urban synergies, and to illustrate the diversity of rural-urban synergies.** Social outcomes of synergistic business models are notable, as is concern that urban populations do not eclipse and therefore erode the quality of regional rural life by acting as a magnet for goods and services. COVID, among its many impacts, will have public budget implications for many years to come. This indicates that **innovative market-based solutions to rural challenges will be needed** and possible, given the rise in demand in local goods and services, the partial out-migration of IT-connected workers to rural regions and the continued restrictions upon and environmental consequences of international travel, leading to increased domestic tourism demand.

The BMLM and PI&SS CoPs in particular reveal **the benefits of enhanced regional infrastructure which can lead to shared economy outcomes and better quality of life.** There is a need to connect public infrastructure and social services to other thematic issues in order to better plan and implement cross-sectoral usage of infrastructure and services. The Food CoP highlights possibilities for regional SMEs as well as sustainable global imports linked to the large potential demand locked within public sector procurement needs. Ensuring an alignment between supply capacity, regulatory conformity, administrative reliability and nutritional standards will demand a high degree of cross-sectoral planning and collaboration. Food sector innovation investment needs to foster cross-sectoral networks to plan and execute progress at local, regional, national and international scales. The key message from the Sustainable Food CoP is therefore that local food policies can strengthen rural-urban relations but **governance arrangements must be multi-level and cross-sectoral** to enable and strengthen balanced re-territorialisation. In the ESS group, a key argument is that **environmental analysis needs to be undertaken by cross-sectoral alliances** involving landholders, local authorities, scientists and local residents.

Table 12: Key CoP messages in relation to ROBUST's research themes

CoP	Rural-urban links	Cross sectoral connections	Smart growth	Governance
Business Models and Labour Markets (BMLM)	<p>Synergistic BMs are distinguished by:</p> <ul style="list-style-type: none"> • multifunctional, circular and / or shared resource use; • wider societal value creation; • spatially and socially balanced value distribution; and • new organisational forms. 	Synergistic business models are characterised by new partnerships and alliances between four cross-sectoral actors : public, private, civil society & 'for-benefit' orgs. Synergistic BMs use their resources in cross-sectoral ways (e.g. circular resource use), by creating broad societal and business benefits.	COVID stimulated a non-place-based / multi-place labour force . Rural business networks and institutions are vital in planning regional growth. Multi-criteria measures of growth are needed; job attractiveness is one alternative to conventional growth.	Synergistic BMs signify different types of enterprise governance models . Public policies are closely interwoven with synergistic BMs (shared values). Novel methods / statistics are needed to grasp the multi-faceted impacts of contemporary labour market flows.
Cultural Connections	The commodification of rural culture can be negative if the interests of visitors overrides the interests of residents. Poor rural infrastructure is a significant constraint, especially in peripheral areas.	Alliances between municipalities, food and cultural enterprises, tourism operators and cultural associations are critical (shared networks).	Rural areas tend to prioritise tourism re. smart specialisation. The pandemic has challenged this. Inter-communal collaboration important to facilitate digital access to cultural information.	Municipal cultural strategies are a tool for planning inclusive networked governance of cultural assets. Food branding is useful governance for valorising rural gastronomic culture.
Ecosystem Services (ESS)	ESS mapping at multiple scales highlights that ESS values are relative to the scale of analysis (not absolute) and to existing knowledge, governance, cross-border mapping & scalar integration. Spatial planning highlights proximate r-u relations.	Optimising territorial ecological interdependence requires cross-sectoral co-ordination within a territory. A science-policy-practice gap needs to be bridged to foster territorial applications of ESS mapping.	ESS provide substantial economic benefits; incentivisations are needed (both market and public) to enhance green enterprise innovation and positive environmental management.	ESS needs to be fully integrated into different scales of spatial planning to capture the cross-border reach of ESS. New forms of governance are needed that successfully involve and engage multiple urban and rural actors.
Public Infrastructure and Social Services (PI&SS)	The availability of public services is foundational and essential in supporting other opportunities, such as sustainable food systems, that add to synergetic rural-urban relations. Internet access is increasingly vital to this availability.	Public-private and multi-level cooperation is key for creating urban-rural public services. Understanding the circumstances and contexts of good practice in other places is useful & requires cross-sectoral research.	Technological progress can improve the quality of life and the provision of services. Digitalisation can make (remote) rural areas more attractive for people and companies in many areas, as the importance of locality decreases.	Multi-locality remains an emerging aspect in Europe. Understanding in inter-municipal cooperation is not yet pronounced but shows potential. Rural-urban governance networks may be found in rural areas (rather than cities).
Sustainable Food Systems	Public procurement holds potential as a mechanism to strengthen rural and urban links by supporting agro-environmental renewal and the greater inclusion of rural SMEs in public food demand.	Advances in sustainable procurement requires transparent and cross-sectoral brokerage. Cross-sectoral regional initiatives can help overcome narrow pro-local agendas.	IT innovations are important new developments to make substantial public sector markets more accessible than they have been in the past.	Food strategies and food policy councils help support the emergence of new r-u business models. Procurement contracts are important governance tools. Branding to regulate food quality.

4. Rural-urban linkages as five dimensions of foundational economy

In this section, we extend the arguments in the previous sections (living lab and CoP clustering), to identify innovations and governance arrangements that strengthen rural-urban relations and cross-sectoral linkages beyond specific topic domains. We also provide specific examples of innovations and governance arrangements that can potentially strengthen rural-urban relations. We focus in particular on what these data tell us about growth from a rural-urban perspective, using recent thinking from foundational economy to inform this final phase of WP3 synthesis work.

The following points explain why this is important, reflecting on the analysis presented so far. Our first observation relates to **what the data collectively are saying about growth**. There is a number of frameworks and approaches emerging in the literature that critique neoliberal, market-based growth models (e.g., diverse economies (Gibson-Graham, 2008), doughnut economics (Raworth, 2017), circular economies (Allwood and Cullen, 2015), degrowth and post-growth (Jackson, 2017), and foundational economy (Foundational Economy Collective, 2018)). These works represent **a new economic paradigm that views the economy as not just about the market** and the transaction of money for profit making. In our ROBUST data, we see first-hand experiences and examples of these new economic practices. We have data at the lab and CoP levels in relation to rural-urban linkages. Secondly, this material extends ideas developed in WP1, particularly around ‘smart growth’ and ‘smart specialisation’. At face value, we might consider these ideas to be in tension with one another, but when viewed through a governance lens we identify synergies between them, or at least examples, which we see in culture for instance, of ways that **new economic practices enrich smart development**. The third point is how to articulate these new growth practices. In preparing this synthesis, we debated different options and frameworks. We considered, for example, labelling the rural-urban clusters so far developed as different forms of (diverse) ‘economy’ or as ‘transition pathways’ (future perspective). After reflection, we focus on **the foundational economy** and explain below what this means and why it is important as a foundation for rural-urban well-being.¹

4.1 *The foundational economy: a new framework for rural-urban well-being*

Our ROBUST WP3 data evidences **dimensions of foundational economy that foster a more integrated approach to economic development** (i.e. new rural-urban growth models). Using the innovations and key messages above, we have evidence from different places and regions of the emergence of this new paradigm of economic development, in line with foundational economy. This appeals to rural and regional policy stakeholders at the European (Green Deal, etc.) and MS levels, and also aligns with the OECD’s new framework of rural well-being and the geography of opportunities (OECD, 2020)², as well as echoing debates in many national economies at the moment.

¹ A version of the arguments and FE dimensions were also presented in a seminar to the WISERD group (Goodwin-Hawkins, Maye and Keech, 26.1.2021), which includes Michael Woods and Jesse Heley from the ROBUST project. The audience provided helpful comments and feedback, for which we are very grateful.

² This work broadens ‘well-being’ from a purely economic perspective (productivity, income) to include environmental and social dimensions. The report introduces three types of rural places (on a rural-urban continuum): *rural inside functional urban areas* (relatively good accessibility to services); *rural close to cities*

However, OECD (2020) thinking emphasises geography through remoteness and territoriality. Here, in keeping with WP1, **the emphasis is about relations**, including relations across distance.

The Foundational Economy (FE) is a new way of thinking about economy that puts well-being and, in the case of ROBUST, rural-urban welfare (cf. OECD, 2020), at its heart. It is about providing everyday material and providential services (Foundational Economy Collective, 2018). FE is defined as ‘the group of heterogeneous activities delivering goods and services which meet essential citizen needs and provide the infrastructure of everyday life’ (Froud et al., 2020: 319). It emphasises multiple zones of economic activity, with the foundational zone producing essential daily services and social and material infrastructures for life (Foundational Economy Collective, 2018). FE is about social value (essential services) rather than economic performance (low wages, low productivity). The focus is on ‘the social value of services produced by the foundational economy and their contribution to well-being’ (Froud et al., 2020: 318). In other words, FE is a **place-based policy that supports foundational infrastructures**.

Conventional approaches to economy render these FE components ‘invisible’ and, crucially, ‘overlook [FE’s] contribution to development’ (Heslop et al., 2019). Calafati et al. (2019), for example, show how industrial policy is focused on ‘the tradeable zone’, which ignores other ‘mutable zones’ (the overlooked economy, the FE of material and providential essentials, and the core economy of family and community) that play vital roles in supporting well-being. FE can be organised as a **local wealth building model** (via anchor institutes); other related alternative economy ideas relate to **the re-municipalisation of public services**³ and **mutualism and co-operation** for social well-being (Heslop et al., 2019). Business Wales, for example, defines the services and products within the FE as “those basic goods and services on which every citizen relies and which keep us safe, sound and civilized” (<https://businesswales.gov.wales/foundational-economy>; last accessed 19.11.2021). It forms a cornerstone of their Economic Action Plan (EAP) and sets the direction for a broader and more balanced approach to place-based economic development.

This thinking resonates with our ROBUST data presented in Sections 2 and 3. For instance, although not expressed as FE, the concept is prevalent in the food work (linked to public procurement), the new business models theme and the public services theme. On the food side, it is part of a *demand perspective*, in terms of anchor institutes that can procure food from producers in their region. For public services, it is more a *supply perspective*, building service infrastructures to allow flows of goods and people and to enable economic synergies. What is central to ROBUST, and helps to extend the concept in term of the geography of the foundational economy as place-based polity, is our emphasis on rural-urban relations. In short, rural-urban relations realise and strengthen foundations for the well-being of rural and urban regions and residents. We can see this coming into sharp focus through climate change and the need for ecosystem services, as well as sustainable energy, sustainable housing, green infrastructure, and recreation.

(two-way connectivity between cities and rural territories); and *remote rural* (depends on the primary activities of the rural area and comparative advantage).

³ This comes with risks, of course, which are important to consider if municipalities are responsible but lack the financial means to support FE dimensions.

These new dynamics create opportunities that crosscut and link rural and urban areas, but there is also a risk of exploitation. Multi-local living in rural areas becomes the preserve of rich urban residents, for example, particularly if across territories, such as the Finnish case, when feelings of mutuality / interdependencies are more easily lost) and equally needs, risks and opportunities will differ across rural areas, particularly remote rural and remote rural-urban areas which may have less complete foundations for their economy. The question then is to identify, if possible, factors, instruments and governance arrangements that foster synergistic rural urban relations in a region and across regions (i.e. interdependence and synergy at multiple levels).

4.2 *Rural-urban linkages as five dimensions of a foundational economy*

We turn now to reframe our WP3 data as dimensions of a FE, which we argue answer this question and provide inspiring examples for policy. Identifying rural-urban relations and ways to strengthen them is core to ROBUST, so clustering the WP3 findings in this way is important. The seven themes presented so far in Section 2 and 3 emerged inductively from the living lab and CoP experimental work. They provide an excellent baseline but are not starting from the same point (three are broad and thematic; two focus on governance; two focus on forms of economy) (see Table 13).

Table 13: Rural-urban linkage clusters presented at the Graz virtual meeting

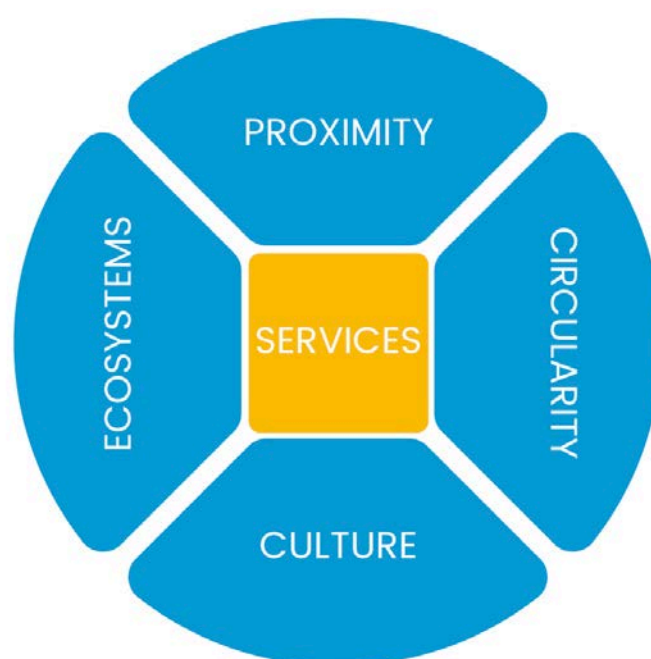
Cluster name	Critique
<ul style="list-style-type: none"> • Service accessibility and quality • Population flows / mobility • Heritage tourism 	The clusters are broad. There is also a risk that Foundational Economy's attention to infrastructure becomes most closely linked to Public Services.
<ul style="list-style-type: none"> • Territorial governance • Governance arrangements for natural resources 	These clusters are already articulated as governance arrangements, pre-empting WP5.
<ul style="list-style-type: none"> • Proximity economy • Circular economy 	These types are good; they represent ways to organise rural-urban links.

Figure 3 relabels and regroups the seven clusters as **five dimensions of a foundational economy**, which are then elaborated in Table 14, with a brief description of each. The dimensions represent different expressions of a foundational economy, **with well-being the overall objective/outcome**. The five dimensions represent foundations for rural-urban welfare and well-being, and interact and enable one another, with business models playing a particularly important transversal role.

In Figure 3, the different dimensions are all important, but **services are the basic essential foundation**, given the intention to put well-being and welfare at the heart of this transition pathway. This is why rural-urban linkages are important, as this can ensure basic services are accessible in rural places (and 'liveable' places) in exchange for contributing to the foundation of urban areas through other dimensions (ecosystems, circularity, etc.). The other four elements work as pairs, with **proximity about strengthening (and shortening) socio-spatial relations and culture about socio-cultural relations**, which reflects the role of culture and for ROBUST heritage in particular. **Ecosystems and circularity are different resource relations to help territories reach climate**

objectives, safeguarding rural assets (land, biodiversity, renewable energy projects, bio and circular economy models), as part of a larger transition to climate neutral economies (cf. OECD, 2020).

Figure 3: Dimensions of the Foundational Economy, with services as the anchor point



In formulating these dimensions, we have drawn on the LL and CoP evidence presented in Sections 2 and 3. It is important to reiterate that these dimensions (different forms of foundational economy) are not mutually exclusive categories. This means that many living lab innovations have characteristics of more than one dimension. Each dimension evidences cross-sectoral linkages and examples of innovation that strengthen rural-urban connections. Table 14, below, describes the focus of each dimension, its attributes and how each is illustrated via living lab innovations and CoP resources.

The five dimensions represent expressions of a move towards a more integrated economy. This notion of integrated economy extends the concept of foundational economy by adding cultural heritage and ecosystem services, with rural-urban linkages about relations rather than a more bounded territorial approach. We have re-organised the clusters as dimensions of foundational economy (as the common object to arrange rural-urban links). In the case of the ecosystem and services dimensions, they combine elements of what was previously a territorial economy cluster.

We provide more elaborated descriptions for each dimension in Table 14 and the sub-sections below, and supported with examples and vignettes using the living lab and CoP synthesis data.

Table 14: Five dimensions of a Foundational Economy

Dimension	Description	Attributes	WP3 examples
Services	Focuses on availability, access to and quality of (social) services (primarily linked to the Public Infrastructures and Social Services COP, but also Business Models and Food Systems)	Accessibility, mobility, municipal cooperation, building public infrastructure	Teleworking, multi-locality living, multi-modal mobility, health care
Proximity	Focuses on reducing the social and / or spatial distance between providers/producers of services / goods and the customers / consumers of these services / goods (links to several CoPs)	Localisation, short chains (spatial and social), collective action, anchor institutes, territorial identity	Public food procurement contracts, direct sales, digital platforms, food plans, territorial branding
Circularity	Focuses on closing loops / cycles and enhancing the circular economy (links to several CoPs)	Closed loops / cycles, resource maximisation, sharing economies	Circular farming, circular waste models, local food economies
Ecosystems	Focuses on topics such as biodiversity, soil, water, landscape, climate change (is primarily related to the Ecosystem Services CoP)	Natural resources, ecosystem services, natural capital, land sparring vs. land sharing	Catchment-based partnerships, ecosystem service payment schemes, multi-scale planning
Culture	Focuses on the role of culture and heritage in strengthening rural-urban relations (primarily linked to the Culture and Food CoPs, but also BMs and ESS).	Culture economy, tourism, valorisation of heritage resources, territorial identity	Municipal cultural strategies, regional branding, gastronomic tourism, Welsh language

4.3 Services dimension

This services dimension contains innovations which emphasise well-being and social connectivity between rural and urban areas. Well-being is evident for example in FRM and Valencia where consideration has been given to the improved social and environmental outcomes of teleworking; in Helsinki there are examples of multi-locational well-being and connectivity; the importance of municipal collaboration and the pooling of budgets in Styria; and foundational economy regeneration in small towns in Carmarthenshire. All these innovations depend, to a greater or less degree, on municipal interaction, collective decision-making, public budget consolidations and partnerships with key private sector and civil society service providers, some of which may be large – such as rail franchise companies, or third sector care providers.

Services – Helsinki

The Helsinki LL team reviewed rural policy and its implementation through a number of rural health, industry, environment civic networks, with a view of finding opportunities to link these to existing and equally well-developed urban policy networks. Public infrastructure and social services are key focus points for Finland's **Rural Policy Council** and its counterpart, the **Urban Policy Committee**. These networks generally do not closely overlap. The rural PCs are active grassroots networks with civil society representation; by contrast the Urban PCs have no civil society members and have '*a stronger foothold in the biggest cities and among top politicians responsible for the economy and industries*' (Helsinki LL report). Synergy of the two policies, rural and urban, is essential for well-functioning regional policy. Rural-urban synergy has long been an issue for the Rural Policy Council, whereas it has never been high on the agenda for the Urban Policy Committee. However, a **new 'Blocks Section' of the Rural PC** has been established with an express remit to bridge the two policy networks. The LL did not generate this new structure, but aided its activity through LL research.

4.4 Proximity dimension

This form of economy is characterised by different types of proximity relations, in terms of shortening spatial and social distance, be that through food, community economies and territorialisation. Anchor institutes are essential to the functioning of the foundational economy and relate especially to this dimension. Anchor institutes use their embedded assets and buying power to achieve certain (social) outcomes from economic transactions, which are governed by contracts. Proximity economy is evidenced via food relations, including living labs with an interest in public food procurement. For instance, Wales (Monmouthshire), Gloucestershire, Ljubljana, Lisbon and, less directly, Tukums, where local branding is a way to territorialise supply chain governance. Lucca is developing an integrated food policy.

Proximity – Municipal food policies (Sustainable Food Systems CoP)

Urban municipal food policies are usually as inclusive, democratic, multi-sectoral and consumer/supply chain focused. By contrast, rural food policies remain nationally set and focused on productivity and competitiveness in the farming industry. An exception is the regional LEADER rural development process. Vertical integration of policies may therefore be harder than horizontal integration of practice. Many municipalities nevertheless have continued to originate food policies from the city and reach out into the adjacent regions. Food policies and their multi-sectoral governance structures thereby span issues of urban access to nutrition and justice for regional farmers whose experience of the non-proximate food chain is disappointing, unprofitable or unsustainable. Furthermore, national and international networks such as the Milan Urban Food Policy Pact provide technical support, for example for enhancing localised public procurement, or build political momentum on national governments to take notice of the commercial, environmental and social potentials of proximate food economies.

4.5 *Circularity dimension*

This dimension focuses on the closing of nutrient cycles and loops, which may be spatially distant and so distinct from proximate relations. The circular economy requires a rethink in terms of market strategies and models that encourage competitiveness in different sectors. This includes changes to consumer behaviour, regulation of production, new avenues for employment, reducing demand for new raw materials and new circular business models.

Circular economy transitions cannot be achieved by single actor governance – it requires collaborative efforts across the supply chain, involving private companies, multiple levels of government, and civil society. Circular farming radically changes the economic functioning of agriculture, for both eco-agri and agri-industrial understandings of the concept. In ROBUST this includes the allocation of land sharing and land sparring as part of a move towards circular farming (Ede). In this case, circularity also emphasises the temporal dimension of resource use, which may impact rural-urban interaction in terms of contrasting circular farming futures.

Circularity – PI&SS CoP rural case studies

The PI&SS CoP gathered a portfolio of rural case studies, which included Akzente Hand:Werk. This is a social enterprise which supports rural women over the age of 50 who have experienced long-term unemployment, back into work. The enterprise also involves media students from the high school on Voralsberg. Together, the women and the students gather remnant, surplus or donated clothing and, after tailoring training, ‘upcycle’ and sell new articles of clothing and accessories. The new tailors also work with other social groups, such as people with dementia, creating new products from surplus fabrics, and enhancing well-being, in this rural area.

4.6 *Ecosystems dimension*

This is about the ecological architecture and functionality of the environment in the pursuit of sustainable environmental resource management. For example, in Gloucestershire, a key measure of flood risk investment is how many homes and businesses can be protected. In Lucca, access to land to kick-start sustainable food enterprise depends on a range of functioning ESS. In FRM, land use zoning is being proposed on the basis of the well-being that outer space can produce, for which new economic models and financial incentives will be needed. The Lisbon lab is developing an integrated approach to governance which aligns business models and food within an ecological capacity / sustainability framework, in order to enhance green infrastructure as a broader matrix of connected territorial environmental networks.

Ecosystems – Lisbon LL

The Lisbon LL set up two working groups (the first of which was concerned with food education). The second working group was concerned with protecting the regional environment by integrating economic growth with environmental capital and capacity. This was pursued by mapping urban and rural green infrastructure, advocating the creation a network of agroparks, and examining opportunities for new business models based on exploiting distinctive regional food and tourism markets. Agroparks are a combined agricultural logistics, processing and distribution system located near to cities. In Lisbon's case, the inclusion of peri-urban farm land enhances the metropolitan region's green infrastructure and ecosystems services.

4.7 *Culture dimension*

Foundational economy advocates identify the disconnection between firm and territory as a form of disconnection between enterprise and the social contexts which shape values. For firms trying to market territorial values / attributes, a reconnection may ensue. This extends early ideas of 'culture economy', which describes how place is valorised based on typical local, cultural and artisanal products and services while at the same time reinforcing a local identity (Ray, 1998). Cultural markers serve as the core on which the story of a place is built e.g. cuisines, languages, crafts, folklore, cultural sites and landscapes, literary and art activities, music festivals. Living lab innovations within the Cultural Connections CoP are important e.g. tourism promotion, market infrastructure and labelling, Tukums; branding, Lucca; Mafra rural tourism network in Lisbon; the Rural New Deal in Mid-Wales; rural tourism and SME business models, Styria.

Rural cultural events – Cultural Connections CoP

Rural cultural events are physically dispersed, can be geared toward niche interests or are less well publicised than urban venue events. **Co-ordinating** rural events can help to avoid duplication of effort and increase publicity impacts, although sensitivity is needed in relation to the established ways of working of local institutions. The Tukums LL-generated cultural strategy is a governance framework within which cultural co-ordination was organised. Rural and urban identities can be distinct and spanning them at regional levels can be challenging. Culture, as a part of identity, needs to be inclusive and shared events can help build connections between rural and urban areas. Supporting networks of joint stakeholders, celebrating local landscapes and bridging distinctive identity and innovative outlooks will help. The Styrian LL is an example where municipal collaboration and a joint network means that rural culture is not overlooked in a city region dominated by Graz. Finally, rural culture can be celebrated as part of the present, not relegated in stereotypical historical interpretations. Frequently, rural landscapes are promoted to urban visitors, while rural culture is not. The latter is linked to absences [of infrastructure or collections] rather than assets. As such, aspects of rural culture need to identified for their innovation potentials, and the quality of their offer must be improved.

5. Monitoring and evaluation of joint learning processes

5.1 Overview of Task 3.4: aim, monitoring and evaluation framework, data collection

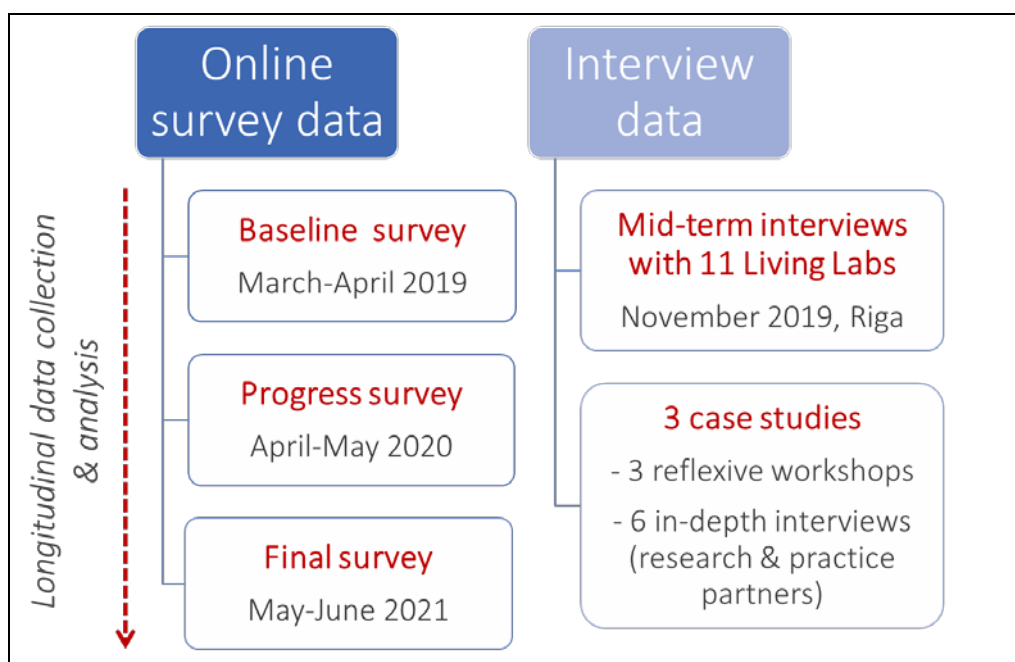
WP3 included a task dedicated to a continuous monitoring and evaluation (M&E) of joint learning processes in the 11 LLs. The aim was to monitor the interaction between research and practice partners, allow adaptive management, facilitate joint learning, as well as to ultimately increase the effectiveness of multi-actor, transdisciplinary collaboration and project impact through the identification of critical factors of successful research design and implementation. To provide a conceptual foundation for Task 3.4, a M&E framework was elaborated to allow monitoring of collaboration in the LLs, to reflect on progress and help identify needs for adjustments and to comprehensively evaluate (based on a series of partners' self-assessment during the project) LL work in ROBUST (Knickel et al., 2019). The framework is structured along four dimensions that matter for assessing the functioning of participatory and TD research processes: *context, approach, process and outcomes*. The four dimensions were operationalised with a total of 44 criteria – each with guiding questions (Table 8 provides an overview of the framework).

Table 15: Overview of the four dimensions of the M&E framework with key criteria and indications

Dimension	Key Issues
Context	<i>Represents the setting in which TD collaboration is taking place</i>
	<ul style="list-style-type: none"> Organizational structure, resources and infrastructure, LL lifespan Real-world context Number and diversity of actors Level of openness Early involvement of key actors, engaged community
	<i>Defines the broad research approach taken and related methodological aspects</i>
	<ul style="list-style-type: none"> Use of a joined learning, action-orientated approach Use of participatory methods and co-creation Use of a systems approach and complementary knowledge Reflexivity, feedback loops and refinement
	<i>Encompasses the way the cooperation is implemented, organised and managed</i>
Process	<ul style="list-style-type: none"> Common vision, genuine inclusion, common language, effective communication Ownership and trust, appreciation and respect Competences, knowledge integration, co-learning and co-creation Leadership, roles and decision-making Team management and conflict resolution
	<i>Subsumes intended and unintended outputs, effects, outcomes and impacts</i>
	<ul style="list-style-type: none"> Relevance, effectiveness, unintended effects and efficiency Dissemination, networking and mobilization of additional support Transformative learning, capacity-building Satisfaction of core constituencies Impact, comparability and transferability of findings, legacy

Using the framework enabled the WP3 leaders to monitor progress made and, at times, indicated the need for necessary adjustments over the course of the project to achieve stated goals. The framework also encouraged self-assessment by the partners in the LLs themselves. Multiple qualitative and semi-quantitative methods were employed to monitor and evaluate LL work in ROBUST (see Figure 4). These included online surveys, reflexive workshops, semi-structured in-depth interviews and continuous participant observation.

Figure 4: Monitoring and Evaluation of joint learning processes in Living Labs



In more detail, evaluation data for the LLs were collected at three levels that represent a progressive deepening in monitoring, reflection and joint learning:

- i. **Three online surveys** – the baseline, the progress and the final – with about a year in between. The three surveys provide longitudinal data for all eleven Living Labs over the 4 years of the ROBUST project. The analysis of these data provides a differentiated picture of the evolution of the TD collaboration in all LLs (i.e. collaboration pathways), and allows to identify possible success factors (as well as the factors that limited a successful cooperation and impact).
- ii. Complementary **semi-structured mid-term interviews** with the key actors from the eleven LLs combined with continuous observation of and participation in project activities. These interviews played a central role in better understanding the challenges faced, the adjustments made over time and the main mechanisms of a more successful collaboration.
- iii. **In-depth studies of three LLs** that aimed at obtaining a deeper understanding of collaboration pathways (i.e. the main challenges faced in the planning and implementation of LL work, the ways to deal with those, and the related co-learning and adjustment). The in-depth studies comprised:

- Reflexive workshops with research and practice partners of each of the three LLs towards the end of the project (March-May 2021). These workshops focussed on LL achievements, experienced difficulties, joint reflection on the results of LL work and drawing out lessons learned for future multi-actor and TD collaborations.
- Six semi-structured in-depth interviews (two interviews in each of the three LLs). These interviews aimed to explore personal experiences, individual perceptions and deepen the results of the reflexive workshops.

As the analysis of the obtained data was evolving, the three levels were informing and reinforcing one another: the findings from the mid-term interviews informed the progress survey; the progress survey informed the selection and focus of the three in-depth case studies; the results from the previous two survey rounds, the mid-term interviews and the in-depth case studies, were used to select and further refine the questions of the final survey run in May 2021; and finally findings from all the above and of final LL reports informed the six interviews in the in-depth case studies.

5.2 *Monitoring and evaluation findings*

In the following key findings from the three surveys – baseline, progress and final – and the longitudinal analysis are presented. These findings are complemented with insights from the interview data collected at different points of the project and the three reflexive workshops.

As indicated above, the underlying idea of Task 3.4 was to support research-practice collaboration and foster co-learning, thereby also ensuring that the way the RIA is implemented is best tailored to the needs of living labs, as well as corresponds well with higher-level project goals. In this sense, the task was not about performance but about improving living lab work as well as generating lessons learned for future projects of similar kind. We were therefore particularly interested in partners' personal views and assessment. To ensure candid responses, engagement was treated confidentially and the living labs are anonymised in this sub-section.

5.2.1 *Key findings from the baseline, progress and final surveys*

Overall, between 54 and 57 responses (4-6 per LL) were recorded for each survey round corresponding with a 56-58% response rate for research partners and 42-44% for practice partners. The professional background of the respondents predominantly fell into social sciences, geography and regional development. As indicated in Figure 4, the baseline survey was carried out in March/April 2019, which coincided with the start of the experimentation phase for most labs (see Section 2.2). At this stage, a high level of expectation was attached to the potential of living labs, following the joint development of the Research and Innovation Agendas (RIAs), and linked to the increased capacity ROBUST offered in meeting RIA objectives. The baseline survey results marked the establishment of research-practice partnerships most often featuring distinct co-leadership (e.g. 39% of respondents referred to joint preparation of the RIA (see Section xx), 40% of respondents pointed to "no single leader in their LL team"). Closely related, about 70% of respondents viewed the blend of different kinds of expertise as very positive in respect of achieving LL goals. Interestingly, the same number of respondents recognised *"the value of [their] own knowledge when ... working*

with the LL colleagues from different disciplinary backgrounds". Nearly 80% of respondents (almost equal for research and practice partners) felt their contribution to the teamwork is valued, which was later found to be one of the critical success factors of the joint LL work. At this rather early stage of actual LL work around 80% of respondents ranked the overall benefit from the collaboration in ROBUST positive.

Besides all the positive signs revealed in the baseline survey, ROBUST partners also voiced some areas of concern. Key issues coming out more and more strongly related to the integration of research and practice knowledge, partners' roles, organisational issues and psychological comfort in the LL team. Illustrative examples of those include the need to better align different interests of partners, to build a shared understanding, and to accommodate both academic and practice partners interests in terms of LL goals and specific research questions to fully benefit from research-practice expertise.

While most of the partners assessed their collaboration as good, 23% rated their functioning as a team only as 'slightly well'. Over 15% of respondents indicated that the partners are able to *"reconcile views and priorities of LL partners to a very limited extent"*. A related and rather striking finding at this point was related to insufficient awareness of what LL colleagues are doing (53% of respondents). This might imply looming organisational issues and insufficient internal communication (e.g. over 50% of partners wished for more frequent meetings, 40% - more feedback rounds and 20% - more openness within the team – all of those primarily from researchers' side). About 50% of respondents referred to a limited influence on decision-making (with around 70% of them being research partners). The need for more feedback and openness can possibly be connected to limited influence on decisions.

Another critical issue identified in the baseline survey was insufficient clarity on partners' roles and expectations, which has later evolved into a significant problem for several LLs leading to delays in achieving LL outcomes as well as partners' frustration.

Concerning potential outcomes, the baseline survey responses illustrated that the planned LL work is expected to contribute significantly to the four main ROBUST goals:

- Improved understanding of functional rural-urban linkages (69% of respondents)
- Identification of opportunities for greater cross-sectoral cooperation and synergies (62%)
- Provision of a set of successful and transferable governance models (41%)
- Formulation of recommendations for more effective policies (65%)

These results were consistent with the responses to questions whether the goals to *enhance cooperation and foster synergies across sectors* and *improve governance arrangements/planning instruments* are central in the LL planned work/RIAs. Though the responses regarding how achievable both goals are, were significantly lower: 68% and 69% respectively rated the goals as not quite achievable. Similarly, the results also showed that respondents felt that the path chosen by the LLs to achieve their goals was not very cost-efficient (63% rated it as 'not at all', 'a little' or 'somewhat'). These results could partially be explained by the early stage of LL work, but needed to be closely monitored through the longitudinal analysis (this also in view of feeding back information into project steering).

Overall, very positive indications as well as first signs of more problematic issues could be identified. Both were brought to partners' attention at the project meeting following the baseline survey with the aim to reflect on and adjust activities and processes where needed. Already at that point it could be seen that about half of the LLs found it difficult to agree on LL goals and jointly map out ways to achieve them, while the other half showed a significant progress in the joint definition of goals and achieving a productive collaboration process. Understanding the related enabling and limiting factors was one of the main goals of the Task 3.4 team.

The progress survey was conducted about a year later in April/May 2020. It included a range of new questions to explore whether planned LL outcomes still seemed feasible and to check how the collaboration between research and practice partners is evolving. Overall, about 65% of respondents noted that the way they function as a research-practice team has significantly affected achieving their LL goals (42.11% rated it as 'A lot' and 22.81% - 'A great deal').

The top three success factors in achieving LL goals identified by research and practice partners were:

- A good fit and complementarity of the competences of the research and practice partner for delivering LL outcomes (67%)
- Regular and effective communication in the LL team (65%)
- The capacity to reconcile the views and priorities of both research and practice partners in the work process (65%)

The top three factors limiting the achievement of LL outcomes were institutional constraints⁴ (63%), other (30%) – meaning both time constraints due to other tasks (especially for practice partners) and politics, and mismatch between political priorities and ROBUST work (25%).

Other newly introduced questions focussed on the collaboration between LLs, the extent local, regional or national stakeholders are aware of LL work, and the stakeholders involved in and supporting LL work. The related data show that most of the collaboration between LLs happens through joint work and exchanges in CoPs (e.g. co-writing reports, discussion papers and/or scientific articles, exchanging experiences and good practices), sometimes via additional meetings beyond CoP and project meetings), whilst part of the respondents referred to the interaction only during project meetings. The progress survey results also demonstrated that in most cases local, regional or national stakeholders are aware of LL work only to a limited extent (65% rated it as 'Somewhat' and 25% as 'Not at all' or 'A little'). As the generally limited stakeholder involvement could affect project impact, project management emphasised its important role during the project meeting.

A new question on the timing of LL work and the connection with potential uptake illustrated that nearly 70% of the respondents believe that the results might influence policy strategising and/or planning. However, the same number of respondents expressed that the potential uptake is not yet clear, while about 20% acknowledged a lack of political interest in LL results at the time.

Compared to the progress survey results, the final survey conducted in May/June 2021 demonstrated a stronger recognition (over 75% of responses – 65% rated it as 'A lot' and 11% - 'A

⁴ As the final survey results recently showed, the respondents predominantly meant limited working hours to dedicate to the project.

great deal') of the connection between the functioning of the research-practice team with its performance, i.e. achievement of joint goals. Related to the latter, only about 17% of respondents assessed that their LL achieved 81-100% in terms of what had initially been planned (unanimously perceived so by the members of only one LL), around 40% of respondents rated it as 61-80% (unanimously perceived so by the members of three LLs) and about 17% rated it at the minimum of 21-40% (unanimously perceived so by the members of three LLs). It should be noted that a significant discrepancy in personal views is observed in at least four LLs. According to the final survey data, the key outputs of LL work in ROBUST are related to improved insights into rural-urban relations, building or enhancing relevant networks, contribution to a regional development plan and policy development.

Most interesting are some changes in the share of respondents referring to different success factors in achieving LL goals:

- The flexibility partners have in adapting plans and processes over the course of the project (72% of responses) has become the top factor in the final survey (from rank 4 in the progress survey). The change points to the importance of mutual learning and adaptation in multi-actor work.
- Regular and effective communication in the LL team remained the second most critically important factor but decreased from about 65% to about 56% of respondents. The change is one indication of the functioning of Task 3.4 in raising awareness and triggering adjustments.
- Competences of the research and practice partner fit well for delivering LL outcomes that used to be the top success factor in the progress survey was rated as third important factor in the final survey having dropped from about 67% to about 54%.

The changes in the weight given to different factors can mean that partners' recognised over time that flexibility in adjusting work plans and processes (and actually adjusting) is more important than a 'good fit' of the research and practice partner competences. This finding also suggests that during project design more attention needs to be paid to the complementarity of competences. Some teams managed over time, and during project implementation, to better deal with limitations. We will see in the longitudinal analysis that outcomes relevant for research, policy and practice can still be achieved if teams remain flexible and are able to learn and adapt collaboration processes. Related to that, the final survey data demonstrated that about 54% of LLs had to significantly re-adjust their work, while about 43% have done that only marginally.

The key limiting factor referred to in the progress survey was 'Institutional constraints' accounting for over 60% of responses. To further understand what issues the partners meant when selecting this answer option, an additional open-ended question was introduced in the final survey. The analysis of the responses point to four key issues:

- i. Mismatch between the implemented LL work and policy cycles and/or political activities and priorities (e.g. elections and changing political mandates; changing policy priorities at local, regional or national levels; political agenda of the local government or municipal administration resulting in a limited interest in project activities; existing internal timelines for formal plans, etc.; no room for stakeholder engagement in formalised planning processes).

- ii. Binding laws and regulations as well as strictly defined responsibilities of a practice partner leaving little room for manoeuvre in certain project activities. One example of that is the practice partner's limited ability to use research inputs for the formal planning procedures: use of data is restricted to a defined scope of data sources.
- iii. Limited impact of project activities as the project timeframe is not sufficient for a sufficient engagement with local or regional actors and creating change. Project discussions might have effects in the longer term and work needs to be continued to have an impact.
- iv. Limited power of a practice partner in delivering impactful results that are in line with project goals. An illustrative example is a mismatch between project goals and the goals pursued by local municipalities and policymakers.

Overall, the final survey elucidated the change in views of the key factors limiting the achievement of living lab goals. The most significant constraint was being able to prioritise the operation of the living lab in relation to other municipal (often statutory) priorities (39% of responses). The other top three limiting factors included 'Realistic LL objectives were formulated rather late', and 'Mismatch in partners' interests' – all with about 32-33% of responses. The fact that limited working hours was referred to as the biggest constraint, is unexpected as project work is supposed to directly benefit practice partners (and not constitute an extra effort). In addition, a significant number of working hours is actually funded by the project. The enabling and limiting factors are further being explored in the three selected case studies.

More changes in progress and final survey results relate to the potential uptake of the LL work and the awareness of different stakeholders about project activities. That the results might influence policy strategizing and/or planning dropped from 67% in the progress survey to 43% in the final survey. At the same time, it is positive that the awareness of local, regional or national stakeholders of the LL work has risen substantially; from 10% to 30% (2% for 'A great deal' and 28% 'A lot'). Local and municipal-level administrations (including development agencies, spatial and territorial planning agencies) (78%), third sector (e.g. associations, CSOs, NGOs, Food councils, voluntary and community groups) (67%), and academic and research institutions (61%) were mentioned as the top three stakeholder groups involved in LL activities. Many of the findings discussed before have been backed by the mid-term interview data collected between baseline and progress surveys.

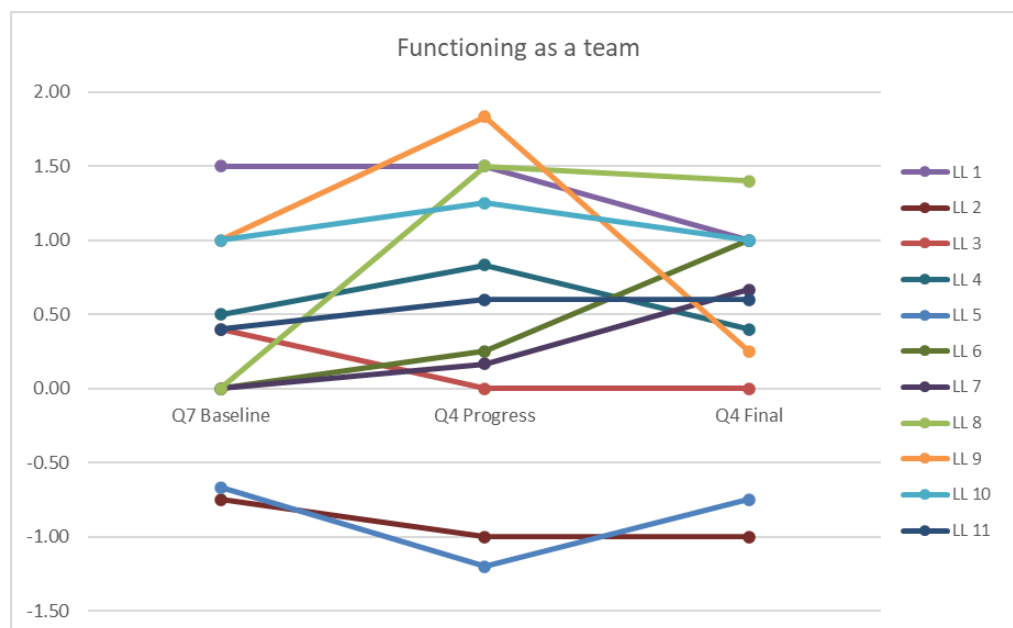
5.2.2 *Longitudinal analysis*

To monitor and evaluate changes over time in the functioning of LLs and identify collaboration pathways for each LL, a longitudinal analysis was carried out. The analysis is based on about one-third of questions that remained the same in the three survey rounds. The values for Likert scale questions in all three surveys were re-coded to capture the mean team view. In the recoding, all respondent's individual views of each LL were included. The re-coded mean values allow to explore changes over time for each LL team. In the following we will focus on perceptions related to the achievement of LL and project goals, the effectiveness of research-practice collaboration, and the overall satisfaction with the joint work over the course of the project. Due to the sensitivity of the issues discussed and examples provided, the names of the LLs are anonymised.

First, all graphs show that the LLs started from different points and that their evolution differed significantly. Based on the evidence obtained, we argue that collaboration pathways reflect the capacity to co-learn and adapt; and that these pathways are more important than the initial entry point. The longitudinal analysis will be deepened, and the following graphs presented in this report will be further elaborated in two forthcoming publications which will focus on interrelations and a more thorough analysis and interpretation of observations. The subsequent discussion provides a first overview of collaboration pathways.

Figure 5 shows changes in the functioning of research-practice teams. The graph illustrates that more than half of the LLs started off their research-practice collaboration positively. Most of them further experienced an improvement in how their collaboration was evolving at the time of the progress survey with a slight decrease (or a steep fall in the case of LL9) towards the end of the project (final survey). The analysis identified two LLs whose collaboration did not start very well: one of them managed to slightly improve it by the end of the project, whilst the joint work of the other remained problematic.

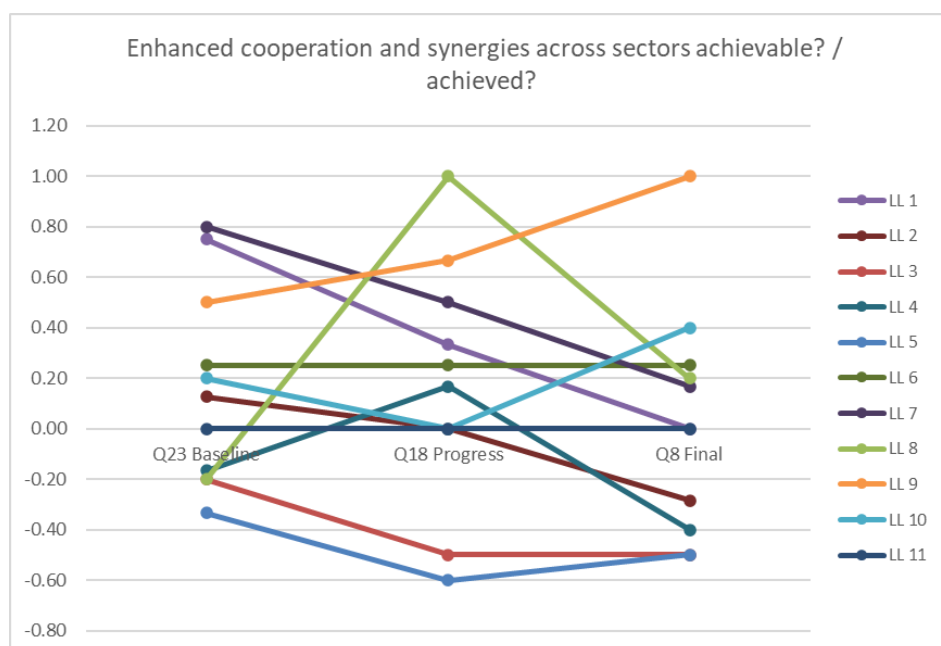
Figure 5: Living labs functioning as a team



Source: Knickel et al., in preparation

In terms of the achievement of the overarching project goal to *enhance cooperation and foster synergies across sectors*, only two LLs managed to achieve significant progress (see Figure 6). The analysis shows either a considerable decline or a rather flat trend for most other LLs. Interestingly, the data on one LL demonstrated a steep rise and subsequent fall related to this question. The related case study data and interviews indicated that this could have been linked to high expectations in the beginning, and a more realistic assessment closer to the end of the project, as well as the disruptive influence of the COVID-19 pandemic. At the same time, two other LLs located at the bottom of the graph showed a downward tendency indicating that co-learning and an effective collaboration has been rather limited.

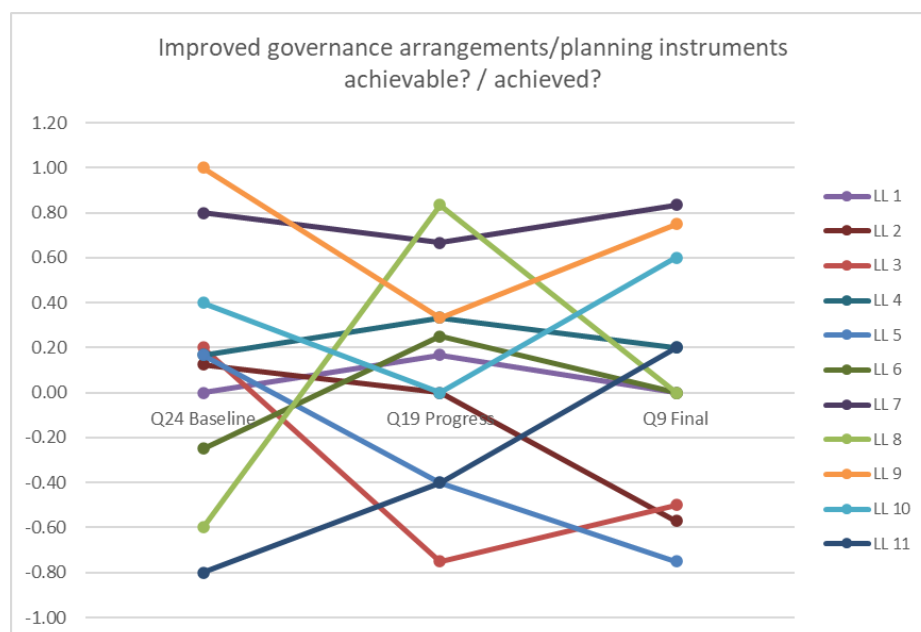
Figure 6: Living labs achieving enhanced co-operation



Source: Knickel et al., in preparation

Concerning the second overarching project goal – improving governance arrangements and planning instruments to better connect rural and urban areas – about half of the LLs in ROBUST demonstrate an upward trend for achieving this goal (Figure 7). Some LLs started in a significantly more favourable position than others, and experienced a downward trend on the way. LL8 experienced a steep increase followed by a sharp drop related to unfulfilled expectations. Moreover, a clear downward tendency is recorded for two other LLs.

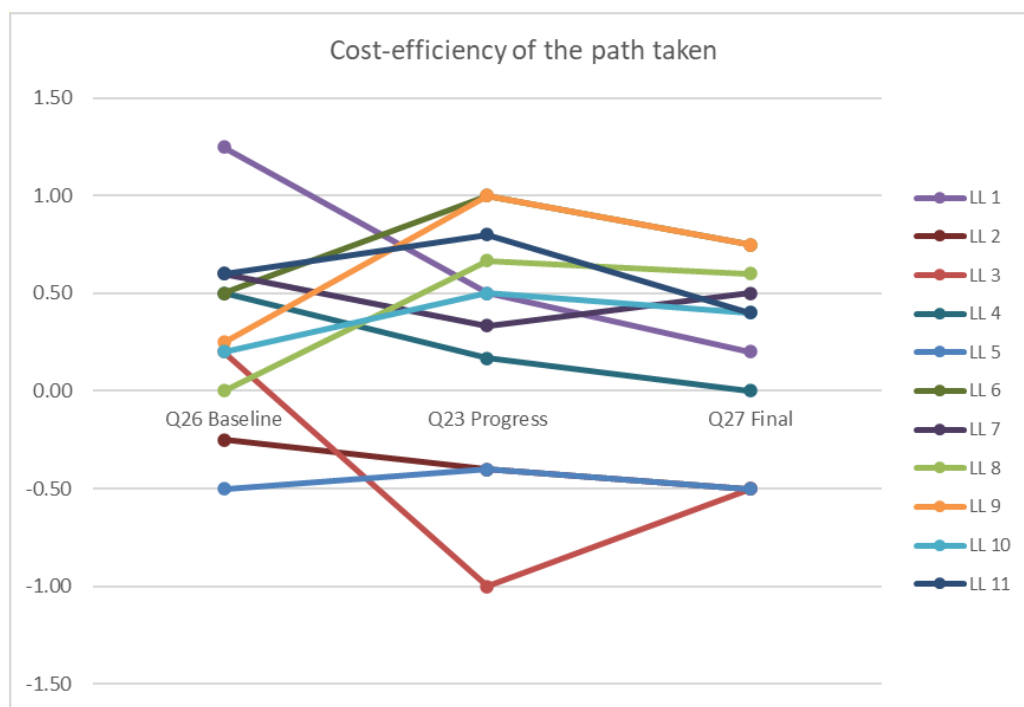
Figure 7: Achievement of improved governance arrangements/planning instruments



Source: Knickel et al., in preparation

An indication of the quality of the LL work is how cost-efficient the joint work was perceived, comparing the expected benefits with the overall effort made (Figure 8). The results provide an interesting entry point for further analyses. A deeper analysis could inform future planning of multi-actor TD projects with tangible and societally relevant aims. In the analysis, six LLs stand out: two LL teams (#2, #5) who always perceived their work as not cost-efficient, two LL teams showing a significant downward trend (#1, #4) and a LL team that had initially assessed their work as not at all cost-efficient – shown by a plummeting trend, which slightly improved by the end of the project (#3).

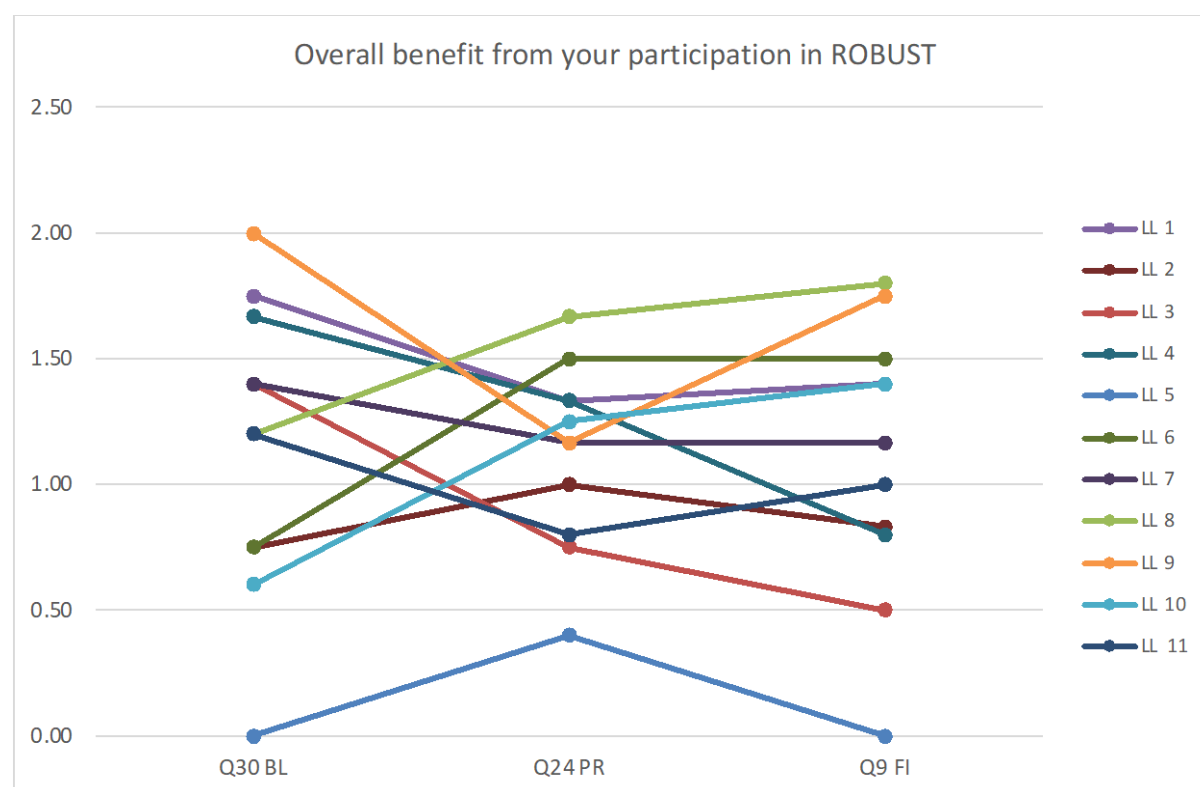
Figure 8: Cost-efficiency of the joint work and path taken



Source: Knickel et al., in preparation

Lastly, partners' perception of the overall benefit from their participation in ROBUST was analysed. The longitudinal analysis illustrated that most LL teams (except one) started very positively, which was however followed by a significant decrease (particularly steep for three LLs; #2, #3, #11). LL5 started and remained low. A more stable and positive trend has been recorded for most LLs towards the end of the project (see Figure 9, which tracks perceived benefit over time).

Figure 9: Overall benefit from the participation in ROBUST



Source: Knickel et al., in preparation

While most respondents seemed to be more sceptical about project outcomes, they consistently emphasised in all three surveys the following main personal benefits obtained from participating in ROBUST: *development of new valuable relationships* (over 70% of respondents), *acquisition of new knowledge* (over 60%), and *opportunity to address an important issue* (over 60%).

In conclusion, collaboration trajectories – upward or downward – is what mattered for the achievement of goals. Learning (and co-learning) and adaptation along the way play a central role in this respect. The analysis demonstrates that not all trends are positive. We believe this can, inter alia, be explained by rather high expectations of the project partners at the start and then becoming more realistic (and often modest) about the outcomes, by the disruptive effect of the pandemic and a limited time span of the project to achieve (and observe) significant (structural) change in policy and practice. Regarding the latter, **continuity is what needs to be secured for multi-actor TD projects to achieve a bigger impact** – ideally through building on the jointly achieved outcomes in subsequent projects and initiatives and through previously established relationships and networks.

5.2.3 Key insights from the complementary interviews and reflexive workshops

Participants from most LL teams emphasised that they value the complementarity of competences and experiences among research and practice partners. The respondents from one LL team explained that each of the partners is experienced in either rural or urban issues and bringing the

two together to explore rural-urban synergies is seen as a real strength. The respondents from another team referred to the highly relevant knowledge of the research partner in combination with the practice partner's long-standing track record of implementing regional, national and European projects as well as a well-developed stakeholder network as their main strengths. Some partners also called themselves 'a natural fit' as a LL team in their joint work in ROBUST (and beyond) – they '*happened to have similar interests and complementary knowledge and competences*'. Respondents emphasised that this makes their joint work and achieving goals much easier.

Multi-actor team dynamics was another aspect that mattered: respondents from nearly half of the LL teams were genuinely excited about the strong LL team they have managed to build over time. A practice partner from one of the LL teams noted how their good cooperation and the related dynamics helped to achieve considerable progress in their work:

'We have got at least two or three really strong outcomes emerging, which could lead to quite significant policy shifts for us. For a practitioner, this is a great outcome for a project. The academic team needs to be congratulated for being receptive to our demands.'

Another important aspect frequently referred to as a key to success is regular, effective and transparent communication.

Along with inspiring experiences, a number of difficulties were revealed in the interviews. Some strategies that were developed to tackle the difficulties are common across teams. A significant number of respondents acknowledged that the uncertainty and evolving nature of the research and policy agenda – which is an inevitable part of TD research – has been very stressful personally, and difficult to communicate to their institutions. Goals were sometimes changed due to the evolving needs of partners and the influence of stakeholders on the joint work. All teams seem to be learning by doing when tackling specific issues. A need to remain flexible and open-minded, and to embrace and respond to changing circumstances, is increasingly recognised as crucial. According to the interviews, such flexibility paid off those teams with unexpected positive impacts in the region and relevant results for practice partners and regional stakeholders.

Another significant challenge experienced by several teams is a mismatch between partners' interests or needs, and competences. For example, in one of the LLs there is a limited interest in a 'rural' component and rural-urban dynamics while 'urban' plays a central role; in two other LLs, one of the partners has either no (or only limited) relevant expertise or no interest to collaborate with the counterpart in a LL on a specific topic. Often, the result is insufficient progress in LL work. Several LL teams hired an external expert or additional expert in the LL team with relevant expertise to complete required tasks to overcome the problem. Others initiated an open discussion of what outcomes are still feasible to achieve within the remaining timeframe and which goals are critical to reach for each of the partners and adjusted planned outcomes on this basis.

The respondents from about half of the LL teams recognised that policy uptake of findings is a crucial step, and that good timing plays a fundamental role for it. A problem is that TD research processes tend to be complex and sometimes unpredictable. A quote illustrates this:

'Integration of research results into policymaking is unpredictable even at the level of local government. Sometimes the results and interesting findings are communicated at a wrong

time while they might be relevant in half a year or more. Sometimes the evidence is instantly relevant, you never know.'

Personal contacts with decision- and/or policymakers in the region, involving them in projects, monitoring policy settings and developments, attending meetings regularly to participate in relevant discussions and timely and effective communication tend to increase chances for policy uptake and positive change.

Respondents from several LLs shared inspiring examples where a policy uptake is very likely. An example is:

'The timing has been great for all of us [in the region]. Various policies like the industrial strategy, the local food strategy, and reviews and planning processes and the 2050 vision have come at a good time. We have really relied on you [practice partner] to inform us about how to make the collaboration policy relevant.'

Based on the experiences in ROBUST to date, a scientific article on the planning and steering of multi-actor TD research projects is currently being elaborated. The suggestions will, for example, include increased flexibility in work programming, time schedules and outputs planning; dedicated tasks to support adaptive management and process facilitation; and introducing a preparatory project phase.

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Despite enormous differences in the socio-cultural and political contexts where the eleven LLs are operating and the different goals that have been formulated for the joint work, some commonalities across the LLs can be identified. These commonalities also help in better understanding the factors underlying the very different collaboration pathways presented in the previous section.

Positive experiences and strengths of LL work:

- Complementarity in competences and interests for research and practice partners
- Strong and engaged teams built over time
- Previous cooperation experience helps
- Regular and effective communication is one key to success
- Relevant and impactful work is an important motivating factor
- Stakeholder engagement tends to be an asset
- Flexibility in goal setting over the course of the project helps
- Timing matters regarding the influence project work has on policies and practices

Main challenges of LL work:

- The evolving nature of LL work and the need to remain flexible and open-minded
- Mismatch between partners' needs and competences
- Practice partners adhere to democratically developed policies. This may present challenges in relation to integrating experimental innovation.
- Innovations, if these are to attract political support, need to be sensitive to prevailing regional political contexts.
- Research partners' ideas are not always realistic (feasible) in given conditions
- Insufficient engagement in joint work

6. Conclusions

6.1 Key messages

A number of key messages emerge from the WP3 work in terms of rural-urban relations, namely:

- The importance of **multilocality living**, new forms of ‘counterurbanisation’ and teleworking
- The importance of **infrastructure and services**, especially for rural areas
- The appetite for new approaches to economy, particularly **economies of well-being**
- The importance of public procurement to lever change through **anchor institutions**
- The role of territorial, or **place-based strategies** (for food, culture, ecosystems), as a governance mechanism
- The role of **municipalities and regional governance** in rural-urban governance and innovation
- The role, influence and need to engage **spatial planners and spatial planning**
- The relationship between different **foundational dimensions in rural-urban relations**
- The relationship between **territorialisation and relations across distance** (i.e. rural urban synergies in a region and across regions), including the relative balance between proximate and more distant rural-urban interactions and interdependencies

Growth is a concept central to European regions. ‘Smart growth’ was the term used, at least initially, to frame the ROBUST project and the aim and objectives to strengthen rural-urban linkages. As we finalise ROBUST in the midst of COP26 climate negotiations and consider future recovery opportunities after Covid, it is tempting to cast aside the growth paradigm as part of national and regional policy discourse. However, the likelihood is that growth will remain important in the years ahead, but usual ways of describing growth (‘productivity’, ‘job growth’, etc.) will become increasingly nested into wider systemic challenges, particularly climate change. We see this now in talk about ‘green recovery’, for example. As captured above in the list of key messages and headline findings from the ROBUST project, the overriding ambition is not so much to entirely abandon the growth narrative but more a desire to build a new approach to regional economy and rural development, which we term **‘economies of well-being’**. This puts strengthening rural-urban synergies and interactions between sectors as key priorities. In our analysis, work from foundational economy was used to articulate these ideas and to reframe and revalue parts of the economy previously undervalued, including infrastructure, public services and ecosystem services, particularly in terms of how they can work in a region to strengthen rural and urban connections.

We observed in the living lab (and CoP) reports several instances where participants challenged models of urban development that prioritise inward investment and assume spillover benefits to rural and urban places from city-region growth deals and allied economic development approaches. This was not the vision shared in ROBUST’s living lab and CoP data, particularly in more remote rural labs (Mid Wales, for example), among others (Gloucestershire, Ede, Lucca, Lisbon, Frankfurt). We also found that it was often **social and ecological issues** (housing provision and climate change in particular) and **mobility issues**, especially the movement of people as a consequence of migration flows (Helsinki in particular) and/or tourism (Mid Wales, Tukums, Styria), that prompted most

debate and priority as forms of rural-urban linkage. The Covid pandemic acted to further highlight and illuminate these rural-urban connections, in some cases revealing a growing sense of divide or unequal access, particularly in terms of digital infrastructure ('digital divide').

This explains why these key issues have emerged so prominently in the ROBUST experimentation and governance work and why well-being has become the guiding principle and core outcome for the project. Approaching rural and regional development through wellbeing makes use of strategies, plans, visions and policies at different levels, which are governance tools to create material outcomes such as infrastructure, to specify economic land uses and operationalise public services. This new model (summarised in Figure 3) means that all dimensions are more consistent and positions them as **forms of foundational economy** as well as different expressions of rural-urban relations and cross-sectoral interactions.

These ideas resonate with **neo-endogenous rural development principles**. The vision for Rural Wales, for example, proposes the use natural and cultural resources within the region, supporting small businesses and entrepreneurship, updating local workforce skills, and retaining income generated locally. These principles reflect engagement with the foundational economy, reframing the significance of the agri-food sector, for example. They align also with smart development, in terms of the strength of a region's economy and valorisation of endogenous resources (embeddedness); the need to achieve the right balance between economic diversification and smart specialisation (relatedness); and the need to improve investment in digital and transport infrastructure and the application of smart technologies (connectivity); priorities in all ROBUST LLs.

Governance – and promising governance innovations - facilitate the resilience of a foundational economy. In this regard, **territorial and networked forms of economy and governance** offer ways to promote foundational economy thinking from the perspective of rural-urban linkages. This can work in at least two ways. The first is an administrative framework of connected and nested municipalities that try to realise strategic rural-urban synergies in a given area. The second is a focus on the articulation of land uses, which should enhance the environmental and social outcomes of the regional economy. We see this through the organisation of a regional economy built on and enhancing ecological foundations (Lisbon); the allocation of development zoning based on well-being considerations (FRM); the organisation of specific multi-locational living, working and connectivity (Helsinki); and the spatial alignment of food production, supply and consumption in and around Lucca.

6.2 The living lab process and implications for future multi-actor projects

This section summarises key learnings from the living lab process, which was at the heart of the ROBUST way of working, and highlights implications for the planning and management of future multi-actor projects (for further elaboration see Knickel et al. 2022, in preparation).

The living lab concept is new to research and practice partners and more time is needed to understand how to plan and implement this form of joint working. This concerns the time and resources that are required, as well as the roles of different LL members, including related

leadership issues, working methods, communication etc. The “rules of the game” need to be negotiated in each LL team. Participants need to understand that a fundamentally different kind of engagement is required, far beyond consultation. Shared leadership was not always the case in our experience and power relations seemed to matter. In ROBUST teams had a relatively tight timescale to work through the envisioning, experimenting, experiencing and evaluating sequence.

The possibility to adapt work schedules, processes and output planning is essential. Most teams had to adapt due to external factors, political sensitivities, etc. Goals needed to be realistic within the given timeframe of the project. That all LLs were obliged to participate in three CoPs, also on reflection seemed to put too much burden and limited the possibilities for a more meaningful engagement. Only a few LL teams referred to significant benefits from the exchanges with other LLs and new ways of fostering cross-LL learning need to be tested.

Logistical issues need to be considered, especially for more remote rural areas, given that collaboration and coproduction are essential for a successful lab and thus require the participation of a wide range of stakeholders. In some cases (e.g. Mid Wales), physically bringing stakeholders together for meetings and workshops was logistically challenging. Moving events online later in the research programme, due to the pandemic, helped increase the diversity of participants.

For most LLs, **the initial phases of gaining a mutual understanding and planning the joint work took much longer than anticipated** (agreeing on goals, focus areas, methods, etc.). This was particularly the case for the more focused innovation projects. Prior work related to the regional issues to be addressed is invaluable in speeding up effective cooperation processes and achieving a bigger impact. It allows more to be achieved in a shorter time because the partners know the context, can assess relevance and feasibility of innovations, can more easily engage with relevant and influential actors to back the work, and establish synergies across sectors and governance levels.

Communicating the goals, principles and functioning of LLs properly to stakeholders and politicians is important. Some teams needed less time to set things up, but other teams spent considerable time figuring out the basis of their collaboration. A sense of urgency of a problem to be addressed by both research and practice partners, as well as local policymakers, administrations and stakeholders, motivates and fosters engagement.

Continuity, the need for a longer duration of multi-actor projects and the legacy of the jointly achieved outcomes is crucial. Ideally the (new) relationships and networks built should be continued. Buy-in and support from policymakers is crucial in this respect. This again reiterates the time it takes to complete living lab work, especially more detailed experimental testing and deepening of ideas. In ROBUST many labs did not get far beyond envisioning and first-stage experimentation. Multi-actor projects of this nature require long-term (e.g. 7-10 years funding and investment).

In some LLs, **success was linked to a combination of policy linkage or the ability to make use of existing networks.** For example, in Gloucestershire the established Regional Flood and Coastal Community established a new sub-group to permanently accommodate the innovations developed in the LL, while also supporting the policies in (LL practice partner) Gloucestershire County Council’s flood risk strategy. Similarly, the Rural Policy Network in Helsinki and the LEADER Action Group in Valencia were both existing arenas where LL work found resonance. Lisbon’s LL was connected to

three of the 10 main commitments in the Portuguese National Programme for Spatial Planning Policy (NPSPP), around payments for ESS, economically and entrepreneurially valuing natural capital, and developing partnerships for safeguarding protected areas through urban-rural partnerships and functions. Regional priorities of the Lisbon 2030 strategy also overlap predominantly with the LL's development. By contrast, the fading of the UK government's commitment to Local Industrial Strategies left no policy 'hook' for Gloucestershire's LL ambitions around BMLM, while the persistent controversies linked to the Dutch national policy on circular farming proved an insurmountable obstacle in Ede. In Mid Wales, because of the limited time and resources, the team worked with existing or planned projects rather than initiating entirely new innovations.

The format of the LLs as co-led and shared between practice and research partners substantially increased the capacity of the practice partner teams. Less tangible, but still very important outcomes of the joint work in LLs, include: raising awareness of particular issues, recognising importance and getting buy-in, mobilising relevant stakeholders and kick-starting new debates at relevant levels. Moreover, the opportunity to obtain a more encompassing perspective and reduce the adverse effects of thinking and acting in silos can be important outcomes.

6.3 Closing remark

To conclude, the synthesis represented in this report provides a rich overview of the processes undertaken at living lab and CoP level, the main innovations and outcomes from the WP3 work and, combining the two datasets, a vision for rural-urban linkages that reframes economic thinking more in line with well-being and foundational economy. Work-packages 4, 5 and 6 further extend and deepen this analysis through consideration of cross-sectoral linkages, governance and policy support, respectively. This work further elaborates foundational economy thinking, including governance arrangements, cross-sectoral connections and policy frameworks that are best placed to strengthen and foster rural-urban relations and synergies for well-being.

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8. Appendices

Appendix 8.1: Living labs in the ROBUST project – overview of the general approach

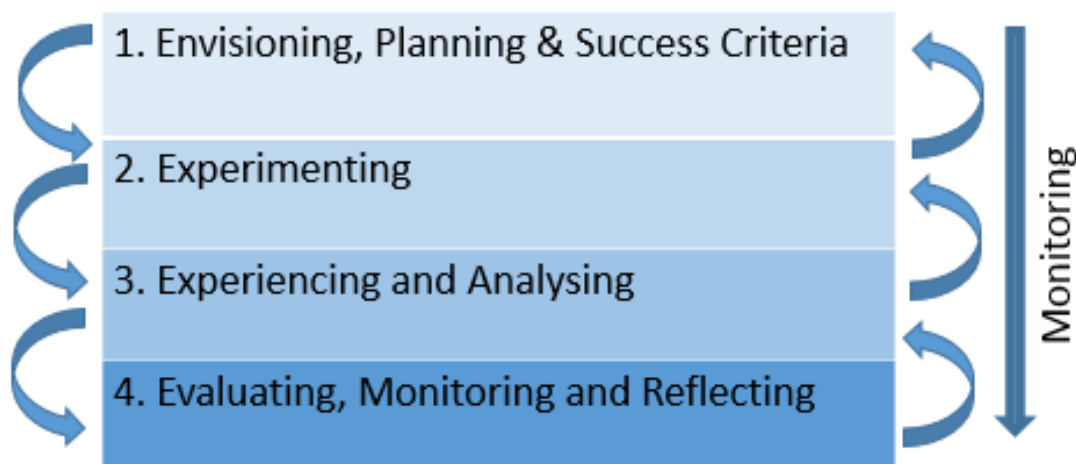
There is no uniform definition of a living lab. Sometimes they are referred as partnerships between public, private and civic actors. Universities typically play an important role. They are also defined as pilot and demonstration projects – this reflects their origin in ICT-based development, where they acted as supportive tools for private actors and industry to commercialise services, products and technologies (Voytenko et al., 2016; cf. Steen and van Bueren, 2017; van Geenhuizen, 2018). Living labs are situated in **real-life contexts** and innovation and the creation of innovative values is implemented by involving actors in a process of **co-creation** and active collaboration (Steen and van Bueren, 2017: 5). Characteristics of urban LLs are summarised in Table 1. External, user-led input, combined with transparent and iterative refinement of experiments, are essential living lab characteristics that can accelerate systemic change. This has lent living labs potential, utility and popularity among governance and social innovators such as city councils, research funders and policymakers seeking multi-actor solutions to complex urban problems.

Table 1: Characteristics of urban living labs (following Voytenko et al., 2016)

Characteristic	Description
Geographical embeddedness	Bounding living labs institutionally and geographically creates spaces that facilitate innovation e.g. via shared or legal agreements. At a pragmatic level, this means territorialising innovation at manageable scales (e.g. community or district). This enables the identification and empowerment of discrete sets of actors to address specific challenges and monitor the effects of their actions.
Experimental learning	ULLs are experimental approaches to governing cities. The overarching challenge is climate change and local policymakers experiment with new techniques of governance. Experimentation in real world conditions and visible spaces can prompt radical change that transforms (urban) governance. Processes of innovation and learning are forms of experimentation: testing new technologies, ideas, solutions and policies.
Participation and user involvement	The quadruple-helix and co-design are key, emphasising participation between government, industry, citizens and researchers to create innovative solutions, with a focus on civic innovation. Participation and co-design should be present at all stages, from identifying stakeholder needs, deciding upon goals and visions, planning and designing, to developing, implementing, evaluating actions and updating ambitions. Interactions must accommodate diverse stakeholder interests and backgrounds.
Leadership and ownership	Clear ULL leadership/ownership is crucial. In some cases, this rests with local government but collaboration rather than leadership is emphasised. This implies an important coordination and management role for ULL effectiveness. ULLs need flexibility for different stakeholders to engage in the lab and its development.
Evaluation and refinement	Evaluation of the actions and impacts of ULL involves feedback on the results and revisiting and refining the goals and visions over time. This aspect is crucial: local autonomy to experiment must come with transparency, openness to external scrutiny and refinement. Evaluation facilitates explicit learning amongst the participants, and the refinement of the goals, visions and methods and alignment with user needs.

The above characteristics are used to inform the design of the LL methodology for ROBUST. Innovation, including experimentalist governance, co-creation and active collaboration in real-life contexts are defining principles. We can apply these principles in ROBUST to enable forms of collective governance and experimentation that, in this case, address rural-urban linkages and smart growth challenges in European regional territories. However, in ROBUST the emphasis is not on urban social innovation, but on how to develop synergistic functional relations between urban, peri-urban and rural areas, both locally and in extended links. To facilitate such an adaptation, a four-stage iterative process was developed (see Figure 1).

Figure 1 - Living lab stages for the ROBUST project



The four stages are outlined below, as principles to set up and run a successful LL.

1. Envisioning, Planning and Identification of Success Criteria

- Identifying stakeholder needs, deciding living lab goals/visions, planning and designing a research and innovation strategy, agreeing evaluation outcomes (i.e. success criteria).
- Participation and co-design is critical (in this stage and throughout the LL process).
- Important to have a leader/owner, but balance is needed to avoid an overly controlling role. This role is often taken on by the research institute/s involved.
- Research institutes help to guide case selection, define visions, and co-design/set up living labs.

2. Experimenting

- In LLs experimentation is about processes of innovation and learning. This can include testing new technologies (traditionally what LLs were about) and ideas/solutions (technical and social) in real world contexts. For example, testing the feasibility of circular economy thinking in Gloucestershire in relation to food waste and procurement contracts, or developing a new approach to territorial planning and de-growth in Frankfurt.
- The objective is to co-produce knowledge and ideas with users; i.e. user-centred experimentation e.g. field visits, focus group meetings, exchange visits.

3. Experiencing and Analysing

- This stage is closely related to the experimenting stage. The idea is that between the user encounters/experimentation stage, teams (led by the research partner) will undertake work that

captures the innovation/s as 'lived experience', collecting and interpreting data linked to the governance experiment.

- This is about deepening the analysis in the case study to further inform the learning/viability of the 'experiment' e.g. interviews with professionals/regulators in waste management regarding circular economy opportunities/bottlenecks for change to the system/regulations; trends analysis; collecting opinions; shadowing regulatory officials.
- Important to also analyse the learning data – so analysing the monitoring data, as well as responding to knowledge gaps identified during experimental visits.

4. Evaluating, Monitoring and Reflecting

- Evaluating the living lab actions and reflecting upon / updating the living lab ambitions and goals. As with all stages, this is participatory and co-produced.
- It is important not to leave the evaluation of learning processes to the end of the research cycle. In other words, monitor and analyse the participatory structures, stakeholders, communication and learning processes through the full LL cycle e.g. collect monitoring data via a short questionnaire at the end of a visit/workshop.
- Important to consider how evaluation can improve living lab activities. Feedback the results and refine visions over time (monitoring data).
- Living labs are more difficult to assess than they appear – having a well-structured monitoring process in place will help overcome this challenge.
- Prepare a final evaluation (using monitoring data and final evaluation data (e.g. longitudinal questionnaires) to report on the bottlenecks and opportunities both in terms of content and the learning process. Consider, as part of this, questions linked to refinement and wider dissemination of the innovation (based on the experiences of the lab).

Appendix 8.2: Living lab profiles

8.2.1 Living Lab Ede (Netherlands)

Key characteristics	Description
Location	Ede municipality, Netherlands
Territorial level ⁵	Local Administrative Unit (LAU) ⁶
Area (km²) ⁷	318
Population density (inhabitants/km)²	364
Population change (%) in last 5 years in % per year (approx. 2015–2020) ⁸	+0.9%
Local context	Intensive agri- and agri-tech growth centre orientated to global markets via a cross-sectoral Food Valley initiative. Protected rural landscapes. Costly homes and land.
Rural-urban characteristics	Predominantly rural. Largely agri-rural landscape with polycentric urban centres, which are home to two-thirds of the 115,000 population.
Practice partner type	Local government
Research partner type	University
Professional background of partners ⁹	Social sciences, Planning, Environmental Sciences
Lead partner ¹⁰	Co-leadership
Priority CoPs ¹¹	Food , ESS, BMLM
Main outputs ¹²	Co-developing concrete practical tools for policy implementation: indicators for current municipal urban food policy dashboarding, indicators for better agricultural ESS delivery through the menu-card approach Co-producing good practice examples: inventory of circular farming topics

⁵ Source: European Commission, 2021, unless indicated otherwise

⁶ Source: <https://ec.europa.eu/eurostat/web/nuts/local-administrative-units>

⁷ The three characteristics “Area”, “Population density” and “Population change” presented in each Living Lab profiles are based on Knickel et al., 2021

⁸ Source: Knickel et al., 2021

⁹ Based on the data from the three surveys run over the course of the ROBUST project

¹⁰ Based on the baseline survey data

¹¹ In the cases where Living Lab work significantly contributed to one or two CoPs, the CoP(s) is highlighted in bold

¹² Based on the synthesis report elaborated by the WP3 team

8.2.2 Living Lab Frankfurt Rhein Main (Germany)

Key characteristics	Description
Location	Frankfurt Rhein Main, Germany
Territorial level	Equivalent to four complete NUTS3 entities plus parts of three other NUTS3 entities.
Area (km²)	2458
Population density (inhabitants/km²)	960
Population change (%) in last 5 years in % per year (approx. 2015–2020)	+1.2%
Local context	Half of all regional jobs are in Frankfurt city, which is growing quickly due to its global and national economic importance.
Rural-urban characteristics	Mixed urban and peri-urban with a large city. Despite the presence of Frankfurt city, the region is polycentric and contains large areas of high quality rural open (outer) space.
Practice partner type	Regional development agency
Research partner type	Consulting firm
Professional background of partners	Planning, Economics, Environmental Sciences, Agricultural Sciences
Lead partner	Practice partner
Priority CoPs	ESS , PI&SS, BMLM
Main outputs	<p>New data: multiple datasets and study reports (e.g. spatial clustering analysis, commuting, statistics)</p> <p>Testing & deliberating novel policy implementation: enhanced regional land use plan</p>

8.2.3 Living Lab Gloucestershire (United Kingdom)

Key characteristics	Description
Location	Gloucestershire County, England, UK
Territorial level	NUTS 3 ¹³
Area (km ²)	3150
Population density (inhabitants/km ²)	239
Population change (%) in last 5 years in % per year (approx. 2015–2020)	+0.9%
Local context	Two-tier municipal system, with planning decisions delegated to second-tier districts.
Rural-urban characteristics	Predominantly rural. Affluent rural county with two adjacent main urban centres. Well-served with transport infrastructure and over 50% of landscape is environmentally designated.
Practice partner type	Local government
Research partner type	University
Professional background of partners	Social sciences, Geography, Economic development, Planning, Flood risk management
Lead partner	Research partner
Priority CoPs	Food, ESS, BMLM
Main outputs	<p>Testing and deliberating novel policy implementation: a new flood management sub-group, agreed drafted wording for the school food contract tender (with dynamic food procurement as an option)</p> <p>Co-producing good practice examples: circular business inventories</p>

¹³ (Eurostat, 2018)

8.2.4 Living Lab Helsinki (Finland)

Key characteristics	Description
Location	Helsinki-Uusimaa Region, Finland
Territorial level	NUTS 3
Area (km ²)	9568
Population density (inhabitants/km ²)	176
Population change (%) in last 5 years in % per year (approx. 2015–2020)	+1.0%
Local context	Rural-urban working patterns, seasonal summer urban-to-rural exodus, and urban-to-urban commuting/enterprise investment (Helsinki-Tallinn).
Rural-urban characteristics	National capital metro-region. The area's population is split roughly 50:50 between Helsinki city and rural Uusimaa.
Practice partner type	Local government
Research partner type	Research institute
Professional background of partners	Social sciences, Geography, Management, Political science
Lead partner	Co-leadership
Priority CoPs	BMLM, ESS, PI & SS
Main outputs	New data on labour mobility, foreign direct investment and multiple locational occupancy; REKO-ring business study

8.2.5 Living Lab Lisbon (Portugal)

Key characteristics	Description
Location	Lisbon Metropolitan Area, Portugal
Territorial level	The living lab covers both NUTS 2 and NUTS 3 territories.
Area (km ²)	3015
Population density (inhabitants/km ²)	944
Population change (%) in last 5 years in % per year (approx. 2015–2020)	+1.3%
Local context	The region of 18 municipalities experiences peri-urban pressures and an unbalanced territorial development pattern, which exerts pressure on high-value natural capital.
Rural-urban characteristics	National capital metro-region. Home to 25% of the national population. Urbanisation pressure linked to rural depopulation and migration.
Practice partner type	Regional development agency
Research partner type	University
Professional background of partners	Geography, Planning, Environmental Sciences
Lead partner	Practice partner / co-leadership
Priority CoPs	BMLM, ESS, PI & SS
Main outputs	<p>Strategic visioning: integrated city-region strategy (territorial plan)</p> <p>Co-developing concrete practical tools for policy implementation: green infrastructure criteria, mapping ecosystem services</p> <p>Testing and deliberating novel policy implementation: AgroParks network, study plan for sustainable food in the curriculum</p> <p>Co-producing good practice examples: ecosystem business models, short food supply chains in procurement</p>

8.2.6 Living Lab Ljubljana (Slovenia)

Key characteristics	Description
Location	Ljubljana Region, Slovenia
Territorial level	NUTS 3 level
Area (km ²)	2334
Population density (inhabitants/km ²)	237
Population change (%) in last 5 years in % per year (approx. 2015–2020)	+0.8%
Local context	25 municipalities make up the region, including those in peripheral rural regions. High consumer preference for local food and regional landscape protection.
Rural-urban characteristics	National capital metro-region. Home to 26% of the Slovene population.
Practice partner type	Regional development agency
Research partner type	Consulting firm
Professional background of partners	Regional development, Environmental Sciences, Management, Planning
Lead partner	Co-leadership
Priority CoPs	BMLM, Food, PI & SS
Main outputs	<p>New data and co-developing concrete practical tools for policy implementation: direct sales mapping, analysis and reports on local food marketplace and public procurement for Ljubljana's food strategy</p> <p>Co-producing good practice examples: short food supply chain examples on how to expand regional food procurement → new practices that enhance regional operations</p>

8.2.7 Living Lab Lucca (Italy)

Key characteristics	Description
Location	Lucca Province, Italy
Territorial level	NUTS 3 level
Area (km ²)	1773
Population density (inhabitants/km ²)	220
Population change (%) in last 5 years in % per year (approx. 2015–2020)	-0.1%
Local context	Second-tier authority of 38 municipalities, including the UNESCO World Heritage city of Lucca. The area is characterised by a distinctive villa-based cultural landscapes
Rural-urban characteristics	Predominantly rural. Lucca province is a varied area of rural landscapes, including coast, mountains and plains.
Practice partner type	Local government
Research partner type	University
Professional background of partners	Economics (e.g. Food and Agricultural Economics), Planning, International relations, Environmental Sciences
Lead partner	Co-leadership / practice partner
Priority CoPs	Culture, ESS , Food
Main outputs	New data: land bank and shared assets data Testing and deliberating novel policy implementation: intermunicipal food policy (joint management model to share functions on food policies), draft Provincial Territorial Coordination Plan

8.2.8 Living Lab Mid-Wales (United Kingdom)

Key characteristics	Description
Location	Mid-Wales, Wales, UK
Territorial level	Mid Wales approximately covers the two NUTS3 regions of Powys and South West Wales ¹⁴ .
Area (km ²)	17,034
Population density (inhabitants/km ²)	60
Population change (%) in last 5 years in % per year (approximately 2015–2020)	-0.2%
Local context	No large-scale urban settlements within the 9 municipalities. The importance of smaller, market towns as employment and service centres is emphasised.
Rural-urban characteristics	Exclusively rural. Faces challenges as a predominantly rural region, including remoteness, limited infrastructure, access to markets and services, and post-Brexit changes.
Practice partner type	Local government
Research partner type	University
Professional background of partners	Geography, Regional development (including rural development), Social sciences, Economics
Lead partner	Research partner
Priority CoPs	Culture, Food, PI&SS
Main outputs	<p>New data for policy implementation: Evidence Report, study on multi-locality seasonal residency, ‘How Local is Local?’ Report as a knowledge input to inform the Monmouthshire County Council’s food policy work</p> <p>Strategic visioning: Rural vision, WLGA Rural Manifesto, Local food planning</p> <p>Testing and deliberating novel policy implementation: local and regional food planning</p>

¹⁴ <https://ec.europa.eu/eurostat/documents/345175/7451602/nuts-map-UK.pdf>

8.2.9 Living Lab Styria (Austria)

Key characteristics	Description
Location	Metropolitan Area Styria, Austria
Territorial level	NUTS 2 level
Area (km ²)	1890
Population density (inhabitants/km ²)	261
Population change (%) in last 5 years in % per year (approx. 2015–2020)	+1.1%
Local context	The metropolitan region of Styria includes 51 municipalities, including Graz, Austria's second city. The region is orientated towards post-industrial hi-tech growth.
Rural-urban characteristics	A polycentric city-region, dominated by Graz. Urban net migration leading to suburbanisation and car-commuter traffic challenges. Public service demands of a growing, affluent population.
Practice partner type	Regional development agency
Research partner type	Research institute
Professional background of partners	Social sciences, Regional development, Geography
Lead partner	Research partner / Co-leadership
Priority CoPs	BMLM, Culture, PI&SS
Main outputs	<p>Testing and deliberating novel policy implementation & co-producing good practice examples: shared multi-modal transport and municipal budget setting examples and best practice reports → new practices that enhance regional operations</p> <p>Co-developing concrete practical tools for policy implementation: online database / regional visitor guide (intercommunal rural-urban cultural networking and tourism promotion)</p>

8.2.10 Living Lab Tukums (Latvia)

Key characteristics	Description
Location	Tukums Municipality, Latvia
Territorial level	Local Administrative Unit (LAU) ¹⁵
Area (km ²)	1195
Population density (inhabitants/km ²)	23
Population change (%) in last 5 years in % per year (approx. 2015–2020)	-1.2%
Local context	Tukums municipality, which is home to a little under 30,000, was created in 2009 and will be merged with adjacent councils in 2021.
Rural-urban characteristics	Predominantly rural. Tukums is largely rural/semi-rural, including some remote and underserved areas, which are experiencing depopulation.
Practice partner type	Local government
Research partner type	Research institute
Professional background of partners	Social sciences, Planning, Regional development
Lead partner	Research partner / co-leadership
Priority CoPs	Culture , Food, PI&SS
Main outputs	<p>Strategic visioning: Tukums cultural strategy</p> <p>New data on Tukums market and public infrastructure</p> <p>Co-developing concrete practical tools & practices for policy implementation: food labels, place branding and local food marketing initiatives</p>

¹⁵ <https://ec.europa.eu/eurostat/web/nuts/local-administrative-units>

8.2.11 Living Lab Valencia (Spain)

Key characteristics	Description
Location	Province of Valencia, Spain
Territorial level	NUTS 3 level
Area (km ²)	10,812
Population density (inhabitants/km ²)	228
Population change (%) in last 5 years in % per year (approx. 2015–2020)	+1.0%
Local context	The region is divided into three distinct industrial/economic regions, namely the coast, the inland plains and the peripheral sierra.
Rural-urban characteristics	Mixed urban and rural with large city. Economic development is uneven and directed towards the coast, causing concerns about rural poverty, depopulation and urban quality of life.
Practice partner type	Non-profit association representing the interests of municipalities and provinces
Research partner type	University
Professional background of partners	Geography, Regional development, Environmental Sciences, Economics, Social sciences
Lead partner	Research partner
Priority CoPs	BMLM, Food, PI&SS
Main outputs	<p>New data for novel policy implementation: recommendations on extension of territorial employment pacts (TEP) into peripheral areas, a study report on school food procurement models and sustainability good practice, recommendations and report on digital service provision, plus also rural transport, cultural resource services, and the rural ATM network</p> <p>Co-producing good practice examples: short food supply chains in procurement</p>


Appendix 8.3: Research and Innovation Agenda, Mid Wales Living Lab (example)

LL name	Mid Wales
LL motto / overarching theme	Polycentric growth without an urban hierarchy
Research aim / question	How can smart development synergising rural and urban resources and opportunities be facilitated and implemented in a predominantly rural region without a large urban centre?
Research Objective 1	To document, examine and strengthen mechanisms for engaging governance actors within and beyond Mid Wales in collectively developing a strategic vision for the region
Research Objective 2 (if applicable)	To examine the extent to which principles of smart development are reflected in economic growth plans and projects in the region and to identify and test opportunities for incorporation
Research Objective 3 (if applicable)	To assess how rural and urban resources are enrolled in smart development initiatives and the added value achieved through rural-urban synergy
What are the innovation/s you are aiming to achieve? e.g. user-centred experimentation, experimentalist forms of governance, innovation activities within / across functions.	
Innovation 1	Using facilitative and participatory techniques to bring regional stakeholders together in articulating a vision for the region.
Innovation 2 (if applicable)	Embedded ethnography in a specific development project to facilitate consolidation of smart development principles, co-production and reflexive engagement.
Innovation 3 (if applicable)	Exploring language as a cultural resource for smart development connecting rural and urban areas
How will you know you have achieved your objective/s? (please suggest indicators and success criteria)	
Innovation 1	Working with the WLGA Rural Forum through workshops and interactions with each of the 9 Local Authorities involved, the Mid Wales team will work with these partners in drawing up a “vision for Rural Wales’ manifesto. This will reflect current challenges and opportunities for service delivery, and with particular reference to public sector actors, perspectives on economic development and the foundational economy. Success for this innovation will be measured in terms of developing a framework for the vision which is both co-produced and designed. Based on preparatory work for this project, a key outcome will be identifying means to translate vision into practise.
Innovation 2 (if applicable)	Linking with the work of the Growing Mid Wales Partnership this will take forward will take forward the focus on co-production outlined in innovation 1. More specifically, the team will consider how ethnography as a technique can be used as a mechanism to explore smart development. This will involve partners exploring how ethnography operates in the ‘workplace’ of policy development, and how ideas

	around smart development in rural-regional contexts can be advanced and shared. Testing this approach and developing effectiveness indicators will be integral to this process. This innovation will necessarily focus on specific case studies, and these might include the Aberystwyth Innovation and Enterprise Campus.
Innovation 3 (if applicable)	This innovation will concentrate on the interconnections between language and economic development strategies. Specifically, it will consider how language can have a direct role in supporting and enhancing the foundational economy, with its basis in everyday politics and culture, as well as broader ambitions for innovation and investment. Success in this innovation will be allied to the identification of benchmarks of success and evaluation frameworks. This will also This innovation will also necessarily focus on specific case studies, and these might include the Arfor economic region in West Wales.
At what geographical scale will you be working?	The sub-national region of Mid Wales / rural Wales, recognising that this is a relational space without commonly agreed fixed boundaries, such that the territories for different projects/initiatives studied through the Living Lab may be different.
How do your innovations relate to functional rural-urban relations?	The innovations map onto initiatives that are concerning with rural-urban relations at two levels. Innovation 1 in particular will be concerned with envisioning relations between small towns and rural communities within Mid Wales / rural Wales, but also the interactions of actors in this space with supra-local initiatives, institutions and structures, including city deals in south Wales, and the growth deal in north Wales. With Innovation 2 also focused on a specific project within the Mid Wales Growth Deal that also requires planning around this question, it will also be important to reflect on the role of key 'transformational' projects as part of this agenda, as well as prospect for inclusive growth. Innovation 2 and Innovation 3 also concern projects that connect sites in rural Wales with urban locations outside the region - for example as potential markets, or as sources of knowledge, technology or investment capital – and here it will be important to reflect on those modes and directions of communication, and agenda-setting capacities.
How do your innovations relate to governance arrangements?	Innovation 1 and the overall steering of the Living Lab are linked to the Rural Forum meeting of leaders of county councils in rural Wales and thus to the established local government system. Innovation 2 is linked to the Growing Mid Wales Partnership, an initiative established by the UK Government and managed by a cross-sectoral partnership. Innovation 3 is linked to Arfor, a Welsh Government initiative also managed by a cross-sectoral partnership. More broadly, the work of the Mid Wales team will also necessarily consider the relations between the institutional case studies and a range of other actors and institutions they are working with. These include those operating at the national, UK and EU level, as well as more local bodies and interest groups.
Methods and Evaluation Pathway (please describe the proposed methods to be used for each stage of the living lab, including methods to monitor and evaluate outcomes)	
LL stage	Methods
Envisioning	Discussion at Rural Forum meetings; 2 x Regional Workshops using techniques such as joint visioning or scenario building, concept mapping and systems mapping.

Experimenting	Action research, being orientated around active reflection upon direct practice and focusing on the effectiveness and appropriateness of approaches to governance. This approach will be applied across studied projects, recorded and analysed through ethnographic observation, interviews and focus groups.							
Experiencing & Analysing	Embedded ethnography in WLGA and WLGA Rural Forum, gathering perspectives through reflection, interviews and focus groups during the research process.							
Evaluating, Monitoring & Reflecting	Post intervention review, analysis of fieldwork notes and interviews with key participants and focus groups.							
How will user participation be enabled in your work (i.e. co-creation)?								
The project has been introduced to the WLGA's Rural Forum, with members proposing suggestions for themes, objectives and case studies. As specific projects are identified for study, key participants will be engaged not only to approve their involvement but also to identify interests and objectives that could be incorporated into the study.								
How will the living lab be co-ordinated and managed? i.e. co-ordination, collaboration, leadership								
The Living Lab will be managed jointly by AU and the WLGA, with Bryonny Goodwin-Hawkins, Carwyn Jones Evans and Jesse Heley responsible for routine coordination and Michael Woods for overall leadership. The WLGA Rural Forum will act as a steering/advisory group. Individual projects studied through the research will have their own independent management structures, with which the LL will cooperate and collaborate.								
What information / resources do you already have that you can use for the LL?								
Access to the WLGA Rural Forum, inclusive of contacts and a range of policy documents and evaluations connected to key projects and potential case studies.								
What information / resources will you need for the LL?								
These needs will emerge in line with the project case studies.								
Please provide a timetable / Gantt chart for your LL research plan / planned activities								
Stage	Time (months)							
	1 – 3	4 - 6	7 - 9	10 -12	13 -15	16-19	19- 22	22+
Envisioning								
Experimenting								
Experience								
Evaluation								

Appendix 8.4: Research and Innovation Agenda, Ecosystem Services (example)

 Community of Practice on Ecosystem Services (ESS)	
CoP coordinator and members	<p>Coordinator: IST</p> <p>Members (motto and research objectives and innovation related to ESS)</p> <p>1. Ede Municipality <u>LL motto:</u> Further developing and integrating Ede's municipal food, environmental and spatial planning policies, by formulating goals and distinguishing key indicators for monitoring its agri-food system and natural capital. <u>Research objective 2:</u> Better insights into the opportunities / limitations of integrative municipal spatial planning through the inclusion of Eco-System Service Delivery in ongoing menu card approach as part of National Environment and Planning Act implementation. This novel municipal policy instrument aspires to contribute to more tailor-made, participatory and integrative spatial planning procedures and approaches. <u>Innovation 2:</u> A more participatory, inclusive and integrative municipal spatial planning with special attention for the inclusion of rural eco-system delivery.</p> <p>2. Gloucestershire County <u>LL motto:</u> To assess the potential and feasibility of circular economy (CE) and natural capital (NC) growth models in the county and their potential for synergies and improved urban-rural linkages. <u>Research objective 2:</u> In the ESS theme, the objective is to explore the potential for circularity within integrated water resources management and links with the NC agenda in terms of new institutional arrangements to provide ecosystem services in Gloucestershire. <u>Innovation 2 (ESS):</u> Experiment with more integrated approaches to water resource management in Gloucestershire, including new public/private arrangements, and foregrounding the opportunities of NE to respond to climate change, economic development and land use planning. Focal point: Experimental governance.</p> <p>3. Frankfurt/Rhine-Main Region <u>LL motto:</u> Transitioning from quantitative growth and expansion, to qualitative growth and quality of life: the role of regional land use planning. <u>Research question:</u> Is the supply of ecosystem services in the Outer Space able to meet the demand from the population in the existing and potentially built-up areas? <u>Research objective 2:</u> Localization, measurement and evaluation of ecosystem services that are provided by the Outer Space as our natural basis for life (natural capital). → qualitative and quantitative assessment <u>Innovation 2:</u> Not only qualitative but also quantitative assessment of the Outer Space and ecosystem services.</p>

	<p>4. City of Helsinki and Luke (Finland) <u>LL motto:</u> “Developing resilient rural-urban solutions that enable knowledge networks and multiple locations for life, work and entrepreneurship across the border of Finland (Helsinki) and Estonia (Tallinn)”. <u>Research objective 3:</u> to determine how ecosystem services can be better accounted for in the land use and building planning system in the Helsinki-Uusimaa region.</p> <p>5. Lucca Rural-Urban Connections Lab <u>LL motto:</u> Developing a local food policy and a territorial plan to reduce urban sprawl, steer synergies between the city and the countryside, and valorise cultural heritage, landscape and territory. <u>Research objective 2:</u> Identify how territorial planning can contribute to promoting multifunctional and sustainable agriculture and food systems in peri-urban areas, restricting urban sprawl, protecting the environment and landscape.</p> <p>6. Lisbon Metropolitan Area (LMA) <u>LL motto:</u> “Territorial cohesion from within: bridging metropolitan communities and economies for improved urban-rural synergies”. <u>Research objective 1:</u> Investigate solutions that enhance ESS in spatial planning for sustainable land use.</p>
<p><u>Developing joint enterprise.</u> Summarise the procedures for and scoping of common goals / issues the CoP will collectively work on, the common learning and matching themes so far identified and the agreed aim/ambitions of the CoP (This work should be complete after two project meetings).</p>	
<p>Entry point: Strategic approaches to integrate ESS in spatial planning associating ESS use and delivery to planning instruments and governance models at multiple scales, to explore the role of ESS in enhancing rural-urban synergies.</p> <p>Use policy and planning instruments, market instruments, governance models, and science and technology to recognize and value ecosystem services (ESS) in a socio-ecological system (SES) taking into account the synergies and conflicts (e.g. Urban pressure and formal and informal open space) that exist in the territory, ensuring the coherence of multi/scales, /actors, and /sectors.</p> <p>The starting point is the model established with all LL in the Lisbon CoP ESS meeting, confirmed and further detailed in Ljubljana CoP ESS meeting as the basis for research, and further refined as a proposed final conceptual model as further described.</p> <p>The conceptual model recognizes the six dimensions that, particularly in the context of rural-urban synergies, express the main concerns of the different LL in addressing ESS towards objectives of resilience and social well-being, in the context of alternative practices and policies integrated goals (Figure 1).</p>	

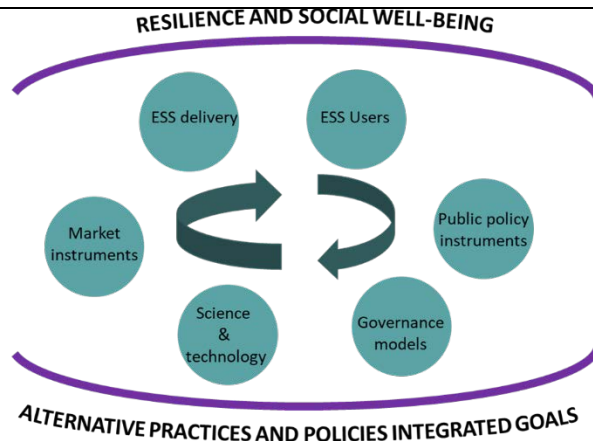


Figure 1 CoP ESS – Conceptual model

This conceptual model can be better explained by a dynamic framework in the form of a multiple loop approach (Figure 2). In SES the dialogue between social (users) and ecological systems (services delivered) can be expressed through the ESS. However, ESS is closely dependent on the respective socio-ecological systems (SES), its social well-being objectives and the inherent resilience. In a second loop, through the use of appropriate tools, including policy and planning instruments, market instruments, governance models and science and technological tools, users can influence the socio-ecological systems and its objectives, and consequently ESS outcomes. Placing it into a wider picture – the third loop – desired SES are also dependent on the societal values promoted by users, directly or indirectly, through the adoption of alternative practices and integrated goals.

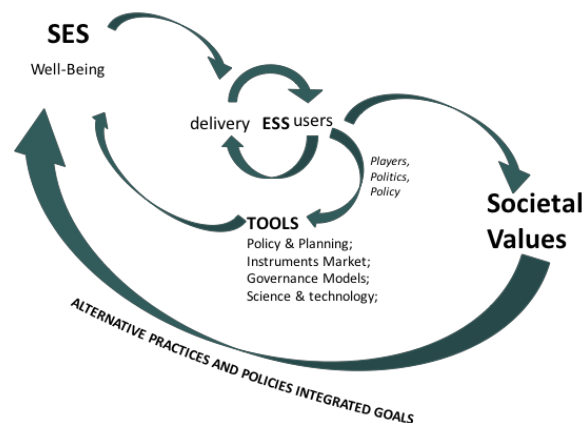


Figure 2 CoP ESS - Conceptual model multiple loop approach

This model can be materialized, for the purpose of exploring rural-urban linkages and synergies, with the following research questions:

ESS users:

- Who are the actors or key players using ESS to enable rural-urban linkages/synergies?
- Who benefits from ESS (directly or indirectly) in case of rural-urban linkages/synergies?

- What are their roles? (e.g. government responsables, producers, inhabitants, students/researchers)

ESS delivery:

- Which ecosystems deliver which ESS that play a role in rural-urban linkages/synergies??
- How can such ESS be mapped? (e.g. matrix approach; monetary valuation; Participatory GIS; Social-cultural value)

SES:

- What are the main relationships, and dependencies, between social and ecological systems relevant in rural-urban linkages/synergies?
- What conditions may stimulate, or threaten, such a balanced SES?

Tools:

- What kind of tools may enable the enhancement of SES in term of its resilience and contribution to social-well being in case of rural-urban linkages/synergies?

Values:

- What are the core societal values associated to the identified users when enabling rural-urban linkages/synergies?

Developing mutual engagement. How will the CoP communicate/share learning? Describe agreed plans to communicate as a group; provide a timeline of activities (face-to-face and virtual meetings)

1. Share knowledge

- Case-initiatives: Inspiring examples on ESS delivery (using template);
- Bi and Tri (multi) lateral exchanges (within the budget available);
- CoP repertoire (tools, knowledge, concepts, etc. illustrated with short case studies for dissemination) (Annex 1);
- Articles (connected with Science discussion) – e.g. CoP methodological approach; outcomes and good practices; case initiatives; mapping ESS; community for biodiversity; etc. – by matching groups.

2. Face to face meetings

- Project meetings (May2019; Oct2019);
- Conference session organization related to ESS. Engage other CoP partners in the organization of the session, also to ensure that both academic and practice partners are in line with the proposed session scope.

3. Virtual meetings

- Internal Communication: shared point; skype meetings; adobe connect;
- Periodic update CoP work on LL (related with WP7, using template).

4. Core matching themes

- Core Matching themes for CoP ESS were further developed at the Helsinki meeting as five ways of looking into how ESS plays a role in rural-urban linkages / synergies, and replace the original matching themes matrix, as follows:

Core Themes in CoP ESS

Mapping and Bundling ESS supply and demand

Lead: Uni Pisa

Contributing: IST+LUKE+PRAC

Multi-scale planning

Lead: IST

Contributing: WU+Uni Pisa+LUKE+PRAC

Circular Farming

Lead: WU

Contributing: Glos

Alternative payment/compensation schemes

Lead: Glos

Contributing: IST+WU+Uni Pisa

Community Partnerships

Lead: Uni Pisa

Contributing: IST+Glos+WU

Developing shared repertoire. What resources will be needed to create a shared repertoire? Methods to be employed for sharing research. For example, the development of evidence papers, creating a resource library, the drafting/agreement of joint meeting minutes ...

Resources considered basic for mapping ESS:

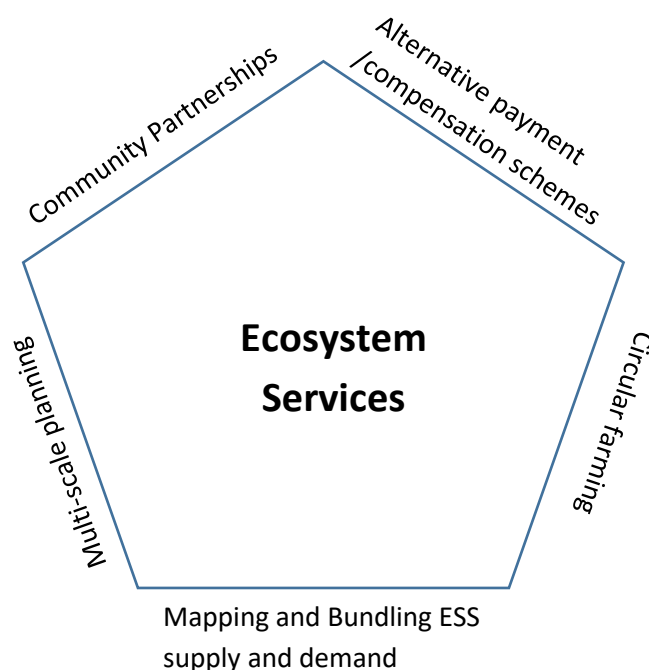
- Land use / cover map (CLC and other scales).

Communications between members:

- Use of Adobe Connect to improve connection and communication between members.

Common five core themes for analysis and comparison

- Represent five ways of looking into how ESS plays a role in rural-urban linkages / synergies



Evidencing learning and assessment. How will learning be monitored in the CoP? What methods will you use and when will learning be monitored? What methods will you use for knowledge exchange/brokerage?

Will learning experiences be shared within the group? E.g. discuss the effectiveness of the CoP at a face-to-face meeting and modify plans, if necessary.

Monitoring:

- Newsletter with updates on CoP work (2);
- Sharing good practices and discussions held through face-to-face meetings (meetings, conference);
- Questionnaires on the effectiveness of CoP development;
- Monitoring assessment and reflection.

Knowledge exchange/brokerage:

- Sharing good practices and discussions held through face-to-face meetings (meetings, conference – Hannover, October 2019);
- Scientific papers;
- List of relevant publications on CoP theme;
- Science shop.

Sharing experiences:

- Webinars (one for each LL focusing on their repertoire);
- Science shop.

How does the CoP work inform ROBUST re functional rural-urban relations? Key theme/s explored; common indicators to develop/test, etc.

The proposed CoP ESS model aims to set a framework that will enhance the value of ESS in the context of the concept model established in WP1, structured in new localities, smart development and network governance, with ESS value transversal to these components. The CoP ESS can contribute to ROBUST re functional rural-urban relations, through the WP1 model, in the following way:

New localities – In the adopted CoP ESS concept model, ESS driven development can generate new localities engaging socio-ecological systems relational space and networks associated to the creation of new values, perceptions and identities.

This may be achieved through:

- Understand the planning system with a focus on its Outer Space exploring how urban and rural features co-exist, overlap and compete;
- Inclusion of functional relations between urban and rural areas in the agendas of rural networks operating in the territory;
- Creating a « relational space » where it is possible to emphasise the multifunctional potential of rural, peri-urban and intra-urban areas.

Smart development - The adopted CoP ESS concept model highlights policy, market, governance and sciences & technology tools to engage the enhancement of socio-ecological systems.

This may be achieved through:

- Review of policy processes, some of which include new governance arrangements;
- Provide actors with the (statistical and GIS) information needed to make more informed plans and decisions, and commit actors to this cooperation.

Network governance - The adopted CoP ESS concept model builds upon collaborative arrangement with a cognitive reconfiguration of the territory to match ecosystem boundaries.

This may be achieved through:

<ul style="list-style-type: none"> • Working on rural-urban synergy building at a lower administrative level and by novel types of public-private partnerships; • More participatory and integrative municipal spatial planning procedures; • Co-creating a new experimentalist rural-urban governance space. <p>Indicators will be co-created throughout the development of the project.</p>
<p>How does the CoP work inform ROBUST re governance arrangements? Key theme/s explored; common indicators to develop/test, etc.</p>
<p>CoP ESS will inform WP5 contributing with top-down and bottom-up governance arrangements. In bottom-up approaches exploring local organizations, individual / community self-governance, smart connections (e.g. through fair trade) and inclusiveness. In top-down approaches addressing how regulation and support ESS require policies and regulatory arrangements.</p> <p>Indicators will be co-created throughout the development of the project.</p>
<p>How does the CoP work inform ROBUST re new growth models? Key theme/s explored; common indicators to develop/test, etc.</p>
<p>CoP ESS will inform WP5 ROBUST new growth models by highlighting how smart development generated by ESS can contribute to new growth, linked to smart connections, such as fair trade.</p> <p>Indicators:</p> <ul style="list-style-type: none"> • Improved management for specific surface area of land, important for ESS; • Proportion of important sites for terrestrial and freshwater biodiversity that are covered; by protected areas, by ecosystem; • Contribution of land use change and reduce of urban sprawl. <p>Further indicators will be co-created throughout the development of the project.</p>